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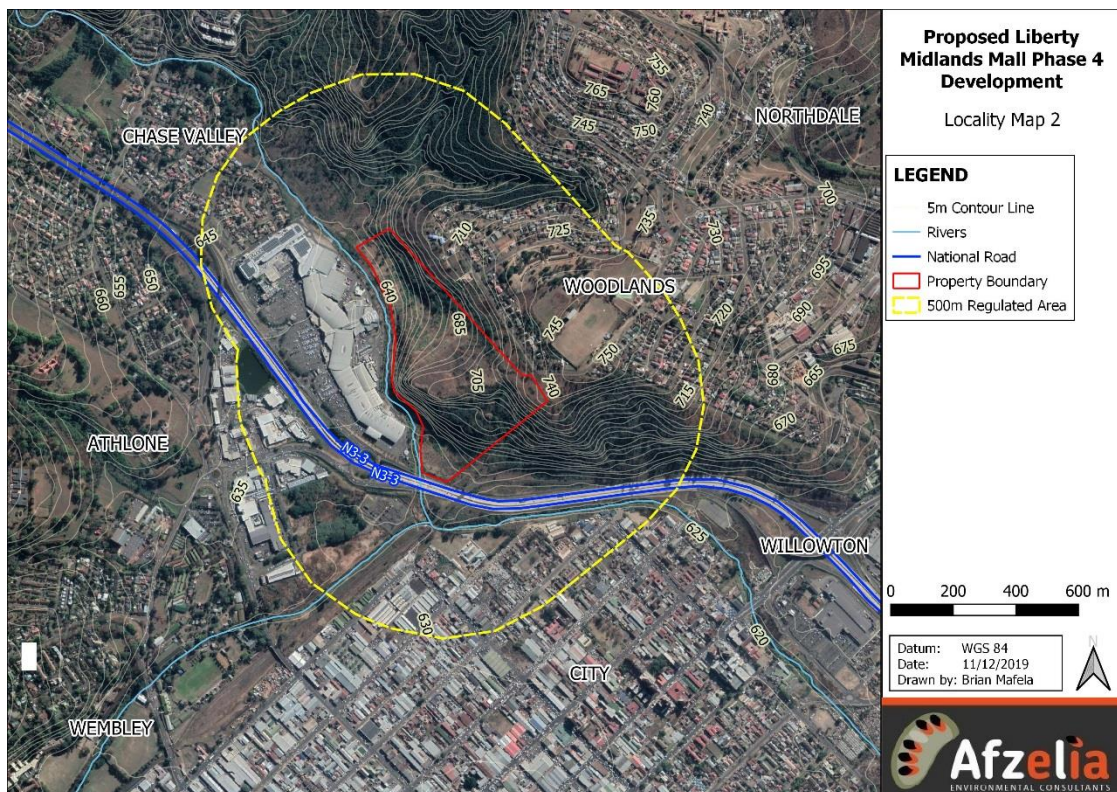
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DRAFT BASIC ASSESSMENT REPORT FOR:

BASIC ASSESSMENT: PROPOSED MIDLANDS PARK RUN AND BIKE TRACK DEVELOPMENT, MSUNDUZI LOCAL MUNICIPALITY, UMGUNGUNDLOVU DISTRICT MUNICIPALITY, KWAZULU NATAL

EDTEA File Reference Number:TBC– NEAS REF: KZN/EIA-TBC

Submitted for commenting by stakeholders in terms of the 2014 Environmental Impact Assessment Regulations promulgated in accordance with the National Environmental Management Act 107 of 1998 (Act No. 107 of 1998), as amended.



Submitted on behalf of: Liberty Two Degrees

DOCUMENT INFORMATION

Document Name	Draft Basic Assessment Report
EDTEA File Ref. No.	TBC – NEAS REF: KZN/EIA/TBC
Title	BASIC ASSESSMENT PROCESS: PROPOSED MIDLANDS PARK RUN AND BIKE TRACK DEVELOPMENT, MSUNDUZI LOCAL MUNICIPALITY, UMGUNGUNDLOVU DISTRICT MUNICIPALITY, KWAZULU NATAL
Client/Proponent	Liberty Two Degrees
Project Manager	Four Winds Project Management
Environmental Assessment Practitioner's Organisation	Afzelia Environmental Consultants (Pty) Ltd
Compiled by	Ms Rivani Maharaj
Reviewed by	Ms Joleen Wilson / Mr Andrew Batho
Issue Date	11/12/2020

REVIEW OF THE FINAL BASIC ASSESSMENT REPORT

This Draft Basic Assessment Report will be available for commenting for a period of **30 days** (excluding public holidays) from **28 September 2020 until 28 October 2020**. Draft copies of the Assessment Report are available at strategic public places within the project area and upon request from Afzelia Environmental Consultants (Pty) Ltd.

The report is available for viewing at the following Public places:

- Msunduzi Municipal Library
- Liberty Midlands Mall Centre Management Offices
- Afzelia website: www.afzelia.co.za.

Please send your comments and queries before **03 February 2021** to:

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ACRONYMS AND ABBREVIATIONS

COGTA	Department of Cooperative Governance and Traditional Affairs	GN	Government Notice
DAFF	Department of Agriculture, Forestry and Fisheries	GNR	Government Notice Regulation
DEA	Department of Environmental Affairs	HGM	Hydrogeomorphic Unit
DEDTEA	Department of Economic Development, Tourism and Environmental Affairs	I&AP	Interested and Affected Parties
DoH	Department of Health	IAIAsa	International Association for Impact Assessment South Africa
DoL	Department of Labour	IAP2 SA	International Association for Public Participation Southern Africa
DWS	Department of Water and Sanitation	IDP	Integrated Development Plan
EA	Environmental Authorisation	KM	Kilometre
EAP	Environmental Assessment Practitioner	KZN	KwaZulu-Natal
ECO	Environmental Control officer	LA21	Local Agenda 21
EDTEA	Economic Development, Tourism and Environmental Affairs	LaRSSA	Land Rehabilitation Society of Southern Africa
EIA	Environmental impact Assessment	MOD	Modified
EIS	Ecological Impact and Assessment	NEMA	National Environmental Management Act (107 of 1998)
EKZNW	Ezemvelo KwaZulu-Natal Wildlife	NFEPA	National Freshwater Ecosystem Priority Areas
ELA	Environmental Law Association	NWA	National Water Act (No 36 of 1998)
EMF	Environmental Management Framework	PAHs	Polycyclic Aromatic Hydrocarbons
EMPr	Environmental Management Programme	PES	Present Ecological State
EPWP	Expanded Public Works Program	PI	Plasticity Index
GG	Government Gazette	PPP	Public Participation Process
GIS	Geographic information System	SABS	South African Bureau of Standards
		SADC	South African Development Community

SANS	South African National Standards	TRH	Technical Recommendations for Highways
SAQA	South African Qualifications Authority		
SDF	Spatial Development t framework	TWQR	Target Water Quality Range
SIP	Strategic Integrated Projects	VOCs	Volatile Organic Compounds
SUDS	Sustainable Urban Drainage Systems	VPH	Vehicles Per Hour
SWMP	Storm water Management Plan	WUA	Water Use Authorisation
		WULA	Water Use License Application

EXECUTIVE SUMMARY

Summary of principal objectives

This report constitutes the Draft Basic Assessment Report (DBAR) which details the risk assessment of key environmental issues and impacts associated with the project, and documents Interested and Affected Parties (I&AP) issues and concerns. Furthermore, it determines the significance, duration and probability of the impacts occurring as a result of the proposed activities on the site, describes the public participation undertaken and identifies suitable measures to avoid, reverse, mitigate or manage potential impacts including. Monitoring is also included to allow for continued improvement and responsible environmental management.

Background and Project Description

Afzelia Environmental Consultants (Pty) Ltd has been appointed by Four Winds Project Management on behalf of the Liberty Midlands Mall to undertake an Environmental Impact Assessment (EIA) in the form of a Basic Assessment (BA) process,) for the proposed park run and bike track development.

