

BASIC ASSESSMENT REPORT FOR THE DEVELOPMENT OF KUSILE TRUCK STOP ON PART OF PORTION 83 (A PORTION OF PORTION 20) OF THE FARM EENZAAMHEID 534 JR

MDARDLEA Reference Number: Pending

FOR PUBLIC REVIEW

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1 INTRODUCTION

Prism Environmental Management Services [hereinafter referred to as Prism EMS] was appointed by Chapmans View Properties (Pty) Ltd [hereinafter referred to as Chapmans View], as the independent Environmental Assessment Practitioner (EAP), to undertake the environmental authorisation application and basic impact assessment process for a proposed Kusile Truck Stop on Portion 83 (a portion of Portion 20) of the Farm Eenzaamheid 534 JR [hereinafter referred to as 'the study area'], at Balmoral, within the Emalahleni Local Municipality and Mpumalanga Province.

An authorisation for a similar activity on the same property has been granted by the Mpumalanga Department of Economic Development, Environment and Tourism in 2011. Reference number: 17/2/3 N-1 to Kego Mining (Pty) Ltd. The environmental authorisation lapsed in 2013. The authorised activity has not commenced and therefore, the Applicant, who is now also the landowner, is applying again for environmental authorisation.

1.1 Process to date

1.1.1 Initial registration

An Interested and Affected Party (I&AP) database was compiled and included adjacent landowners, businesses and authorities. I&APs were provided with 30 days to register as an I&AP (from 23 March 2018 – 23 April 2018). An advert was also placed in the “Witbank News” newspaper on 23 March 2018. In addition, site notices were placed at the boundary of and close to the study area. All comments received were added to the Comments and Responses Report (refer to Appendix 7.10).

1.1.2 Application

An application for Environmental Authorisation was lodged with the competent authority on the 04 July 2018.

1.1.3 Basic Assessment Report

A Basic Assessment Report was compiled in line with the requirements contained in Appendix 1 of the EIA Regulations, 2014 promulgated under the National Environmental Management Act, 1998 (Act No. 107 of 1998), as amended. The Basic Assessment Report is available for public review between **04 July 2018 and 04 August 2018**. All comments received will be considered in the Final Basic Impact Assessment Report to be submitted to the Competent Authority i.e. the Mpumalanga Department of Agriculture, Rural Development, Land and Environmental Affairs (MDARDLEA).

1.2 Basic Assessment Report Requirements and Outline

According to Appendix 1 Environmental Impact Assessment Regulations, 2014 [as amended] (EIA Regulations) promulgated under the National Environmental Management Act, 1998 (Act No. 107 of 1998)

[as amended] (NEMA), the environmental outcomes, impacts and residual risks of the proposed activity must be set out in the basic assessment report.

The objective of the basic assessment process is to, through a consultative process-

- (a) Determine the policy and legislative context within which the proposed activity is located and how the activity complies with and responds to the policy and legislative context;*
- (b) Identify the alternatives considered, including the activity, location, and technology alternatives;*
- (c) Describe the need and desirability of the proposed alternatives;*
- (d) Through the undertaking of an impact and risk assessment process, inclusive of cumulative impacts, which focused on determining the geographical, physical, biological, social, economic, heritage, and cultural sensitivity of the sites and locations within sites and the risk of impact of the proposed activity and technology alternatives on these aspects to determine-*
 - (i) The nature, significance, consequence, extent, duration, and probability of the impacts occurring to; and*
 - (ii) The degree to which these impacts-*
 - (aa) can be reversed;*
 - (bb) May cause irreplaceable loss of resources; and*
 - (cc) Can be avoided, managed or mitigated; and*
- (e) Through a ranking of the site sensitivities and possible impacts the activity and technology alternatives will impose on the sites and location identified through the life of the activity to-*
 - (i) Identify and motivate a preferred site, activity and technology alternative;*
 - (ii) Identify suitable measures to avoid, manage or mitigate identified impacts; and*
 - (iii) Identify residual risks that need to be managed and monitored.*

The format of the Basic Assessment Report has been aligned with the requirements contained in Appendix 1 of the EIA Regulations. The required report contents and how it is structured in this report is indicated in Table 1.

Table 1: Required contents of the scoping report

Appendix 1 of the EIA Regulations, 2014	Reference in Report
1 (a) Details of the: <ul style="list-style-type: none"> (i) EAP who prepared the report; and (ii) Expertise including CV 	Section 1.3 Appendix 1
1 (b) Location of the activity including: <ul style="list-style-type: none"> (i) 21-digit SG code of each parcel (ii) Physical address and farm name (iii) Co-ordinates of property boundary 	Section 3.3.1
1 (c) Plan locating the proposed activity	Figure 3 Appendix 2
1 (d) description of the scope of the activity <ul style="list-style-type: none"> (i) Listed activities 	Section 3.2

Appendix 1 of the EIA Regulations, 2014	Reference in Report
(ii) Description of the activities to be undertaken (including associated structures and infrastructure)	Section 3.3
1 (e) Policy and legislative context including legislation, policies, plans, guidelines, spatial tools, municipal development planning frameworks and instruments and how the proposed activity complies with and responds to the legislation and policy context, plans, guidelines, tools frameworks, and instruments	Section 2
1 (f) Motivation for the need and desirability for the proposed development	Section 5
1 (g) Motivation for the preferred site, activity and technology alternative.	Section 9.7
1 (h) Description of the process followed to reach the proposed preferred alternative within the site, including: <ul style="list-style-type: none"> (i) Alternatives; (ii) Public participation process (iii) Summary of issues raised by I&AP's (iv) Environmental attributes (v) Potential Environmental Impacts and risks (vi) Methodology to determine potential impacts (vii) Positive and negative impacts (viii) Possible mitigation measures and level of residual risk (ix) Outcome of the site selection matrix (x) Motivation for not considering alternatives (xi) Concluding statement indicating preferred alternatives 	<p>Section 6</p> <p>Section 7</p> <p>Section 7</p> <p>Section 4</p> <p>Section 9</p> <p>Section 9.2</p> <p>Section 9</p> <p>Section 9</p> <p>N/A</p> <p>N/A</p> <p>Section 9.7.1</p>
1 (i) Description of the process undertaken to identify, assess and rank impacts on preferred location throughout the life of the activity including: <ul style="list-style-type: none"> (i) A description of all environmental issues and risks that were identified during the environmental impact assessment process; (ii) An assessment of the significance of each issue and risk and an indication of the extent to which the issue and risk could be avoided or addressed by the adoption of mitigation measures; (iii) An assessment of each identified potentially significant impact and risk, including- <ul style="list-style-type: none"> (i) cumulative impacts; (ii) the nature, significance and consequences of the impact and risk; (iii) The extent, duration of the impact and risk; (iv) The probability of the impact and risk occurring; (v) The degree to which the impact and risk occurring; 	Section 9

Appendix 1 of the EIA Regulations, 2014	Reference in Report
<p>(vi) The degree to which the impact and risk can be reversed;</p> <p>(vii) The degree to which the impact and risk may cause irreplaceable loss of resources; and</p> <p>(viii) The degree to which the impact and risk can be avoided, managed or mitigated.</p>	
1 (k) Summary of the findings and impact management measures identified in specialist reports and how these findings and recommendations have been included in the report.	Section 8
<p>1 (l) An Environmental Impact Statement which contains:</p> <p>(i) Summary of the key findings of the environmental impact assessment;</p> <p>(ii) Sensitivity Map;</p> <p>(iii) Summary of positive and negative impacts and risks of the proposed activity and identified alternatives;</p>	Section 10
1 (m) Impact management measures from specialist reports, the recording of the proposed impact management outcomes for the development for inclusion in the EMPr;	Section 10.3 Section 10.4
1 (n) Aspects which were conditional to the findings of the assessment either by the EAP or specialist which are to be included as conditions of authorisation;	Section 10.6
1 (o) Description of assumptions, uncertainties, and gaps in knowledge which relate to the assessment and mitigation measures proposed;	Section 8.4
1 (p) Reasoned opinion as to whether the proposed activity should or should not be authorised, and if the opinion is that it should be authorised, nay conditions that should be made in respect of that authorisation.	Section 10.5
1 (q) The period for which the environmental authorisation is required, the date on which the activity will be concluded, and the post construction monitoring requirements finalised;	Section 10.7
1 (r) Undertaking of the EAP	Section 11
1 (s) Financial provision for the rehabilitation, closure, and ongoing post decommissioning management of negative environmental impacts	N/A
1 (t) any specific information that may be required by the competent authority; and	N/A
1 (u) Any other matters required in terms of section 24(4)(a) and (b) of the Act.	N/A

1.3 Environmental Assessment Practitioner

Prism EMS have been appointed to undertake the required Environmental Authorisation process in terms of the required Environmental Impact Assessment. Details and expertise of the Environmental Assessment Practitioner (EAP) who prepared the Basic Impact Assessment Report is provided in Table 2 and Curriculum Vitae is appended in Appendix 1.

Table 2: Details of the EAP

EAP:	Monica Niehof			
Company:	Prism Environmental Management Services			
Qualifications:	BSc. (Hons) Environmental Management			
Experience:	11 Years			
Address:	PO Box 1401, Wilgeheuwel, 1736			
Tel:	087 985 0951			
Fax:	086 601 4800			
Email:	monica@prismems.co.za			
Prism EMS Team				
Contact Details	Post: PO Box 1401, Wilgeheuwel, Johannesburg, 1736		Tel: 087 985 0951 Fax: 086 601 4800 Email: prism@prismems.co.za www.prismems.co.za	
Designation	Name	Qualification	Professional Registration	Experience:
Project Director	De Wet Botha	M.A. (Env.Man.) (PHED)	Founder Member of Environmental Assessment Practitioners Association of South Africa (EAPASA) Member of the International Association for Impact Assessors (IAIASa)(1653) Member of the Gauteng Wetland Forum Member of the South African Wetland Society	15 Years
Project Principle	Vanessa Stippel	MSc. Ecology, Environment and Conservation	SACNASP– Pr. Sci. Nat (116221).	7 Years

1.4 Authorities

The following competent authority is involved in the decision-making process:

- The Mpumalanga Department of Agriculture, Rural Development, Land and Environmental Affairs (MDARDLEA), with reference to activities triggered in terms of the:
 - National Environmental Management Act, 1998 (Act No. 107 of 1998) [as amended] (NEMA).

1.5 Applicant

The applicant is the entity that will assume responsibilities as the holder of the environmental authorisation, if granted. Details of the applicant are contained in Table 3.

Table 3: Details of the Applicant and Landowner

Applicant:	Chapmans View Properties (Pty) Ltd
Landowner:	Chapmans View Properties (Pty) Ltd
Responsible Person:	Mr D. Zeelie
Designation:	Director

2 LEGISLATIVE FRAMEWORK

This section aims to provide an overview of key policy, legislation, plans, guidelines and municipal development planning frameworks triggered by the proposed project. The requirements set out in these Acts and Regulations will be adhered to through the scoping and impact assessment phases of the project.

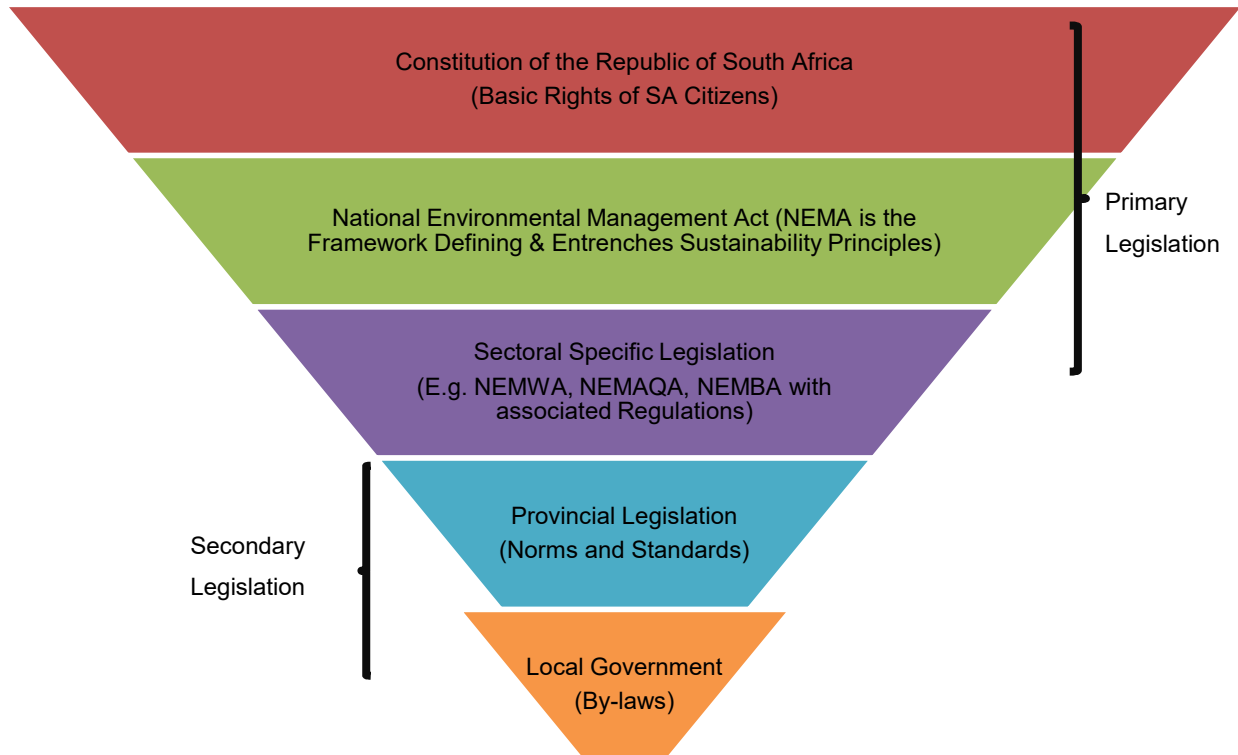


Figure 1: South African Environmental Legislation Hierarchy

The following Acts, Regulations, By-Laws and Guidelines are applicable to the proposed development.

2.1 Constitution of the Republic of South Africa 1996 (Act No. 108 of 1998) [as amended] (CSA)

Section 24 of the Constitution states that –

“Everyone has the right to -

- a) an environment that is not harmful to their health or well-being; and*
- b) have the environment protected, for the benefit of present and future generations, through reasonable legislative and other measures that –*
 - (i) Prevent pollution and ecological degradation;*
 - (ii) Promote conservation; and*
 - (iii) Secure ecologically sustainable development and use of natural resources while promoting justifiable economic and social development.”*

The proposed development has the potential to have negative impacts on the environment and cause pollution. However, these impacts as shown by the findings of the impact assessment and description of mitigation measures in this report and the Environmental Management Programme (Appendix 9), can be mitigated to acceptable levels. The proposed development, therefore, will comply with the Constitution of the Republic of South Africa. To ensure that the development is sustainable, a Basic Environmental Impact Assessment process is being undertaken to identify impacts related to the development and propose mitigation measures where possible.

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

NEMA is the umbrella framework for all environmental legislation, primarily to assist with implementing the environmental rights of the Constitution (refer to Section 2.1). NEMA provides fundamental principles required for environmental decision making and to achieve sustainable development. It also makes provision for duty of care to prevent, control and rehabilitate the effects of significant pollution and environmental degradation, and prosecute environmental crimes. These principles must be adhered to and taken into consideration during the impact assessment phase.

NEMA defines “environment” as –

“the surroundings within which humans exist and that are made up of –

- (i) the land, water and atmosphere of the earth;*
- (ii) micro-organisms, plants and animal life;*
- (iii) any part or combination of (i) or (ii) and the interrelationship 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.”*

Section 24D and 24(2) of the NEMA makes provision for the publication of lists and associated regulations containing activities identified that may not commence without obtaining prior environmental authorisation from the competent authority. These regulations are referred to as the Environmental Impact Assessment Regulations and are interpreted hand in hand with the various listed activities discussed further below.

Section 28 imposes a duty to avoid pollution and environmental degradation on every person.

The triggered activities form part of this application and basic assessment process. The proposed development cannot commence without prior authorisation from the Competent Authority.

The applicant, contractors, residents and occupiers of the land, all have a duty to avoid pollution and environmental degradation.

2.2.1 Environmental Impact Assessment Regulations, 2014 (GN R 982 of 4 December 2014) [as amended]

The EIA regulations were promulgated in terms of Section 24 of the NEMA, for providing methodologies and specific requirements for the undertaking of an EIA. The Regulations stipulate that any proposed activity listed in the associated notices must undertake either a Basic Assessment (BA) or Scoping & Environmental Impact Report (S&EIR) to obtain an environmental authorisation (if granted by the competent authority) before the commencement of the specified listed activity. The EIA Regulations provide the minimum requirements for appointing an Environmental Assessment Practitioner (EAP) and for undertaking the relevant Public Participation Process (PPP) as required. They also detail the contents of the impact assessment reports and all other aspects associated with BA and/or EIAs.

Listed activities are identified in terms of the following Listing Notices that was promulgated in terms of the EIA Regulations:

2.2.1.1 Listing Notice 1: GN R 983 of 4 December 2014 [as amended by GN R327 of 7 April 2018]

Activities listed under this process require a Basic Assessment process to be undertaken. Refer to Section 3.2 for a description of the specific listed activities that pertain to this project. Since activities listed in this Listing Notice are triggered by the proposed development, a Basic Assessment process is required to apply for Environmental Authorisation.

2.2.1.2 Listing Notice 2: GN R 984 of 4 December 2014 [as amended by GN R325 of 7 April 2018]

Activities listed under this process require Scoping and EIA to be undertaken. Refer to Section 3.2 for a description of the specific listed activities that pertain to this project. Since no activities listed in this Listing Notice are triggered by the proposed development, it is not required to undertake a full Scoping and EIA process to apply for Environmental Authorisation.

2.2.1.3 Listing Notice 3: GN R 985 of 4 December 2014 [as amended by GN R324 of 7 April 2018]

Activities listed under this process require a Basic Assessment process to be undertaken but only in specified geographic areas. Refer to Section 3.2 for a description of the specific listed activities that pertain to this project. No activities listed in this Listing notice are triggered by the proposed development.

The proposed truck shop development triggers a number of activities in terms of GN 983 of 4 December 2014 (as amended). Please refer to Section 3.2. for a list of all triggered activities. Hence a Basic Assessment Process is being undertaken and the proposed development cannot commence without prior authorisation from the Competent Authority.

The Basic Assessment Report complies with the requirements of the content of impact assessment reports as detailed in Appendix 1 of the Regulations, the EMPR complies with the requirements of Appendix 4 and the specialist reports with Appendix 6.

2.3 National Water Act (NWA), 1998 (Act No. 36 of 1998)

The NWA is the primary regulatory legislation; controlling and managing the use of water resources as well as the pollution thereof and is implemented and enforced by the Department of Water and Sanitation (DWS). Section 21 of the NWA lists water uses that must be licensed unless it is listed in the schedule (existing lawful use) and/or is permissible under a general authorisation, or if a responsible authority waives the need for a Water Use Licence. Section 21 water uses.

The NWA is the primary regulatory legislation; controlling and managing the use of water resources as well as the pollution thereof and is implemented and enforced by the Department of Water and Sanitation (DWS). Section 21 of the NWA lists water uses that must be licensed unless it is listed in the schedule (existing lawful use) and/or is permissible under a general authorisation, or if a responsible authority waives the need for a Water Use Licence. Section 21 water uses include:

- Section 21(a): taking water from a water resource
- Section 21(b): storing water
- Section 21(c): impeding or diverting the flow of water in a watercourse
- Section 21(d): engaging in a stream flow reduction activity contemplated in section 36
- Section 21(e): engaging in a controlled activity as identified in Section 37 (1) or declared under Section 38 (1).
- Section 21(f): discharging waste or water containing waste into a water resource through a pipe, canal, sewer, sea outfall, or other conduit.
- Section 21(g): disposal of waste (i.e. effluent from sewage works) in a manner which may detrimentally impact on a water resource;
- Section 21 (h): disposing in any manner of water which contains waste from, or which has been heated in, any industrial or power generation process.
- Section 21 (i): altering the bed, banks, course or characteristics of a watercourse.
- Section 21 (j): removing, discharging, or disposing of water found underground if it necessary for the efficient continuation of an activity or for the safety of people.
- Section 21(k): using water for recreational purposes.

The water supply design criteria for the development site is to provide 0,4 kl / day / 100m² developed space. As the development would be limited to a 1 hectare stand with a Floor Area Ratio (FAR) of 0.7, the maximum developed space would be 7 000m², resulting in a water demand of 28 kl / day. Water will be supplied through the existing borehole located on site. The water will be treated to the required standards for domestic use and pumped to a 60 cubic metre storage tank located at an elevation high enough to provide sufficient pressure to the development site for domestic and fire requirements.

The proposed development triggers Section 21 a) of the act: taking water from a water resource. The Applicant will take more than 10 cubic metres of water from a groundwater resource per day on average over a year. The study area is located within Water Management Area 2: Olifants and in quaternary catchment B20G, where no water is to be abstracted without authorisation from the Department of Water and Sanitation. The study area is also located within 500 m of a wetland and therefore, a Water Use license is required for taking of groundwater. The Applicant will be applying for a water use license prior to commencement of the activity. A separate process will be undertaken.

The sewage and waste water will be treated with a Lilliput treatment system [*or similar*] (Refer to Appendix 5.2). The treated effluent will be irrigated with or discharged, and a Water Use License, triggering Section 21 e) and f) water uses, requiring a water use license. The Applicant will be applying for a water use license prior to commencement of the activity.

The proposed development should conform to the standards and guidelines of the NWA and associated regulations, to fulfil the Duty of Care for the environment in terms of nearby water resources, including groundwater and surface water resources.

The Applicant also needs to comply with provisions of this Act, especially in terms of its obligation of "Duty of Care" for water resources in terms of Section 19 and 20 of the Act.

Part 4: Section 19

Prevention and remedying effects of pollution

Part 4 of the act deals with pollution prevention and remedying effects of pollution prevention, and in particular the situation where pollution of a water resource occurs or might occur as a result of activities on land. The person who owns, controls, occupies or uses the land in question is responsible for taking measures to prevent pollution of water resources. If these measures are not taken, the catchment management agency concerned may itself do whatever is necessary to prevent the pollution or to remedy its effects, and to recover all reasonable costs from the persons responsible for the pollution.

Part 5: Section 20

Control of emergency incidents

Part 5 of the Act deals with pollution of water resources following an emergency incident, such as an accident involving the spilling of a harmful substance that finds or may find its way into a water resource. The responsibility for remedying the situation rests with the person responsible for the incident or the substance involved. If there is a failure to act, the relevant catchment management agency may take the necessary steps and recover the costs from every responsible person.

2.4 National Heritage Resource Act (NHRA), 1999 (Act No. 25 of 1999)

The NHRA provides for the protection and management of South Africa's heritage resources. The South African National Heritage Resources Agency (SAHRA) is the administering authority regarding all matters relating to heritage resources. A heritage resource refers to any historically important feature such as graves, trees, archaeology, culturally significant symbols, spaces, landscapes and fossil beds as protected heritage resources. In terms of Section 38 of the NHRA, SAHRA can call for a Heritage Impact Assessment (HIA) for certain categories of development. The NHRA also makes provision for the assessment of heritage impacts as part of an EIA process and indicates that if such an assessment is deemed adequate, a separate HIA is not required.

Section 38 (1) of the NHRA notes that the relevant heritage authority should be notified provided with details such as location, nature and extent of the following developments:

- (a) the construction of a road, wall, powerline, pipeline, canal or other similar form of linear development or barrier exceeding 300m in length;
- (b) the construction of a bridge or similar structure exceeding 50 m in length;
- (c) any development or other activity which will change the character of a site—
 - (i) exceeding 5 000 m² in extent; or
 - (ii) involving three or more existing erven or subdivisions thereof; or
 - (iii) involving three or more erven or divisions thereof which have been consolidated within the past five years; or
 - (iv) the costs of which will exceed a sum set in terms of regulations by SAHRA or a provincial heritage resources authority;
- (d) the re-zoning of a site exceeding 10 000 m² in extent; or
- (e) any other category of development provided for in regulations by SAHRA or a provincial heritage resources authority,

The proposed development triggers Section 38 (1) of the Act. Statutory comment must be obtained from the South Africa Heritage Resources Authority (SAHRA) and the Mpumalanga Provincial Heritage Resources Authority (MPHRA) should be notified. A Heritage Impact Assessment (HIA) was conducted by a suitably qualified specialist (Refer to Appendix 6.2). The specialist report was submitted to the heritage authority and comments requested. The final comment of the heritage authority will be submitted with the final basic impact assessment report to the Competent Authority (MDARDLEA). The specialist made the following findings and recommendations (summary):

A Previous study of the area (Fourie 2010) recorded no sites of significance within the study area. The lack of sites within the study area was confirmed during the current study and no archaeological sites or material was recorded during the survey. Based on the SAHRIS Paleontological Sensitivity Map, the area is of low paleontological sensitivity. Therefore, no further mitigation prior to construction is recommended in terms of Section 35 for the proposed development to proceed. In terms of the built environment, no standing structures older than 60 years occur in the study area. In terms of Section 36 of the Act no burial sites were recorded in the study area although a grave site is located approximately 190 meters to the south west of the study area and will not be impacted on by the current development. However, if any graves are identified in the study area they should ideally be preserved in-situ or alternatively relocated according to existing legislation. No public monuments are located within or close to the study area. The study area is surrounded agricultural developments, road and mining infrastructure and the proposed truck stop development will not impact negatively on significant cultural landscapes or viewsapes. During the public participation process conducted for the project no heritage concerns were raised.

Due to the lack of significant heritage resources in the study area the impact of the proposed project on heritage resources is considered low and impacts can be mitigated to an acceptable level. It is therefore recommended that the proposed project can commence on the condition that the following recommendations are implemented as part of the EMPr and based on approval from SAHRA:

- Implementation of a chance find procedure as outlined under section 10.1 and;
- In terms of the paleontological aspect a protocol for finds should be implemented as outlined under section 10.2 of the HIA (Appendix 6.2).

2.5 National Environmental Management: Biodiversity Act (NEM:BA), 2004 (Act No. 10 of 2004)

The NEM:BA aims to provide for the management and conservation of South Africa's biodiversity within the framework of the NEMA. The purpose of the NEM:BA is to protect ecosystems and the species within as well as the promoting of sustainable use of indigenous biodiversity. During any environmental authorisation process the following regulations are considered and researched if at any stage the following regulations are applicable:

- Alien and Invasive Species Regulations, 2014;
- Alien and Invasive Species Lists, 2016;

- Lists of Critically Endangered, Endangered, Vulnerable and Protected Species, 2007; and
- Threatened or Protected Species Regulations, 2007.

Declared weeds and invader plant species have the tendency to dominate or replace the canopy or herbaceous layer of natural ecosystems, thereby transforming the structure, composition and function of these systems. Therefore, it is important that these plants are controlled and eradicated by means of an eradication and monitoring programme. Some invader plants may also degrade ecosystems through superior competitive capabilities to exclude native plant species. The National Environmental Management: Biodiversity Act (NEMBA) is the most recent legislation pertaining to alien invasive plant species. In August 2014, the list of Alien Invasive Species was published in terms of the National Environmental Management: Biodiversity Act (Act 10 of 2004) (Government Gazette No 78 of 2014). The Alien and Invasive Species Regulations were published in the Government Gazette No. 37886, 1 August 2014. The legislation calls for the removal and / or control of alien invasive plant species (Category 1 species). In addition, unless authorised thereto in terms of the National Water Act, 1998 (Act No. 36 of 1998), no land user shall allow Category 2 plants to occur within 30 meters of the 1:50 year flood line of a river, stream, spring, natural channel in which water flows regularly or intermittently, lake, dam or wetland. Category 3 plants are also prohibited from occurring within proximity to a watercourse.

The NEMBA listed species identified within the study area are listed in the Ecological Habitat Assessment Report (Appendix 6.1). Six (6) Category 1b invasive species were recorded within the study area and must therefore be removed by implementing an alien invasive plant management programme in compliance of section 75 of the Act as stated above. Measures to control alien and invasive species are included in the Environmental Management Programme for the construction and operation of the proposed development.

2.6 National Environmental Management: Waste Management Act (NEMWA), 2008 (Act No. 59 of 2008)

NEMWA aims to regulate waste management in South Africa to protect health and the environment through the provision of reasonable measures for the prevention of pollution and ecological degradation.

The Act includes regulations which provide a list of waste management activities that require a waste management licence in terms of NEMWA (GN 921 of 29 November 2013). Activities related to the treatment of effluent, wastewater or sewage are however excluded and do not require a waste management licence but are regulated under NEMA and the NWA.