Afzelia Environmental Consultants (PTY) Ltd was also appointed by Four Winds Project Management (PTY) Ltd to undertake a specialist studies for the proposed Phase 4 development of the Liberty Midlands Mall. The Liberty Midlands Mall proposed Park Run and Bike Track Development is situated within the town of Pietermaritzburg. Pietermaritzburg is located within the Msunduzi Local Municipality, in the KwaZulu-Natal Province. The proposed development site is located north of the Pietermaritzburg CBD along the National Route 3 (N3) Highway (Figure 1.2). The proposed development entails construction the following infrastructure:

- i Numerous standalone residential units;
- ii Ablution facilities and associated sewer infrastructure;
- iii An amphitheatre;
- iv Activities management container offices;
- v Access road and parking area;
- vi Small vehicular bridge over the Townbush River;
- vii Bike and running Tracks;
- viii Zip line;
- ix Put-put golfing area;
- x Paintball court;
- xi Acrobranching and rock-climbing structures;
- xii Property fence and security cameras;
- xiii Restaurant;

- xiv Club House;
- xv Function Venue;
- xvi Management offices;
- xvii Food Trucks;
- xviii Farmers market; and
- xix Alternative vehicular access and exit routes.

Legislation and Regulatory Environmental Requirements

The proposed development project triggers Listed Activities as stipulated in the EIA Regulations (2014) promulgated in terms of the NEMA, 1998 (Act 107 of 1998) as amended under Government Notice No. 982, 983 and 985 of 04 December 2014. The activities contained in Listing Notice 1 of the EIA Regulations 2014 (GN R. 983, dated 04 December 2014), promulgated in terms of the National Environmental Management Act, must be subjected to a Basic Assessment.

The following table provides a summary of the Listed Activities in terms of the EIA Regulations 2014 that are triggered by the proposed project:

Government Notice Number	Activity number	Description of each listed activity	Component of project
324	9	The development and related operation of zip line or foefie slides exceeding 100m in length (d)KwaZulu-Natal (gg) Areas on the watercourse side of the development setback line or within 100m from the edge of the watercourse where no such setback line has been determined. (hh) areas within a watercourse of wetland	A zip line recreational activity is proposed across the site. The site falls within the regulated buffer area of a wetland and a watercourse.
327	12	(cc) The development of- i. Infrastructure or structures with a physical footprint of 100 square meters or more; where such development occurs- a. within a watercourse; b. in front of a development setback; or c. if no development setback exists, within 32 metres of a watercourse, measured from the edge of a watercourse; -	The proposed development falls within 32 metres of a watercourse

		<p>excluding-</p> <p>aa) the development of infrastructure or structures within existing ports or harbours that will not increase the development footprint of the port or harbour;</p> <p>bb) where such development activities are related to the development of a port or harbour, in which case activity 26 in Listing Notice 2 of 2014 applies;</p> <p>cc) activities listed in activity 14 in Listing Notice 2 of 2014 or activity 14 in Listing Notice 3 of 2014, in which case that activity applies;</p> <p>where such development occurs within an urban area; or where such development occurs within existing roads or road reserves.</p>	
327	19	<p>a) The infilling or depositing of any material of more than 10 cubic metres into, or the dredging, excavation, removal or moving of soil, sand, shells, shell grit, pebbles or rock of more than 10 cubic metres from-</p> <p>i. a watercourse;</p> <p>ii. the seashore; or</p> <p>iii. the littoral active zone, an estuary or a distance of 100 metres inland of the high-water mark of the sea or an estuary, whichever distance is the greater</p> <p>but excluding where such infilling, depositing, dredging, excavation, removal or moving-</p> <p>a. will occur behind a development setback;</p> <p>b. is for maintenance purposes undertaken in accordance with a maintenance management plan; or;</p> <p>falls within the ambit of activity 21 in this Notice, in which case that activity applies.</p>	<p>The development will include the construction of a Bridge cross the Town Bush river</p>
327	27	<p>The clearance of an area of 1 hectare or more, but less than 20 hectares of indigenous vegetation, except where such clearance of indigenous vegetation is required for-</p>	<p>The proposed development area to be cleared will be approximately 3.6 hectares in size</p>

		(i) the undertaking of a linear activity; or (ii) maintenance purposes undertaken in accordance with a maintenance management plan.	
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Due to the proposed project occurring within the 1:100 year floodline of a watercourse and within 500m radius of wetlands, a Water Use Licence Application (WULA) will be submitted to the Department of Water and Sanitation (DWS) in terms of Section 21 (c) or (i) in accordance with the National Water Act 1998 (Act No. 36 of 1998) (NWA).

The following table provides a summary of water uses that apply to this upgrade:

Activity Number	Water Use	Description
Section 21 (a)	Taking water from a water resource	Water is to be abstracted per day from the Town Bush River to be used during the construction activities.
Section 21 (c) of NWA of 1998	Impeding or diverting the flow of water in a watercourse	<ul style="list-style-type: none"> • Impeding flow means the temporary or permanent obstruction or hindrance to the flow of water into a watercourse by structures built either fully or partially in or across a watercourse. • Diverting flows means a temporary or permanent structure causing the flow of water to be re-routed in a watercourse for any purpose.
Section (i) of NWA of 1998	Altering the bed and banks of a watercourse or characteristics of a watercourse	<ul style="list-style-type: none"> • Altering the bed and banks means any change affecting the resource quality of the watercourse (the area within the riparian habitat or 1:100 year floodline, whichever is greatest).

Layout Alternatives

Four alternatives have been proposed for the proposed Liberty Midlands Park Run and Bike Park, within Alternative 1 being the applicants preferred alternative. The differences between each alternative are listed below :

Alternative 1 : Option 1 has extensive parking, an amphitheatre, various recreational activities including, but not limited to a zip line, paintball, bike tracks, hiking and running routes as well as several residential units, restaurants, club house, function venue, management offices, food trucks, farmers markets and alternative vehicular access and exit

Alternative 2 : Option 2 has extensive parking, an amphitheatre, various recreational activities including, but not limited to a zip line, paintball, bike tracks, hiking and running routes as well as several residential units, restaurants, club house,

function venue, management offices, food trucks, farmers markets and alternative vehicular access and exit. The facilities are almost identical to option 1 with an alternative layout and additional parking.

Alternative 3 : Option 3 has eliminated the residential units but maintained the remainder of the recreational activities

Alternative 4 : Option 4 includes no recreational activities but retains residential units.

Bridge location Alternatives

Three bridge locations were assessed as possible access routes to the site with Location 1 being the preferred location.

Location 1

This site is located in the northern portion of the proposed new Liberty Mall Phase 4 project boundaries.

Location 2

This site is located south of location 1 towards the northern portion of the proposed project area.

Location 3

The site is located south of location 1 towards the central portion of the proposed project area.

Specialist Studies

The following specialist studies were conducted for the proposed project and are included within the Appendices of this Draft Basic Assessment Report (DBAR):

- Wetland assessment and rehabilitation plan;
- Aquatic ecological assessment;
- Vegetation assessment;
- Desktop heritage and paleontological assessment;
- Structural Engineering and
- Geotechnical Investigation.

Public Participation Process

Due to COVID-19 Lockdown no pre-application meeting was held with the KZN DEDTEA for the EIA Application or DWS for the Water Use Licence Application process. Meetings will only be conducted should they be deemed necessary by the Departments

The Heritage Impact Assessment Study, Background Information Document (BID) and DBAR will be uploaded into the AMAFA website on the purpose of this application for comment in terms of section 38(8) of the National heritage legislation and NEMA.

A background information document (BID) was sent to the key stakeholders and government departments via email.

A total of ten (10) site notices were erected around the proposed site and Liberty Midlands Mall area which contained details of the proposed project, location and application process. The Environmental Assessment Practitioners details were also displayed. These notices served to inform I&AP's of the project and afforded them the opportunity to comment.

The report has been made available at the following public locations within the study area, which are all readily accessible to I&APs:

- Public Place: Msunduzi Public Library;
- Liberty Midlands Mall Centre Management Offices; and
- Afzelia Environmental Consultants website: www.afzelia.co.za

The Draft Basic Assessment Report is now available for commenting for a period of **30 days** (excluding contractors shut down) from **Friday 11/12/2020 until Wednesday 03/02/2021**. Adverts have been placed in the iLanga and the Witness newspapers.

Environmental Impact Assessment

The Impact Assessment of the project's activities was determined by identifying the environmental aspects and then undertaking an environmental risk assessment to determine the significant environmental impacts. The significant scoring of this environmental impact assessment was focussed only on the construction, operational phase and the decommissioning of the project

The EIA provides a description of the potential impacts as identified by the specialists, EAP and through the PPP as well as the assessment according to the criteria described from the significance ratings of negative and positive results. All potential impacts associated with the proposed development through the construction, operation and decommissioning of the project life-cycle have been considered and assessed including mitigation measures.

Key Concerns

The key biophysical concerns identified for the proposed development, which will require careful management, are:

- Direct impacts to wetlands;
- Direct impacts to aquatic habitat;
- Direct impacts to terrestrial and riparian vegetation;
- Increase storm water flows due to the new hardened surfaces
- Erosion and sedimentation risk including bank instability;
- Water pollution/contamination risk during construction;
- Social impacts as a result of additional activities in the area;
- Visual and aesthetic impacts; and
- Alien plant infestation post-disturbance.

Proposed Monitoring and Auditing

Monitoring and auditing schedules have been proposed in this report for each phase of the development to address how identified impacts and mitigation will be monitored and/or audited by an independent Environmental Control Officer (ECO) with relevant experience and knowledge for vegetation and rehabilitation.

Conclusion

The proposed project will result in short term negative impacts to the stream, wetlands, vegetation, residents and surrounding land owners, however, these negative impacts are only expected during the construction phase and possibly the early stages of rehabilitation. Whilst these impacts can be rated as moderate especially on the ecological, aquatic /riverine areas and social scale they can be reduced to an acceptable level provided that the mitigation measures as proposed in this BAR, specialist reports, and the accompanying EMP are effectively implemented.

The overall significance of positive socioeconomic and environmental impacts is beneficial as it will improve the economic and social aspects in the area. Temporary job opportunities and skills development is expected during the construction phase while permanent employment opportunities are expected during the maintenance, management and operation of the proposed project.

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Appendix B: Site Photographs

Appendix C: Facility illustration(s)

AFZELIA ENVIRONMENTAL CONSULTANT | DRAFT BASIC ASSESSMENT | LIBERTY MIDLANDS PHASE 4 PARK
RUN AND BIKE TRACK

Appendix D: Specialist reports

Appendix D1: Geotechnical Report

Appendix D2: Heritage Impact Assessment

Appendix D3: Palaeontological Impact Assessment

Appendix D4: Ecological Impact Assessment

Appendix D5: Aquatic Impact Assessment Studies

Appendix D6: Wetland Assessment

Appendix D7: Structural report

Appendix E: Public Participation

Appendix E1: I&AP Register

Appendix E2: Attendance Register: Pre-Application Meeting with DEDTEA

Appendix E3: Copy of Zulu and English Adverts and Flyers

Appendix E4: BID Document & Proof of circulation of BID

Appendix E5: Proof of circulation of DBAR

Appendix E6: Copy of Site Notice(Posters) and Pictures

Appendix E7 : Comments received as part of the preliminary consultation

Appendix E8 : Copy of comments and response report.

Appendix F: Draft Environmental Management Programme (EMPr)

Appendix G: Other Information

Appendix G1: Details of EAP and Declaration of Interest

Appendix G2: Specialists Declaration of Interest

SECTION A: THE CORE PROJECT TEAM

1. DETAILS OF THE CORE PROJECT TEAM

1.1 Contact Details of the Proponent / Applicant and Project Manager

Table 1: Contact details of Applicant

Project Manager	Liberty Property Group				
Contact person	Desmond Heunis				
Physical address	50 Sanctuary Road, Pietermaritzburg, 3201				
Email	Desmond.Heunis@excelleratejhi.com	Fax		Tel	083 450 1781

1.2 Name and Contact Details of Environmental Assessment Practitioner (EAP)'s Organisation

Table 2: Contact details of EAP's Organisation

Contact details of the EAP's organisation	
Business Name	Afzelia Environmental Consultants (Pty) Ltd
Physical Address	236 Ninth Avenue Morningside, Durban, 4001
Postal Address	PO Box 37069, Overport, Durban, 4067
Telephone	031 303 2835
Fax	086 692 2547
Email	rivani@afzelia.co.za

1.3 Names and details of expertise of the EAP involved in the preparation of the report

Table 3: Contact details of EAPs and their expertise

Name of the EAP	Education Qualifications	Professional Affiliations	Experience at Environmental Assessments (yrs)
Ms Rivani Maharaj	BA. Environmental Management:	None	7
Mr Andrew Batho	M Soc Sci Geography and Env Management	EAPSA, IAISA	10

Ms Joleen Wilson	Hons. BSc Environmental Management	EAPASA (2020/1067) IAIAsa	5
Mr Jon Marshall			

1.4 Names and details of expertise of each specialist that has contributed to the report

Table 4: Contact details of Specialists and their expertise

Name of Specialist	Educations Qualifications	Field of Expertise	Title of Specialist Report/s as attached in the Appendices
A Pillay		Geotechnical Assessments	Geotechnical Report
Brian Mafela	BSc. (Hons) Forest Resources and Wildlife Management	Soils, Wetlands & Surface Water Assessments	Wetland Delineation and Functional Assessment & Rehabilitation Plan
Andrew Briggs	MSc Conservation Ecology	Aquatic Assessments	Baseline Aquatic Biodiversity and Risk Assessment
Jean Beater	MA Heritage Studies	Heritage Assessments	Desktop Heritage Impact Assessment
Leigh Ann De Wet	MSc Botany	Botanical Assessments	Botanical Assessment
Prof Mariom Bamford	PhD (Wits Univ, 1990); FRSSAf, ASSAf	Palaeontological Assessments	Palaeontological Impact Assessment

SECTION B: ACTIVITY INFORMATION

1. INTRODUCTION

1.1 Activity Background

Afzelia Environmental Consultants (PTY) Ltd has been appointed by Four Winds Project Management (PTY) Ltd on behalf of the Liberty Midlands Mall to undertake an Environmental Impact Assessment (EIA) in the form of a Basic Assessment (BA) process, for the proposed park run and bike track development.

Afzelia Environmental Consultants (PTY) Ltd was also appointed by Four Winds Project Management (PTY) Ltd to undertake a Wetland Habitat Impact Assessment for the proposed Phase 4 development of the Liberty Midlands Mall situated within the city of Pietermaritzburg. Pietermaritzburg is located within the Msunduzi Local Municipality, in the KwaZulu-Natal Province. The proposed development site is located north of the Pietermaritzburg CBD along the National Route 3 (N3) Highway (Figure 1 and 2).