Based on the above, no waste management license is required for the proposed development. General waste will be collected by municipal waste collectors and disposed of at the municipal landfill. Hazardous waste will be collected by a registered service provider and disposed of at a registered facility.

2.7 National Environmental Management: Air Quality Act (NEMAQA), 2004 (Act No. 39 of 2004) and the National Dust Control Regulations, 2013

The aim of NEMAQA is to regulate air quality to protect the environment from pollution and ecological degradation.

The proposed development does not trigger any activities that require an Air Emissions License. Dust produced during the construction phase will be managed through the implementation of mitigation measures that has been included in the Environmental Management Programme (EMPr).

2.8 National Veld and Forest Fire Act, 101 (Act No. 101 of 1998)

The purpose of this Act is to prevent and combat veld, forest and mountain fires throughout the Republic. The Act provides for a variety of institutions, methods and practices for achieving the purpose.

- Chapter 4 places a duty on owners to prepare and maintain firebreaks; and
- Chapter 5 places a duty on all owners to acquire equipment and have available personnel to fight fires.

During the construction phase the Applicant will be required to adhere to the requirements of the Act. Measures to prevent and manage fires and emergency response procedures are included in the Environmental Management Programme.

2.9 Occupational Health and Safety Act, 1993 (Act No. 85 of 1993) [as amended] (OHSA)

The purpose of the Act is:

To provide for the health and safety of persons at work and for the health and safety of persons in connection with the use of plant and machinery; the protection of persons other than persons at work against hazards to health and safety arising out of or in connection with the activities of persons at work; to establish an advisory council for occupational health and safety; and to provide for matters connected therewith.

2.9.1 Hazardous Chemical Substances Regulations, 1995

These regulations have been promulgated in terms of OSHA and apply to an employer or a self-employed person who carries out work at a workplace which may expose any person to the intake of a Hazardous Chemical Substance at the workplace.

It is the responsibility of the Applicant to adhere to the requirements of OHSA and all regulations promulgated in terms thereof, during the construction and operational phases.

2.10 Hazardous Substances Act, 1973 (Act No. 15 of 1973) [as amended]

The purpose of the Act is to provide for the control of substances which may cause injury or ill-health to or death of human beings by reason of their toxic, corrosive, irritant, strongly sensitizing or flammable nature or the generation of pressure thereby in certain circumstances, and for the control of certain electronic products; to provide for the division of such substances or products into groups in relation to the degree of danger; to provide for the prohibition and control of the importation, manufacture, sale, use, operation, application, modification, disposal or dumping of such substances and products; and to provide for matters connected therewith.

It is the responsibility of the Applicant to adhere to the requirements of OHSA and all regulations promulgated in terms thereof, during the construction and operational phases.

2.11 Other Legislation and Guidelines

2.11.1 Guidelines

The following guidelines have been adopted by the applicant in the pursuit of best practice and sustainable development and are considered in the management measures and mitigation of impacts identified.

- DEA, 2014 – IEMS Guideline series
 - Integrated Environmental Management Guideline: Guideline on Need and Desirability
 - Integrated Environmental Management Guideline Series (Guideline 7)
 - Public Participation in the Environmental Impact Assessment Process
 - Guidelines on Alternatives

These guidelines have been considered in the Basic Impact Assessment Process and the development of the basic impact assessment report.

3 SCOPE OF PROPOSED PROJECT

3.1 Environmental Authorisation

An “Environmental Authorisation” means an authorisation granted by the competent authority of a listed activity in terms of Section 24 of the National Environmental Management Amendment Act, (Act No. 107 of 1998).

An application for Environmental Authorisation (EA) has been submitted to MDARDLEA.

As activities under Listing Notice 1 of the 2014 EIA Regulations are triggered, a BA process is being conducted. The process being followed is detailed in Figure 2.

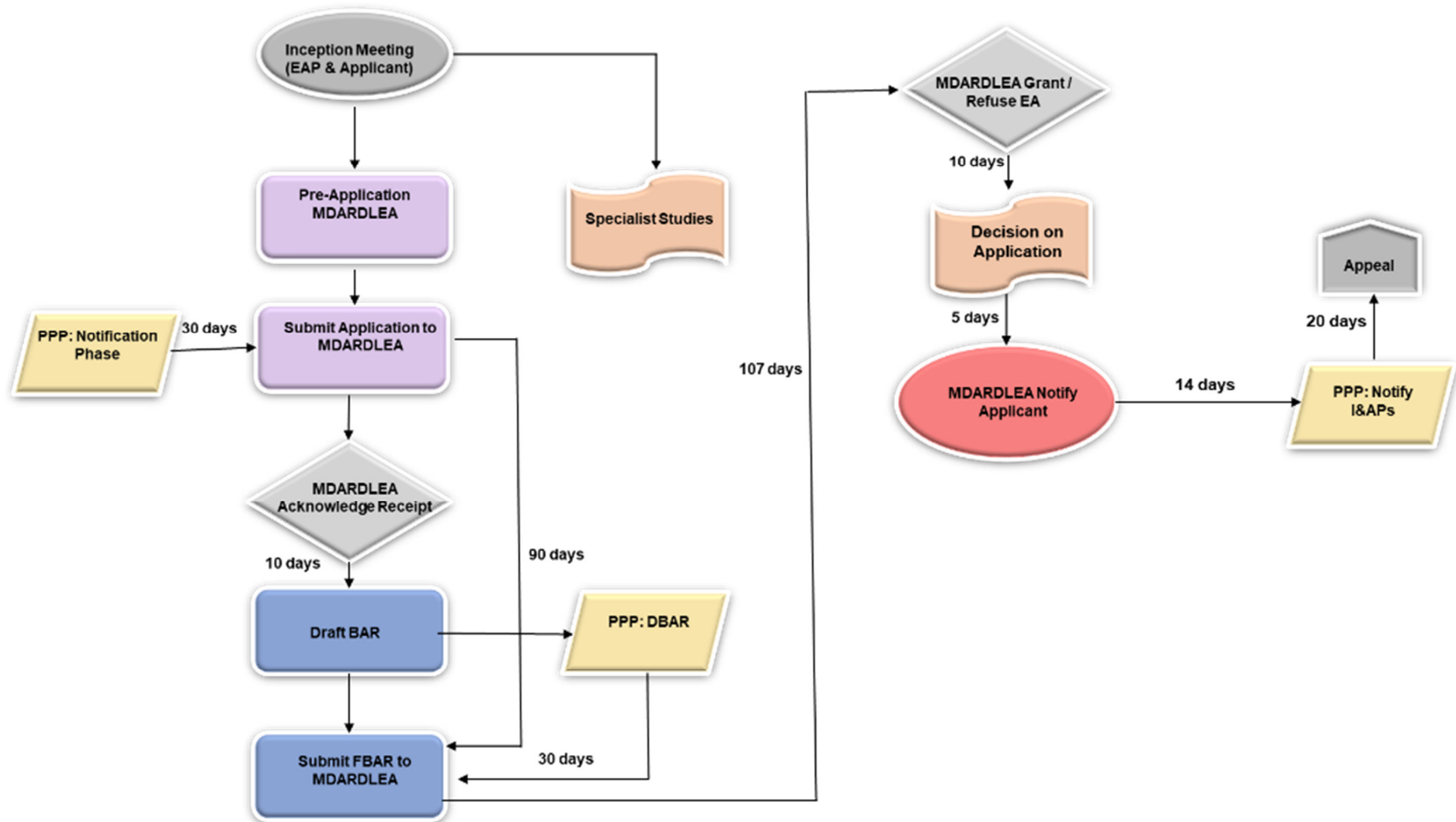


Figure 2: Proposed Basic Assessment environmental authorisation process

3.2 Listed Activities

In terms of the EIA Regulations and Listed Activities 2014 [as amended] (introduced in Section 2.2) the activities that are triggered under the Listing Notice for this proposed development are provided in Table 4. Refer to Section 2 for a description and overview of the applicable legislative framework.

Table 4: Description of the Listed Activities Triggered under NEMA

Listing Notice	Activity	Description of Listed Activity	Interpretation
<i>NEMA: Listing Notice 1 (require Basic Assessment)</i>			
GN R 984 4 December 2014 [as amended]	Activity 14:	The development and related operation of facilities or infrastructure, for the storage, or for the storage and handling, of a dangerous good, where such storage occurs in containers with a combined capacity of 80 cubic metres or more but not exceeding 500 cubic metres.	The applicant proposes to develop and operate facilities and infrastructure for the storage and handling of dangerous goods including petroleum and diesel with a combined capacity of 500 cubic metres. The construction of a Diesel and Petroleum outlet facility with ancillary uses and the proposed installation of diesel and petroleum tanks. Tanks of variable sizes (23 000 litres minimum and 80 000 litres maximum) for the storage of fuel with a minimum of 80 cubic meters, but not exceeding 500 cubic meters will be installed. Other related infrastructure such as, a convenience store/shop, restrooms, restaurant, recreational area, truck stop, offices will be constructed and will form part of the application.
	Activity 27:	The clearance of an area of 1 hectares or more, but less than 20 hectares of indigenous vegetation.	The study area is approximately 2.5 Ha in extent and contains disturbed, but natural vegetation. An area larger than 1 hectare, but less than 20 hectares of indigenous vegetation will be cleared for the activity.
	Activity 28:	Residential, mixed, retail, commercial, industrial or institutional developments where such land was used for agriculture, game farming, equestrian purposes or afforestation on or after 01 April 1998 and where such	The study area is larger than 1 hectare in extent, occurs outside an urban area and has been used for agricultural purposes after 1 April 1998.

Listing Notice	Activity	Description of Listed Activity	Interpretation
		development: (ii) will occur outside an urban area, where the total land to be developed is bigger than 1 hectare.	

Refer to Section 2 for a description and overview of the applicable legislative framework.

3.3 Description of Project Activities

3.3.1 Location

The proposed development is planned to be located on Portion 83 of the Farm Eenzaamheid 534 JR at Balmoral within the Emalahleni Local and Nkangala District Municipalities, Mpumalanga Province. The study area is located immediately south of the R686 (Lone Rock Road), approximately 2 km south of the N4 Highway.

The Surveyor General 21-digit diagram number for the affected property is provided in Table 5.

Table 5: Surveyor General Diagram Number

Farm	Surveyor General Diagram number
534	T0JR00000000053400083

Table 6: Coordinates of the Study Area

	Latitude (S):	Longitude (E):
Proposal and Alternatives	25°53'18.85"S S25.888570	28°57'28.09"E E28.957800

Refer to Figure 3 for a visual indication of the study area's location in relation to major roads and towns.

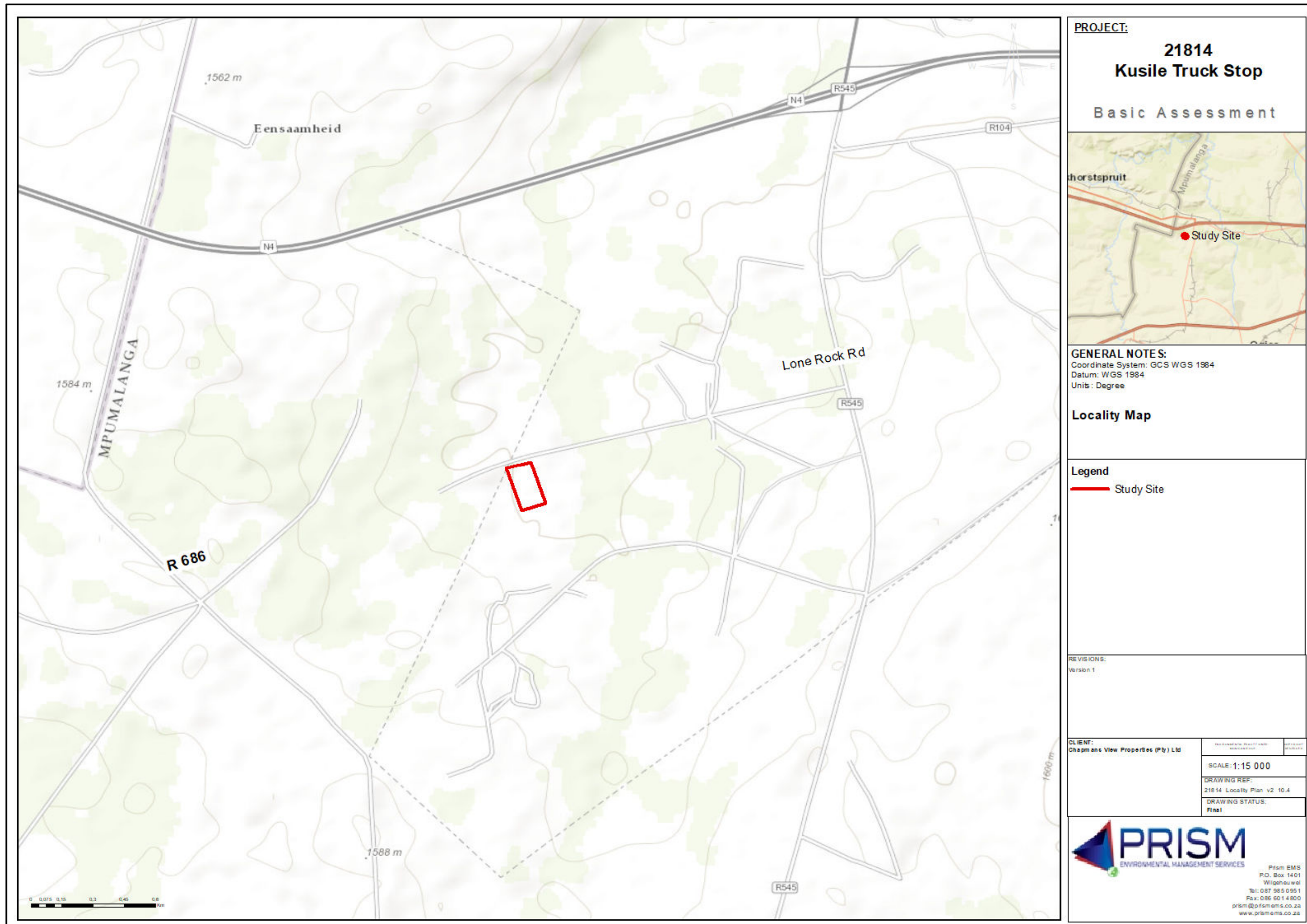


Figure 3: Location of the study area in relation to major roads and towns

3.3.2 Size of the activities

The size of the study area is 2,5 Ha in extent and the footprint of the proposed activity is approximately 2,5 Ha in extent.

3.3.3 Study area access

Access to the study area will be provided off the newly constructed Lone Rock Road (R686). The proposed access arrangements are based on the standards contained in the "Guidelines for Access to Filling Stations (BB2 document)" (November 2003). The proposed filling station and internal layout is shown on the plan appended in Appendix 5.2.

3.3.4 Activities and layout

The proposed development involves the construction and operation of a Diesel and Petroleum outlet facility with ancillary uses and the proposed installation of underground diesel and petroleum tanks. A minimum of three tanks and a maximum of 5 tanks of variable sizes (23 000 litres minimum and 80 000 litres maximum) for the storage of fuel with a minimum of 80 cubic metres, but not exceeding 500 cubic metres, will be installed.

Related infrastructure includes a convenience store/shop, restrooms, restaurant, recreational area, truck stop and offices.

The sewage and waste water will be treated with a Lilliput treatment system (Refer to Appendix 5.2).

The water supply design criteria for the development site is to provide 0,4 kl / day / 100m² developed space. As the development would be limited to a 2.5 hectare stand with a Floor Area Ratio (FAR) of 0.7, the maximum developed space would be 7 000m², resulting in a water demand of 28 kl / day. Water will be supplied through the existing borehole located on site. The water will be treated to the required standards for domestic use and pumped to a 60 cubic metre storage tank located at an elevation high enough to provide sufficient pressure to the development site for domestic and fire requirements.

Initially, electricity to the development will be provided by two 10MVA Generators to supply 220V for the infrastructure and when required, power supply will be from a new three phase 6.6kV overhead powerline, to 380V to 220V to be sourced from Eskom, from the existing 6.6kV overhead powerline, running east of the study area (refer to Appendix 5.3).

Access to the proposed development will be provided from the newly constructed R686, Lone Rock Road, also providing access to the Kusile power station.

3.4 Timeframes

The proposed development will be constructed according to the following preliminary timeframes. Refer to Table 7.

Table 7: Operational hours for construction phases

Period	Open	Close
Weekdays	07:00	18:00
Saturdays	07:00	15:00
Sunday	Only when required	
Public holidays	Only when required	

3.4.1 Ancillary Infrastructure Required for Construction

No major infrastructure is required on site for the construction of the development. The required ancillary infrastructure for the purposes of supporting services is discussed below.

3.4.1.1 Security

A construction camp for housing equipment will be erected on site for the duration of the construction. This camp will be fenced for security purposes. A security guard will also be posted on site during non-operational times.

3.4.1.2 Sanitation

During the construction phase of the project, chemical toilets will be placed on site for the duration of the construction phase. One chemical toilet per 15 workers is recommended. More detail will be provided in the Environmental Management Programme for the construction phase.

3.4.1.3 Construction Camp and Laydown Areas

Designated areas will be established during the construction phase for construction equipment and vehicles.

3.5 Project Life-Cycle

To adequately consider the impacts associated with the proposed development, the major activities during each phase of the project life-cycle are listed below:

- Feasibility Studies
 - Technical, economic and environmental screening of alternatives;

-
- Development of Engineering Concept Site Development Plan, Project Description and Services Reports;
 - Environmental Authorisation Process.
 - Pre-construction Phase
 - Detailed layouts and services designs;
 - Procurement process for Contractors;
 - Procurement of other necessary materials.
 - Construction Phase
 - Appointments and site camp set up:
 - Appoint Environmental Control Officer;
 - Set up site camp with temporary offices and administrative facilities;
 - Set up ablutions;
 - Set up access control, security; signage and lighting;
 - General materials storage and laydown areas
 - Construction employment;
 - Change-houses, chemical toilets and showering facilities (linked to conservancy tanks – removal of contents by exhauster vehicle and disposal at permitted facility); and
 - Temporary waste storage areas; these shall be established and managed in accordance with EMP requirements to be developed in the EIA phase.
 - Sourcing of construction materials and equipment:
 - All bulk materials (aggregate, cement, steel etc.) will be sourced from existing lawful commercial sources; there will be no direct mining, harvesting or extraction of natural resources.
 - Excavation and earthworks
 - Excavation and Earthworks as necessary;
 - Levelling and compaction using heavy machinery / earthmoving equipment.
 - Potential for excavations and trenching to lay below ground level equipment (cables, pipes, sumps, drainage etc.);
 - Potential for excavation dewatering in the event of water-table interception; and
 - Use of general mechanical equipment within construction areas (generators, cutting and welding equipment, compressors etc.).
 - Operation Phase:
 - Operation of facilities;
 - Storage of dangerous goods; and
 - Maintenance of infrastructure.

- Decommissioning Phase
 - Decommissioning of the proposed development and associated services is not envisioned. However, should decommissioning be required the activity will need to comply with the appropriate environmental legislation and best practices at that time.

4 DESCRIPTION OF THE RECEIVING ENVIRONMENT

This section describes the biophysical and socio-economic environment that may be affected and the known baseline conditions, which may be affected by the proposed development.

4.1 Local Climate

The Witbank region is characterised by summer rainfall with thunderstorms, with annual rainfall figures of 735 mm (Middelburg) and 842 mm (Belfast) recorded at the closest weather stations to the site. Winters are dry with frost common. The warmest months are normally December and January and the coldest months are June and July.

An analysis of the data confirms a Weinert's N-Value in the order of 2.4 for Witbank. The chemical decomposition of rocks will therefore be dominant over mechanical disintegration, and deep soil horizons are expected in areas of poor drainage, underlain by igneous rocks (Geoset cc., 2010).

Stormwater drainage and road pavement design must incorporate the climatic extremes above.

4.1.1 Temperature

The highest daily average maximum temperatures occur in December, January and February, with a high of 30 °C for January 2018. The lowest average maximum temperatures occur in May, June and July, with a low of 14 °C for June 2017.

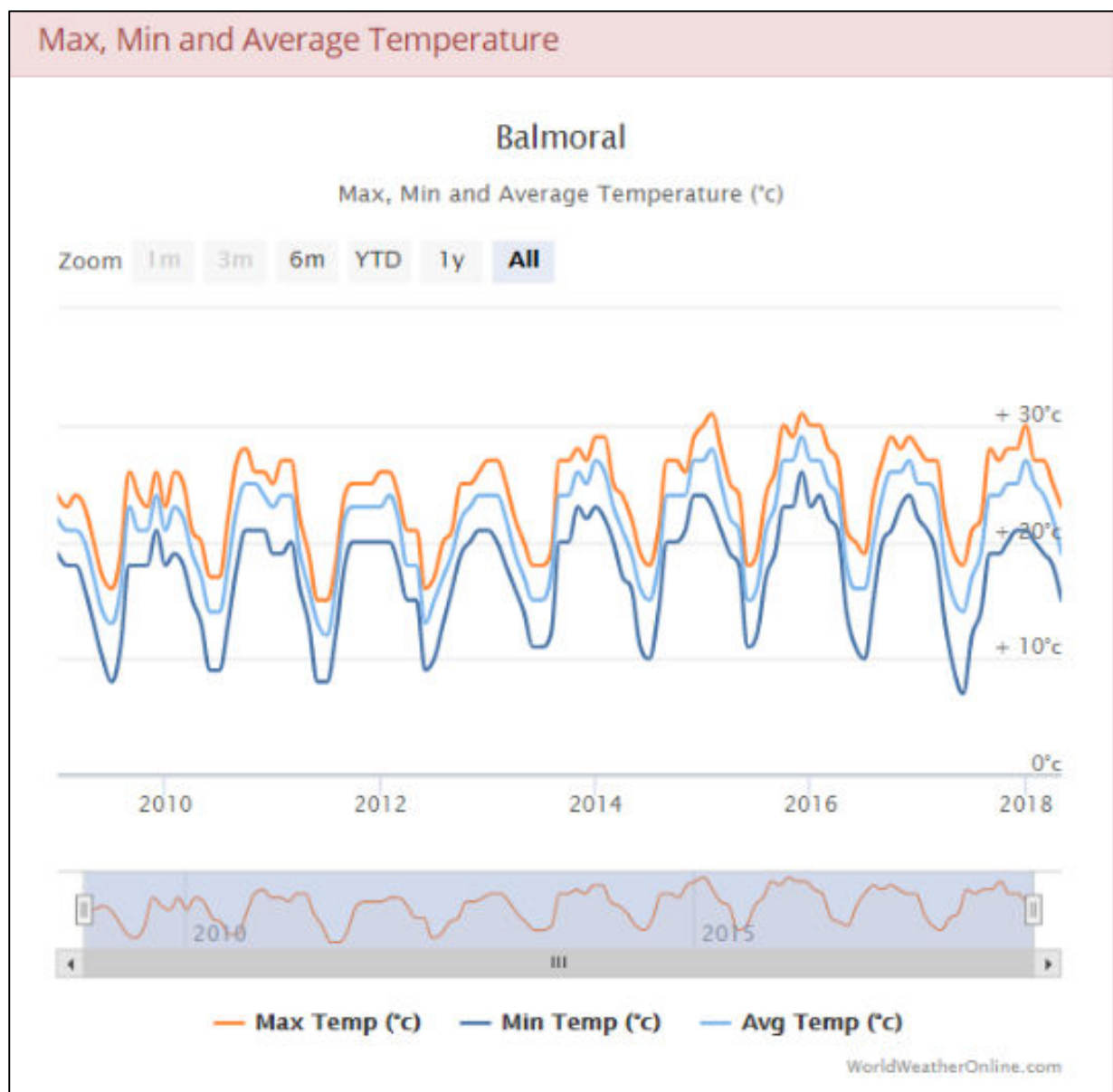


Figure 4: Balmoral average temperatures

4.1.2 Precipitation

Precipitation occurs mostly in Spring and Summer, with some rainfall in Autumn. The average annual rainfall is approximately 700 mm per annum for Balmoral.

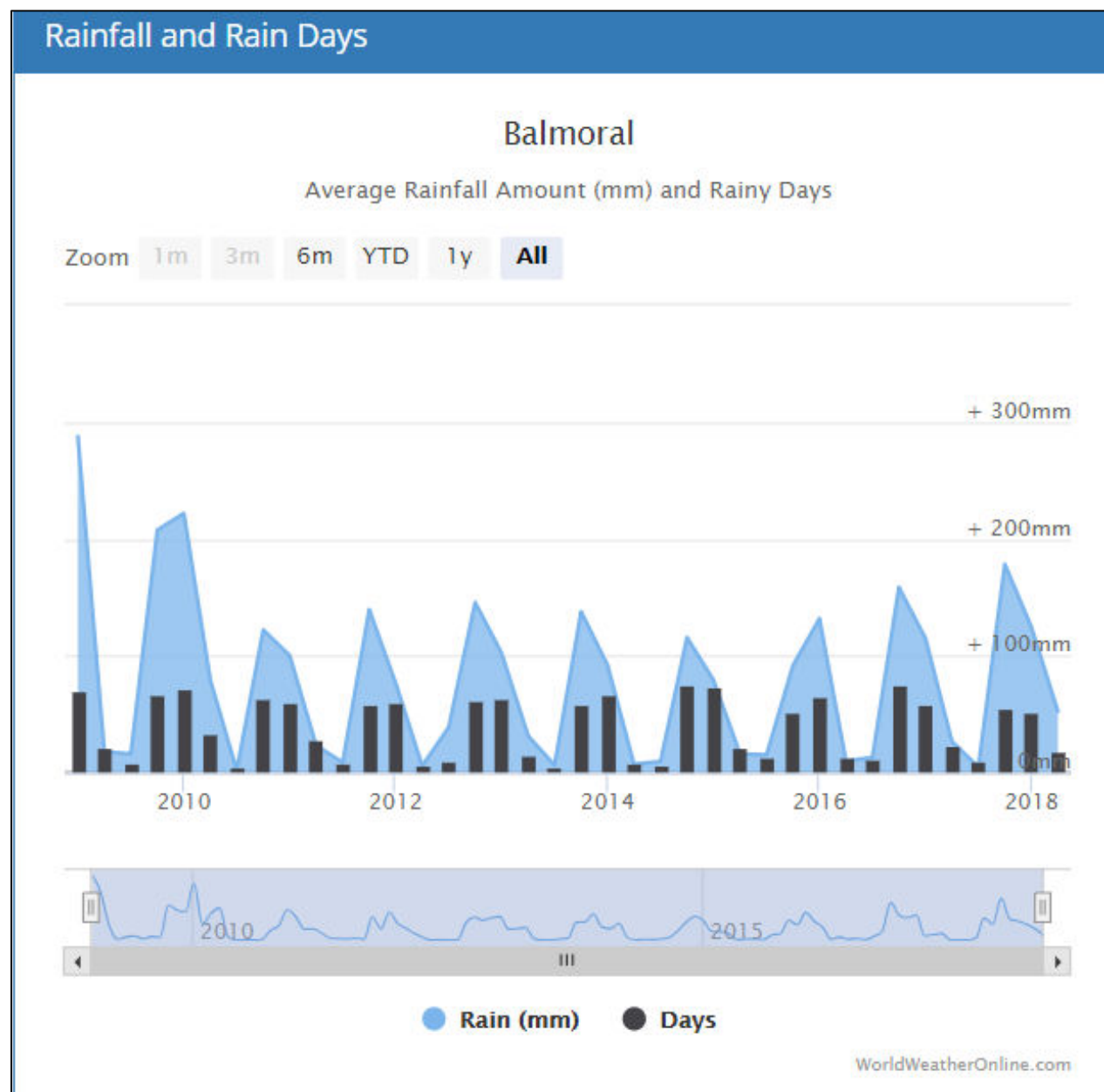


Figure 5: Balmoral average precipitation

4.1.3 Wind

Figure 6 below shows that gentle breezes is prevalent in the area from February to August, with moderate breezes prevalent between September and January.