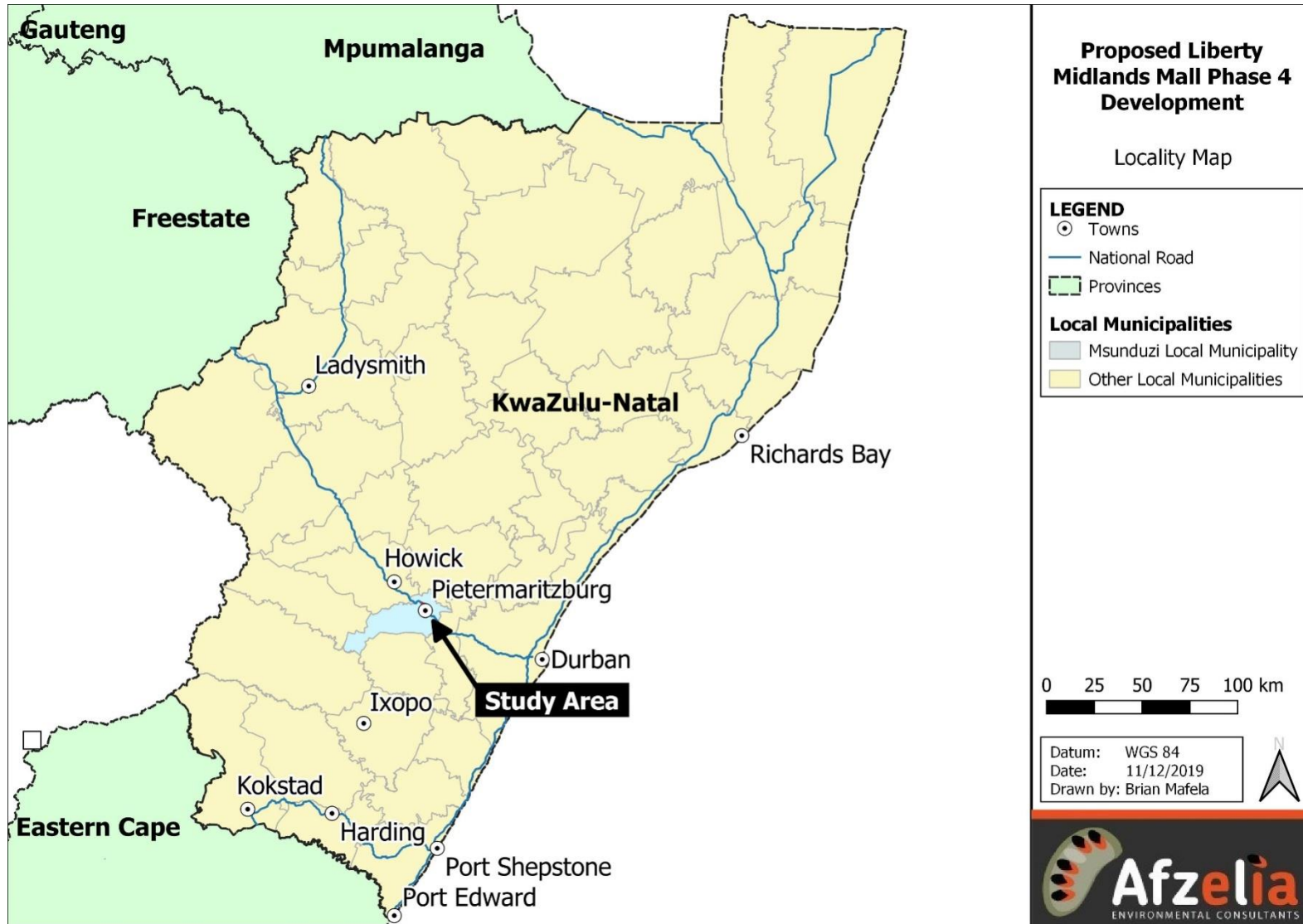


Figure 1: Locality Map

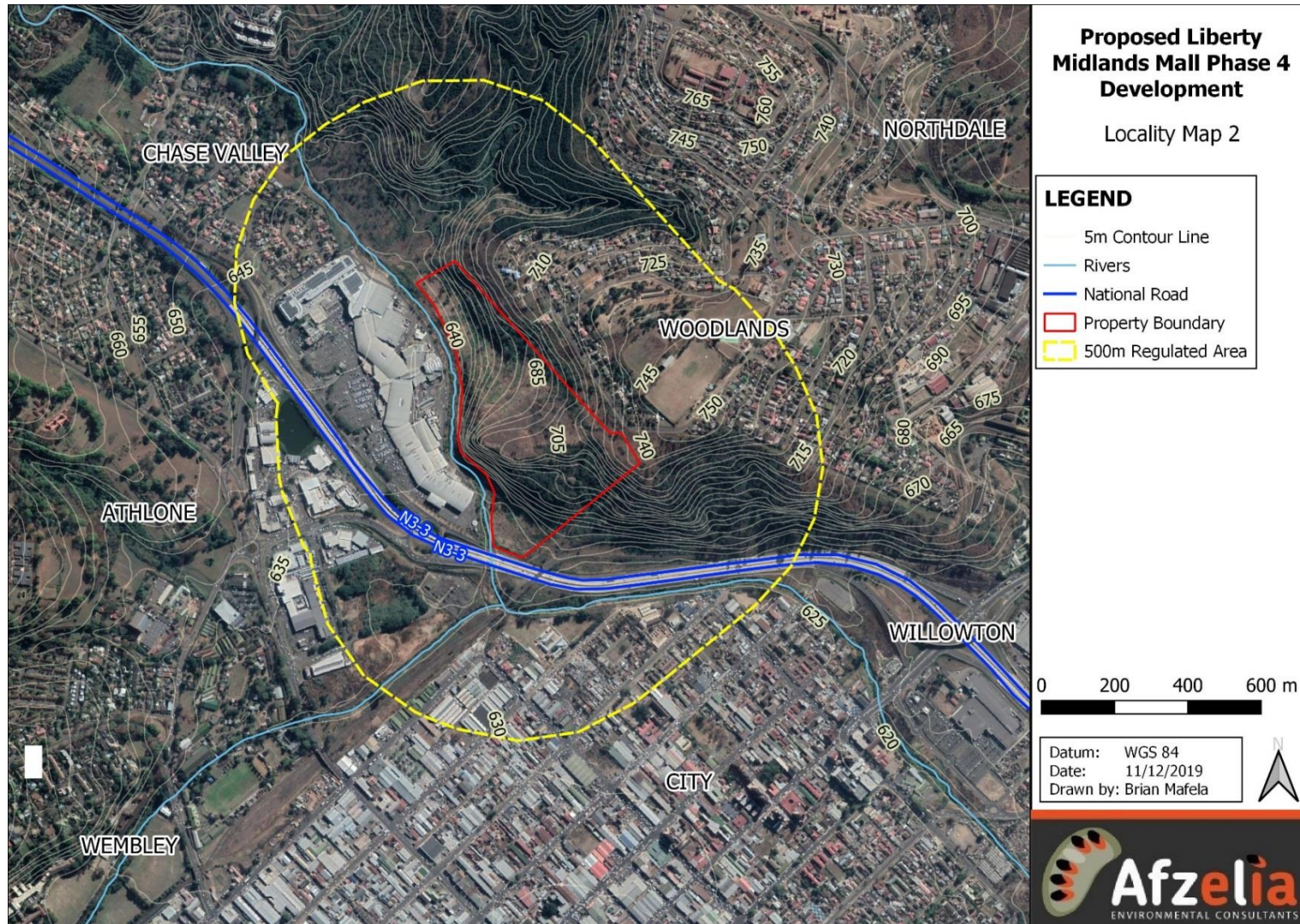


Figure 2: Aerial Map

The proposed development entails construction the following infrastructure:

- i Numerous stand alone residential units;
- ii Ablution facilities and associated sewer infrastructure;
- iii An amphitheatre;
- iv Activities management container offices;
- v Access road and parking area;
- vi Small vehicular bridge over the Town Bush River;
- vii Bike and running Tracks;
- viii Zip line;
- ix Put-put golfing area;
- x Paintball court;
- xi Acrobranching and rock-climbing structures;
- xii Property fence and security cameras;
- xx Restaurant;
- xxi Club House;
- xxii Function Venue;
- xxiii Management offices;
- xxiv Food Trucks;
- xxv Farmers market; and
- xxvi Alternative vehicular access and exit routes.

1.2 Purpose of the BA Report

The main purpose of this report is to:

- Determine the policy and legislative context within which the activity is located and how the activity complies with and responds to said policy and legislative context;

- Identify the alternatives or motivations considered, including the activity, site location, and layout alternatives;
- State the need and desirability of the proposed activity;
- Provide a description of the receiving environment that would be affected by the proposed activity;
- Identify the preferred site through a detailed site selection process, which includes an impact and risk assessment process inclusive of cumulative impacts and a ranking process of the identified preferred alternatives focusing on the geographical, physical, biological, social, economic and cultural aspects of the environment;
- Provide a summary of the specialist studies conducted as part of the BA process;
- Determine the significance, duration and probability of the impacts occurring to inform the technology and micro-siting of the activity on the site;
- Identify the most compatible micro-siting for the activity;
- Identify, assess and rank the significant impacts and risks the activity will impose on the preferred site through the lifetime of the activity;
- Identify suitable measures to avoid, reverse, mitigate or manage identified impacts;
- Identify residual risks that need to be managed and monitored;
- Describe the public participation process that was undertaken; and
- Make recommendations for decision-making.

1.3 Regional Setting and Location of Activity

The proposed site of the Midlands Mall Phase 4 Development is located in Pietermaritzburg, uMgungundlovu District Municipality, KwaZulu-Natal (KZN). The site lies to the east of the Liberty Midlands Mall across the Town Bush River. The site is approximately 1.9km away from the centre of Pietermaritzburg and lies on the western boundary of the Woodlands residential area. The site is approximately 300 meters from the National Highway (N3), however there is no direct access from the property onto the highway.

The geographical co-ordinates of the proposed road upgrade are shown in **table 5** below:

Table 5: Coordinates of the proposed site

Latitude /Longitude	Degrees	Minutes	Seconds
South	29	34	58.61
East	30	22	52.42

1.4 Property Description

The properties affected by the proposed development are reflected in **Table 6** below.

Table 6: Properties associated with the project

Property Name	Owner

ERF 10143 PIETERMARITZBURG	Liberty Group Limited
----------------------------	-----------------------

2. CONCEPTUALISATION OF ACTIVITY

2.1 Project Description

According to the structural report compiled by ETL Consulting attached in **Appendix D6**, The development of the Liberty Park Run and Bike Track proposes to include two residential blocks as well as a bike track, Trail running routes, archery, put-put / golf and paintball activities, function venue, club house, restaurant, food trucks, management offices, vehicular access and exits. Associated infrastructure will include parking, ablutions, seating areas, an amphitheatre, eating areas and open-air events area. The development will include the construction of a vehicular bridge over the Town Bush River.

The proposed full site area is 208 433m² with the developmental area being 36000m². The proposed development is planned for vacant land opposite the existing Liberty Midlands Mall and across the Town Bush River. The site is approximately 1.9km away from the centre of Pietermaritzburg and lies on the western boundary of the Woodlands residential area.

A vehicular bridge catering for pedestrians and cyclists is required over the river. Three options have been identified for the position of the bridge. The proposed bridge is expected to be 11.4m wide over a span ranging between 30m to 45m. It should be noted that upon finalising hydraulic investigations, the span of the bridge may increase.

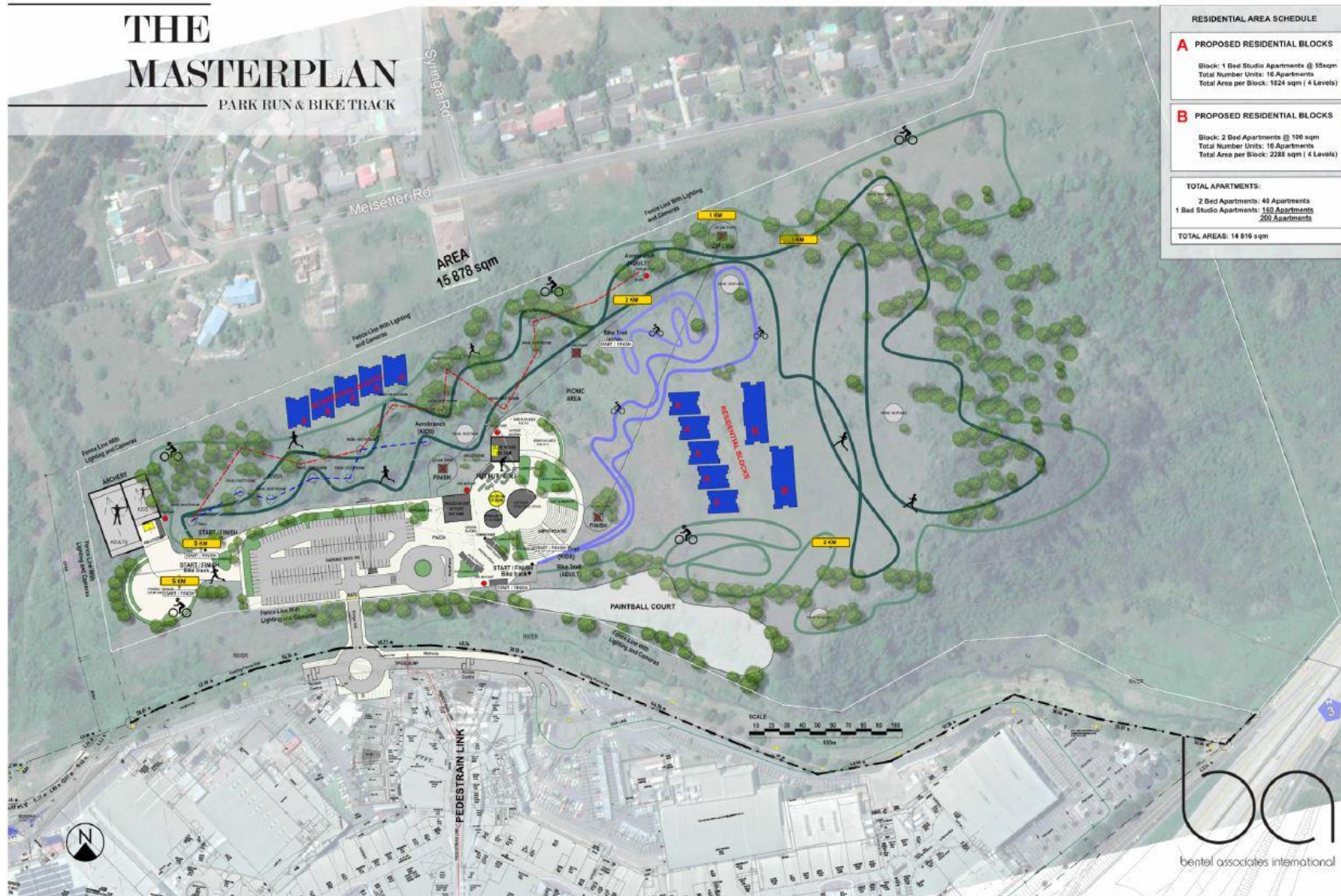


Figure 3: Conceptual Master Layout Plan

2.2 Analysis of Alternatives

Alternatives are defined in the Regulations as “different means of meeting the general purpose and requirements of the activity which may include alternatives to the property on which or location where the activity is proposed to be undertaken, type of activity to be undertaken, design or layout of the activity, technology to be used in the activity; or operational aspects of the activity and includes the option of not implementing the activity” (DEA, 2014). In terms of the NEMA EIA Regulations (2014) alternatives must be assessed and evaluated by the EAP at a scale and level that enables adequate comparison with the proposed development. The EAP must provide opportunities for stakeholder input in terms of the identification and evaluation of alternatives. When considering alternatives, the criterion to be taken into account is “any feasible and reasonable alternatives to the activity and any feasible and reasonable modifications or changes to the activity that may minimise harm to the environment”.

2.3.1 Site Alternative

There are no other site alternatives available for the applicant. The proposed location of the project is adjacent to the Liberty Midlands Mall and is owned by the applicant and therefore is favoured location for the project.

2.3.2 Design or Layout Alternative

Based on the Structural Engineering report compiled by ETL consulting attached as Appendix D7. Three Bridge locations were assessed, location 1 was identified as the most desirable in terms of cost from a Geotechnical perspective.

Three bridge locations were assessed as possible access routes to the site with Location 1 being the preferred location.