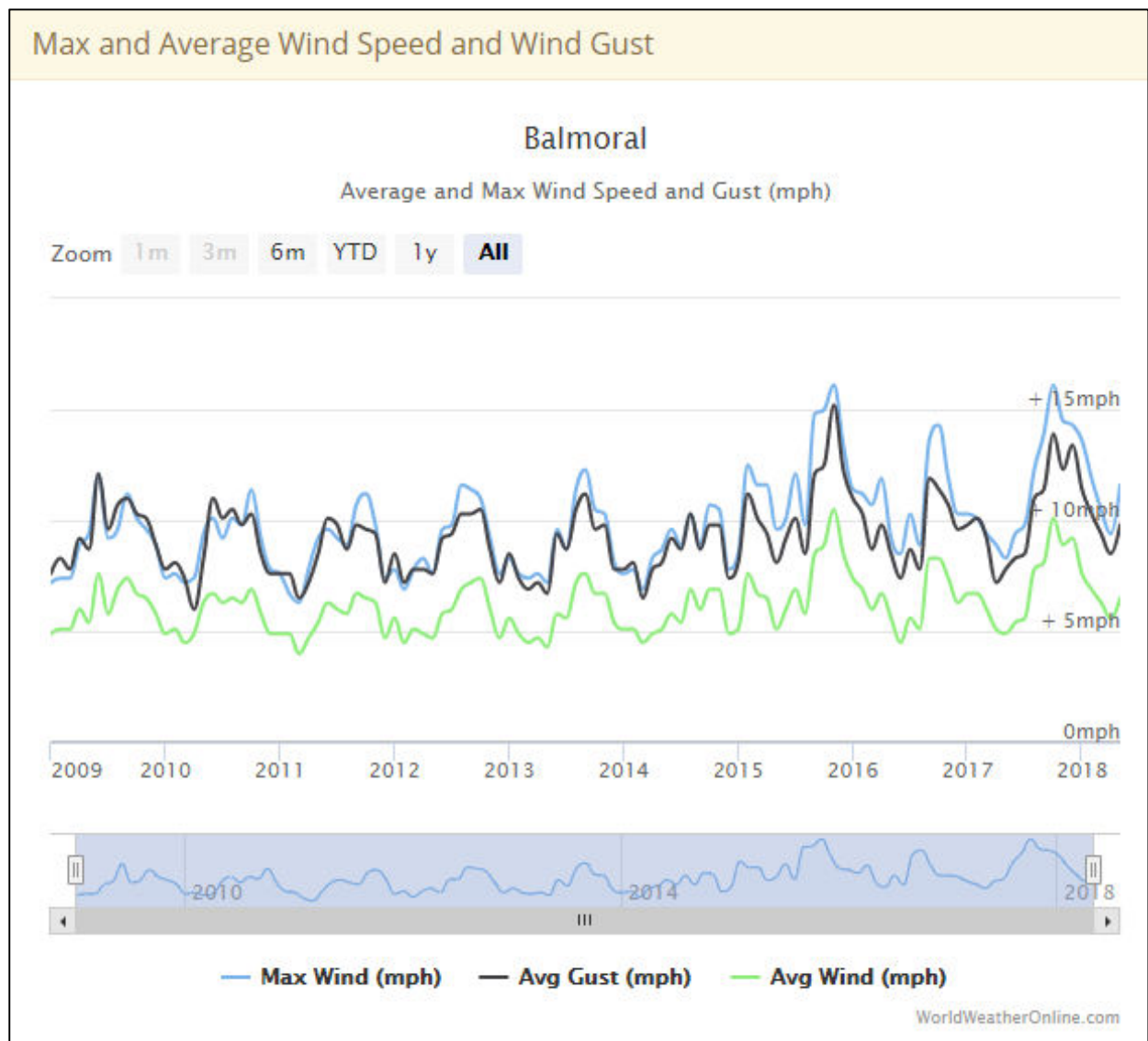


Figure 6: Balmoral maximum an average wind speed and gust

4.2 Topography

The local topography is a low to moderate slope towards the drainage feature and the dam to the north of the site.

The proposed development will result in minor changes to the topography of the site. Mitigation measures to ensure management of erosion will be included in the EMP.

4.3 Geology, Soils and Land Capability

A site of 51 hectares on Portion 20 of the farm Eenzaamheid 534JR (of which Portion 83 forms a part of), for the development of a filling station and truck stop in Balmoral, eMalahleni, Mpumalanga Province, was preliminary investigated by Geoset cc in 2010, to identify the engineering geological properties that will influence the planned development.

The site itself is underlain by Strubenkop formation shale and Daspoort formation quartzite of the Pretoria Group, Transvaal Supergroup, with intrusive dolerite dykes.

The soil of the site was provisionally classified as follows:

- Site Class H1 to H3 with the following foundation solutions:
 - Soil raft comprising the removal of all or part of expansive horizon to 1,0 m beyond the perimeter of the construction and replacing it with inert backfill compacted to 93% MOD AASHTO density at -1% to 2% of optimum moisture content, followed by normal construction with lightly reinforced strip footings and masonry and site drainage and plumbing/service precautions.
 - Stiffened or cellular raft with articulation joints or lightly reinforced masonry.
 - Piled construction comprising piled foundations with suspended floor slabs with or without ground beams.
- Site Class PD/H1 to H3
 - This zone comprises the drainage features and development should take place outside this zone that is also associated with expansive clay. A geophysical survey indicating contact zones for water source targeting and structuring the complex geology should be included in the next phase of investigation of the specific footprint where the development is proposed.

4.4 Air Quality

Existing sources of air pollution on and around the study area include:

- Dust created by agriculture to the north, north-west, south-west, south and south-east of the study area;
- Emissions from the Kusile power station to the south-west of the study area;
- Roma bricks to the south-west of the study area and other quarries to the west and south-west;
- Vehicle emissions from vehicles on nearby roads including the N4 Highway (to the north), R545 (to the east) and R686 (to the north and west).

Existing impacts as described above will have some impact on workers and customers of the proposed development. The proposed development may result in added vehicle emissions into the atmosphere. The proposed development does not require any license in terms of legislation that governs air quality. Dust suppression measures during the construction phase should be implemented.

4.5 Noise

There are no existing noise sources currently emanating from the proposed site. Existing noise sources surrounding the study area include:

-
- Agriculture to the north, north-west, south-west, south and south-east of the study area;
 - Kusile power station to the south-west of the study area;
 - Roma bricks to the south-west of the study area and other quarries and mining operations to the west and south-west;
 - Traffic noise on nearby roads including the N4 Highway (to the north), R545 (to the east) and R686 (to the north and west).

The proposed development may result in increased noise levels from construction and operational activities on the site. It should be noted that the proposed development is in an area with mixed land uses (residential, agricultural, industrial, quarrying, etc.), it is envisaged that the proposed development will not have a significant negative impact on the surrounding area or land uses in terms of noise.

4.6 Visual Quality

Since the proposed development is a small-scale development, situated within an area that is characterised by mixed-land uses (residential, agricultural, industrial, quarrying, etc.), it is envisaged that the proposed development will not have a negative impact on the surrounding area or land uses from a visual perspective.

4.7 Land Use

Land uses and/or prominent features that does currently occur within a 500 m radius of the study area include the following:

- The R686 (Lone Rock Road) immediately to the north;
- Agriculture to the north, north-west, south-west, west, south-west, south, south-east and east of the study area;
- Sand mining to the north-east;
- A stream, wetland and dam to the east and north; and
- Drainage line to the north and north-east.

Land uses further away include the following:

- Roma bricks approximately 1 km to the south-east;
- TOR bricks approximately 1,5 km to the east;
- Kusile power station approximately 3 km south-east;
- The N4 Highway (approximately 1,2 km to the north) and R545 (approximately 1,4 km to the east); and
- Agriculture and residential.

4.8 Services

The sewage and waste water will be treated with a Lilliput treatment system (Refer to Appendix 5.2).

The water supply design criteria for the development site is to provide 0,4 kl / day / 100m² developed space. As the development would be limited to a 1 hectare stand with a Floor Area Ratio (FAR) of 0.7, the maximum developed space would be 7 000m², resulting in a water demand of 28 kl / day. Water will be supplied through the existing borehole located on site; refer to Appendix A of Appendix 5.1 for the borehole position. The water will be treated to the required standards for domestic use and pumped to a 60 cubic metre storage tank located at an elevation high enough to provide sufficient pressure to the development site for domestic and fire requirements.

Initially, during phase 1, electricity to the development will be provided by two 10MWA Generators to supply 220V for the infrastructure and in phase 2, power supply will be from a new three phase 6.6kV overhead powerline, to 380V to 220V to be sourced from Eskom, from the existing 6.6kV overhead powerline, running east of the study area (refer to Appendix 5.3).

4.9 Roads

The road affected by the application is the R686 (Lone Rock Road). This road has been constructed as part of the Kusile Eskom Power Station to provide access to the Kusile power station. The road also provides a link between the N12 and R545 roads. The design speed for the road is 80km/hr. The section of road comprises of a two-lane single carriageway road with surfaced shoulders.

4.10 Socio-Economic Environment

According to StatsSA (Community Survey 2016 – CS2016), Emalahleni's population has increased from 395 466 in 2011 to 455 228 people in 2016. Emalahleni has the largest population in the province and consist of 31.5% of the total population of the Nkangala District in 2016. The population grew by 59 762 in the relevant period and a population growth rate of 3.2% per annum between 2011 & 2016 was recorded. The population number for 2030 is estimated at approximately 707 530 people, considering the historic population growth per annum. This will put pressure on infrastructure development, service delivery and eventually sustainable job creation within the municipality.

Emalahleni is composed of all racial groups with 391,982 Black Africans occurring in the area which shows an increase since 2011. In addition, there are an estimated 5 450 Coloured people, 3 762 Indian or Asian people, and 54 033 White people. There was an increase in both African/Black and Indian/Asian and a decrease in both the Coloured and the White population since 2011.

According to the 2016 CS of StatsSA, the population in Emalahleni aged 20+ completed grade 12, increased from 117 021 in 2011 to 146 952 (increase of 29 931) in 2016, an increase of 25.6% in the relevant period. Emalahleni's grade 12 pass rate improved from 75.8% in 2011 to 84.6% in 2015, which

was the 6th highest of the municipal areas of the Province. The municipality achieved an admission rate to university/degree studies of 27.7% in 2015. The challenge is to accommodate and integrate the educated young people in the area into the labour market, especially those with Grade 12 certificates, the unemployment rate of these people is approximately 30%.

The unemployment rate of Emalahleni decreased from 27.3% in 2011 to 23.2% in 2015. Emalahleni's unemployment rate was the 5th lowest among all the municipal areas of Mpumalanga. The unemployment rate for females were 9.8% and that of males 19.2%. The youth unemployment rate according to the Census amounted to approximately 36.0%. The largest employing industries in the municipality are trade and community/government services. The investment climate of the municipality needs to improve and be conducive, so it can accommodate the new job seekers. The municipality also need to increase the levels of education and skills to improve the employability of young people. Projects of high labour absorption and intensity as well as viable and sustainable SMMEs and Cooperatives need to play a significant role.

From a socio-economic point of view, the proposed development will have a positive impact and will create employment opportunities to the benefit of the surrounding community. The proposed development will also stimulate the local economy.

Construction Phase:

- Approximately 5 skilled employment opportunities; and
- Approximately 25 unskilled employment opportunities.

Operational Phase:

- Approximately 5 skilled employment opportunities; and
- Approximately 25 unskilled employment opportunities.

4.11 Biodiversity

4.11.1 Overview

The Biodiversity Company (TBC), was appointed to conduct a terrestrial ecology baseline and impact (risk) assessment for the proposed development. Information on the receiving environment has been taken from this Report which is included in Appendix 6.1.

4.11.1.1 Study area in relation to the Mpumalanga Biodiversity Sector Plan (MBSP)

Based on the MBSP Terrestrial Critical Biodiversity Area (CBA) map, the proposed development areas will potentially overlap with:

- Other Natural Areas (ONA's); and
- Moderately or Heavily Modified Areas (MMA's or HMA's).

Based on desktop information, much of the study and greater area are identified as being heavily or moderately modified, and the study area itself is situated within an area classified as heavily modified.

4.11.1.2 National Biodiversity Assessment (NBA)

The National Biodiversity Assessment (NBA) was completed as a collaboration between the South African National Biodiversity Institute (SANBI), the Department of Environmental Affairs (DEA) and other stakeholders, including scientists and biodiversity management experts throughout the country over a three-year period (Driver *et al.*, 2012).

The two headline indicators assessed in the NBA are ecosystem threat status and ecosystem protection level (Driver *et al.*, 2012).

- **Ecosystem Threat Status**

Ecosystem threat status outlines the degree to which ecosystems are still intact or alternatively losing vital aspects of their structure, function and composition, on which their ability to provide ecosystem services ultimately depends (Driver *et al.*, 2012). Ecosystem types are categorised as Critically Endangered (CR), Endangered (EN), Vulnerable (VU) or Least Threatened (LT), based on the proportion of each ecosystem type that remains in good ecological condition (Driver *et al.*, 2012). According to the terrestrial ecosystem threat status map, the study area falls within one ecosystem, which is listed as Vulnerable (VU).

- **Ecosystem Protection Level**

Ecosystem protection level indicates whether ecosystems are adequately protected or under-protected. Ecosystem types are categorised as not protected, poorly protected, moderately protected or well protected, based on the proportion of each ecosystem type that occurs within a protected area recognised in the Protected Areas Act (Driver *et al.*, 2012). According to the terrestrial ecosystem protection level map, the study and surrounding area are rated as not protected.

4.11.1.3 Study area in relation to protected areas

Formally protected areas refer to areas protected either by national or provincial legislation.

Based on the SANBI (2010) Protected Areas Map and the National Protected Areas Expansion Strategy (NPAES) the study area does not overlap with any formally or informally protected area. Based on the above information and the location of the proposed development, the study area is not expected to have an impact on formally protected areas.

4.11.1.4 National Freshwater Ecosystem Priority Area (NFEPA) Status

To better conserve aquatic ecosystems, South Africa has categorised its river systems according to set ecological criteria (i.e. ecosystem representation, water yield, connectivity, unique features, and threatened taxa) to identify Freshwater Ecosystem Priority Areas (FEPAs) (Driver *et al.* 2011). The

FEPA's are intended to be conservation support tools and envisioned to guide the effective implementation of measures to achieve the National Environment Management Biodiversity Act (NEM:BA) biodiversity goals (Nel *et al.* 2011). The 500-meter WULA trigger area in relation to the study area, does not overlap with FEPA wetland areas. No FEPA rivers occur in proximity to the study area. A perennial river runs to the East of the study area, from north to south.

4.11.1.5 Mpumalanga Highveld Wetlands

The study area in relation to the Mpumalanga Highveld Wetlands data system, which was created by refining the current data layers of the extent, distribution, condition and type of freshwater ecosystems in the Mpumalanga Highveld coal belt, to support informed and consistent decision-making by regulators in relation to the water-biodiversity-energy nexus, shows an A class AB (Largely Natural) wetland is located within 500-meters from the study area.

4.11.2 Vegetation

4.11.2.1 Desktop vegetation study

The study area is situated within the grassland biome. This biome is centrally located in southern Africa, and adjoins all except the desert, fynbos and succulent Karoo biomes (Mucina & Rutherford, 2006). Major macroclimatic traits that characterise the grassland biome include:

- Seasonal precipitation; and
- The minimum temperatures in winter (Mucina & Rutherford, 2006).

The grassland biome is found chiefly on the high central plateau of South Africa, and the inland areas of KwaZulu-Natal and the Eastern Cape. The topography is mainly flat and rolling but includes the escarpment itself. Altitude varies from near sea level to 2 850 m above sea level. Grasslands are dominated by a single layer of grasses. The amount of cover depends on rainfall and the degree of grazing. The grassland biome experiences summer rainfall and dry winters with frost (and fire), which are unfavourable for tree growth. Thus, trees are typically absent, except in a few localised habitats. Geophytes (bulbs) are often abundant. Frosts, fire and grazing maintain the grass dominance and prevent the establishment of trees.

The grassland biome comprises many different vegetation types. The study area is situated mainly in one vegetation type; the Eastern Highveld Grassland (Gm12), according to Mucina & Rutherford (2006). The other closest vegetation type, the Rand Highveld Grassland (Gm11), occurs within a few kilometres of the study area.

The Eastern Highveld Grassland vegetation type occurs on slightly to moderately undulating planes, including some low hills and pan depressions. The vegetation is a short dense grass land dominated by the usual highveld grass composition (*Aristida*, *Digitaria*, *Eragrostis*, *Themeda*, *Tristachya* etc.) with small scattered rocky outcrops with, wiry sour grasses and some woody species. Some 44%

transformed primarily by cultivation, plantations, mines, urbanisation and by building of dams. No serious alien invasions are reported (Mucina & Rutherford, 2006).

According to Mucina & Rutherford (2006), this vegetation type is classified as Endangered. The national target for conservation protection for both these vegetation types is 24%, but only a few patches are statutorily conserved in Nootgedacht Dam and Jericho Dam Nature Reserves and in private reserves (Holkransse, Kransbank, Morgenstond). Some 44% of this vegetation type has already been transformed primarily by cultivation, plantations, mines, urbanisation and by building of dams. Cultivation may have had a more extensive impact, indicated by land-cover data. No serious alien invasions are reported, but *Acacia mearnsii* can become dominant in disturbed sites. Erosion is very low.

Based on the Plants of Southern Africa (BODATSA-POSA, 2016) database, 159 plant species are expected to occur in the area. Of the 159-plant species, no species are listed as being Species of Conservation Concern (SCC).

4.11.2.2 Vegetation field assessment

Various vegetation/land cover areas were identified by the specialist (Figure 7).

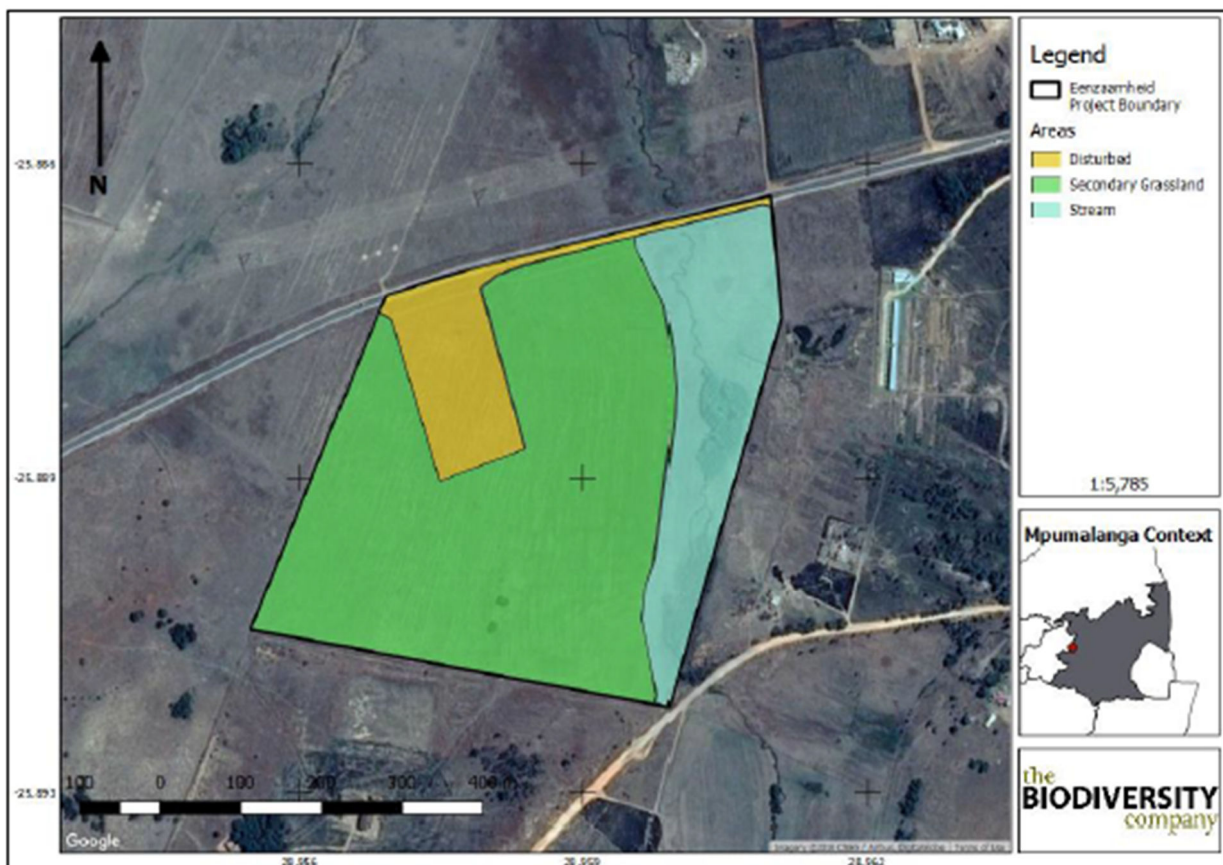


Figure 7: Vegetation areas identified during the field assessment

The approximate size of each of the specific areas was calculated as follows:

The disturbed area (yellow) are the areas which have been extensively degraded. Weeds such as *Bidens pilosa*, *Conyza bonariensis* and *Tagetes minuta* occurred on the sides and are most likely to dominate the bare soil.

The secondary grassland areas had the highest species composition within the overall study area, even though it had previously been disturbed. Using Google Earth historical imagery, it is evident that the area has been previously utilised for agriculture, and that the area has recovered since. The phytomass present during the survey is more than enough to support a large amount of fauna.

The stream area to the east, which is characterised as a perennial system, consisted of patches of *Imperata cylindrica*, *Typha capensis* and *Paspalum dilatatum* on the fringes of the stream system with many *Cyperus* species within.

A total of 45 tree, shrub and herbaceous plant species were recorded in the study area during the March 2018 field assessment, including alien invader species.

4.11.2.3 Habitat Sensitivity Mapping

As per the terms of reference for the Ecological Habitat Assessment, a GIS sensitivity map is required in order to identify sensitive features in terms of the relevant specialist discipline/s within the study area. Site sensitivities were classified and mapped. The sensitivity scores identified during the field survey for each habitat were then visually mapped (Figure 11). Areas that were classified as having low or low-moderate sensitivities are those areas which were deemed by the specialists to have been most impacted upon and/or were modified from their original condition due to factors such as over-grazing, intensive farming and/or presence of alien invasive species.

4.11.3 Fauna

4.11.3.1 Avifauna

Based on the South African Bird Atlas Project, Version 2 (SABAP2) database, 337 bird species are expected to occur near the study area (pentads 2545_2850, 2545_2855, 2545_2900, 2550_2850, 2550_2855, 2550_2900, 2555_2850, 2555_2855, 2555_2900). Of the expected bird species, twenty-two (22) species (6.52%) are listed as Species of Conservation Concern (SCC) either on a regional (19) or global scale (3) (Table 1).

The SCC include the following:

- Two (2) species that are listed as Endangered (EN) on a regional basis;
- Nine (9) species that are listed as Vulnerable (VU) on a regional basis; and
- Eight (8) species that are listed as Near Threatened (NT) on a regional basis.

Balearica regulorum (Crane, Grey Crowned) is listed as Endangered (EN) on a regional scale as well as global scale. The species inhabits wetlands such as marshes, pans and dams with tall emergent vegetation, open riverine woodland, shallowly flooded plains and temporary pools with adjacent grasslands, open savannas, croplands and breeds within or at the edges of wetlands. The habitat within the study area is suitable, but due to the human influence associated with the surrounding agricultural area, the likelihood to occur in the study area is moderate.

Circus ranivorus (African Marsh Harrier) is listed as EN in South Africa (Taylor et al, 2015). This species has an extremely large distributional range in sub-equatorial Africa. South African populations of this species are declining due to the degradation of wetland habitats, loss of habitat through over-grazing and human disturbance and possibly, poisoning owing to over-use of pesticides (IUCN, 2017). This species breeds in wetlands and forages primarily over reeds and lake margins. There are some, but not extensive, wetlands and marsh areas at the study area, and the occurrence of *C. ranivorus* in the study area is therefore considered to be moderate.

Aquila verreauxii (Verreaux's Eagle) is listed as VU on a regional scale and LC on a global scale. This species is locally persecuted where it coincides with livestock farms, but because the species does not take carrion, is little threatened by poisoned carcasses. Where hyraxes are hunted for food and skins, eagle populations have declined (IUCN, 2017). Based on absence of suitable habitat for its preferred prey items – namely hyraxes, the likelihood of occurrence of this species is rated as low.

Ciconia nigra (Black Stork) is native to South Africa, and inhabits old, undisturbed, open forests. They are known to forage in shallow streams, pools, marshes swampy patches, damp meadows, flood-plains, pools in dry riverbeds and occasionally grasslands, especially where there are stands of reeds or long grass (IUCN, 2017). It is unlikely that this species would breed in the study area due to the lack of forested areas and proximity of the human activity, therefore the likelihood of occurrence is rated as low.

Eupodotis senegalensis (White-bellied Korhaan) is Near-endemic to South Africa, occurring from the Limpopo Province and adjacent provinces, south through Swaziland to KwaZulu-Natal and the Eastern Cape (Hockey et al, 2005). This species generally prefers tall, dense sour or mixed grassland, either open or lightly wooded, occasionally moving into cultivated or burnt land. Some of these habitat types are present in the study area and thus the likelihood of occurrence was rated as moderate.

Falco biarmicus (Lanner Falcon) is native to South Africa and inhabits a wide variety of habitats, from lowland deserts to forested mountains (IUCN, 2017). They may occur in groups up to 20 individuals but have also been observed solitary. Their diet is mainly composed of small birds such as pigeons and francolins. The likelihood of occurrence for this species in the study area is rated as moderate due to the presence of many bird species on which Lanner Falcons may predate as well as this species' wide general habitat use.

Geronticus calvus (Southern Bald Ibis) is listed as Vulnerable (VU) on a regional and global basis. The species is known to prefer high rainfall, sour and alpine grasslands, characterised by an absence of trees and a short, dense grass sward. Foraging occurs preferentially on recently burned ground, also using unburnt natural grassland, cultivated pastures, reaped maize fields and ploughed areas. It has a varied diet, mainly consisting of insects and other terrestrial invertebrates. It has high nesting success on safe, undisturbed cliffs (IUCN, 2017). Likelihood of occurrence is rated as moderate depending on the available roosting habitat.

Neotis denhami (Denham's Bustard) inhabits grasslands, grassy Acacia-studded dunes, dense shrubland, light woodland, farmland, crops, dried marsh and arid scrub plains, also grass-covered ironstone pans and burnt savanna woodland in Sierra Leone and high rainfall sour grassveld, planted pastures and cereal croplands in fynbos in South Africa (IUCN, 2017). Due to the existence of suitable habitat, the likelihood of occurrence is rated as moderate.

Podica senegalensis (African Finfoot) occurs in forest and wooded savanna along permanent streams with thick growths of *Syzygium guineense*, along secluded reaches of thickly wooded rivers and on the edges of pools, lakes and dams with well-vegetated banks on the edges of dense papyrus beds far from the shore. It is rarely found away from shoreline vegetation and generally avoids stagnant or fast-flowing water (IUCN, 2017). There is some habitat for this species in the study area in the forms of dams and as such the likelihood of occurrence is rated as moderate.

Sagittarius serpentarius (Secretarybird) occurs in sub-Saharan Africa and inhabits grasslands, open plains, and lightly wooded savanna. It is also found in agricultural areas and sub-desert (IUCN, 2017). The likelihood of occurrence is rated as moderate due to the presence of suitable habitat.

Tyto capensis (African Grass-owl) is rated as Vulnerable (VU) on a regional basis. The distribution of the species includes the eastern parts of South Africa. The species is generally solitary, but it does also occur in pairs, in moist grasslands where it roosts (IUCN, 2017). The species prefers thick grasses around wetlands and rivers which are not present in the study area. Furthermore, this species specifically prefers nesting in dense stands of the grass species *Imperata cylindrica*. Some areas of this grass species are evident within the study area and as such the likelihood of occurrence is rated as moderate.

Alcedo semitorquata (Half-collared Kingfisher) is listed as Near Threatened (NT) on a regional scale and occurs across a large range. This species generally prefers narrow rivers, streams, and estuaries with dense vegetation onshore, but it may also move into coastal lagoons and lakes. It mainly feeds on fish (IUCN, 2017). The possibility of occurrence is low-moderate since there is a small stream within in the study area, which could provide suitable habitat for this species.

Anthropoides paradiseus (Blue Crane) is listed as NT on a regional scale and as VU on a global scale. This species has declined, largely owing to direct poisoning, power-line collisions and loss of their grassland breeding habitats owing to afforestation, mining, agriculture and development (IUCN, 2017).

This species breeds in natural grass and sedge-dominated habitats, preferring secluded grasslands at high elevations where the vegetation is thick and short. There is a presence of open grassland and some wetland areas but the human presence and activity within the project site, causes a moderate the likelihood of occurrence.

Ciconia abdimii (Abdim's Stork) is listed as NT on a local scale and the species is known to be found in open grassland and savanna woodland often near water but also in semi-arid areas, gathering beside pools and water-holes. They tend to roost in trees or cliffs (IUCN, 2017). The existence of wet areas creates the potential for this species to occur in the area and the likelihood of occurrence was rated as moderate.

Falco vespertinus (Red-footed Falcon) is known to breed from eastern Europe and northern Asia to north-western China, heading south in the non-breeding season to southern Angola and southern Africa. Within southern Africa it is locally uncommon to common in Botswana, northern Namibia, central Zimbabwe and the area in and around Gauteng, South Africa (Hockey *et al*, 2005). The habitat it generally prefers is open habitats with scattered trees, such as open grassy woodland, wetlands, forest fringes and croplands. Many of these habitats are present in the study area and thus the likelihood of occurrence is rated as high.

Glareola nordmanni (Black-winged Pratincole) is a migratory species which is listed as NT both globally and regionally. This species has a very large range, breeding mostly in Europe and Russia, before migrating to southern Africa. Overall population declines of approximately 20% for this species are suspected (IUCN, 2017). This species generally occurs near water and damp meadows, or marshes overgrown with dense grass. Due to its migratory nature, this species will only be present in South Africa for a few months during the year and will not breed locally. There is a small amount of suitable habitat within the study area and adjacent to it and as such the likelihood of occurrence is rated as moderate.

Oxyura maccoa (Maccoa Duck) has a large northern and southern range, South Africa is part of its southern distribution. During the species' breeding season, it inhabits small temporary and permanent inland freshwater lakes, preferring those that are shallow and nutrient-rich with extensive emergent vegetation such as reeds (*Phragmites* spp.) and cattails (*Typha* spp.) on which it relies for nesting (IUCN, 2017). The likelihood of occurrence of this species in the study area was rated as moderate due to the stream system present and also a dam to the north of the footprint area.

Phoeniconaias minor (Lesser Flamingo) is listed as NT on a global and regional scale whereas *Phoenicopterus roseus* (Greater Flamingo) is listed as NT on a regional scale only. Both species have similar habitat requirements and the species breed on large undisturbed alkaline and saline lakes, salt pans or coastal lagoons, usually far out from the shore after seasonal rains have provided the flooding necessary to isolate remote breeding sites from terrestrial predators and the soft muddy material for nest building (IUCN, 2017). Due to the absence of its preferred habitat within the study area, combined the proximity of the urban area, the likelihood of occurrence is low.

Calidris ferruginea (Curlew Sandpiper) is migratory species which breeds on slightly elevated areas in the lowlands of the high Arctic and may be seen in parts of South Africa during winter. During winter, the species occurs at the coast, but also inland on the muddy edges of marshes, large rivers and lakes (both saline and freshwater), irrigated land, flooded areas, dams and salt pans (IUCN, 2017). Due to the presence of some of these habitat types within the study area the likelihood of occurrence of this species was rated as moderate.

4.11.3.2 Mammals

The IUCN Red List Spatial Data (IUCN, 2017) lists 89 mammal species that could be expected to occur within the study area. Of these species, 9 are medium to large conservation dependant species, such as *Ceratotherium simum* (Southern White Rhinoceros) and *Equus quagga* (Zebra) that, in South Africa, are generally restricted to protected areas such as game reserves. These species are not expected to occur in the study area and are removed from the expected SCC list.

Of the remaining 80 small to medium sized mammal species, sixteen (16) (20%) are listed as being of conservation concern on a regional or global basis.

The list of potential species includes:

- Two (2) that are listed as Endangered (EN) on a regional basis;
- Three (3) that are listed as Vulnerable (VU) on a regional basis; and
- Eight (8) that are listed as Near Threatened (NT) on a regional scale.

On a global scale, 1 species is listed as EN, 2 are listed as VU and 2 as NT.

Some of the expected mammal SCC are discussed below.

Cloeotis percivali (Short-eared Trident Bat) is listed as Endangered (EN) on a regional basis. The species presumably occurs in savanna areas where there is sufficient cover in the form of caves and mine tunnels for day roosting (IUCN, 2017). Feeding exclusively on moths and appears to be very sensitive to disturbance. Due to the nature of the species, the likelihood of occurrence is moderate. Suitability of habitat will be the main determinant whether the species may be found.

Ourebia ourebi (Oribi) has a patchy distribution throughout Africa and is known to occur in South Africa. Populations are becoming more fragmented as it is gradually eliminated from moderately to densely settled areas (IUCN, 2017). Although suitable habitat exists within the study area, the likelihood of occurrence is rated as low due to the human presence.

Redunca fulvorufula (Mountain Reedbuck) is listed as EN both regionally and globally. The South African population has undergone a decline of 61-73% in the last three generations (15 years) (IUCN, 2017). Mountain Reedbuck live on ridges and hillsides in broken rocky country and high-altitude

grasslands (often with some tree or bush cover). Due to the lack of this habitat at the study area including the high human activity, the likelihood of occurrence of this species is rated as low.

Crocidura maquassiensis (Maquassie Musk Shrew) is listed as Vulnerable (VU) on a regional basis and is known to be found in rocky, mountain habitats. It may tolerate a wider range of habitats and individuals have been collected in Kwa-Zulu Natal from a garden, and in mixed bracken and grassland alongside a river at 1,500 m (IUCN, 2017). Likelihood of occurrence is rated as moderate.

Felis nigripes (Black-footed cat) is endemic to the arid regions of southern Africa. This species is naturally rare, has cryptic colouring is small in size and is nocturnal. These factors have contributed to a lack of information on this species. Given that the highest densities of this species have been recorded in the more arid Karoo region of South Africa, the habitat in the study area can be considered to be sub-optimal for the species and the likelihood of occurrence is low.

Hydricotis maculicollis (Spotted-necked Otter) inhabits freshwater habitats where water is un-silted, unpolluted, and rich in small to medium sized fishes (IUCN, 2017). Suitable habitat may be available in stream and the dam to the north of the footprint area, the quality of the habitat is the main determinant, the likelihood of occurrence is moderate.

Mystromys albicaudatus (White-tailed Rat) is listed as Vulnerable (VU) on a regional basis and Endangered (EN) on a global scale. It is relatively widespread across South Africa and Lesotho; the species is known to occur in shrubland and grassland areas. A major requirement of the species is black loam soils with good vegetation cover. Although the vegetation type is suitable, the likelihood of black loam is another determinant, therefore the likelihood of occurrence of this species is rated as low.

Panthera pardus (Leopard) has a wide distributional range across Africa and Asia, but populations have become reduced and isolated, and they are now extirpated from large portions of their historic range (IUCN, 2017). Impacts that have contributed to the decline in populations of this species include continued persecution by farmers, habitat fragmentation, increased illegal wildlife trade, excessive harvesting for ceremonial use of skins, prey base declines and poorly managed trophy hunting (IUCN, 2017). Although known to occur and persist outside of formally protected areas, the densities in these areas are considered low and the likelihood of occurrence in an area in close proximity to human activity and where they are likely to be persecuted due to the surrounding land uses, is regarded as low.

Aonyx capensis (Cape Clawless Otter) is the most widely distributed otter species in Africa (IUCN, 2017). This species is predominantly aquatic, and it is seldom found far from water. Based on the presence of a perennial river within the study area and various dams, the likelihood of occurrence of this species occurring in the study area is considered high.

Atelerix frontalis (South African Hedgehog) has a tolerance of a degree of habitat modification and occurs in a wide variety of semi-arid and sub-temperate habitats (IUCN, 2017). Based on the Red List of Mammals of South Africa, Lesotho and Swaziland (2016), *A. frontalis* populations are decreasing

due to the threats of electrocution, veld fires, road collisions, predation from domestic pets and illegal harvesting. Although the species is cryptic and therefore not often seen, there is suitable habitat in the study area and therefore the likelihood of occurrence is rated as high.

Dasymys incomtus (African Marsh Rat) is listed as NT on a regional scale and LC on a global scale. This species has a wide distributional range that includes Central Africa, East Africa and parts of Southern Africa. This species has been recorded from a wide variety of habitats, including forest and savanna habitats, wetlands and grasslands (IUCN, 2017). The likelihood of occurrence is for this species is rated as high due to the presence of suitable habitat for this species in the study area (i.e. wetlands, dams, vleis or rivers).

Leptailurus serval (Serval) occurs widely through sub-Saharan Africa and is commonly recorded from most major national parks and reserves (IUCN, 2017). The Serval's status outside reserves is not certain, but they are inconspicuous and may be common in suitable habitat as they are tolerant of farming practices provided there is cover and food available. In sub-Saharan Africa, they are found in habitat with well-watered savanna long-grass environments and are particularly associated with reedbeds and other riparian vegetation types. Due to the presence of grassland and wetland areas in the study area the likelihood of occurrence for this species within the study area is rated as high.

Parahyaena brunnea (Brown Hyaena) is endemic to southern Africa. This species occurs in dry areas, generally with annual rainfall less than 100 mm, particularly along the coast, semi-desert, open scrub and open woodland savanna. Although this species is known to persist outside of formally protected areas, the likelihood of occurrence of this species in the study area is low.

Pelea capreolus (Grey Rhebok) is endemic to a small region in southern Africa, inhabiting montane and plateau grasslands of South Africa, Swaziland, and Lesotho. In South Africa, their distribution is irregular and patchy, and they no longer occur north of the Orange River in the Northern Cape, or in parts of the North-West Province (IUCN, 2017). Grey Rhebok can be found in suitable habitat which has rocky hills, grassy mountain slopes, and montane and plateau grasslands in southern Africa. They are predominantly browsers, and largely water independent, obtaining most of their water requirements from their food. Based on the lack of their favoured habitat at the study area, the likelihood of occurrence of this species is rated as low.

Poecilogale albinucha (African Striped Weasel) is usually associated with savanna habitats, although it probably has a wider habitat tolerance (IUCN, 2017). Due to its secretive nature, it is often overlooked in many areas where it does occur. There is sufficient habitat for this species in the study area and the likelihood of occurrence of this species is therefore considered to be moderate.

Eidolon helvum (African Straw-coloured Fruit Bat) is listed as LC on a regional scale and NT on a global scale. This species has been recorded from a very wide range of habitats across the lowland rainforest and savanna zones of Africa (IUCN, 2017). Although considered to be widespread and abundant across its range, certain populations are decreasing due to severe deforestation, hunting for food and medicinal

use (IUCN, 2017). This species is known to form large roosts and colonies numbering in the thousands to even millions of individuals (IUCN, 2017). No colonies of this species are known to occur in the study area or in the immediate vicinity and although individuals may occasionally be recorded it is not expected to be resident in the study area.

4.11.3.3 Herpetofauna (Reptiles & Amphibians)

Based on the IUCN Red List Spatial Data (IUCN, 2017) and the ReptileMap database provided by the Animal Demography Unit (ADU, 2017) 15 reptile species are expected to occur in the study area. One reptile species of conservation concern, namely *Crocodylus niloticus* (Nile crocodile) is expected to occur within the study area. The likelihood of occurrence is very low due to the absence of suitably large river habitat.

Based on the IUCN Red List Spatial Data (IUCN, 2017) and the AmphibianMap database provided by the Animal Demography Unit (ADU, 2017) 18 amphibian species are expected to occur in the study area. No amphibian species of conservation concern should be present in the study area according to the above-mentioned sources but in situ confirmation is required.

4.11.3.4 Fauna field assessment

Twenty-one (21) bird species were recorded in the study area during the March 2018 survey based on either direct observations, or the presence of visual tracks & signs. No bird SCC was recorded during the survey.

Overall, mammal diversity in the study area was moderate, no mammal species were observed but four (4) mammals were recorded during the March 2018 survey based on the presence of visual tracks & signs. One SCC, namely *Aonyx capensis* (Cape Clawless Otter) was confirmed via tracks.

No reptile species were recorded in the study area during the March 2018 survey.

Two (2) amphibian species was recorded in the study area during the March 2018 survey based from calls made by the frog species.

4.11.4 Current Impacts

During the rapid field survey, the current impacts that are having a negative impact on the area were identified, and are listed below;

- Presence of alien and invasive plant species;
- Existing disturbance of vegetation;
- Presence of livestock grazing within the area;
- Adjacent road with the associated constant disturbance, road mortalities and litter; and
- Powerlines within the vicinity of the study area.

It is clear from the regional ecological overview, as well as the baseline data collected that the study area has been somewhat altered (historically and currently). The previous agriculture as well as the recent disturbance will require at least 5 years to recover to a better, more natural ecological state.

However, despite these impacts, the remaining natural habitats (including secondary grassland and stream habitats) (surveyed, but mainly located outside the study area / footprint of the proposed development), exhibited a healthy balance between various common grassland species and associated herbaceous plants. The ecological integrity, importance and functioning of the secondary grassland area is not as functional as the stream which is a water resource system as well as crucial habitat for various fauna and flora, for example the Cape Clawless Otter. This diversity is indicative of the importance of these systems to collectively provide refuge, food and corridors for dispersal in and through the surrounding area.

4.12 Surface Water

Prism Environmental Management Services was requested by Chapmans View Properties (Pty) Ltd to undertake a wetland assessment to determine extent and delineate the wetlands that are in proximity of the study site and that could possibly be affected by the proposed development of the Kusile Truck Stop. This, specifically to inform the Environmental Impact Assessment (EIA) for the said develop.

The site falls within Quaternary catchment area B20G and is part of the new Olifants Water Management Area (WMA).

The field investigations of the wetland specialist concluded that no functional or natural wetland is present on the development site. A wetland was recorded in proximity to the development site (150m away), but no direct impact is envisaged.

The following Hydrogeomorphic wetland was identified during the site evaluation:

- KTS_CVB1 was found on the slope draining towards the north.

It is concluded from the results presented in the wetland report that the construction activities will not directly impact on the adjacent wetland system. Possible impacts can be mitigated to satisfactory standards if all mitigatory actions are implemented with due care. It is key to preserve water quality and supply to the downstream aquatic resources.

4.13 Groundwater

According to Geoset cc (2010), water seepage may be encountered especially during high rainfall periods in the rainy season. The seepage may occur in the sandy residual sandstone, usually just below the clay. It can therefore be expected that shallow water tables may also exist elsewhere during high rainfall periods. Generally, the clay horizon will serve as a natural barrier from the groundwater, but care should be taken against rising damp if this horizon is removed during construction. The clay has a

low permeability and ponding of surface water may occur, since seepage into the clay will be very slow. Thus, good surface drainage should be ensured through landscaping. Possible groundwater contamination should be monitored by boreholes downstream of the development, and boreholes should be drilled to enable periodic monitoring of the water quality. A geophysical survey indicating contact zones for water source targeting and structuring the complex geology should be included in the next phase of investigation.

4.14 Archaeology and Cultural Heritage

The presence and distribution of heritage resources define a 'heritage landscape'. In this landscape, every site is relevant. In addition, because heritage resources are non-renewable, heritage surveys need to investigate an entire project area, or a representative sample, depending on the nature of the project.

A Heritage Impact Assessment (HIA) was undertaken to determine whether heritage resources would be impacted upon by the proposed development and provided an overview of the historical background of the area:

The study area is situated on a previously ploughed field which is evident from aerial photos through old plough lines running across the site. The survey area's top soil has been stripped away. The stripped area outlines the borders of the study area.

4.14.1 Desktop archaeology of the area

The archaeological record for the greater study area consists of the Stone Age and Iron Age.

4.14.1.1 The Stone Age

The Stone Age is divided in Early; Middle and Late Stone Age and refers to the earliest people of South Africa who mainly relied on stone for their tools.

Very few Early Stone Age sites are on record for Mpumalanga and no sites dating to this period are expected for the study area. An example in Mpumalanga is Maleoskop on the farm Rietkloof where ESA tools have been found. This is one of only a handful of such sites in Mpumalanga.

The MSA has not been extensively studied in Mpumalanga but evidence of this period has been excavated at Bushman Rock Shelter, a well-known site on the farm Klipfonteinhoek in the Ohrigstad district. This cave was excavated twice in the 1960s by Louw and later by Eloff. The MSA layers show that the cave was repeatedly visited over a long period. Lower layers have been dated to over 40 000 BP (Before Present) while the top layers date to approximately 27 000 BP (Esterhuizen & Smith in Delius, 2007; Bergh, 1998). Some isolated finds were recorded by Van Vollenhoven (1992) close to the study area.

The Later phases of the Stone Age began at around 20 000 years BP. This period was marked by numerous technological innovations and social transformations within these early hunter-gatherer societies. These people may be regarded as the first modern inhabitants of Mpumalanga, known as the San or Bushmen. They were a nomadic people who lived together in small family groups and relied on hunting and gathering of food for survival. Evidence of their existence is to be found in numerous rock shelters throughout the Eastern Mpumalanga where some of their rock paintings are still visible. A number of these shelters have been documented throughout the Province (Bornman, 1995; Schoonraad in Barnard, 1975; Delius, 2007).

4.14.1.2 Iron Age

These include areas such as Witbank, Ermelo, Barberton, Nelspruit, White River, Lydenburg and Ohrigstad.

The Iron Age as a whole represents the spread of Bantu speaking people and includes both the pre-Historic and Historic periods. It can be divided into three distinct periods:

- The Early Iron Age: Most of the first millennium AD.
- The Middle Iron Age: 10th to 13th centuries AD
- The Late Iron Age: 14th century to colonial period.

The Iron Age is characterised by the ability of these early people to manipulate and work Iron ore into implements that assisted them in creating a favourable environment to make a better living. No Sites dating to the Early or Middle Iron Age have been recorded or is expected for the study area. The same goes for the Later Iron Age period where the study area is situated outside the western periphery of distribution of Late Iron Age settlements in Mpumalanga. This phase of the Iron Age (AD 1600-1800's) is represented by various tribes including Ndebele, Swazi, BaKoni, Pedi marked by extensive stonewalled settlements found throughout the Mpumalanga escarpment

4.14.1.3 Historical

The discovery of diamonds and gold in the Northern provinces had very important consequences for South Africa. After the discovery of these resources, the British, who at the time had colonized the Cape and Natal, had intentions of expanding their territory into the northern Boer republics. This eventually led to the Anglo-Boer War, which took place between 1899 and 1902 in South Africa, and which was one of the most turbulent times in South Africa's history. Even before the outbreak of war in October 1899 British politicians, including Sir Alfred Milner and Mr. Chamberlain, had declared that should Britain's differences with the Z.A.R. result in violence, it would mean the end of republican independence. This decision was not immediately publicized, and republican leaders based their assessment of British intentions on the more moderate public utterances of British leaders. Consequently, in March 1900, they asked Lord Salisbury to agree to peace on the basis of the status quo ante bellum. Salisbury's reply was; however, a clear statement of British war aims. (Du Preez 1977).

During the British march into the Transvaal between February and September 1900, several troops passed by the area where Witbank is situated today. The battalions of Lieutenant Generals J. French, R. Pole-Carew and F. Roberts all travelled close by the Witbank area and through Middelburg. A railway line ran along this route at the time. (Bergh 1999: 51).

During the Anglo-Boer War, two railway stations were located in the vicinity of the Witbank area, and close to each a black concentration camp had been established. At Middelburg, about 20 kilometres to the east of Witbank, one white and one black concentration camp was also set up. No skirmishes took place in the direct vicinity of the farm area. (Bergh 1999: 54).

A large Concentration camp was located at Balmoral. The camp was established in June 1901 and was to accommodate inmates from Middelburg as well as other areas including Bronkhorstpruit. Conditions in the camp was terrible and the camp had a higher than average death rate for camps in the Transvaal. The camp at times had around 10 000 inmates and the large numbers increased the spread of disease. Interestingly it is noted that the camp was not fenced and that the tents had dung floors, increasing the possibility of archaeological finds. The camp was also moved to higher ground over a period of time also increasing possible remnants or artefacts (Boers.co.za). Today, there is still a concentration camp graveyard in Balmoral.

There are no battlefields or related concentration camp sites located in the study area, the greater area has been home to a large concentration camp and the developer should be mindful of this fact should artefacts be uncovered during construction. Fourie (2010) determined that it is more probable that the camp was positioned close to the train station that is in the northern section of the farm to the north of the N4 highway.

4.14.1.4 Palaeontology

Based on the SAHRIS Paleontological Sensitivity Map the area is of insignificant paleontological significance. Therefore, no further mitigation prior to construction is recommended in terms of Section 35 for the proposed development to proceed.

4.14.2 Field assessment

The study area has been extensively transformed by agricultural activities and this resulted that the entire site was disturbed and damaged from a heritage point of view. No standing structures older than 60 years occur in the study area. No archaeological sites or material was recorded during the survey.

In terms of Section 36 of the Act no burial sites were recorded in the study area. A known cemetery is located approximately 190 meters to the south west of the study area but will not be impacted on. Cultural Landscapes, Intangible and Living Heritage. No known grave sites are on record close to the study area.

Long term impact on the cultural landscape is negligible as the immediate area has been disturbed by agricultural activities and the larger area by extensive mining activities. Visual impacts to scenic routes and sense of place are low due to the extensive developments in the greater area.

5 MOTIVATION FOR NEED AND DESIRABILITY

In terms of Section 2 (f) of Appendix 2 of GN 921 of 4 December 2014, this section discusses the need and desirability of the project. A re-zoning application for the proposed land use was submitted and approved.

5.1 Need

- The need for the proposed development is firstly based on the positive consultations and discussions that preceded the re-zoning application.
- The site selected for the proposed development provides the best existing opportunity to establish the proposed land use, when considering the preceding consultations, discussions and investigations prior to the re-zoning application.
- The proposed development will serve the contractors, workers and service providers to the new Kusile Power Station.
- The proposed development will serve the community and public using the concerned road (R686). The R686 provides a linkage between the N4 national road and the N12 national road.
- From a socio-economic point of view, the proposed development will have a positive impact and will create employment opportunities (approximately 30 during the construction phase and 30 during the operational phase), to the benefit of the surrounding community. The proposed development will also stimulate the local economy.
- The Spatial Development Frameworks (SDFs) of Nkangala District Municipality and Emalahleni Local Municipality acknowledges the significance of the transport network, coal reserves and power stations in the concerned area. The SDFs are however silent about the new Kusile Power Station and access road.
- The following concerned principles, as contained in Chapter 1 of the Development Facilitation Act, 1995 (Act 67 of 1995), supersedes any other principles or policies contained in any other policy documents, and should, therefore be considered when any aspect of land development is considered:
 - The proposed development will constitute a new, formal development.
 - The proposed development will discourage the illegal occupation of the concerned property.
 - The proposed development will not have a detrimental impact on the environment.
 - Development on the concerned property is restricted by way of development parameters and relevant legislation.
 - The proposed development will optimise use of existing renewable resources (e.g. infrastructure) without exhaustion of the capacity thereof.
 - The proposed development promotes integrated land development in rural and urban areas in support of each other.

-
- The proposed development can be described as sustainable since the development can be operated successfully on an ongoing basis. It will also not be developed on a unique natural habitat, a place of hazard and an archaeological and cultural significant site.
 - Public participation for the re-zoning application was done by way of:
 - preliminary discussions with relevant role players; and
 - notification of interested and affected parties about the proposed development in the prescribed matter.
 - The proposed development will contribute to the transfer skills by way of training, etc. Skills will also be transferred during the construction and operation phase of the proposed development.
 - The proposed development complies with governmental policy and interacting with the relevant governmental structures in compiling and finalising the proposed development application.

5.2 Desirability

The desirability of this application can be considered in light of the following factors:

- Visual/physical impact
 - Since the proposed development is a small-scale development, situated within an area that is characterised by mixed land uses (residential, agricultural, industrial, quarrying, etc.), it is envisaged that the proposed development will not have a negative impact on the surrounding area or land uses.
 - The opinion is offered that the study area will be utilised optimally and competitively.
- Vehicular movement/accessibility
 - In assessing the accessibility of the study area, it is clear the proposed development enjoys good accessibility due to its location. Access to and from the proposed development will be provided from the newly constructed Kusile access road (R686), and gains access from the R545 provincial road in the east.
 - Sufficient parking will be provided to the satisfaction of Emalahleni Local Municipality.
- Impact on surrounding development
 - The land uses, and development were already in use on the concerned property at the time of the purchase of the concerned property and will thus have no negative impact on the surrounding properties.

[Memorandum, Plan Centre; August 2010]

6 PROCESS FOLLOWED TO REACH THE PROPOSED PREFERRED ACTIVITY, SITE AND LOCATION WITHIN SITE

6.1 Nature of the Activities

The nature of the activities to be undertaken is to permanently transform the property to a Truck Stop. The development will consist of access, parking, truck shop infrastructure and buildings and services.

6.2 Alternatives

According to the 2014 EIA Regulations, alternatives are defined as:

“Different means of meeting the general purpose and requirements of the activity, which may include alternatives to the-

- (a) property on which or location where the activity is proposed to be undertaken;*
- (b) type of activity to be undertaken;*
- (c) design or layout of the activity;*
- (d) technology to be used in the activity; or*
- (e) operational aspects of the activity;*

and includes the option of not implementing the activity”

In line with the Regulations, the following alternatives have been assessed for the proposed development:

- Layout alternatives;
- Technology Alternatives; and
- The No -Go Option.

More information on each of these alternatives is provided below.

6.2.1 Layout alternative

In terms of layout, two alternative layouts have been assessed. These include:

- The Proposal; and
- Alternative Layout (Previously Authorised Layout).

Figure 8 below provides an overview of the Proposal and shows that in this layout, there is one-way traffic through the study area. In contrast, the Alternative Layout includes two accesses to and from the proposed development and two-way traffic within the study area (Figure 9).