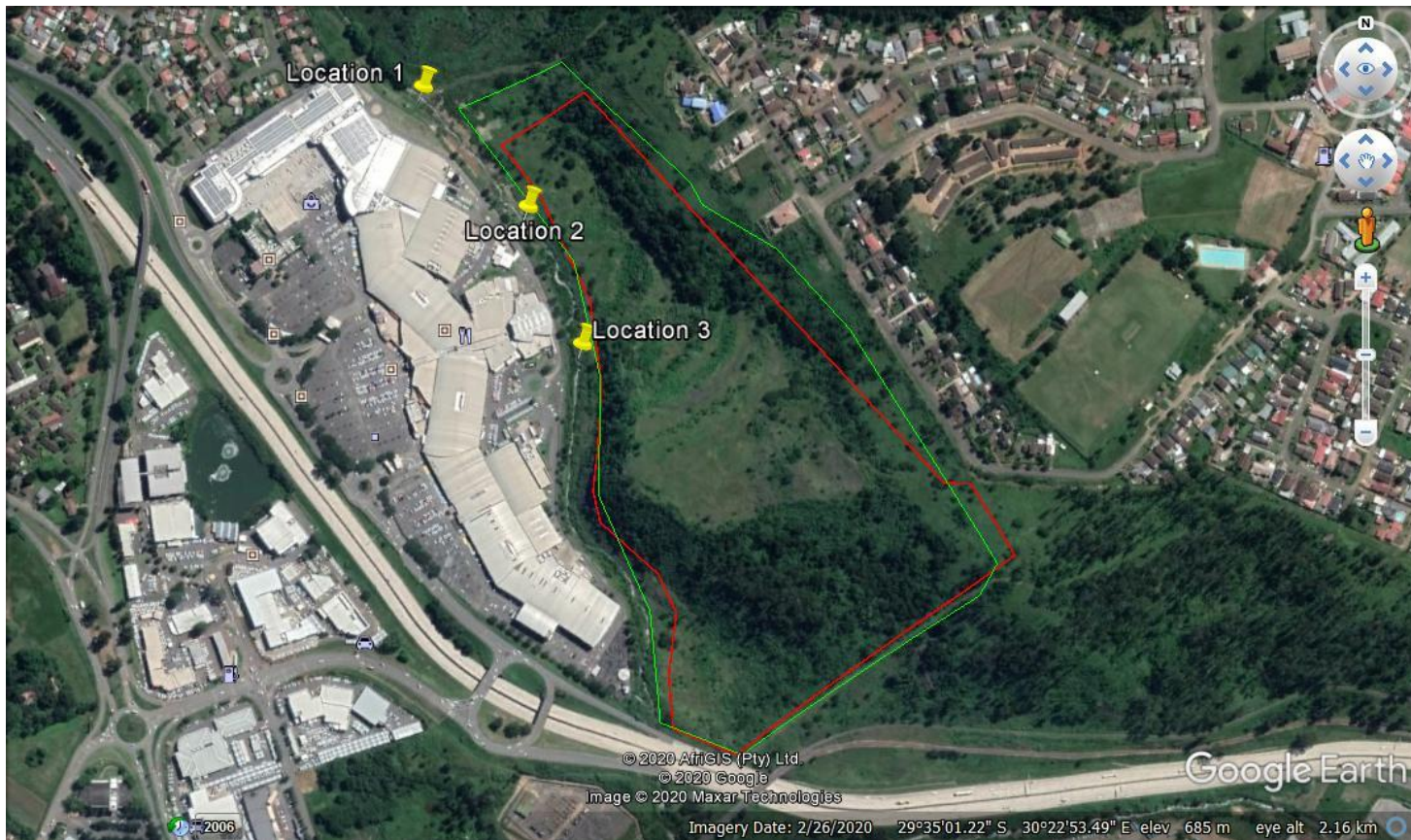


Figure 4: Bridge location alternatives

Location 1

This site is located in the northern portion of the proposed new Liberty Mall Phase 4 project boundaries. The following geotechnical constraints/conditions are anticipated:

- Bridge deck approximately 30m long excluding landing areas on both sides.
- Good access for detailed investigation of subsoil material for assessment of founding conditions.
- River levees are well developed, generally resulting in good founding material i.e. shallow bedrock conditions if erosional conditions are consistent.
- The river trajectory is generally linear, therefore less alluvial river deposition, thus resulting in generally good founding conditions.
- Good founding conditions will result in inexpensive founding remediation required.

Location 2

This site is located south of location 1 towards the northern portion of the proposed project area. The following geotechnical constraints/conditions are anticipated:

- Bridge deck approximately 55m long excluding landing areas on both sides.
- Moderately good access for detailed investigation, may require costs associated with access on the western side of the river.
- River levees are relatively horizontal which may indicate the presence of deeply weathered residual and alluvial sediment resulting in costly founding remediation.
- The river seems to meander near to the selected location which may result in the need for wider column arrangements resulting in higher costs for construction purposes.
- Good founding conditions may only be encountered outside of the defined watercourse.

Location 3

The site is located south of location 1 towards the central portion of the proposed project area. The following geotechnical constraints/conditions are anticipated:

- Bridge deck approximately 30m long excluding landing areas on both sides.
- Poor access for detailed investigations. May result in access costs both for investigation and construction phases.
- The river is undergoing a large sweeping meander around this location which may result in the deposition of deep alluvial sediments resulting in costly founding remediation.
- Steep valley sides may pose some relief for founding conditions as bedrock may be present at a relatively shallow depth dependent on erosional conditions.

- Moderately good, but potentially costly founding conditions dependent on the trajectory/dip of underlying bedrock conditions.

Four alternatives have been proposed for the proposed Liberty Midlands Park Run and Bike Park, within Alternative 1 being the applicants preferred alternative. The differences between each alternative are listed below :

Alternative 1 : Option 1 has extensive parking, an amphitheatre, various recreational activities including, but not limited to a zip line, paintball, bike tracks, hiking and running routes as well as several residential units. The area for each proposed sizes is listed in the table below.

Table 7: Structure details of Alternative 1

Type of structure	Area	Parking bays
Function Venue	242m ²	24
Admin and Ablution	202m ²	8
Clubhouse	360m ²	35
Ablutions	116m ²	
Office containers	32m ²	1
Amphitheatre	1000m ²	200
Residential Component	1532m ²	77
Bridge Geometry	2 * 3.7m	
Sidewalks for bridge	2 * 2.0m	
Access Road	2 * 3.7m	
Sidewalks for access road	2 * 2.0m	
Cycle lane	1 * 2m	

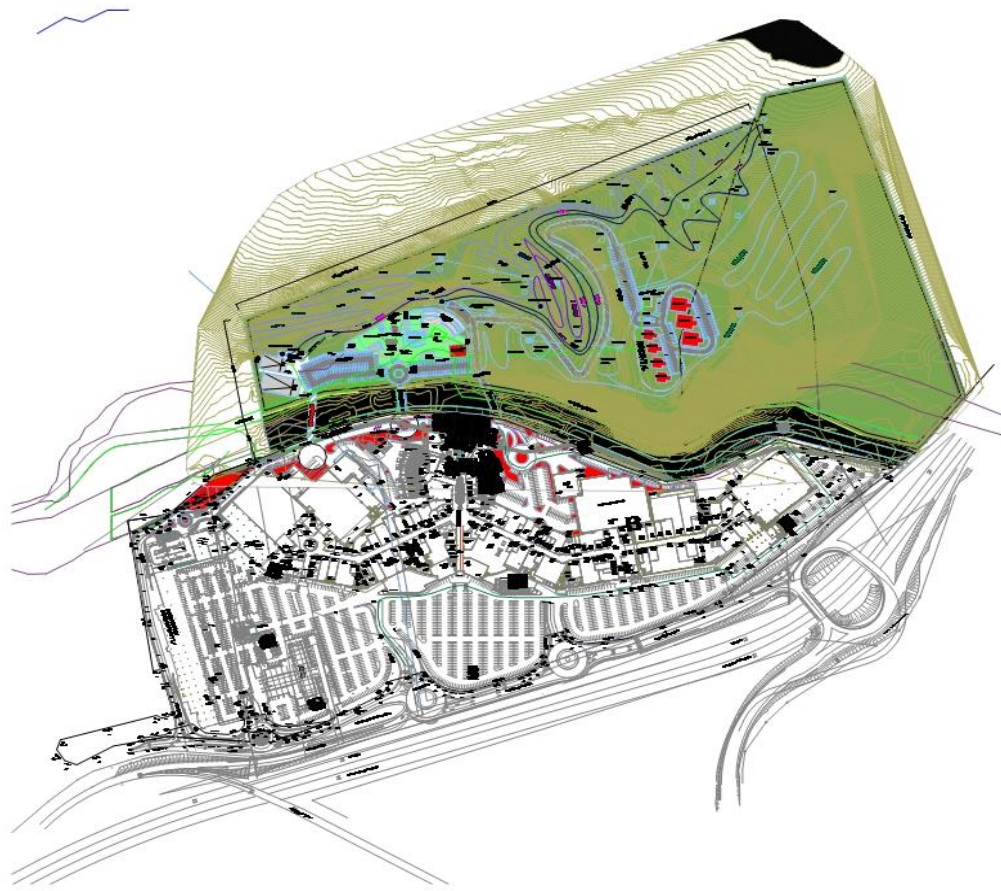


Figure 5: Proposed Alternative 1 (Preferred)

Alternative 2 : Option 2 has extensive parking, an amphitheatre, various recreational activities including, but not limited to a zip line, paintball, bike tracks, hiking and running routes as well as several residential units. The facilities are almost identical to option 1 with an alternative layout and additional parking.

Table 8: Structure details of alternative 2

Type of structure	Area	Parking bays
Function Venue	242m ²	24
Admin and Ablution	202m ²	8
Clubhouse	360m ²	35
Ablutions	116m ²	
Office containers	32m ²	1
Amphitheater	1000m ²	200
Residential Component	1532m ²	77
Bridge Geometry	2 * 3.7m	
Sidewalks for bridge	2 * 2.0m	
Access Road	2 * 3.7m	
Sidewalks for access road	2 * 2.0m	
Cycle lane	1 * 2m	