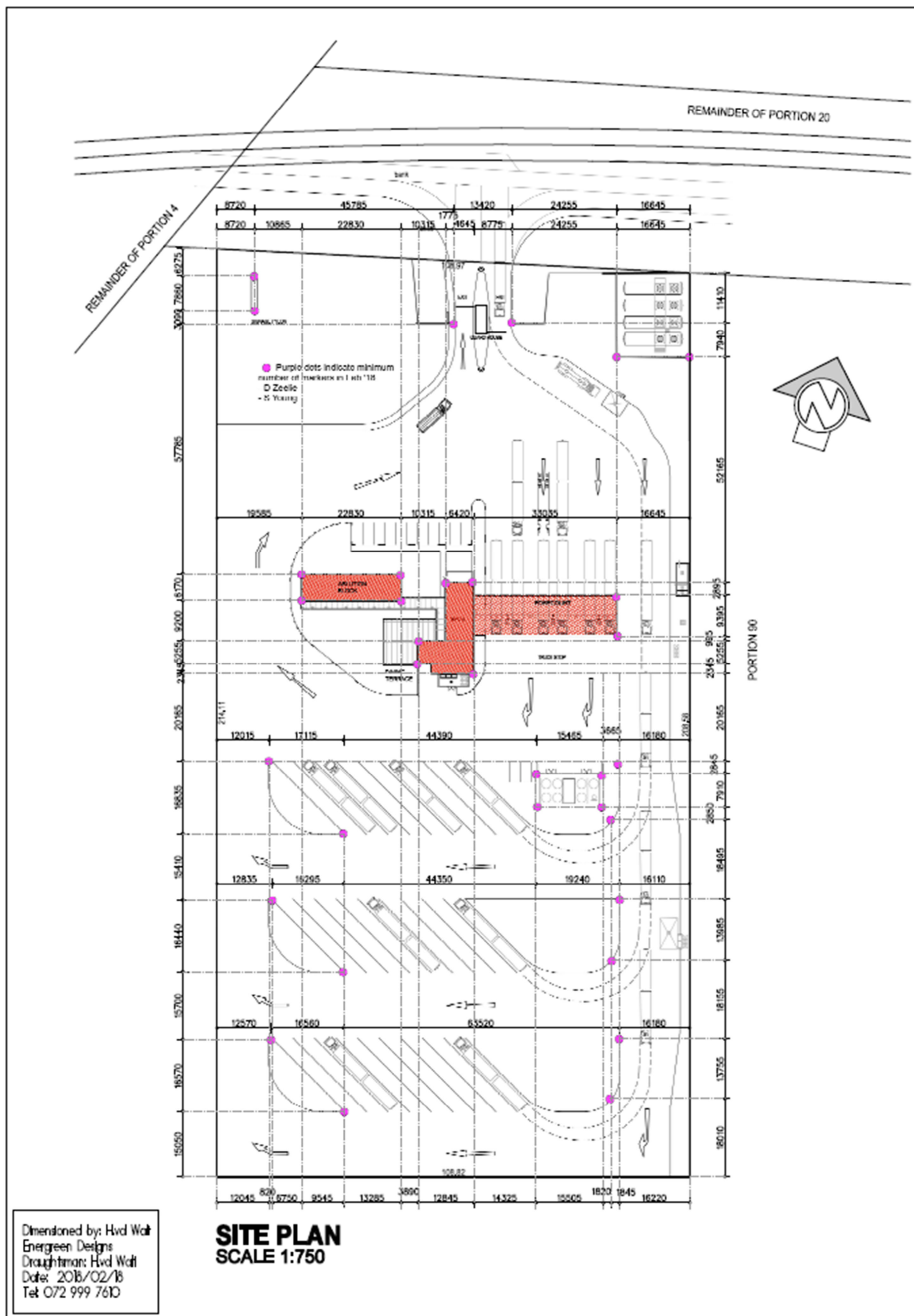


Figure 8: Proposed layout of Kusile Truck Stop

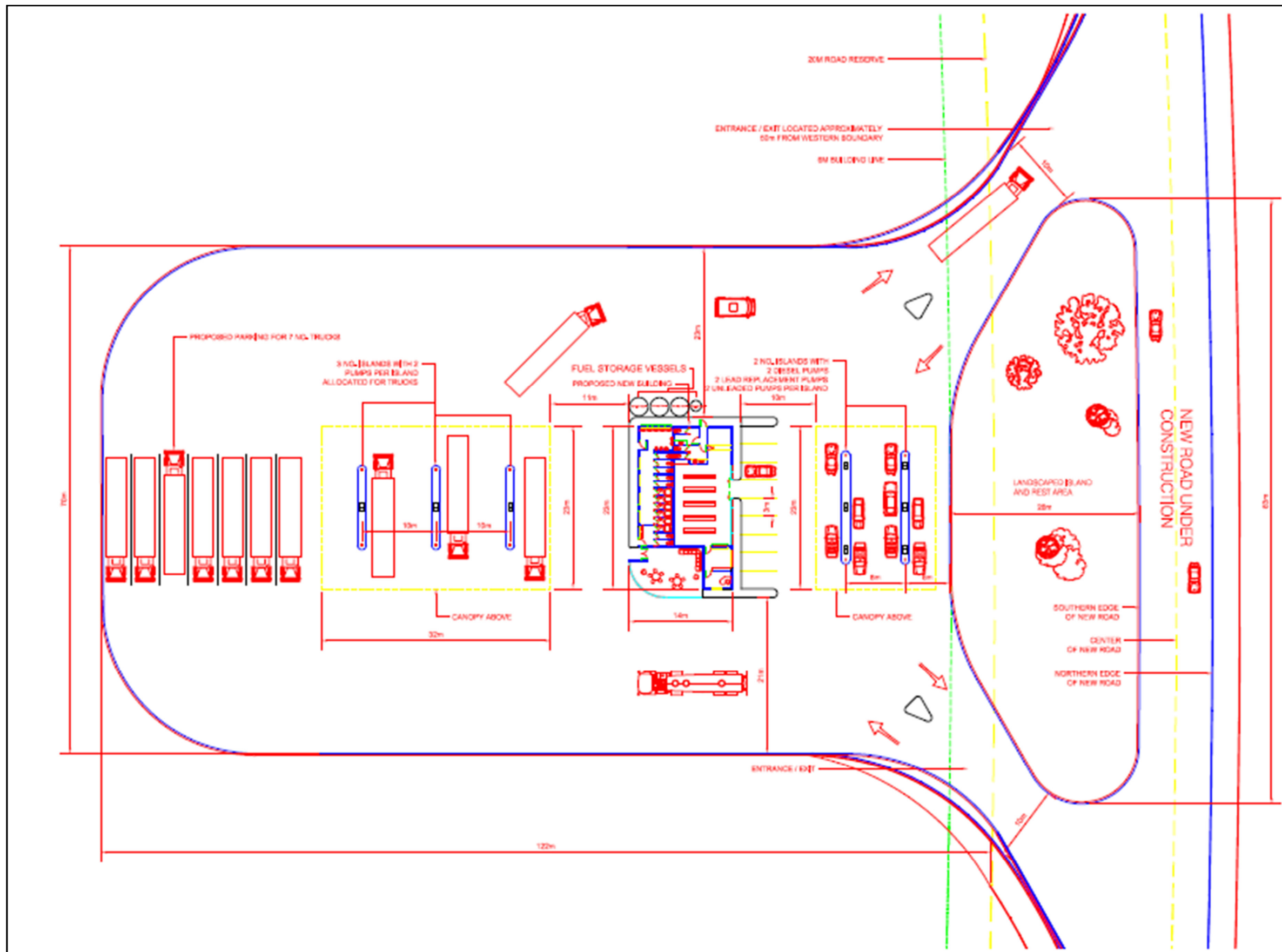


Figure 9: Alternative layout of Kusile Truck Stop

6.2.2 Technology alternative

The technology alternative relates to the sewage and waste water disposal and treatment and the following technology alternatives have been assessed:

- The proposal is to install a Lilliput Treatment system.
- The alternative is to install a conservancy tank with a suction coupling and for the sewage to be removed by a registered service provider to the municipal waste water treatment plant.

Lilliput Treatment Systems are simple to install and to run. They exceed the limits for discharge to the environment and are biologically processed. These systems comply with responsible disposal requirements and are odourless and silent. The water can be re-used for irrigation. Lilliput has received the following awards and endorsements:

- SABS Engineering Design Award;
- The National Department of Environmental Affairs;
- The National Department of Agriculture, Forestry and Fisheries;
- The Water Institute of Southern Africa.

The sewage from the septic tanks (pre-digestion) is pumped at a constant rate to the LILLIPUT BIOREACTOR. The effluent enters the bio-reactor below the AWW MARK TWO fixed-growth media where it mixes with an air diffuser. The effluent then rises through the media where the microbial population attached to the media removes and aerobically degrades the organic material contained in the aerated effluent. A degree of nitrification takes place in the upper layers of the media. Once it has passed through the media, the treated effluent is pumped through a disinfecting chlorine contactor and discharged to the garden for irrigation or rivers and streams or dams and storm water systems. The range can incorporate all their components into a single unit such as containerised applications or in modular form to suit topographical and/or aesthetic requirements. In rural areas, to do away with the need for electrical power, modular components can be arranged to promote the use of gravity. Trickling introduction of effluent, with natural up-drafts and a residency of only five (5) minutes is achieved. The disposal of the treated effluent by irrigation is totally safe and helps to conserve water. Domestically, such savings are in the order of 40. The only requirement for the installation of all models is a 220-volt power supply and in some cases a surface bed. The plant does not require continuous supervision and minimal maintenance. All pumps are sealed units rated for continuous use. The chlorine disinfection unit should be topped up intermittently to ensure optimum efficiency. All mechanical and electrical components are readily available off the shelf from local shops. All plant and equipment are supplied in non-corrosive or corrosive protected material. As the entire plant can be constructed above ground, the necessity for extensive earth works and civil requirements is curtailed. The treatment plant is easily installed with simple plumbing requirements. Technical details of the system are provided in Appendix 5.2.

In contrast, the alternative which is the use of a conservancy tank would involve sewage being pumped to a tank and stored until it could be removed by a honeysucker and then transported to sewage treatment plant.

6.2.3 No-go option

As standard practice and to satisfy regulatory requirements, the option of not proceeding with the project is included in the evaluation of the alternatives.

The main implication of the No Go Option is that should the development not proceed, there will be a loss of the economic benefits of the investment in the area. There will also be a loss of the construction and operational phases related employment opportunities and the positive socio-economics effects of these employment opportunities.

7 PUBLIC PARTICIPATION PROCESS

7.1 Objectives and Purpose of Public Participation

The purpose of the public participation process is to provide information regarding the proposed project to any potentially interested and/or affected person for use and consideration throughout the environmental assessment process. The information usually involves a combination of the technical project scope, environmental attributes and sensitivities, cultural and heritage aspects as well as socio-economic factors that may be potentially beneficial or problematic to various role players.

The dissemination of such information is intended to assist the public with understanding how the proposed project and/or development may impact them and the environment in either a positive and/or negative manner, and especially where impacts are determined or perceived as significantly high, how such impacts may be influenced by project changes (layout or design aspects) or management measures may be implemented to reduce or minimise the significance of any identified impacts.

As a registered I&AP, members of the public of any affiliation are awarded the opportunity to remain informed of the steps, actions and decisions made within the environmental impact assessment process and are able to actively participate by reviewing all information provided by the EAP to the I&AP's in a reasonable period in order to provide comments, objections, suggestions or any other information that will assist the project to develop in a favourable for all manner or contribute to the competent authority's knowledge in order to make an informed decision on the application for environmental authorisation.

7.2 Notification Phase of Public Participation

The public participation process commenced with identifying and notifying all potential Interested and Affected Parties (I&APs). Notices were provided as a source of information and potential interested and/or affected members of the public were invited to register as I&APs for the remainder of the process. All public participation is conducted in English.

7.2.1 Identified I&AP's

The following potential I&AP's were identified:

- Mpumalanga Department of Agriculture, Rural Development, Land and Environmental Affairs (MDARDLEA) (Competent Authority);
- The Emalahleni Local Municipality;
- The Nkangala District Municipality;
- National Department of Water and Sanitation (DWS);
- The Department of Mineral Resources (DMR);
- The National Department Rural Development and Land Reform (DRDLR);
- The Mpumalanga Department of Public Works, Roads and Transport;

-
- The South African Heritage Resources Agency (SAHRA);
 - The Mpumalanga Provincial Heritage Resources Authority (MPHRA);
 - Mpumalanga Tourism and Parks Agency (MTPA);
 - Ward Councillor;
 - Surrounding Landowners / Occupiers; and
 - Surrounding businesses.

Refer to Appendix 7.1 for a detailed list of the interested and/or affected members of the public and Organs of State that is registered as an I&AP.

7.2.2 First Notification Period

7.2.2.1 Newspaper Notice

A notice was published in the following newspaper on the specified dates:

- **Local:** The Witbank News, published on the 23 March 2018.

Refer to Appendix 7.2 for proof of the newspaper notices.

7.2.2.2 Site Notice

Two site notices were placed at and in proximity to the study area adjacent to roads on 23 March 2018.

Refer to Appendix 7.3 for proof of the site notices.

7.2.2.3 Written Notifications

The surrounding landowners and/or occupiers and organs of state (listed in Appendix 2.1) were notified in writing via email on 23 March 2018.

Refer to Appendix 7.4 for proof of the written notices.

7.2.3 Second notification period

Please note that proof of the second notification period will be included in the final submission of the Basic Assessment Report to the competent authority.

7.2.3.1 Newspaper Notice

A notice was published in the following newspaper on the specified dates:

- **Local:** The Witbank News, published on 29 June 2018.

Refer to Appendix 7.5 for proof of the newspaper notices.

7.2.3.2 Site Notice

Two site notices were placed at and in proximity to the study area adjacent to roads on 04 July 2018.

Refer to Appendix 7.6 for proof of the site notices.

7.2.3.3 Written Notifications

The surrounding landowners and/or occupiers and organs of state (listed in Appendix 7.1) were notified in writing via email on 04 July 2018.

Refer to Appendix 7.7 for proof of the written notices.

7.2.4 Comments Raised by I&AP's during the Initial Notification Period

The comments received, and responses provided thereto during the first notification period, were summarised in the Comments and Responses Report and is attached in Appendix 7.10. All communication to and from Interested and Affected Parties is attached in Appendix 7.9.

7.3 Basic Assessment Report Public Participation

The Basic Assessment Report is made available for comment to all registered interested and affected parties and relevant organs of state for a period of 30 days from **04 July 2018 to 03 August 2018**. Proof will be included in the Final Basic Assessment Report to be submitted to the Competent Authority.

7.3.1 Proof of Notification

All registered I&APs were notified via email of the review period of the Basic Assessment Report.

The following authorities were provided with a copy of the Basic Assessment Report:

- Mpumalanga Department of Agriculture, Rural Development, Land and Environmental Affairs (MDARDLEA) (Competent Authority);
- The Emalahleni Local Municipality;
- The Nkangala District Municipality;
- National Department of Water and Sanitation (DWS);
- The South African Heritage Resources Agency (SAHRA) (online submission).

7.3.2 Comments raised by I&AP's during the review of the Basic Assessment Report

All comments received during the notification and Basic Assessment report review period, will be considered in the Final Basic Assessment report which will be submitted to MDARDLEA in August 2018.

7.4 Outcome of the Decision

Registered I&AP's will be notified in writing of the outcome of the Department's decision within 14 days of the decision. The notification will include details of the process and timeframes in which to appeal the outcome of the decision made by the competent authority, MDARDLEA.

8 SUMMARY OF FINDINGS AND RECOMMENDATIONS OF SPECIALIST STUDIES

8.1 Ecological Habitat Assessment

The Biodiversity Company (TBC) was appointed by Prism EMS to conduct a terrestrial ecology baseline and impact (risk) assessment for the proposed service station development on Portion 20 of the Farm Eenzaamheid, Mpumalanga, South Africa. The study focused on the project area affected by the proposed development (called the project area in the Specialist Report and indicated in red in Figure 10). In addition, the biodiversity of the larger farm boundary was indicated and discussed at a desktop level (shown in black in Figure 10).

Please refer to Appendix 6.1 for a copy of the Ecological Baseline and Impact Assessment. Details of the expertise of the specialist are also provided within the report.

It should however be noted that the actual area to be developed by the Kusile Truck Stop is only a small portion of the study area (red) studied by TBC.

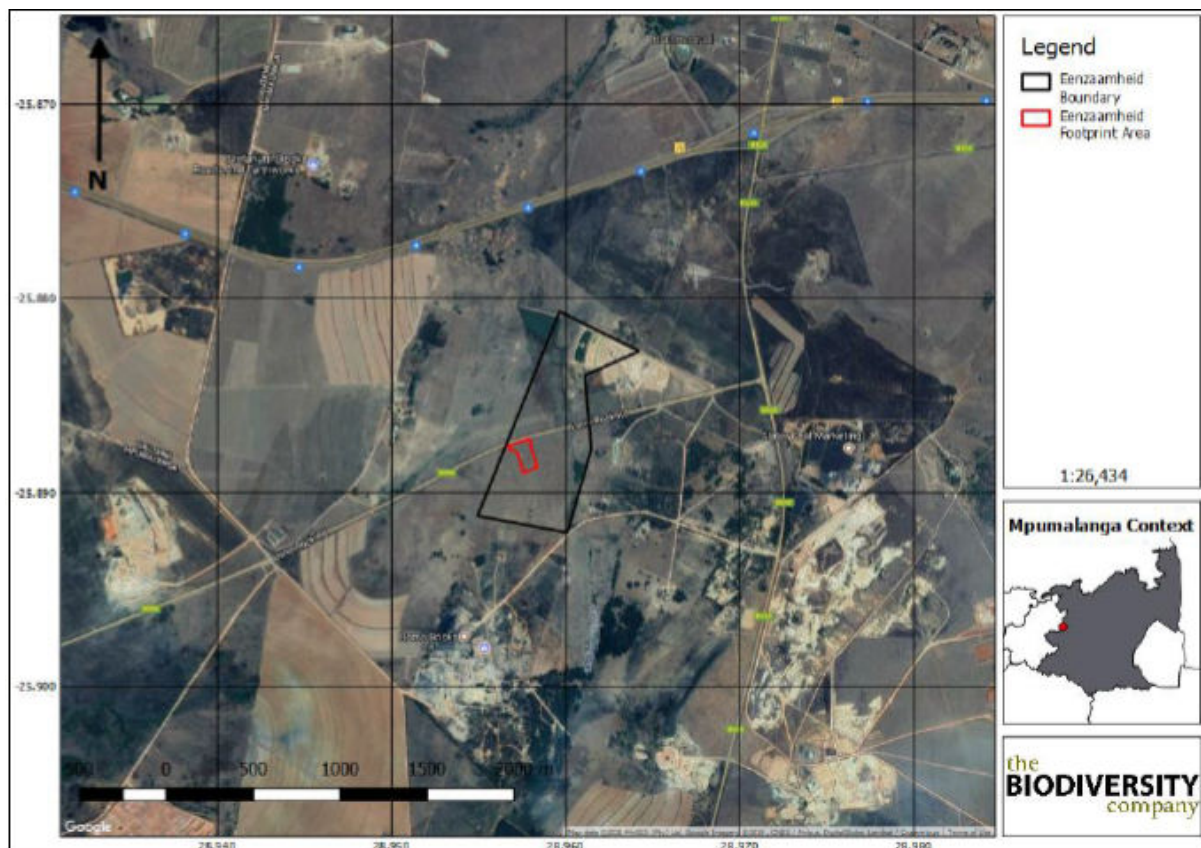


Figure 10: General location of the study area assessed by The Biodiversity Company

8.1.1 Scope of Work

The Scope of Work for the Biodiversity Baseline and Impact Assessment was as follows:

- Desktop description of the baseline receiving environment specific to the field of expertise (general surrounding area as well as site specific environment);
- Identification and description of any sensitive receptors in terms of relevant specialist disciplines (biodiversity) that occur in the study area, and the manner in which these sensitive receptors may be affected by the activity;
- Identify “significant” ecological, botanical and zoological features within the proposed development areas;
- Site visit to verify desktop information;
- Screening to identify any critical issues (potential fatal flaws) that may result in project delays or rejection of the application; and
- Provide a map identifying sensitive receptors in the study area, based on available maps, database information & site visit verification.

8.1.2 Sensitivity Map

Areas that were classified as having low or low-moderate sensitivities are those areas which were deemed by the specialists to have been most impacted upon and/or were modified from their original condition due to factors such as over-grazing, intensive farming and/or presence of alien invasive species. The overall sensitivity of the project area is indicated in Figure 11.

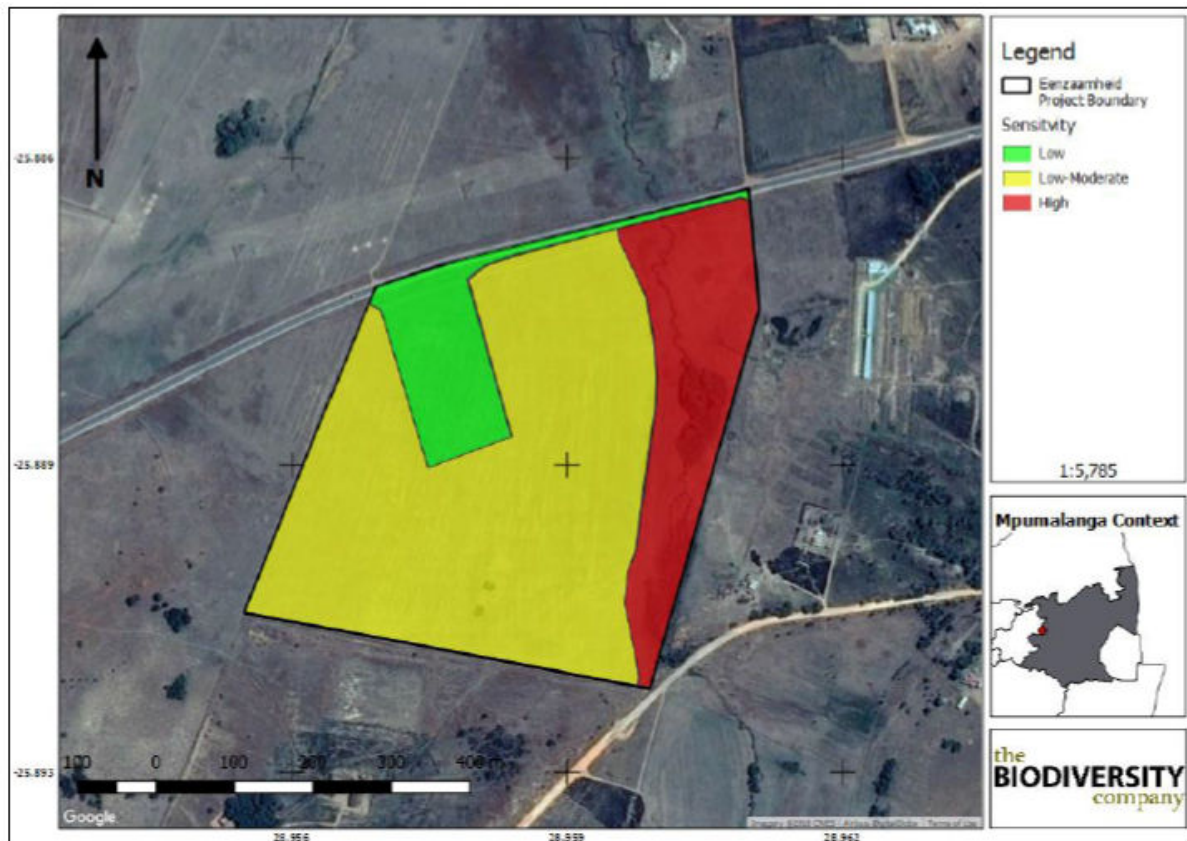


Figure 11: Habitat sensitivity within the Project area

It should be noted that only the area indicated as a low sensitivity in the above figure will be developed by the Kusile Truck Stop

8.1.3 Conclusion

The completion of a study, in conjunction with the detailed results from the survey means that there is a high confidence in the information provided. The survey which was completed, and the corresponding studies resulted in good site coverage, assessing the major habitats and ecosystems, obtaining a general species (fauna and flora) overview and observing the major current impacts.

It is clear from the regional ecological overview, as well as the baseline data collected to date that the study area has been somewhat altered (historically and currently). The previous agriculture as well as the recent disturbance will require at least 5 years to recover to a better, more natural ecological state.

However, despite these impacts, the remaining natural habitats (including secondary grassland and stream habitats) exhibited a healthy balance between various common grassland species and associated herbaceous plants. The ecological integrity, importance and functioning of the secondary grassland area is not as functional as the stream which is a water resource system as well as crucial habitat for various fauna and flora, for example the Cape Clawless Otter. This diversity is indicative of the importance of these systems to collectively provide refuge, food and corridors for dispersal in and

through the surrounding area. The preservation of these systems especially the stream area, is the most important aspect to consider for the consideration of the proposed project.

Careful consideration must be afforded to each of the mitigation measures provide. In the event that environmental authorisation is issued for this project, proven ecological (or environmental) controls and mitigation measures must be entrenched in the management framework.

The following further conclusions were reached based on the results of this assessment (these conclusions are limited due to the unknown extent and type of development which is proposed for the study area):

- The study area is identified as Heavily Modified, with the surrounding area moderately modified;
- Based on the National Biodiversity Assessment (NBA, 2012) the study area overlaps largely with ecosystems that are listed as Vulnerable (VU);
- Most of the terrestrial ecosystems associated with the development are rated as not protected;
- Based on the SANBI (2010) Protected Areas Map and the National Protected Areas Expansion Strategy (NPAES) the study area does not overlap with any formally or informally protected area;
- The study area does overlap with certain wetland areas and one perennial stream. The stream area is not classified as an NFEPA area;
- The study area is situated within one vegetation type; the Eastern Highveld Grassland (Gm12) which is listed as an Endangered (EN) vegetation type according to Mucina & Rutherford (2006);
- Based on the Plants of Southern Africa (BODATSA-POSA, 2016) database, 159 plant species are expected to occur in the study area, of these no species are listed as being Species of Conservation Concern (SCC);
- Based on the South African Bird Atlas project, Version 2 (SABAP2) database, 337 bird species are expected to occur near the study area. Of the expected bird species, twenty-two (22) species (6.52%) are listed as SCC either on a regional (19) or global scale (3);
- Six (6) Category 1b invasive species were recorded at the site and must therefore be removed by implementing an alien invasive plant management programme;
- Twenty-one (21) bird species were recorded in the study area during the March 2018 survey;
- Overall, mammal diversity in the study area was considered moderate, with four (4) mammal species being recorded during the March 2018 survey based on the presence of visual tracks & signs;
- No reptile species were recorded in the study area during the March 2018 survey. Two (2) amphibian species was recorded in the study area during the March 2018 survey;
- Assessment of significance of the construction phase regarding further loss and fragmentation of the vegetation community and further displacement of faunal community due to habitat loss and disturbance was rated as **moderate pre-mitigation, and low post-mitigation**; and

- Assessment of significance of the operational phase regarding encroachment and displacement of indigenous vegetation community by alien invasive plant species, infringement by humans into the grassland, the ongoing displacement and fragmentation of faunal community was rated as **moderate pre-mitigation, and low post-mitigation**.

8.1.4 Mitigation Measures

Recommended mitigation and rehabilitation measures for vegetation communities include the following:

- As far as possible, the proposed developments should be placed in areas that have already been disturbed, and no further loss of secondary grassland should be permitted. It is recommended that areas to be developed be specifically demarcated so that during the construction phase, only the demarcated areas be impacted upon (including fencing off the defined project area);
- Areas of indigenous vegetation, even secondary communities should under no circumstances be fragmented or disturbed further or used as an area for dumping of waste;
- The areas rated as highly sensitive in the Project area as defined in this report should be declared a 'no-go' area during the construction and operational phases and all efforts must be made to prevent access to this area from construction workers, machinery and the general public;
 - These areas should be clearly demarcated and all access to the adjoining areas should be restricted;
- All laydown, storage areas etc should be restricted to within the Project area and all access roads must be kept within this area or from existing access roads;
- A qualified environmental control officer must be on site when construction begins to identify species that will be directly disturbed and to relocate fauna/flora that is found during construction (including all reptiles and amphibians);
- Areas of indigenous vegetation should be delineated, and rehabilitation measures implemented in areas where the indigenous community is still present but degraded;
- Areas that are denuded during construction need to be re-vegetated with indigenous vegetation to prevent erosion during flood events. This will also reduce the likelihood of encroachment by alien invasive plant species; and
- Compilation of and implementation of an alien vegetation management plan for the entire site

Recommended mitigation and rehabilitation measures for faunal community's hinge largely on protecting their habitats and ensuring it remains intact. In addition to this the following measures are recommended:

- If any faunal species are recorded during construction, activities should temporarily cease, and an appropriate specialist should be consulted to identify the correct course of action;

-
- Fencing should be erected around the Project area to prevent workers and members of the public from entering the surrounding farm portion. This fence should have small openings to allow wildlife to pass through;
 - Waste management must be a priority and all waste must be collected and stored adequately. It is recommended that all waste be removed from site on a weekly basis to prevent rodents and pests entering the site
 - No trapping, killing or poisoning of any wildlife should be allowed on site;
 - Adequate signage should be erected that raises awareness about possible fauna in the area (e.g. amphibians) and speed bumps should be put in place to reduce speeding and faunal road mortalities;
 - Staff should be educated about the sensitivity of faunal species and measures should be put in place to deal with any species that are encountered during the construction process. The intentional killing of any animals including snakes, insects, lizards, birds or other animals should be strictly prohibited; and
 - All livestock must be kept out of all grassland and wetland area in order to prevent overgrazing of remaining grassland; and
 - All domesticated animals are forbidden within the entire Project area.

8.2 Wetland Assessment

Prism Environmental Management Services was requested by Chapmans View Properties (Pty) Ltd to undertake a wetland assessment to determine extent and delineate the wetlands that are in proximity of the study site and that could possibly be affected by the proposed development of the Kusile Truck Stop. This, specifically to inform the Environmental Impact Assessment (EIA) for the said develop.

Please refer to Appendix 6.3 for a copy of the Wetland. Details of the expertise of the specialist are also provided within the report.

8.2.1 Scope of Work

The aim of this study was to undertake a wetland assessment to determine extent and delineate the wetlands that are in proximity of the study site and that could possibly be affected by the proposed development of the Kusile Truck Stop.

8.2.2 Wetland Delineation

No wetlands were identified within the study area although one wetland does occur outside the study area. A 32m buffer was applied to the wetland that is in line with the National Environmental Management Act (NEMA) listed activities and a 50m buffer in line with bio-diversity and conservation requirements. The study site is more than 150m away.