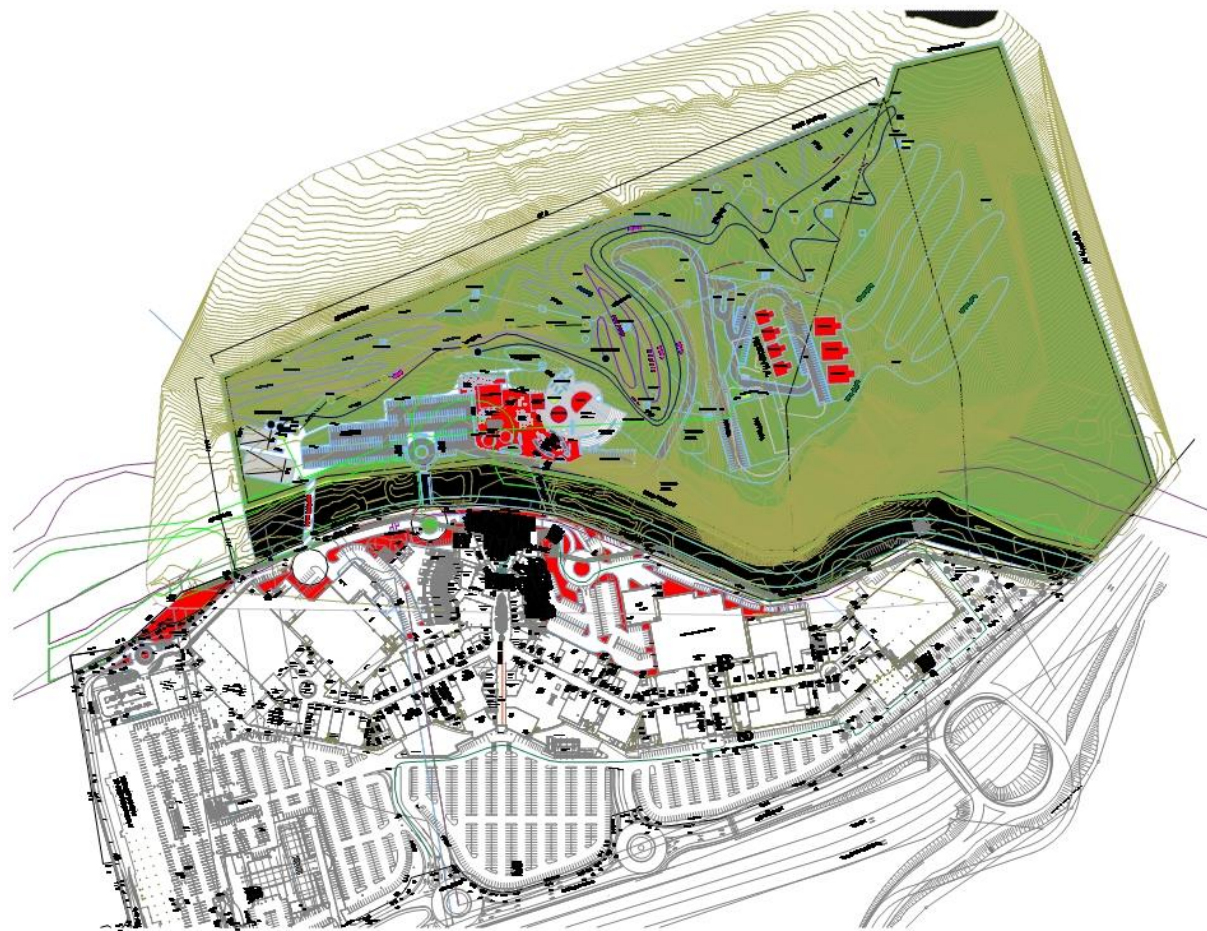


Figure 6: Proposed Alternative 2

Alternative 3 : Option 3 has eliminated the residential units but maintained the remainder of the recreational activities

Table 9: Structure details of alternative 3

Type of structure	Area	Parking bays
Function Venue	242m ²	24
Admin and Ablution	202m ²	8
Clubhouse	360m ²	35
Ablutions	116m ²	
Office containers	32m ²	1
Amphitheater	1000m ²	200
Bridge Geometry	2 * 3.7m	
Sidewalks for bridge	2 * 2.0m	
Access Road	2 * 3.7m	
Sidewalks for access road	2 * 2.0m	
Cycle lane	1 * 2m	

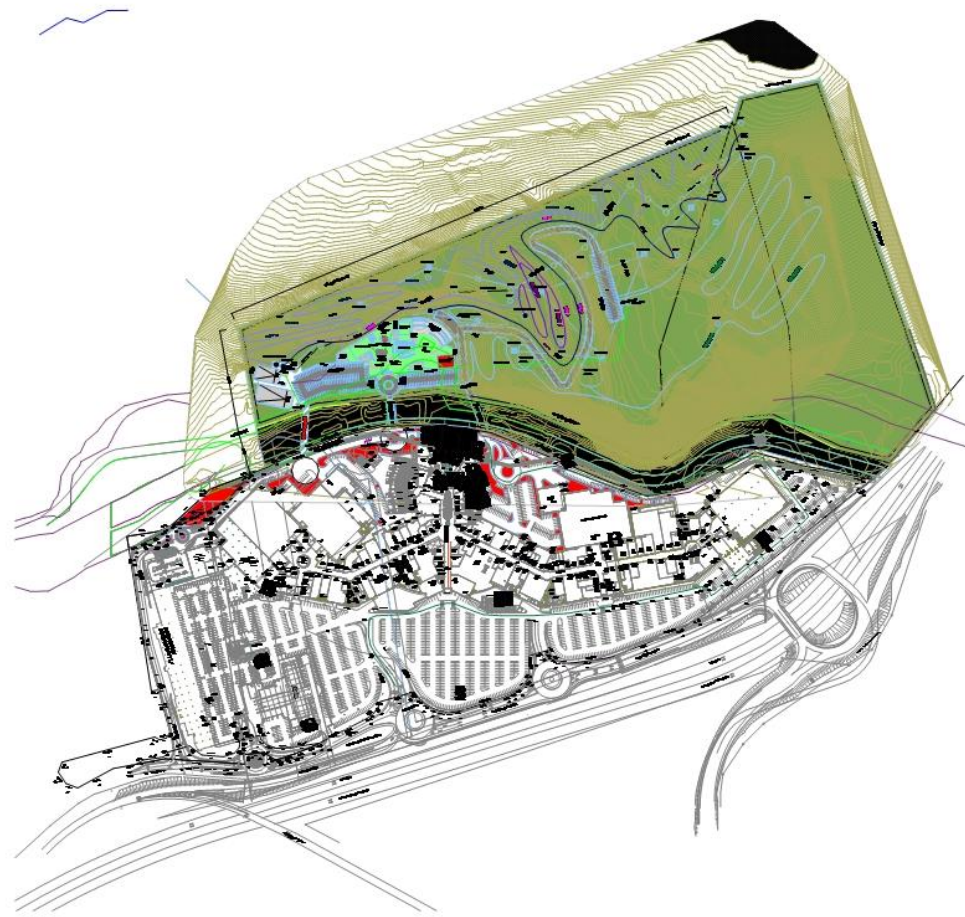


Figure 7: Proposed Alternative 3

Alternative 4 : Option 4 includes no recreational activities but retains residential units.

Table 10: Structure details of alternative 4

Type of structure	Area	Parking bays
Residential Component	1532m ²	77
Bridge Geometry	2 * 3.7m	
Sidewalks for bridge	2 * 2.0m	
Access Road	2 * 3.7m	
Sidewalks for access road	2 * 2.0m	