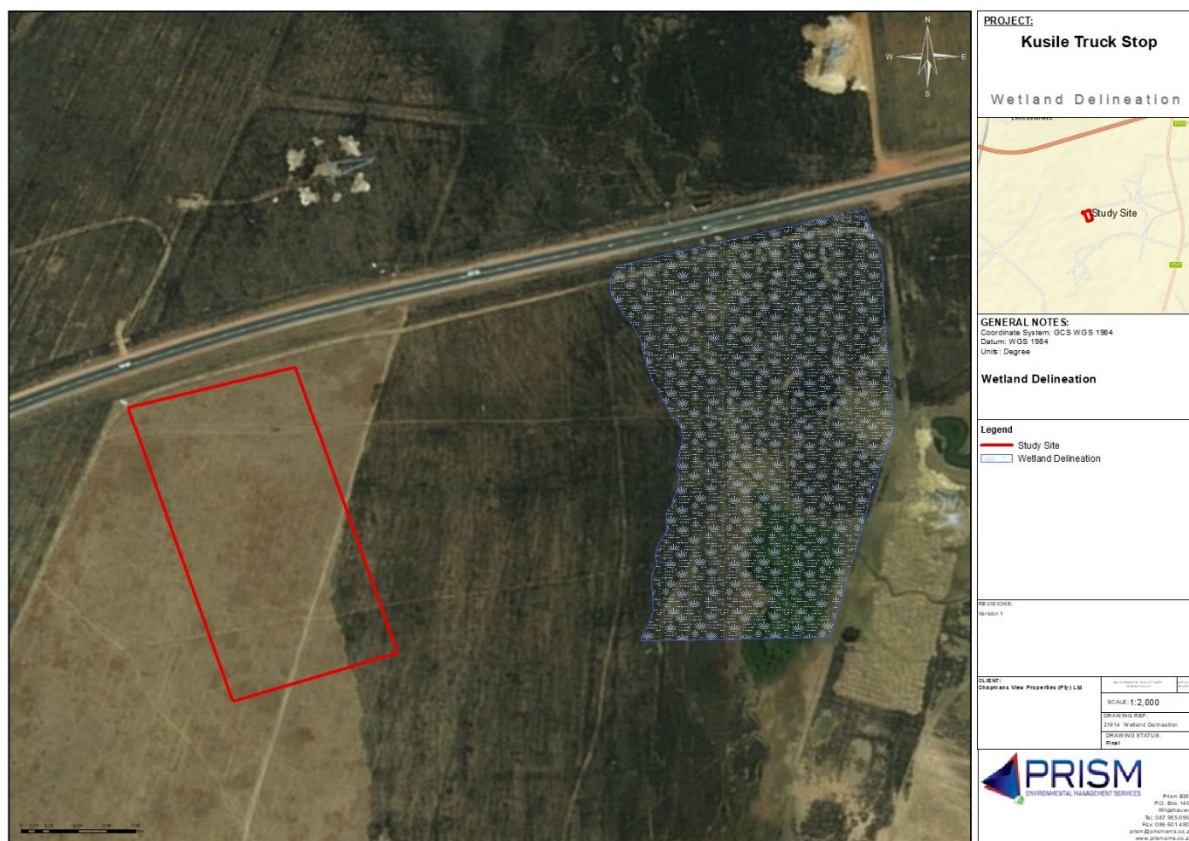


Figure 12: Wetland Delineation

8.2.3 Conclusion

The field investigations concluded that no wetland is present on the study area. A wetland was recorded in proximity to the development site (150m away), but no direct impact is envisaged.

Concluded from the results of the assessment, the construction activities will not directly impact on the wetland system. Possible impacts can be mitigated to satisfactory standards if all mitigatory actions are implemented with due care. It is key to preserve water quality and supply to the downstream aquatic resources. For this reason, it can be supported that the development may go-ahead if the required buffers are maintained and the resource drivers preserved. The stormwater management is vital to ensure sustainable functionality of the adjacent wetland.

The wetland drivers must be sustained during the development, especially during the construction period. In respect of the construction phase, it is important to ensure that the required erosion protection measures be implemented to avoid silt entering the system and that good water quality be maintained in the system.

8.2.4 Mitigation and Monitoring Requirements

Monitoring programmes can measure the success of mitigation implementations, monitor unforeseen impacts, and can be used as a feedback system to adjust or correct management of the wetlands.

The following in terms of monitoring are recommended:

- Development of Environmental Management Programme (EMPr);
- Auditing linked to Environmental Management Programme (EMPr);
- The wetland monitoring occurring on a quarterly basis should be conducted by a skilled professional qualified in assessing and understanding the complex nature of wetlands and their associated drivers;
- It should be attempted to preserve complete wetland function (current status) if at all possible.
- Wetland drivers should be protected.

Mitigation measures recommended include the following:

- Runoff from the construction areas must be controlled and directed away from the wetlands;
- On site storm water management, must be implemented;
- The proposed activities must be initiated and constructed in such a way to prevent the reduction of natural water flow into the wetland and downstream which is the driving factor in terms of water provision; and
- An approved stormwater management plan must be implemented.

8.3 Heritage Impact Assessment

HCAC was appointed to conduct a Heritage Impact Assessment of the proposed project to determine the presence of cultural heritage sites and the impact of the proposed development on these non-renewable resources. The study area was assessed both on desktop level and by a field survey. The field survey was conducted as a non-intrusive pedestrian survey to cover the extent of the development footprint.

Please refer to Appendix 6.2 for a copy of the Heritage Impact Assessment. Details of the expertise of the specialist are also provided within the report.

8.3.1 Scope of Work

The scope of work/terms of reference for the Heritage Impact Assessment is as follows:

- Field study
 - Conduct a field study to: (a) locate, identify, record, photograph and describe sites of archaeological, historical or cultural interest; b) record GPS points of sites/areas identified as significant areas; c) determine the levels of significance of the various types of heritage resources affected by the proposed development.

-
- Reporting
 - Report on the identification of anticipated and cumulative impacts the operational units of the proposed project activity may have on the identified heritage resources for all 3 phases of the project; i.e., construction, operation and decommissioning phases. Consider alternatives, should any significant sites be impacted adversely by the proposed project. Ensure that all studies and results comply with the relevant legislation, SAHRA minimum standards and the code of ethics and guidelines of ASAPA.
 - To assist the developer in managing the discovered heritage resources in a responsible manner, and to protect, preserve, and develop them within the framework provided by the National Heritage Resources Act of 1999 (Act No 25 of 1999).

8.3.2 Conclusion

A previous study of the area (Fourie, 2010) recorded no sites of significance within the study area. The lack of sites within the study area was confirmed during the current study and no archaeological sites or material was recorded during the survey. Based on the SAHRIS Paleontological Sensitivity Map, the area is of low paleontological sensitivity. Therefore, no further mitigation prior to construction is recommended in terms of Section 35 for the proposed development to proceed. In terms of the built environment, no standing structures older than 60 years occur in the study area. In terms of Section 36 of the Act no burial sites were recorded in the impact area. However, if any graves are identified they should ideally be preserved in-situ or alternatively relocated according to existing legislation. No public monuments are located within or close to the study area. The study area is surrounded by agricultural developments, road and mining infrastructure and the proposed truck stop development will not impact negatively on significant cultural landscapes or views.

Due to the lack of significant heritage resources in the study area the impact of the proposed project on heritage resources is considered low and impacts can be mitigated to an acceptable level. It is therefore recommended that the proposed project can commence on the condition that the following recommendations are implemented as part of the EMP and based on approval from SAHRA:

- Implementation of a chance find procedure and;
- Implementation of a palaeontological protocol for finds.

From a heritage perspective, the proposed project is acceptable. If the above recommendations are adhered to and based on approval from SAHRA, HCAC is of the opinion that the development can continue as the development will not impact negatively on the heritage record of the area.

8.4 Assumptions and Limitations Identified by Specialists

The following limitations should be noted for the ecological habitat assessment study:

-
- As per the scope of work, the fieldwork component of the assessment comprised of one assessment only, which was conducted during the wet season. This study has not assessed any temporal trends for the respective seasons;
 - Despite these limitations, a comprehensive desktop study was conducted, in conjunction with the detailed results from the surveys, and as such there is a high confidence in the information provided.

The following limitations should be noted for the wetland assessment:

- The study was limited to a snapshot view during one site visit. The field investigation was undertaken during March 2018 to assess and confirm the delineated Wetland zones present adjacent to the study site. Weather conditions during the survey were favourable for recordings. The delineations were recorded by hand held GPS;
- It must be noted that, during the process of converting spatial data to final output drawings, several steps are followed that may affect the accuracy of areas delineated. Due care has been taken to preserve accuracy. Printing or other forms of reproduction may also distort the scale indicated in maps. It is therefore suggested that the wetland areas identified in this report be pegged in the field in collaboration with the surveyor for precise boundaries. It is unlikely that more surveys would alter the outcome of this study radically.

The following limitations should be noted for the heritage impact assessment:

- The authors acknowledge that the brief literature review is not exhaustive on the literature of the area. Due to the subsurface nature of archaeological artefacts, the possibility exists that some features or artefacts may not have been discovered/recorded during the survey and the possible occurrence of unmarked graves and other cultural material cannot be excluded. Similarly, the depth of the deposit of heritage sites cannot be accurately determined due its subsurface nature. This report only deals with the footprint area of the proposed development and consisted of non-intrusive surface surveys. This study did not assess the impact on medicinal plants and intangible heritage as it is assumed that these components would have been highlighted through the public consultation process if relevant. It is possible that new information could come to light in future, which might change the results of this Impact Assessment.

9 IMPACT ASSESSMENT

9.1 Overall Impact Assessment

This section focuses on the potential environmental impacts that could be caused by the proposed development.

An 'impact' refers to the change to the environment resulting from an environmental aspect (or activity), whether desirable or undesirable. An impact may be the direct or indirect consequence of an activity. From a qualitative perspective, impacts were identified as follows:

- Impacts associated with listed activities contained in GN 983-985 of 4 December 2014 [as amended] (Listing Notice, 1, 2 and 3), for which authorisation has been applied for;
- An assessment of the project activities and components; and
- Issues highlighted by I&APs (both the public and authorities).

In addition to the above more qualitative descriptions of impacts, a more detailed quantitative assessment of impacts is also provided and specifically considers impacts to the receiving environment (Section 4) and the findings from Specialist Studies (Section 8). This quantitative impact assessment uses the impact assessment methodology in the following section.

9.2 Impact Assessment Methodology

The standard methodology used in the environmental impact assessment to determine the significance rating of the potential impacts are outlined in this section.

9.2.1 Significance

The **significance** of an impact is defined as the combination of the **consequence** of the impact occurring and the **probability** that the impact will occur. The nature and type of impact may be direct or indirect and may also be positive or negative, refer to Table 8 for the specific definitions.

Table 8: Nature and type of impact.

IMPACT	Nature and Type of Impact:		
	Direct	Impacts that are caused directly by the activity and generally occur at the same time and place as the activity	✓/✗
	Indirect	Indirect or induced changes that may occur because of the activity. These include all impacts that do not manifest immediately when the activity is undertaken, or which occur at a different place as a result of the activity	✓/✗
	Cumulative	Those impacts associated with the activity which add to, or interact synergistically with existing impacts of past or existing activities, and include direct or indirect impacts which accumulate over time and space	✓/✗
	Positive	Impacts affect the environment in such a way that natural, cultural and / or social functions and processes will benefit significantly, and includes neutral impacts (those that are not considered to be negative	✓
	Negative	Impacts affect the environment in such a way that natural, cultural and/or social functions and processes will be comprised	✗

Table 9 presents the defined criteria used to determine the **consequence** of the impact occurring which incorporates the extent, duration and intensity (severity) of the impact.

Table 9: Consequence of the Impact occurring

CONSEQUENCE	Extent of Impact:	
	Site	Impact is limited to the site and immediate surroundings, within the study site boundary or property (immobile impacts)
	Neighbouring	Impact extends across the site boundary to adjacent properties (mobile impacts)
	Local	Impact occurs within a 5km radius of the site
	Regional	Impact occurs within a provincial boundary
	National	Impact occurs across one or more provincial boundaries
	Duration of Impact:	
	Incidental	The impact will cease almost immediately (within weeks) if the activity is stopped, or may occur during isolated or sporadic incidences
	Short-term	The impact is limited to the construction phase, or the impact will cease within 1 - 2 years if the activity is stopped
	Medium-term	The impact will cease within 5 years if the activity is stopped
	Long-term	The impact will cease after the operational life of the activity, either by natural processes or by human intervention
	Permanent	Where mitigation either by natural process or by human intervention will not occur in such a way or in such a time span that the impact can be considered transient
	Intensity or Severity of Impact:	
	Low	Impacts affect the environment in such a way that natural, cultural and/or social functions and processes are not affected
	Low-Medium	Impacts affect the environment in such a way that natural, cultural and/or social functions and processes are modified insignificantly
	Medium	Impacts affect the environment in such a way that natural, cultural and/or social functions and processes are altered
	Medium-High	Impacts affect the environment in such a way that natural, cultural and / or social functions and processes are severely altered
	High	Impacts affect the environment in such a way that natural, cultural and / or social functions and processes will permanently cease

The probability of the impact occurring is the likelihood of the impacts occurring and is determined based on the classification provided in Table 1Table 10.

Table 10: Probability and confidence of impact prediction.

PROBABILITY	Probability of Potential Impact Occurrence:	
	Improbable	The possibility of the impact materialising is very low either because of design or historic experience
	Possible	The possibility of the impact materialising is low either because of design or historic experience
	Likely	There is a possibility that the impact will occur
	Highly Likely	There is a distinct possibility that the impact will occur
	Definite	The impact will occur regardless of any prevention measures

The **significance** of the impact is determined by considering the consequence and probability without taking into account any mitigation or management measures and is then ranked according to the ratings listed in Table 11. The level of confidence associated with the impact prediction is also considered as low, medium or high and is described in Table 12.

Table 11: Significance rating of the impact.

SIGNIFICANCE	Significance Ratings:	
	Low	Neither environmental nor social and cultural receptors will be adversely affected by the impact. Management measures are usually not provided for low impacts
	Low-Medium	Management measures are usually encouraged to ensure that the impacts remain of Low-Medium significance. Management measures may be proposed to ensure that the significance ranking remains low-medium
	Medium	Natural, cultural and/or social functions and processes are altered by the activities, and management measures must be provided to reduce the significance rating
	Medium-High	Natural, cultural and/or social functions and processes are altered significantly by the activities, although management measures may still be feasible
	High	Natural, cultural, and/or social functions and processes are adversely affected by the activities. The precautionary approach will be adopted for all high significant impacts and all possible measures must be taken to reduce the impact

Table 12: Level of confidence of the impact prediction.

CONFIDENCE	Level of Confidence in the Impact Prediction:	
	Low	Less than 40% sure of impact prediction due to gaps in specialist knowledge and/or availability of information
	Medium	Between 40 and 70% sure of impact prediction due to limited specialist knowledge and/or availability of information
	High	Greater than 70% sure of impact prediction due to outcome of specialist knowledge and/or availability of information

Once significance rating has been determined for each impact, management and mitigation measures must be determined for all impacts that have a significance ranking of Medium and higher in order to attempt to reduce the level of significance that the impact may reflect.

The EIA Regulations, 2014 specifically require a description is provided of the degree to which these impacts:

- can be reversed;
- may cause irreplaceable loss of resources; and
- can be avoided, managed or mitigated.

Based on the proposed mitigation measures the EAP will determined a mitigation efficiency (Table 13) whereby the initial significance is re-evaluated and ranked again to affect a significance that incorporates the mitigation based on its effectiveness. The overall significance is then re-ranked, and a final significance rating is determined.

Table 13: Mitigation efficiency

MITIGATION EFFICIENCY	Mitigation Efficiency	
	None	Not applicable
	Very Low	Where the significance rating stays the same, but where mitigation will reduce the intensity of the impact. Positive impacts will remain the same
	Low	Where the significance rating reduces by one level, after mitigation
	Medium	Where the significance rating reduces by two levels, after mitigation
	High	Where the significance rating reduces by three levels, after mitigation
	Very High	Where the significance rating reduces by more than three levels, after mitigation

The reversibility is directly proportional the “Loss of Resource” where no loss of resource is experienced, the impact is completely reversible; where a substantial “Loss of resource” is experienced there is a medium degree of reversibility; and an irreversible impact relates to a complete loss of resources, i.e. irreplaceable (Table 14).

Table 14: Degree of reversibility and loss of resources.

DEGREE REVERSABILITY & LOSS OF RESOURCES	Loss of Resources:	
	No Loss	No loss of social, cultural and/or ecological resource(s) are experienced. Positive impacts will not experience resource loss
	Partial	The activity results in an insignificant or partial loss of social, cultural and/or ecological resource(s)
	Substantial	The activity results in a significant loss of social, cultural and/or ecological resource(s)
	Irreplaceable	The activity results in the complete and irreplaceable social, cultural and/or ecological loss of resource(s)
	Reversibility:	
	Irreversible	Impacts on natural, cultural and/or social functions and processes are irreversible to the pre-impacted state in such a way that the application of resources will not cause any degree of reversibility
	Medium Degree	Impacts on natural, cultural and/or social functions and processes are partially reversible to the pre-impacted state if less than 50% resources are applied
	High Degree	Impacts on natural, cultural and/or social functions and processes are partially reversible to the pre-impacted state if more than 50% resources are applied
	Reversible	Impacts on natural, cultural and/or social functions and processes are fully reversible to the pre-impacted state if adequate resources are applied

9.2.2 Cumulative Impacts

It is important to assess the natural environment using a systems approach that will consider the cumulative impact of various actions. Cumulative impact refers to the impact on the environment, which results from the incremental impact of the actions when added to other past, present and reasonably foreseeable future actions regardless of what agencies or persons undertake such actions. Cumulative impacts can result from individually minor, but collectively significant actions or activities taking place over a period. Cumulative effects can take place frequently and over a period that the effects cannot be assimilated by the environment.

9.3 Qualitative Discussion of Impacts

9.3.1 Impacts Associated with Listed Activities

As mentioned, the project requires authorisation for certain activities listed in the 2014 EIA Regulations, which serve as triggers for the environmental assessment process. The potential impacts associated with the key listed activities are broadly stated in Table 15.

Table 15: Potential impacts associated with Listed Activities

Listing Notice	Activity	Description of Listed Activity	Potential Impact Overview
<i>NEMA: Listing Notice 1 (require Basic Assessment)</i>			
GN R 984 4 December 2014 [as amended]	Activity 14:	The development and related operation of facilities or infrastructure, for the storage, or for the storage and handling, of a dangerous good, where such storage occurs in containers with a combined capacity of 80 cubic metres or more but not exceeding 500 cubic metres.	<ul style="list-style-type: none"> • Impact on soil; • Impact on ground and surface water; • Health and safety incidents; • Traffic impacts; • Visual impacts.
	Activity 27:	The clearance of an area of 1 hectares or more, but less than 20 hectares of indigenous vegetation.	<ul style="list-style-type: none"> • Impacts on soil; • Impacts on ground and surface water; • Disturbance to fauna and avifauna during construction; • Loss of available habitat; • Visual impacts.
	Activity 28:	Residential, mixed, retail, commercial, industrial or institutional developments where such land was used for agriculture, game farming, equestrian purposes or afforestation on or after 01 April 1998 and where such development: (ii) will occur outside an urban area, where the total land to be developed is bigger than 1 hectare.	<ul style="list-style-type: none"> • Impacts on soil; • Impacts on ground and surface water; • Disturbance to fauna and avifauna during construction; • Loss of available habitat; • Visual impacts.

9.3.2 Environmental Activities

In order to understand the impacts related to the project it is necessary to unpack the activities associated with the project life-cycle (refer to Section 3.5). The main project activities as well as high-level environmental activities undertaken in the various project phases are listed in Table 16.

Table 16: Project Activities

<i>Pre-Construction</i>	Project Activities
	Detailed layouts and services designs
	Procurement process for Contractors
	Procurement of other necessary materials
	Environmental Activities
	Appointment of Environmental Control Officer (ECO)
<i>Construction</i>	Project Activities
	<p>Appointments and site camp set up:</p> <ul style="list-style-type: none"> Set up site camp with temporary offices and administrative facilities; Set up ablutions Set up access control, security; signage and lighting General materials storage and laydown areas Construction employment Change-houses, chemical toilets and showering facilities (linked to conservancy tanks – removal of contents by exhauster vehicle and disposal at permitted facility) Temporary waste storage areas; these shall be established and managed in accordance with EMPr requirements
	<p>Sourcing of construction materials and equipment:</p> <ul style="list-style-type: none"> All bulk materials (aggregate, cement, steel etc.) will be sourced from existing lawful commercial sources; there will be no direct mining, harvesting or extraction of natural resources.
	<p>Excavation and earthworks</p> <ul style="list-style-type: none"> Removal of existing surfacing material where necessary (concrete, asphalt etc.) which could involve excavation below ground level Levelling and compaction using heavy machinery / earthmoving equipment Potential for excavations and trenching in order to lay of below ground level equipment (cables, pipes, sumps, drainage etc.) Construction work within the existing dams Potential for excavation dewatering in the event of water-table interception Use of general mechanical equipment within construction areas (generators, cutting and welding equipment, compressors etc.)
	Environmental Activities
	Diligent compliance monitoring of the EMPr, environmental authorisation and other relevant environmental legislation.
	Continued consultation with I&APS (as required).
	Environmental awareness creation.

<i>Operation</i>	Project Activities
	Operation of service facilities.
	Maintenance of infrastructure.
	Recreational use of development by visitor.
	Environmental Activities
	Monitoring of boreholes.
	Removal of hazardous waste.
	Water quality monitoring.

9.3.3 Environmental Aspects

Environmental aspects are regarded as those components of an organisation's activities, products and services that are likely to interact with the environment and cause an impact. The following environmental aspects have been identified for the proposed development which are linked to the project activities (note that only high-level aspects are provided):

Table 17: Environmental Aspects

<i>Pre-Construction</i>	Aspects
	Inadequate consultation with landowners/occupiers of land.
	Inadequate environmental and compliance monitoring.
	Poor construction site planning and layout.
	Poor waste management.
	Absence of ablution facilities.
<i>Construction</i>	Aspects
	Inadequate consultation with I&Aps.
	Inadequate environmental and compliance monitoring.
	Lack of environmental awareness creation.
	Indiscriminate site clearing.
	Inadequate waste management on site.
	Poor site establishment.
<i>Operation</i>	Aspects
	Inadequate consultation with I&Aps.
	Inadequate environmental and compliance monitoring.
	Lack of environmental awareness creation.
	Lack of maintenance.
	Inadequate management of waste water treatment facilities.
	Inadequate waste management on site.

	Water conservation/re-use activities not implemented.
	Poor management of dangerous goods/spillages

9.3.4 Issues raised by Environmental Authorities and IAPs

The issues raised by authorities (both regulatory and commenting) and I&APs that may be received, will be incorporated and addressed once and if received.

9.4 Quantitative Impact Assessment

Table 18 provides a summary of the identified impacts and significance ranking (WOM = Without Mitigation) for the construction and operational phases of development. Impacts for each alternative (both layout and treatment alternatives) are also provided. Brief management measures have been provided for the purposes of assessing whether the implementation of recommended

Table 18: Impact Assessment and Significance Rating

	IMPACTS				SIGNIFICANCE (WOM)	MANAGEMENT & MITIGATION MEASURES	MITIGATION EFFICIENCY	SIGNIFICANCE (WM)	DEGREE	
	TYPE	DESCRIPTION	CUMULATIVE	NATURE					LOSS RESOURCE	REVERSABILITY
CONSTRUCTION PHASE										
Atmospheric Emissions	Direct	Dust emissions altering air quality and visibility.	No	Negative	Low-Medium	Dust suppression measures by means of either water or biodegradable chemical agent will be implemented during the construction phase to minimise dust generated by construction activities. A speed limit of 20km/h must be maintained on all dirt roads.	Very High	Low	No Loss	Reversible
	Direct	Emissions from vehicles and machinery (CO2, NOx, SOx, VOC's etc.) altering air quality.	Yes	Negative	Low-Medium	All construction vehicles will be maintained such as to operate efficiently. Idling times of machinery to be minimised. In terms of transportation of workers and materials, collective transportation arrangements should be made to reduce individual car journeys where possible. All vehicles used during the project should be properly maintained and in good working order. All vehicles and other machinery should comply with road worthy requirements and comply with legislation in terms of allowable emissions.	Medium	Low	Minimal	High Degree
	Indirect	Noise nuisance to surrounding land owners.	Yes	Negative	Low-Medium	All construction vehicles will be maintained such as to operate efficiently. Idling times of machinery to be minimised. Operations shall not occur before or after normal working hours. Equipment and/or machinery which will be used must comply with the manufacturer's specifications on acceptable noise levels. Construction activities should be limited to daytime only.	Medium	Low	Minimal	High Degree
Discharge to Water	Direct	Sewage discharge into the wetland and stream adjacent to the study area and other surface water resources due to accidental spillage or overflow of sewage from chemical toilets, when not maintained appropriately and serviced regularly.	Yes	Negative	Low	Please note that no wetland habitat occurs within the project area, however in order to ensure no indirect impacts, the following mitigation measures apply: Not using the bush for toilet facilities. 1 chemical toilet to be provided per 15 workers. Toilets are to be secured to the ground and must have a closing mechanism. Certified contractors to maintain and remove chemical toilets regularly. The contractor must ensure that spillage does not occur when toilets are cleaned/serviced, and contents must be properly stored and disposed of properly	Very High	Low	No Loss	Reversible

	IMPACTS				SIGNIFICANCE (WOM)	MANAGEMENT & MITIGATION MEASURES	MITIGATION EFFICIENCY	SIGNIFICANCE (WM)	DEGREE	
	TYPE	DESCRIPTION	CUMULATIVE	NATURE					LOSS RESOURCE	REVERSABILITY
	Direct	Sedimentation of surface water resources due to poor or lack of stormwater management practices.	Yes	Negative	Low	Please note that no wetland habitat occurs within the project area, however in order to ensure no indirect impacts, the following mitigation measures apply: Stormwater management will be properly implemented as per the engineering design such as to minimise silt discharge into surrounding systems during rainstorm events.	Very High	Low	No Loss	Reversible
	Direct	Contamination of surface water from spillage of hazardous substances e.g. hydrocarbons from poorly maintained construction vehicles and equipment and other construction materials e.g. paint.	No	Negative	Low	Please note that no wetland habitat occurs within the project area, however in order to ensure no indirect impacts, the following mitigation measures apply: No servicing of vehicles and equipment on site. Proper management and storage of hazardous material (such as fuel). Proper management of spills.	Very High	Low	No Loss	Reversible
	Direct	Disturbance of natural drainage lines	Yes	Negative	Low	Please note that no wetland habitat occurs within the project area, however in order to ensure no indirect impacts, the following mitigation measures apply: Discharge and divert stormwater to sediment trap to allow particulate matter to settle out. Under no circumstances may any area be used for ablution purposes. Vehicles to be serviced under controlled conditions. No construction rubble to be dumped.	Very High	Low	No Loss	Reversible
	Direct	Disturbance/pollution of groundwater	No	Negative	Low	Measures will be implemented to ensure that no hydrocarbons and/or other pollutant liquids are spilt, and if so, they are contained, and a clean-up protocol followed.	Very High	Low	No Loss	Reversible
	Direct	Disturbance of aquatic ecological systems	Yes	Negative	Low	Please note that no wetland habitat occurs within the project area, however in order to ensure no indirect impacts, the following mitigation measures apply: Measures will be implemented to ensure that disturbances to aquatic ecological systems are prevented as far as possible.	Very High	Low	No Loss	Reversible

	IMPACTS				SIGNIFICANCE (WOM)	MANAGEMENT & MITIGATION MEASURES	MITIGATION EFFICIENCY	SIGNIFICANCE (WM)	DEGREE	
	TYPE	DESCRIPTION	CUMULATIVE	NATURE					LOSS RESOURCE	REVERSABILITY
Waste Generation	Direct	Domestic waste generation and potential pollution as a result thereof.	No	Negative	Low	<p>A waste management system, including recycling practises, will be formulated and implemented on site.</p> <p>All employees will be subjected to induction to understand the environmental management requirement on site.</p> <p>Solid waste shall only be stored in the designated general waste storage area which must be enclosed and impermeable.</p> <p>All solid waste shall be disposed of by a certified contractor, off-site, at an approved landfill site if no municipal services are available. The Contractor shall supply the ECO with a certificate of disposal for auditing purposes.</p>	Very High	Low	No Loss	Reversible
	Direct	Construction waste generation and potential pollution as a result thereof.	No	Negative	Low-Medium	<p>All construction waste will be placed in a demarcated area and disposed of accordingly. This area will be bermed so as to prevent the dispersal of said waste by wind and rain.</p> <p>Litter (from outside the camp included) and concrete bags etc. must be collected and put into suitable closed bins on a daily basis.</p> <p>Construction rubble must be disposed of at a registered landfill site. Certificates of safe disposal of construction waste will be kept on record for auditing purposes.</p>	Very High	Low	No Loss	Reversible

	IMPACTS				SIGNIFICANCE (WOM)	MANAGEMENT & MITIGATION MEASURES	MITIGATION EFFICIENCY	SIGNIFICANCE (WM)	DEGREE	
	TYPE	DESCRIPTION	CUMULATIVE	NATURE					LOSS RESOURCE	REVERSABILITY
	Direct	Hazardous waste generation and potential pollution due to poor waste management.	No	Negative	Low-Medium	<p>All hazardous waste will be stored in a bunded and lockable area.</p> <p>The classification of waste determines the handling methods and the ultimate disposal of the material. The contractor shall manage hazardous waste that are anticipated to be generated by his operations as follows:</p> <ul style="list-style-type: none"> - Characterise the waste to determine if it is general or hazardous (Use the Appendix 1 of the Norms and Standards for the Classification of Waste for landfill to determine whether additional classification is required). - Obtain and provide an acceptable container with a label. - Place hazardous waste material in the container. Inspect the container on a regular basis. - Haul the full container to the licenced and correct disposal site. - Provide documentary evidence of proper disposal of the waste. <p>Only temporary storage of waste is allowed (once of storage of waste for a period less than 90 days). The volume of material should be limited to less than 80m3 of hazardous waste. Should this be exceeded the Norms and Standards for the Storage of Waste will need to be complied with.</p> <p>Hazardous waste will be removed from the site by a certified waste contractor. Certificates of safe disposal of hazardous waste will be kept on record for auditing purposes.</p>	Very High	Low	No Loss	Reversible
Soil Alteration	Direct	Loss of topsoil	Yes	Negative	Low-Medium	<p>Soil conservation practices to be implemented as per the EMPr.</p> <p>Top soil should be separated and used in landscaping and rehabilitation.</p>	Medium	Low	Minimal	High Degree
	Indirect	Loss of land capability	Yes	Negative	Low	Impact on the environment is expected to be of minimal importance. No measures are deemed necessary. The site is approximately 2,5 hectares in size. The rest of the farm portions zoning will remain agricultural. The site is currently not utilised to its full potential. The proposed site does not have a high agricultural potential nor is currently used for agriculture. No mitigation measures are therefore recommended or required.	None	Low	Minimal	High Degree
	Direct	Soil pollution through contamination with hazardous substances.	No	Negative	Low	Measures will be implemented to ensure that no hydrocarbons and/or other pollutant liquids are spilt, and if so, they are contained, and a clean-up protocol followed.	Very High	Low	No Loss	Reversible
Resource Consumption	Indirect	Electricity consumption	Yes	Negative	Low-Medium	<p>Enforce electricity reduction strategies.</p> <p>Environmental awareness training.</p>	Medium	Low	Minimal	High Degree
	Direct	Water consumption	Yes	Negative	Low-Medium	<p>Enforce water saving strategies.</p> <p>Environmental awareness training.</p>	Medium	Low	Minimal	High Degree

	IMPACTS				SIGNIFICANCE (WOM)	MANAGEMENT & MITIGATION MEASURES	MITIGATION EFFICIENCY	SIGNIFICANCE (WM)	DEGREE	
	TYPE	DESCRIPTION	CUMULATIVE	NATURE					LOSS RESOURCE	REVERSABILITY
	Indirect	Fuel consumption	Yes	Negative	Low-Medium	All construction vehicles will be maintained such as to operate efficiently. Idling times of machinery to be minimised. Record and monitor fuel consumption regularly. Reduce theft of fuel (increase security).	Medium	Low	Minimal	High Degree
	Indirect	Raw materials consumption	Yes	Negative	Low-Medium	Raw materials will be used efficiently. Recycling will be implemented on applicable waste streams.	Medium	Low	Minimal	High Degree
Effects on Biodiversity	Direct	Loss of habitat	Yes	Negative	Medium	Construction activities must be limited to the development site and good waste management to ensure minimal footprint. Alien species must be removed to improve the ecological integrity of the area. During the construction phase of the development, building or waste material should be discarded in an authorised location, which should not be within the identified sensitive ecosystems. Movement of construction workers through sensitive areas should be minimised; It is recommended that the natural grassland vegetation is conserved in open landscaped gardens; Retain natural vegetation as landscaped gardens. Only vegetation in areas of work may be removed (i.e. road reserves, site camp, service infrastructure reserves etc.) Same should be phased as work progresses. Indigenous vegetation should be planted in the public areas of the development and an invasive vegetation containment plan should be implemented. Mitigation measures as per the Ecological Study to be implemented.	High	Low	Minimal	High Degree

	IMPACTS				SIGNIFICANCE (WOM)	MANAGEMENT & MITIGATION MEASURES	MITIGATION EFFICIENCY	SIGNIFICANCE (WM)	DEGREE	
	TYPE	DESCRIPTION	CUMULATIVE	NATURE					LOSS RESOURCE	REVERSABILITY
	Direct	Loss of fauna	Yes	Negative	Medium	<p>No trapping or snaring of wild animals if any. Nesting sites should not be disturbed.</p> <p>The use of "migratory friendly" property borders, such as palisade fencing or wire fencing with large gaps, should be considered as this will allow for the ongoing survival of most species presently inhabiting the property. This will allow for the free movement of small mobile organisms (such as rodents).</p> <p>Construction activities must be limited to the development site and good waste management to ensure minimal footprint.</p> <p>Only vegetation in areas of work may be removed (i.e. road reserves, site camp, service infrastructure reserves etc.) Same should be phased as work progresses.</p> <p>Indigenous vegetation should be planted in the public areas of the development and an invasive vegetation containment plan should be implemented. Mitigation measures as per the Ecological Study to be implemented.</p> <p>If the development is approved, construction contractors, sub-contractors and operators must ensure that no fauna taxa are unduly disturbed, trapped, hunted or killed.</p> <p>All workers will undergo environmental awareness training to address potential human and wildlife interaction and the permissible reactions to this interaction.</p>	High	Low	Minimal	High Degree
	Direct	Loss of flora	Yes	Negative	Medium	<p>Construction activities must be limited to the development site and good waste management to ensure minimal footprint.</p> <p>See mitigation measures for "Loss of Habitat" impact.</p>	High	Low	Minimal	High Degree
	Direct	Degradation of ecological systems	Yes	Negative	Low	<p>Construction activities must be limited to the development site and good waste management to ensure minimal footprint.</p>	Medium	Low	Minimal	High Degree
	Direct	Disruption of natural corridors	Yes	Negative	Medium	<p>Construction activities must be limited to the development site and good waste management to ensure minimal footprint.</p>	Very High	Low	No Loss	Reversible
Incidents, Accidents and Potential Emergency Situations	Direct	Pollution incidents	No	Negative	Low	<p>Spillages to be cleaned up immediately.</p> <p>Notification of DWS should groundwater be affected.</p> <p>Spill kits to be located in strategic areas for when needed</p> <p>Environmental awareness training</p>	Very High	Low	No Loss	Reversible

	IMPACTS				SIGNIFICANCE (WOM)	MANAGEMENT & MITIGATION MEASURES	MITIGATION EFFICIENCY	SIGNIFICANCE (WM)	DEGREE	
	TYPE	DESCRIPTION	CUMULATIVE	NATURE					LOSS RESOURCE	REVERSABILITY
	Direct	Health and safety incidents e.g. injury to workers or visitors to the site.	No	Negative	Low	<p>Health and safety standards will be formulated prior construction and implemented during construction.</p> <ul style="list-style-type: none"> • 24-hour security and access control. • Health and Safety awareness training. • Contractor to submit a Health and Safety Plan, prepared in accordance with the Health and Safety Specification, for approval prior to the commencement of work. • A Safety Agent should be appointed • A Dedicated Occupational Health and Safety system to be implemented by Contractor's Safety Officer. To be monitored and audited by the Client's Safety Agent, in terms of the Construction Regulations (2003). 	Very High	Low	No Loss	Reversible
	Indirect	Spillage and accidents and injury caused by the inappropriate storage of hydrocarbons and other hazardous material.	No	Negative	Low	<p>All hazardous materials will be stored in a bunded and lockable area. Safety Data Sheet (SDS) sheets will be available for all hazardous products.</p> <ul style="list-style-type: none"> • Best practice regarding storage of substances • Spill kits to be located in strategic areas for when needed • Environmental awareness training • Firefighting equipment must be accessible on site at all times. <p>Display of emergency numbers</p>	Very High	Low	No Loss	Reversible
	Indirect	Fire and resultant injury, death and damage to property.	No	Negative	Low-Medium	<p>Fire and emergency plans will be implemented during construction. Adequate firefighting equipment will be instituted as recommended.</p> <p>Adhere to the appropriate emergency procedures</p> <ul style="list-style-type: none"> • Firefighting equipment must be accessible on site at all times. • Display of emergency numbers • Environmental awareness training should include a section of firefighting and should highlight the seriousness of fire in the area. In addition, designated smoking areas should be provided and there should be zero tolerance to smoking outside these areas. Cooking over open flames is not allowed. 	Very High	Low	No Loss	Reversible
Social	Indirect	Visual impact	Yes	Negative	Low-Medium	<p>The visual impact of construction activities will be medium term. Bollards and protective barriers as well as safety tape may be utilised around the site. The aesthetics of the area will be bettered by the development of the new development infrastructure.</p> <ul style="list-style-type: none"> • No littering to be allowed. • Good housekeeping practices to be followed 	Medium	Low	Minimal	High Degree

	IMPACTS				SIGNIFICANCE (WOM)	MANAGEMENT & MITIGATION MEASURES	MITIGATION EFFICIENCY	SIGNIFICANCE (WM)	DEGREE	
	TYPE	DESCRIPTION	CUMULATIVE	NATURE					LOSS RESOURCE	REVERSABILITY
	Indirect	Safety and security: Potential influx of work seekers. Unauthorised access.	No	Negative	Low	Site security will ensure that the site is secured, and only authorised access allowed. Appointment of people not to take place on site in order to reduce a potential influx of work seekers. No informal settlers will be allowed to establish on site. • 24-hour access control to the site and 24 hour security. • Workers found to be engaging in activities such as excessive consumption of alcohol, drug use or selling of any such items on site must be disciplined.	High	Low	Minimal	High Degree
	Indirect	Traffic disruptions	Yes	Negative	Low-Medium	Traffic warning and calming measures will be put in place when construction activities may impact on traffic flow. •	Medium	Low	Minimal	High Degree
	Direct	Loss of cultural heritage	No	Negative	Low-Medium	Should any human related graves or artefacts be discovered, work should be immediately stopped and SAHRA notified. No heritage resources were identified on site. However should any heritage resources be identified, then the chance find procedure in the EMPr must be adhered to.	High	Low	Minimal	High Degree
	Direct	Loss of rural sense of place	Yes	Negative	Medium	The visual impact of construction activities will be medium term. Bollards and protective barriers as well as safety tape may be utilised around the site. The aesthetics of the area will be bettered by the development of the new development infrastructure. The development should be designed in line with future planning documents, architectural guidelines and existing and planned surrounding land uses.	High	Low	Minimal	High Degree
Economic	Direct	Increase in economy: Construction on site will provide employment and skills to the local community. The local economy will benefit in terms of supply of building materials and services.	No	Positive	+Medium	To maximise this positive impact, local labour should be utilised, and construction materials and supplies should be sourced locally, where possible.	Very High	+High	No Loss	Reversible

	IMPACTS				SIGNIFICANCE (WOM)	MANAGEMENT & MITIGATION MEASURES	MITIGATION EFFICIENCY	SIGNIFICANCE (WM)	DEGREE	
	TYPE	DESCRIPTION	CUMULATIVE	NATURE					LOSS RESOURCE	REVERSABILITY
	Direct	Construction on site will provide employment and skills to the local community.	No	Positive	+Medium	To maximise this positive impact, local labour should be utilised, and construction materials and supplies should be sourced locally, where possible.	Very High	+High	No Loss	Reversible
OPERATIONAL PHASE										
Atmospheric Emissions	Direct	Emissions from vehicles and equipment (CO2, NOx, SOx, VOC's etc.)	Yes	Negative	Medium	All vehicles and equipment used during the project should be properly maintained and in good working order. • All vehicles and other machinery should comply with road worthy requirements and comply with legislation in terms of allowable emissions.	Medium	Low-Medium	Minimal	High Degree
	Indirect	Noise	Yes	Negative	Low-Medium	Mitigation measures in EMP to be implemented.	Medium	Low	Minimal	High Degree
Discharge to Water	Indirect	Sewage discharge into the wetland and stream adjacent to the study area and other surface water resources due to accidental spillage or overflow of sewage from chemical toilets, when not maintained appropriately and serviced regularly.	Yes	Negative	Low	Sewage infrastructure must be inspected and maintained on a regular basis.	Very High	Low	No Loss	Reversible
	Indirect	Sedimentation of surface water resources due to poor maintenance of stormwater infrastructure.	Yes	Negative	Low	Stormwater infrastructure must be designed with Sustainable Drainage Systems (SUDS) principles and be inspected and maintained on a regular basis.	Very High	Low	No Loss	Reversible
	Indirect	Disturbance of natural drainage lines.	Yes	Negative	Low	Discharge and divert stormwater to sediment trap to allow particulate matter to settle out. Under no circumstances may any area be used for ablution purposes. No waste to be dumped on the study area. All waste should be temporarily stored within waste skips to be emptied, when full.	Very High	Low	No Loss	Reversible
	Indirect	Disturbance/pollution of groundwater due to sewage spillages from poorly maintained infrastructure.	No	Negative	Low	Sewage infrastructure must be inspected and maintained on a regular basis. • Approved treatment plant to be used. • Management and maintenance of the sewage treatment works must be by an experienced and competent person. • Water quality monitoring to be undertaken. • Pre-screening mechanisms to ensure proper management of large influxes of debris. • Treated waste water must meet the requirements of the Department of Water and Sanitation.	Very High	Low	No Loss	Reversible

	IMPACTS				SIGNIFICANCE (WOM)	MANAGEMENT & MITIGATION MEASURES	MITIGATION EFFICIENCY	SIGNIFICANCE (WM)	DEGREE	
	TYPE	DESCRIPTION	CUMULATIVE	NATURE					LOSS RESOURCE	REVERSABILITY
	Indirect	Disturbance of aquatic ecological systems	Yes	Negative	Low	Measures will be implemented to ensure that disturbances to adjacent aquatic ecological systems are prevented as far as possible. Measures include placing beams to the entrance of the open space area to prevent vehicles from entering the open space area but allowing pedestrians through. Environmental awareness signs could be placed throughout the open space area to educate residents and tenants of the importance of conserving the adjacent wetland and stream.	Very High	Low	No Loss	Reversible
Waste Generation	Direct	Domestic waste generation and potential pollution as a result thereof.	Yes	Negative	Medium	Waste to be collected on a weekly basis by a waste contractor. This will feed into the waste stream of Emahaleni Local Municipality. Dustbins to be secured in place with closable lids. Recycling to be encouraged at the development with separate receptacles for each waste type / recyclables and to be collected by the relevant providers / contractors once these bins or containers are full.	Medium	Low-Medium	Minimal	High Degree
Soil Alteration	Indirect	Loss of topsoil and erosion through inefficient landscaping and landscaping maintenance, as well as poor stormwater management and design of infrastructure.	Yes	Negative	Low	Topsoil conservation practices as per the Environmental Management Programme to be strictly implemented. Topsoil to be stored separately and protected for rehabilitation purposes and for use in the landscaping. See impacts and mitigation measures under construction phase.	Very High	Low	No Loss	Reversible
	Indirect	Soil pollution caused by sewage discharge into the wetland and stream adjacent to the study area and other surface water resources due to accidental spillage through poor maintenance of sewage pipelines and connections.	Yes	Negative	Low	Sewage infrastructure must be inspected and maintained on a regular basis. Hazardous substances must be stored and handled in accordance with the appropriate legislation and standards, which include the Hazardous Substances Act (Act No. 15 of 1973), the Occupational Health and Safety Act (No. 85 of 1993), relevant associated Regulations, and applicable SANS and international standards. <ul style="list-style-type: none"> Any hazardous materials (apart from fuel) must be stored within a lockable store with a sealed floor. All storage tanks containing hazardous materials must be placed in bunded containment areas with impermeable surfaces. The bunded area must be able to contain 110% of the total volume of the stored hazardous material. In the event of spillages of hazardous substances, the appropriate clean up and disposal measures are to be implemented. Necessary materials and equipment must be available on site to deal with spills of any hazardous materials present. Spill contingency plans must include the procedure to distinguish between spills which can be cleaned up by the operator/staff of the Water Park and those that require specialist input. <ul style="list-style-type: none"> The name and contact numbers of various clean up companies must be posted and visible at the construction camp and site office. 	Very High	Low	No Loss	Reversible

	IMPACTS				SIGNIFICANCE (WOM)	MANAGEMENT & MITIGATION MEASURES	MITIGATION EFFICIENCY	SIGNIFICANCE (WM)	DEGREE	
	TYPE	DESCRIPTION	CUMULATIVE	NATURE					LOSS RESOURCE	REVERSABILITY
Resource Consumption	Direct	Electricity consumption	Yes	Negative	Medium	Energy saving measures as per EMPR to be implemented.	Medium	Low-Medium	Minimal	High Degree
	Direct	Water consumption	Yes	Negative	Medium	Water conservation initiatives as per EMPR to be implemented.	Medium	Low-Medium	Minimal	High Degree
Effects on Biodiversity	Indirect	Loss of fauna	Yes	Negative	Low	Use of "migratory friendly" property borders, such as palisade fencing or wire fencing with large gaps this free movement corridors for small animals should be retained throughout the operational phase. Operator must ensure that no fauna is unduly disturbed, trapped, hunted or killed. Environmental awareness training to this effect must be undertaken.	Very High	Low	No Loss	Reversible
	Indirect	Degradation of ecological systems, including the aquatic system adjacent to the study area.	Yes	Negative	Low	It is recommended that the natural grassland vegetation is conserved in open landscaped gardens; Retain natural vegetation as landscaped gardens. Use of "migratory friendly" property borders, such as palisade fencing or wire fencing with large gaps this free movement corridors for small animals should be retained throughout the operational phase.	Very High	Low	No Loss	Reversible
Incidents, Accidents and Potential Emergency Situations	Indirect	Fire	No	Negative	Low	Mitigation measures in EMPR to be implemented. Adhere to the appropriate emergency procedures • Firefighting equipment must be accessible on site at all times. • Display of emergency numbers • Environmental awareness training should include a section of firefighting and should highlight the seriousness of fire in the area. In addition, designated smoking areas should be provided and there should be zero tolerance to smoking outside these areas.	Very High	Low	No Loss	Reversible
Social	Direct	Visual impact	Yes	Negative	Medium	The buildings within the development should be designed following the recommended architectural guidelines for the area.	Medium	Low	Minimal	High Degree
	Indirect	Safety and security	No	Negative	Low-Medium	Access control to be implemented at all times.	High	Low	Minimal	High Degree
	Indirect	Increase in traffic flow	Yes	Negative	Medium	All recommendations as per the TIA should be implemented.	High	Low-Medium	Minimal	High Degree
Economic	Direct	Increase in economy	No	Positive	+Medium-High	Encourage business opportunities and economic development and growth.	Very High	+High	No Loss	Reversible

	IMPACTS				SIGNIFICANCE (WOM)	MANAGEMENT & MITIGATION MEASURES	MITIGATION EFFICIENCY	SIGNIFICANCE (WM)	DEGREE	
	TYPE	DESCRIPTION	CUMULATIVE	NATURE					LOSS RESOURCE	REVERSABILITY
	Indirect	Increase in property value	No	Positive	+Medium	N/A	None	+Medium	No Loss	Reversible
	Indirect	Employment	No	Positive	+Medium-High	Encourage employment of local communities within the development.	Very High	+High	No Loss	Reversible

9.5 Cumulative Impacts

It is important to assess the natural environment using a systems approach that will consider the cumulative impact of various actions. A cumulative impact refers to *“the impact on the environment, which results from the incremental impact of the actions when added to other past, present and reasonably foreseeable future actions regardless of what agencies or persons undertake such actions”*. Cumulative impacts can result from individually minor, but collectively significant actions or activities taking place over a period of time. Cumulative effects can take place frequently and over a period of time that the effects cannot be assimilated by the environment. Cumulative impacts are also discussed in the subsections that follow.

9.5.1 Atmospheric Emissions

Both dust emissions and emissions from vehicles and equipment are cumulative in nature as they are compounded by existing activities in the environment. However, in general, these impacts are incidental in nature and are of a low intensity. Regardless, mitigation measures to reduce these impacts are vital and must be implemented. Odour is not viewed to be a cumulative impact.

9.5.2 Noise

Recent developments in the area have increased the noise levels in the area slightly (although the general noise level is still low). The impact was still assessed as 'low' with the implementation of the mitigation measures. Mitigation measures included in the EMP must be implemented.

9.5.3 Groundwater Impacts

Both water quality and drawdown are cumulative impacts.

9.5.4 Waste Generation

All waste generated will add to the waste generated by existing and future developments as such waste generation is cumulative in nature. Minimisation and recycling of waste must be undertaken to reduce this impact.

9.5.5 Soil Alteration

Loss of land capability can be seen to be cumulative as developments in the Mpumalanga area have reduced the available land that can be productive. No mitigation measures are possible for this impact however it should be noted that the site is already impacted and thus this impact is not seen to be highly significant.

9.5.6 Resource Consumption

All four types of resource consumption (water, electricity, raw materials and fuel) have a cumulative impact as they add to the existing and future use of resources. In particular, water consumption may place

additional burden on resources. It is for this reason that the design of the Water Park has included a number of water conservation strategies to reduce water consumption.

9.5.7 Effects on Biodiversity

Impacts to biodiversity can be seen to be cumulative in nature as development, especially mining, is prolific in Mpumalanga. However, the study area affected by the Truck Stop is already disturbed and overall the impact to biodiversity can be satisfactorily mitigated.

9.5.8 Incidents, accidents and potential emergency situations

Impacts relating to incidents, accidents and potential emergency situations are not seen to be cumulative as they are limited to the specific site in question.

9.5.9 Social

Safety and security, traffic disruptions and change in land use are all cumulative in nature.

From a safety and security perspective, the area already has a high crime rate. However, a number of mitigation measures have been suggested. The impact is also short-term in duration and should not have a significant impact.

In terms of traffic disruption, current traffic as well as traffic increases due to the new Kusile Power Station were considered and by the Traffic Impact Assessment. Cumulative impacts have therefore been catered for.

Change in land use can be seen to be cumulative as developments in the Mpumalanga area, especially mining, have reduced the agricultural land that is available. No mitigation measures are possible for this impact however it should be noted that the site has a low agricultural potential and is not currently used for agriculture and thus this impact is not seen to be highly significant.

9.5.10 Economic

Increases in economy and increase in the economy are both cumulative in nature and will thus have a compounded positive impact. In light of the fact that the fact that there is a high unemployment in the area, this is very important.

9.6 Mitigation

According to the EIA Regulations, 2014, "mitigation" means to "*anticipate and prevent negative impacts and risks, then to minimise them, rehabilitate or repair impacts to the extent feasible*". Based on this definition, it possible to see that a mitigation hierarchy exists.

At the bottom of this hierarchy is the most preferred option which includes **prevention (1)**. These mitigation measures aim to avoid impacts completely. Some mitigation measures suggested for the proposed Water Park are at this level (for example, designing the Water Park around the existing ESA and watercourses).

The second level of mitigation is **reduction (2)** which involves mitigation measures that minimise impacts. Most of the mitigation measures suggested for the proposed Water Park fall into this level.

Mitigation measures for the proposed Water Park also include **remediation measures (3)** for environmental impacts. These measures focus on remediating or rehabilitating areas after they have been impacted.

Compensation (4) involves compensating the loss of an entire feature. In the case for the environment, this usually means consideration of an off-set associated with rehabilitation and mitigation. No offsets or compensation measures are included in the mitigation measures for the proposed development.

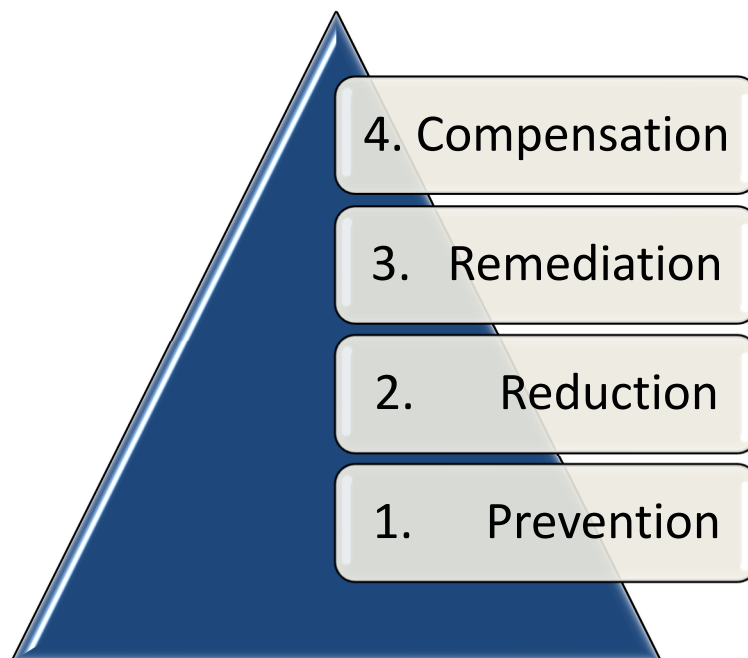


Figure 13: Mitigation Hierarchy

An EMPr will be developed based on the findings of the impact assessment of the EIA and in line with the requirements of Appendix 4 of GN 982 of 4 December 2014 [as amended in 2017]. The EMPr represents a detailed plan of action and includes site-specific mitigation measures for all medium to high (significant) impacts. The mitigation and management measures will include a combination of the following:

- (v) Physical environmental management structures.
- (vi) Monitoring and compliance of pollution and regulatory requirements.

All liability for the implementation of the EMPr (as well as the EIA findings and environmental authorisation) lies with the project applicant which in this case is Chapmans View Properties (Pty) Ltd.

9.7 Assessment of Alternatives

According to the EIA Regulations, 2014, alternatives can be defined as:

“Different means of meeting the general purpose and requirements of the activity, which may include alternatives to the-

- a) property on which or location where the activity is proposed to be undertaken;*
- b) type of activity to be undertaken;*
- c) design or layout of the activity;*
- d) technology to be used in the activity; or*
- e) operational aspects of the activity; and*
- f) includes the option of not implementing the activity;*

The EIA Regulations, 2014 also require that the EIA Report undertake *“a ranking process of all the identified development footprint alternatives focusing on the geographical, physical, biological, social, economic, heritage and cultural aspects of the environment”*. The aim of this process is to identify the most ideal location for the activity within the preferred site based on the *“lowest level of environmental sensitivity”* identified during the assessment.

9.7.1 Comparative assessment based on receiving environment and impact assessment

The site alternative will have some disadvantages to the proposal; listed:

- Access and parking will less practical;
- Bulk refuelling of the storage tanks will less practical and could be a risk factor; and
- Spill control will be less pragmatic as the storage tanks are not as accessible.

In line with the above, this section aims to provide a comparative analysis of the alternatives based on the receiving environment and impact assessment (Section 4 and Section 9, respectively). The aim of this comparative assessment is to identify the Best Practicable Environmental Option (BPEO). Münster (2005) defines BPEO as the alternative that *“provides the most benefit or causes the least damage to the environment as a whole, at a cost acceptable to society, in the long term as well as in the short term”*.

Table 19 provides the comparative analysis of layout alternatives and shows that the proposal is preferred for two main reasons, namely:

- Only one access is provided, which reduces impacts;
- A parking area is provided as well as a one-way entry and exit system which reduces traffic impacts.

Table 19: Comparative analysis between layout alternatives (black shaded blocks show preference, if any)

	Proposed layout	Alternative layout	Reason
Atmospheric Emissions	<i>No preference</i>		<ul style="list-style-type: none"> In terms of dust and vehicle and equipment emissions, there is no difference between the two layout alternatives.
Noise	<i>No preference</i>		<ul style="list-style-type: none"> From a noise perspective there is no difference between the two alternatives.
Surface Water	<i>No preference</i>		<ul style="list-style-type: none"> From a surface water perspective, there is no difference between the two alternatives.
Groundwater	<i>No preference</i>		<ul style="list-style-type: none"> From a groundwater perspective, there is no difference between the two alternatives.
Waste Generation	<i>No preference</i>		<ul style="list-style-type: none"> Both alternatives will result in waste being generated. As such, there is no difference between alternatives.
Soil Alteration	✓	X	<ul style="list-style-type: none"> The alternative layout requires that two accesses be built. This would likely increase impacts. Layout Alternative 1, with only 1 access, is therefore preferred.
Resource Consumption	<i>No preference</i>		<ul style="list-style-type: none"> Both alternatives require resources. There is therefore no preference.
Effects on Biodiversity	<i>No preference</i>		<ul style="list-style-type: none"> From a biodiversity perspective, there is no difference between the two alternatives.
Incidents and Accidents	✓	X	<ul style="list-style-type: none"> The proposed layout is preferred from a traffic safety point of view as it has a one-way entry and exit point, and only one access.
Social	✓	X	<ul style="list-style-type: none"> The proposed layout is preferred as it has a parking area and flow of traffic minimises traffic impact.
Economic	<i>No preference</i>		<ul style="list-style-type: none"> From an economic perspective, there is no preference between alternatives.

Table 20 provides the comparative analysis of the technical (treatment) alternatives. The proposed alternative (Lilliput system). The main reasons with respect to environmental attributes for this are:

Table 20: Comparative Analysis Between Technical Alternatives (black shaded blocks show preference, if any)

	Treatment Alternative 1 Lilliput System	Treatment Alternative 2 - Conservancy Tank	Reason
Atmospheric Emissions	<i>No preference</i>		<ul style="list-style-type: none"> From atmospheric emissions perspective, there is no difference between the proposed system and the alternative treatment system. Both options will result in some dust emissions during the construction phase, but no dust during the operational phase.
Noise	<i>No preference</i>		<ul style="list-style-type: none"> From a noise perspective, there is no difference between the proposed system and the alternative treatment system. Both will not generate noise.
Surface Water	<i>No preference</i>		<ul style="list-style-type: none"> From a surface water perspective, there is no difference between the proposed system and the alternative treatment system.
Groundwater	✓	X	<ul style="list-style-type: none"> From a groundwater perspective, the Lilliput system is preferred as the risk of groundwater pollution is lower due to the tanks being installed above ground.
Waste Generation	✓	X	<ul style="list-style-type: none"> From a waste generation perspective, the proposed option is preferred, due to having less impact on the municipal sewage system.
Soil Alteration	✓	X	<ul style="list-style-type: none"> From a soil perspective, the Lilliput system is preferred, as it will result in less disturbance to soil and a lower risk of soil pollution.
Resource Consumption	✓	X	<ul style="list-style-type: none"> From a resource consumption perspective, the proposed option is preferred as it will not consume any fuel for collection and delivery of sewage.
Effects on Biodiversity	<i>No preference</i>		<ul style="list-style-type: none"> From an economic perspective, there is no difference between the proposed and alternative options.

	Treatment Alternative 1 Lilliput System	Treatment Alternative 2 - Conservancy Tank	Reason
Incidents and Accidents	✓	X	<ul style="list-style-type: none"> The Lilliput system may result in a lower risk of accidents occurring, as there will not be any vehicles (Honey suckers) on the roads.
Social	X	✓	<ul style="list-style-type: none"> From a social impact perspective, the lillieput system will create some visual impact, but in relation to the surrounding landscape and due to the scale of the development, this is not a significant impact. The conservancy tank will not create any visual impact.
Economic	No preference		<ul style="list-style-type: none"> From an economic perspective, there is no difference between the proposed and alternative options.

10 ENVIRONMENTAL IMPACT STATEMENT

In terms of the EIA regulations, a Basic Assessment Report must contain an environmental impact statement, which contains:

1. A summary of the key findings of the environmental impact assessment;
2. A map at an appropriate scale which superimposes the proposed activity and its associated structures and infrastructure on the environmental sensitivities of the preferred site indicating any areas that should be avoided, including buffers; and
3. A summary of the positive and negative impacts and risks of the proposed activity and identified alternatives.

In order to ensure that the Impact Statement is comprehensive and includes all the requirements of the Regulations, this section aims to meet the abovementioned requirements.

10.1 Proposal and alternatives

10.1.1 Summary of the key findings of the environmental impact assessment

10.1.1.1 Need for the proposed development

- The need for the proposed development is firstly based on the positive consultations and discussions that preceded the re-zoning application.
- The proposed development will serve the contractors, workers and service providers to the new Kusile Power Station.
- The proposed development will serve the community and public using the concerned road (R686). The R686 provides a linkage between the N4 national road and the N12 national road.
- The proposed development will optimise use of existing renewable resources (e.g. infrastructure) without exhaustion of the capacity thereof.
- The proposed development promotes integrated land development in rural and urban areas in support of each other.
- The proposed development can be described as sustainable since the development can be operated successfully in an ongoing basis. It will also not be developed on a unique natural habitat, a place of hazard and an archaeological and cultural significant site.

10.1.1.2 Site Selection

The site selected for the proposed development provides the best existing opportunity to establish the proposed land use, when considering the preceding consultations, discussions and investigations prior to the re-zoning application.

10.1.1.3 Environmental Sensitivities

Based on the findings of the specialist studies undertaken through the Basic Assessment process, no environmental fatal flaws have been identified because of the construction and operational of the proposed development. The ecological specialists found that the study area has low sensitivity and the impacts have been rated as having a low significance after mitigation.

An overall sensitivity map has been compiled and is included in Figure 14 below.

10.1.1.4 Socio-economic impacts

From a socio-economic point of view, the proposed development will have a positive impact and will create employment opportunities to the benefit of the surrounding community. The proposed development will also stimulate the local economy. The proposed development will discourage the illegal occupation of the concerned property. The proposed development will contribute to the transfer skills by way of training, etc. Skills will also be transferred during the construction and operation phase of the proposed development.

10.1.1.5 Services Infrastructure

Stormwater, water and sewage services will be provided on site in a closed-system and no services are required from outside providers (e.g. the municipality). Should it be required, a water use license application will be submitted to the Department of Water and Sanitation (DWS) for the sewage disposal and discharge and the abstraction of groundwater. Initially electricity will be provided by generators and later, when required, an application to Eskom will be submitted to obtain electricity from an existing power line running east of the study area. General and hazardous waste will be disposed of by registered service providers at a registered landfill site.

10.1.1.6 Impact Assessment

The most significant potential impacts that may result from the proposed activity are shown in the impact assessment table (Table 18) within this report. The significance of these impacts can effectively be mitigated with the implementation of the EMPr contained in Appendix 9.

10.1.2 A map at an appropriate scale which superimposes the proposed activity and its associated structures and infrastructure on the environmental sensitivities of the preferred site indicating any areas that should be avoided, including buffers

The environmental sensitivities that have been identified on the study area have been indicated on the sensitivity map overlain onto the footprint of the development. (Refer to Appendix 8 and Figure 14).



Figure 14: Sensitivity map overlaid with development footprint

10.1.3 A summary of the positive and negative impacts and risks of the proposed activity and identified alternatives

Please see Table 21 and Table 22 for a summary of the impact assessment undertaken. In general, most negative impacts from both construction and operation could be mitigated to a low significance with the implementation of the proposed mitigation measures which are included in the EMPr.

Table 21: Summary of impacts on the proposed site layout for construction phase

Impacts	Comment
Atmospheric Emissions	Dust and vehicle emissions is evaluated as low impacts before mitigation and is kept as low after mitigation measures are implemented. This is mainly due to construction vehicles operating on site, as well as the clearance of groundcover. Noise levels will also increase in the area because of construction and is rated with low-medium significance but can be mitigated to a low significance.
Water Resources	Construction activities have the potential to impact negatively on surface and groundwater resources on and surrounding the study area through contamination, sedimentation and general disturbance to the adjacent natural drainage lines and aquatic ecological systems. These impacts were rated as having a low or low significance before mitigation and with a low significance after mitigation with no loss of resources. It should be noted that the proposed development will not directly impact on wetlands as the site is 150m from any wetlands.
Waste Generation	During the construction phase domestic, construction and hazardous waste will be generated. The impact of domestic waste was rated as with a significance rating of low before and after mitigation, construction waste and hazardous waste as low before and low after mitigation.
Soil Alteration	Soil maybe impacted on through the loss of topsoil, loss of land capability, alteration of the topography and soil pollution through contamination by spillage of hazardous materials e.g. hydrocarbons and sewage from chemical toilets. These impacts have been rated as low-medium (loss of topsoil) and low (loss of land capability and contamination) before mitigation and low after mitigation.
Resource Consumption	The consumption of raw materials is regarded as low-medium impact before mitigation. The effective use of raw materials will be promoted to minimise use. The construction phase will also cause an increase in electricity, water and indirectly, fuel consumption in the area. These impacts have been rated with low-medium significance due to the short and medium term of the construction period and the low volumes required. After mitigation, the significance rating for these impacts is low.
Effects on Biodiversity	The majority of the study area is disturbed with small portions of low-medium and medium sensitivity as Figure 14. Impacts include: <ul style="list-style-type: none"> • Loss of habitat • Loss of fauna • Loss of flora • Degradation of ecological systems The significance rating of these impacts is all low after mitigation.
Incidents, Accidents and Potential	This category of impacts includes potential pollution incidents and health and safety incidents e.g. injury to workers or visitors to the site i.e.: <ul style="list-style-type: none"> • Spillage and accidents and injury caused by the inappropriate storage of hydrocarbons and other hazardous material

Impacts	Comment
Emergency Situations	<ul style="list-style-type: none"> Fire and resultant injury, death and damage to property. <p>The incidents referred to above have the potential to cause significant socio-economic and biophysical impacts, however, the risk of them occurring when all mitigation and management measures are implemented, are low and the significance rating after mitigation is, therefore, low.</p>
Social	<p>Social impacts generally include impacts that influence the quality of life of people. For the proposed development the following social impacts have been identified:</p> <ul style="list-style-type: none"> The visual impact is rated as low-medium before and after mitigation; Safety and security: <ul style="list-style-type: none"> Potential influx of work seekers can be mitigated to a low significance; Unauthorised access can be mitigated to a low significance. Traffic disruptions are rated as low-medium significance, but can be mitigated to having only a low significance; Loss of Sense of Place - This impact was rated with a medium significance rating before mitigation and low after mitigation.
Economic	<p>Construction on site will provide employment and skills to the local community and the local economy will benefit in terms of supply of building materials and services to the proposed development. The significance rating of is Medium, but after measures implemented to maximise the benefits, the significance is High.</p>

Table 22: Summary of impacts on the proposed site layout for operational phase

Impacts	Comment
Atmospheric Emissions	<p>Emissions from vehicles (CO₂, NO_x, SO_x, VOC's etc.), due to an increase in traffic flow in the area may alter air quality in the long term or permanently. This impact cannot be directly mitigated by the developer, however, mitigation through regulation by government e.g. establishing emissions standards for vehicles, may reduce this impact in the long term. This impact is, therefore, rated as having a medium significance before mitigation and a low-medium significance after mitigation.</p> <p>The proposed operational phase of the project may also cause an increase in ambient noise levels which may be generated by an increase in traffic flow in the area, however though proper mitigation the impact of noise will be lowered. The significance of noise impacts is rated as low-medium before and low after mitigation.</p>
Water Resources	<p>The proposed development and associated activities have the potential to impact negatively on surface and groundwater resources on and surrounding the study area through contamination, sedimentation and general disturbance to the adjacent natural drainage lines and aquatic ecological systems. These impacts were rated as having a low significance before and after mitigation. It</p>

Impacts	Comment
	should be noted that the proposed development will not directly impact on wetlands as the site is 150m from any wetlands.
Waste generation	Domestic and hazardous waste and sewage sludge generation and potential pollution as a result thereof. During the operational phase waste will be generated. The impact of waste was rated as with a significance rating of medium before mitigation due to the high volumes of waste that may potentially be created by the proposed development and the long duration of the impact. However, with mitigation measures e.g. recycling practises this impact may be mitigated to a low-medium significance.
Soil Alteration	Soil maybe impacted on through the loss of topsoil through erosion and soil pollution through contamination by spillage of hazardous materials e.g. hydrocarbons and sewage from poorly maintained stormwater and sewage infrastructure. These impacts have been rated as low before and after mitigation.
Resource Consumption	During the operational phase, the proposed development will cause an increase in electricity and water consumption in the area. These impacts have been rated with medium significance due to long term of the operational phase and the significance volumes and capacity of resources and infrastructure required for the development. After mitigation, the significance rating for these impacts is low-medium. Electricity and water consumption can be mitigated through measures included in the Environmental Management Programme. The Outline Scheme Report also confirmed the availability and capacity for the proposed development. These impacts can therefore be mitigated to a low-medium significance rating.
Effects on Biodiversity	<p>The majority of the study area is disturbed with small portions of low-medium and medium sensitivity as indicated in Figure 14. Impacts during the operational phase include:</p> <ul style="list-style-type: none"> • Loss of fauna; • Degradation of ecological systems. <p>The significance rating of these impacts is all low after mitigation.</p>
Incidents, Accidents and Potential Emergency Situations	<p>This category of impacts includes potential pollution incidents and health and safety incidents e.g. injury to residents and tenants of the proposed development:</p> <ul style="list-style-type: none"> • Spillage and accidents and injury caused by the inappropriate storage of hydrocarbons and other hazardous material; • Fire and resultant injury, death and damage to property. <p>The incidents referred to above have the potential to cause significant socio-economic and biophysical impacts, however, the risk of them occurring when</p>

Impacts	Comment
	all mitigation and management measures are implemented, are low and the significance rating after mitigation is, therefore, low.
Social	<p>Social impacts generally include impacts that influence the quality of life of people. For the proposed development the following social impacts have been identified:</p> <ul style="list-style-type: none"> • The visual impact is rated as medium before and low after mitigation; • Safety and security: access control is rated as low-medium before and low after mitigation; • Increase in traffic flow. There will be a significant increase in traffic flow during the operational phase and the significance of this impact is rated as medium. However, this impact can be mitigated to having a low-medium significance through road upgrades and other mitigation measures.
Economic	The proposed development will positively affect the economic value of the local community by creating employment and increase the property value of neighbouring properties. The significance of economic impacts is medium (property values) and high (increase in economy and creation of employment opportunities) after implementation of measures to maximise the benefit.

10.2 No-Go Alternative

The No-go Alternative assumes that the property will retain the status quo. This implies that the site be left as is and that no development or alteration be done. If this alternative is pursued, the study area's existing habitat will be retained. Under this scenario, the following benefits and disadvantages are expected to occur:

- The No-go option will sterilise the study area for development, where there is a need for a truck stop;
- A viable opportunity to exploit the limited opportunities in the area and creating jobs and income for the local market will be negated;
- By not approving the proposed development, the general area may not be economically uplifted neither will job opportunities and skills development be encouraged;
- The study area will fall further in disrepair and the protection and appropriate management of ecology on the study area will not occur;
- Illegal squatters or vagrants could inhabit the site as the local area is currently impacted;
- Given the fact that the site will eventually degenerate if left unmanaged, and the fact that it is most likely unsuitable to be utilised for grazing or agricultural purposes due to the size of the study area and the high cost thereof, it is reasonable to state that the No-go option is less favourable than the Proposal;

- The approval will ensure that an EMPr be implemented and that the sensitive areas on the site will be managed.

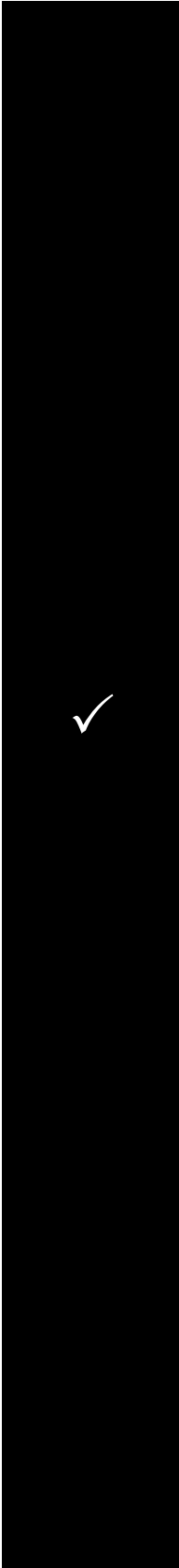
The No-go alternative is therefore not preferred.

10.3 Recommendations from Specialist Reports

An overview of the recommendations of the various environmental and technical specialists are provided in Table 23. Please note that only the main mitigation measures are provided. All mitigation measures are however included in the EMPr.

Table 23: Specialist recommendations

	Recommendations	Development to proceed
Ecological Habitat Assessment	<ul style="list-style-type: none"> • Mitigation Measures for Impacts on Vegetation Communities - As far as possible, the proposed developments should be placed in areas that have already been disturbed, and no further loss of secondary grassland should be permitted. It is recommended that areas to be developed be specifically demarcated so that during the construction phase, only the demarcated areas be impacted upon (including fencing off the defined study area); and • Areas of indigenous vegetation, even secondary communities should under no circumstances be fragmented or disturbed further or used as an area for dumping of waste; • The areas rated as highly sensitive in the study area (Figure 14) as defined in this report should be declared a 'no-go' area during the construction and operational phases and all efforts must be made to prevent access to this area from construction workers, machinery and the general public; These areas should be clearly demarcated and all access to the adjoining areas should be restricted; • All laydown, storage areas etc should be restricted to within the study area and all access roads must be kept within this area or from existing access roads; • A qualified environmental control officer must be on site when construction begins to identify species that will be 	✓

	Recommendations	Development to proceed
	<p>directly disturbed and to relocate fauna/flora that is found during construction (including all reptiles and amphibians);</p> <ul style="list-style-type: none"> • Areas of indigenous vegetation should be delineated, and rehabilitation measures implemented in areas where the indigenous community is still present but degraded; • Areas that are denuded during construction need to be re-vegetated with indigenous vegetation to prevent erosion during flood events. This will also reduce the likelihood of encroachment by alien invasive plant species; and • Compilation of and implementation of an alien vegetation management plan for the entire site. <p>Mitigation Measures for Impacts on Faunal Communities: Recommended mitigation and rehabilitation measures for faunal community's hinge largely on protecting their habitats and ensuring it remains intact. In addition to this the following measures are recommended:</p> <ul style="list-style-type: none"> • If any faunal species are recorded during construction, activities should temporarily cease, and an appropriate specialist should be consulted to identify the correct course of action; • Fencing should be erected around the study area to prevent workers and members of the public from entering the surrounding farm portion. This fence should have small openings to allow wildlife to pass through; • Waste management must be a priority and all waste must be collected and stored adequately. It is recommended that all waste be removed from site on a weekly basis to prevent rodents and pests entering the site • No trapping, killing or poisoning of any wildlife should be allowed on site; 	

	Recommendations	Development to proceed
	<ul style="list-style-type: none"> Adequate signage should be erected that raises awareness about possible fauna in the area (e.g. amphibians) and speed bumps should be put in place to reduce speeding and faunal road mortalities; Staff should be educated about the sensitivity of faunal species and measures should be put in place to deal with any species that are encountered during the construction process. The intentional killing of any animals including snakes, insects, lizards, birds or other animals should be strictly prohibited; and All livestock must be kept out of all grassland and wetland area in order to prevent overgrazing of remaining grassland; and All domesticated animals are forbidden within the entire study area. 	✓
Wetland Assessment	<p>Monitoring programmes can measure the success of mitigation implementations, monitor unforeseen impacts, and can be used as a feedback system to adjust or correct management of the wetlands.</p> <p>The following in terms of monitoring are recommended:</p> <ul style="list-style-type: none"> Development of Environmental Management Programme (EMPr); Auditing linked to Environmental Management Programme (EMPr) <ul style="list-style-type: none"> The wetland monitoring occurring on a quarterly basis should be conducted by a skilled professional qualified in assessing and understanding the complex nature of wetlands and their associated drivers; It should be attempted to preserve complete wetland function (current status) if at all possible. Wetland drivers should be protected. <p>The following in terms of mitigation:</p>	✓

	Recommendations	Development to proceed
	<p>➤ Mitigations for the proposed development activities should be implemented, managed and monitored:</p> <ul style="list-style-type: none"> ○ Runoff from the construction areas must be controlled and directed away from the wetlands; ○ On site storm water management, must be implemented; ○ The proposed activities must be initiated and constructed in such a way to prevent the reduction of natural water flow into the wetland and downstream which, in essence, is the driving factor in terms of water provision; ○ An approved stormwater management plan must be implemented. 	✓
Heritage Impact Assessment	<p>Due to the lack of significant heritage resources in the study area the impact of the proposed project on heritage resources is considered low and impacts can be mitigated to an acceptable level. It is therefore recommended that the proposed project can commence on the condition that the following recommendations are implemented as part of the EMPr and based on approval from SAHRA:</p> <p>Implementation of a chance find procedure as outlined below; and</p> <p>In terms of the paleontological aspect a protocol for finds should be implemented as outlined below.</p> <p>Chance Find Procedures:</p> <ul style="list-style-type: none"> • The possibility of the occurrence of subsurface finds cannot be excluded. Therefore, if during construction any possible finds such as stone tool scatters, artefacts or bone and fossil remains are made, the operations must be stopped, and a qualified archaeologist must be contacted for an assessment of the find and therefore chance find procedures should be put in place as part of the EMPr. A short summary of chance find procedures is discussed below. 	✓

	Recommendations	Development to proceed
	<ul style="list-style-type: none"> This procedure applies to the developer's permanent employees, its subsidiaries, contractors and subcontractors, and service providers. The aim of this procedure is to establish monitoring and reporting procedures to ensure compliance with this policy and its associated procedures. Construction crews must be properly inducted to ensure they are fully aware of the procedures regarding chance finds as discussed below. If during the pre-construction phase, construction, operations or closure phases of this project, any person employed by the developer, one of its subsidiaries, contractors and subcontractors, or service provider, finds any artefact of cultural significance or heritage site, this person must cease work at the site of the find and report this find to their immediate supervisor, and through their supervisor to the senior on-site manager. It is the responsibility of the senior on-site Manager to make an initial assessment of the extent of the find and confirm the extent of the work stoppage in that area. The senior on-site Manager will inform the ECO of the chance find and its immediate impact on operations. The ECO will then contact a professional archaeologist for an assessment of the finds who will notify the SAHRA. <p>Palaeontological protocol for finds</p> <p>In the unlikely event of fossil discovery, a professional palaeontologist must be called in to confirm and record the finds. Ex situ remains must be wrapped in paper towels or heavy-duty tin foil and stored in a safe place. The material should not be washed or cleaned in any way. In situ material must be kept in place and protected from further damage by covering it with light but rigid object like a box, bucket or metal sheet until further confirmation by the palaeontologist.</p>	✓
Geotechnical Assessment	<p>The site is provisionally classified as follows:</p> <ul style="list-style-type: none"> Site Class H1 to H3 with the following foundation solutions: 	N/A

	Recommendations	Development to proceed
	<ul style="list-style-type: none"> ○ Soil raft comprising the removal of all or part of expansive horizon to 1,0m beyond the perimeter of the construction and replacing it with inert backfill compacted to 93% MOD AASHTO density at -1% to 2% of optimum moisture content, followed by normal construction with lightly reinforced strip footings and masonry and site drainage and plumbing/service precautions. ○ Stiffened or cellular raft with articulation joints or lightly reinforced masonry. ○ Piled construction comprising piled foundations with suspended floor slabs with or without ground beams. <p>• Site Class PD/H1 to H3</p> <ul style="list-style-type: none"> ○ This zone comprises the drainage features and development should take place outside this zone that is also associated with expansive clay. ○ A geophysical survey indicating contact zones for water source targeting and structuring the complex geology should be included in the next phase of investigation. <p>This preliminary or initial investigation was done to provisionally identify the expected geotechnical properties on site with the techniques as described. Although every possible factor during the investigation was dealt with, it is possible to encounter variable local conditions. This will require the inspection of foundations by a competent person to verify expected problems during the next phase of investigation. A geotechnical investigation for the planned filling station and truck stop on the specific footprint of the planned foundations and placement of fuel tanks will be required.</p>	
Traffic Impact Assessment	<ul style="list-style-type: none"> • The filling station access application needs to be submitted to the engineers at Eskom for approval. • Detail design drawings will be prepared and submitted to the relevant Department/s and Eskom, once the application is approved in principle. 	✓

10.4 Impact Management Objectives and Outcomes

Impact management objectives and outcomes will be provided in the EMP to ensure that the proposed development is sustainable and has not significantly negative impacts. A summary of these management objectives is provided below:

- Planning and layout of construction site is undertaken responsibly to ensure protection of sensitive environmental features.
- Environmental awareness creation and training is undertaken throughout the construction phase in order to minimise environmental impacts and ensure compliance to relevant legislation and authorisations
- Minimise environmental impacts associated with emergency procedures
- A safe working environment for contractors/construction workers and the public is provided.
- Proper management of site clearing is undertaken to ensure minimal environmental disturbance.
- Minimise environmental impacts associated with site establishment
- Ensure access to sensitive environmental features is restricted and proper access control is in place
- Minimal disturbances to traffic due to delivery of construction material.
- Proper management of labour force is undertaken to ensure that:
 - There are no security-related issues or disturbance to tenants or landowners outside the construction footprint.
 - There is optimal use of local labourers.
 - There is no disturbance to sensitive environmental feature
 - Minimise environmental impacts associated with ablution facilities.
- Reduce the generation of waste by changing behaviours of contractors throughout the development
- Re-use waste generated by the construction where possible thereby resulting in decreased waste disposal volumes
- Waste separation and recycling must be undertaken as part of construction
- Waste generated during the proposed development to be disposed of at licensed landfills
- Minimal environmental impacts associated with waste
- Effective and safe management of hazardous and non-hazardous materials on site, in order to minimise the impact of materials on the environment.
- Minimal environmental impacts associated with the management of workshops and equipment
- Ensure that all possible causes of pollution are mitigated as far as possible to minimise impacts to the surrounding environment.
- Prevent polluted water from entering the surface water.
- Minimise noise disturbance to surrounding areas
- Preserve protected flora species outside of construction areas.

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- Control alien plants and noxious weeds.
 - Minimal impact to fauna species.
 - To have no adverse impact on the historical inheritance of the area.
 - The preservation and appropriate management of new findings should these be discovered during construction.
 - Adequate reinstatement and rehabilitation of construction areas.
 - Water conservation mechanisms to be implemented.
 - Electricity reduction mechanisms to be implemented.

10.5 Reasoned opinion of EAP

Based on the findings of the specialist studies and impact assessment and considering the successful implementation of the EMPr, it is felt that the proposed development should proceed. In summary, the following reasons form the basis of this opinion.

- There is a need for the proposed development in the specific area. The proposed development will serve the contractors, workers and service providers to the new Kusile Power Station. The proposed development will also serve the community and public using the concerned road (R686);
- The proposed development will optimise use of existing renewable resources (e.g. infrastructure) without exhaustion of the capacity thereof;
- The proposed development promotes integrated land development in rural and urban areas in support of each other;
- The proposed development can be described as sustainable since the development can be operated successfully in an ongoing basis. It will also not be developed on a unique natural habitat, a place of hazard and an archaeological and cultural significant site;
- The site selected for the proposed development provides the best existing opportunity to establish the proposed land use, when considering the preceding consultations, discussions and investigations prior to the re-zoning application;
- Based on the findings of the specialist studies undertaken through the Basic Assessment process, no environmental fatal flaws have been identified because of the construction and operational of the proposed development. The ecological specialists found that the study area has low sensitivity and the impacts have been rated as having a low significance after mitigation;
- From a socio-economic point of view, the proposed development will have a positive impact and will create employment opportunities to the benefit of the surrounding community. The proposed development will also stimulate the local economy. The proposed zoning will discourage the illegal occupation of the concerned property. The re-zoning will contribute to the transfer skills by way of training, etc. Skills will also be transferred during the construction and operation phase of the proposed development.

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- Services required for the development are available or will be developed during the construction phase;
 - The site is currently impacted upon by existing land uses. Using this site therefore reduces the need for greenfields development elsewhere.
 - The assumptions, uncertainties and gaps are such that the impact assessment is expected to be accurate;
 - The mitigation measures included in the EMPr are thought to adequately mitigate impacts so that the impact management objectives can be met.

The comparison of alternatives resulted in the selection of the BPEO for the site:

- Proposed layout; and
- Treatment Alternative 1 (Lilliput System).

10.6 Aspects to be included as conditions of authorisation

The following is recommended to be included in the conditions of the Environmental Authorisation:

- The construction and operation of the proposed development should be implemented according to an Environmental Management Programme (EMPr) [Refer to Appendix 9] to adequately mitigate and manage the identified impacts;
- An Environmental Control Officer must be appointed to oversee the development during the construction phase, to implement the Environmental Management Programme (EMPr) and Environmental Authorisation (EA) and to monitor against same; and
- A stormwater management plan with Sustainable Urban Drainage Systems (SUDS) principles must be compiled, approved, and implemented.

10.7 The period for which the environmental authorisation is required

The proposed development includes operational activities and thus once construction has commenced, the authorisation will be viewed to be permanently valid. The proposed period for which the environmental authorisation should be valid prior to operation is 8 years with an option to extend if necessary. Should construction not commence within this period, the authorisation will lapse and new authorisation process would be required

11 UNDERTAKING

I, Monica Niehof, as the Environmental Assessment Practitioner managing this application provide the following affirmation in relation to -

- the correctness of the information provided in the report;
- the inclusion of comments and inputs from stakeholders and interested and affected parties;
and
- any information provided myself to interested and affected parties and any responses to comments or inputs made by interested and affected parties.
- the level of agreement between myself and interested and affected parties on the plan of study for undertaking the environmental impact assessment.

Designation: Senior Environmental Assessment Practitioner

Prism Environmental Management Services

Company

Date