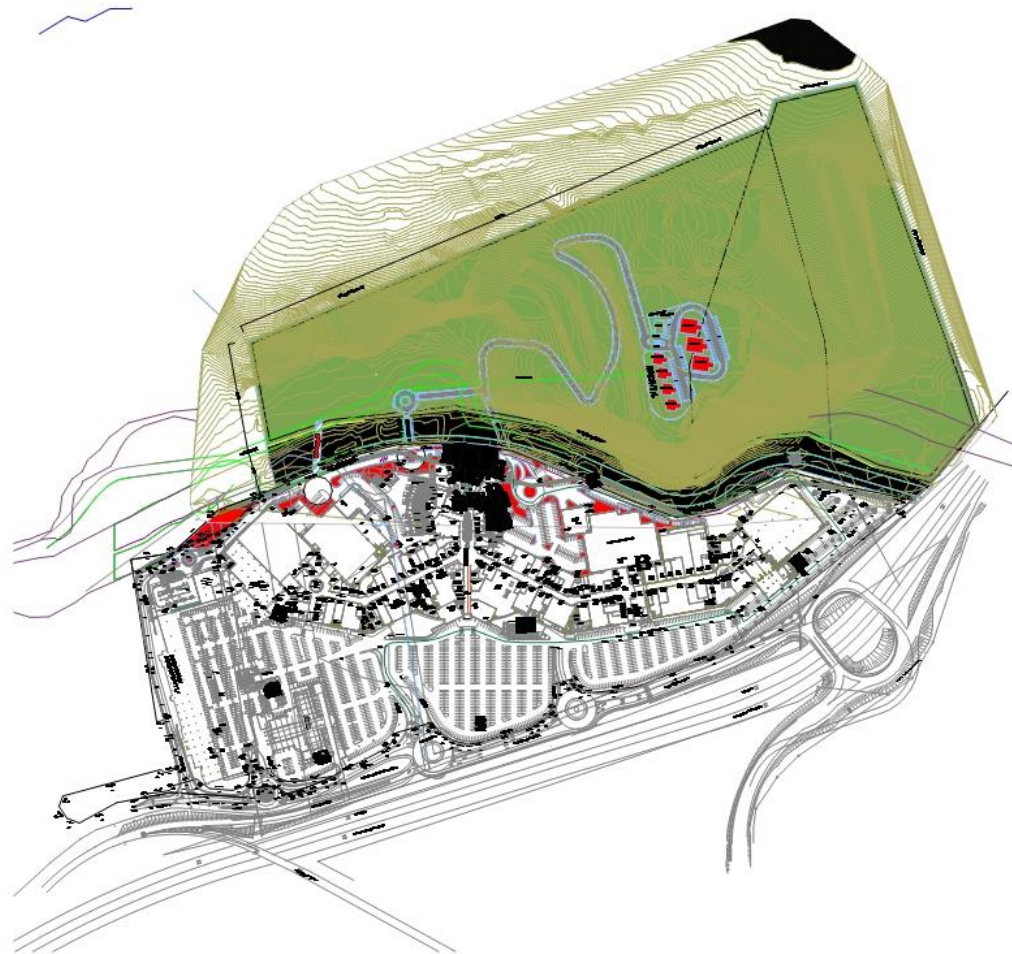


Figure 8: Proposed Alternative 4

Each alternative has been assessed in detail in each specialist study attached under Appendix D of this report. Due to alternate 4 consisting of the least area to be used for development and therefore the least environmental disturbances this was identified as the preferred alternative by all the specialist. The infrastructure required will be the same for all alternatives. No fatal flaws were identified by any specialist for any of the alternatives. Specialist identified mitigation measures that should be implemented to ensure that impacts are reduced if Alternative 1 is approved.

2.3.3 No-Go Alternative

The no-go alternative would leave the existing site in its current state. The no-go alternative will not require any construction works nor create negative impacts on the existing environment (stream, wetlands, vegetation, surrounding land owners and residents) as a result of construction. However, based on the current state of the site the threat to biodiversity and water resources as a result of soil erosion, sedimentation and encroachment of alien invasive species will remain if the development does not proceed.

No temporary job opportunities or skill development will occur for the local communities during the construction phase. If no construction occurs the site will remain in its current state with no rehabilitation and monitoring

2.3 The Need and Desirability for the Proposed Activity

The Guideline on Need and Desirability in terms of the Environmental Impact Assessment (EIA) Regulations, 2014 – GN 891 issued in April 2017 has been used to inform and provide structure for this Need and Desirability section (DEA, 2017).

The concept of “need and desirability” relates to, amongst others, the nature, scale and location of the development being proposed, as well as the wise use of land. Need and desirability are inter-related and the two have been considered in an integrated and holistic manner.

The following policies, statues and documents were interrogated:

1. National Spatial Development Perspective (NSDP) (2003 and updated in 2006);
2. The New Growth Path (2010);
3. The National Development Plan 2030;
4. The Integrated Development Plans (IDP) for the Msunduzi Municipality; and
5. The NEMA Principals; and

The environmental ‘thinking’ and ‘implementation’ of the mitigation measures set out in this document will assist with ensuring that one of the six key drivers of the growth and development strategy is met. This driver is Environmental Sustainability and is explained as a commitment to reversing the environmental degradation that has taken place within the District. Implementation of the mitigation measures presented in the Impact Assessment section of this report focuses on addressing environmental impacts and degradation which could occur as a result of the project.

The element of temporary employment during the construction phase will assist in contributing to the growth and development of the Municipality and at a broader scale the Umgungundlovu District Municipality. Permanent jobs will be created in a form of management, maintenance and operation of the different aspects of the development. The recreational component of the development will assist in increasing the local tourism opportunities of the area.

Through the interrogation of the Msunduzi Municipality's IDP and EMF it can be said that the proposed development supports the views and plans of the Msunduzi Municipality.

2.4 Assumptions and Limitations

Assumptions and limitations as addressed in this Draft Basic Assessment Report (FBAR) for the proposed Midlands Park Run and Bike Track are:

- All information provided by the Proponent, and Project Manager, to the EAP was taken to be correct and valid at the time it was provided;
- The EAP does not accept any responsibility in the event that additional information comes to light at a later stage of the process from the Project Manager or Proponent;
- The scope of work is limited to assessing the potential environmental impacts associated with the proposed development, as indicated in the engineering report and shown on diagrams submitted by Four Winds Project Management
- Due to the COVID19 pandemic and national lockdown in South Africa since March 2020, public and departmental consultation has been limited; and
- The location of the construction camp site is unknown at this stage. The generic associated impacts relating to the location of a contractor's camp site have been addressed through suitable mitigation measures in the EMPr as well as in this report. The EMPr is attached in **Appendix F**. Of primary importance is that this location must be approved by the Engineer under advisement by the ECO prior to its establishment. The contractor's camp site area must be located outside the 1:100 year flood line or riparian habitat of a river, spring, lake, dam, wetland or outside any drainage feeding any wetland or pan and at least 50m away from any watercourse in a disturbed area.

In addition to the above, assumptions and limitations were noted by the specialist team, who have clearly stated their own concerns which are considered as assumptions and limitations, namely:

The wetland specialist (Afzelia Environmental Consultants):

- At the time of assessment, the alignment of the sewer pipeline route had not been finalised and therefore not available for detailed assessment. Therefore, the specialist relied on conceptual options provided by the project manager (Four Winds Project Management).

The aquatic specialist (Afzelia Environmental Consultants):

- Information pertaining to the precise location of sewerage and stormwater infrastructure was not provided by the client although broad level conceptual options regarding the location of sewerage infrastructure was provided by the project manager. In this regard, only low-resolution inferences could be made about the potential location of pipes or outlets within watercourses.
- No sewage treatment and discharge will take place on site. It is the understanding of the specialist that the client intends to connect to existing municipal reticulation at the proposed construction site.

The Ecological specialist (Afzelia Environmental Consultants):

- The site was covered as far as possible, however, the site is steep with large areas of impenetrable thorny alien vegetation which prevented access to many areas.

- Photographs of species not yet identified have been posted to various social media sites for plant identification and some species may be added to the list depending on the outcome of these identifications.
- The location of the site and timing of the site visit did not allow for the trapping (camera and traps) of animals, and though there are likely several species of animal on site, only tracks and signs have been used to identify these.

3. ENVIRONMENTAL LEGAL REQUIREMENTS FOR THE PROPOSED PROJECT

3.1 National Environmental Management Act (NEMA) (Act No. 107 of 1998) as amended

The proposed project triggers Listed Activities as stipulated in the EIA Regulations (2014) promulgated in terms of the NEMA, 1998 (Act 107 of 1998) as amended under Government Notice No. 982, 983 and 985 of 04 December 2014 (DEA, 2014).

The following table provides a summary of the Listed Activities in terms of the EIA Regulations 2014 that are triggered by the proposed project:

Table 11: Summary of the Listed Activities

Government Notice Number	Activity number	Description of each listed activity	Component of project
324	9	The development and related operation of zipline or foefie slides exceeding 100m in length (d)KwaZulu-Natal (gg) Areas on the watercourse side of the development setback line or within 100m from the edge of the watercourse where no such setback line has been determined. (hh) areas within a watercourse of wetland	A zip line recreational activity is proposed across the site. The site falls within the regulated buffer area of a wetland and a watercourse.
327	9	a)The development of infrastructure exceeding 1000 metres in length for the bulk transportation of water or storm water- (i) with an internal diameter of 0.36 metres or more; or (ii) with a peak throughput of 120 litres per second or more; Excluding where – a) Such infrastructure is for bulk transportation of water or storm water or storm water	The activity will include associated infrastructure such as sewer, and storm water.

		<p>drainage inside a road reserve or railway line reserve; or</p> <p>Where such development will occur within an urban area.</p>	
327	10	<p>(a) The development and related operation of infrastructure exceeding 1 000 metres in length for the bulk transportation of sewage, effluent, process water, wastewater, return water, industrial discharge or slimes –</p> <p>(i) With an internal diameter of 0.36 metres or more;</p> <p>(ii) With a peak throughput of 120 litres per second or more;</p> <p>Excluding where –</p> <p>(a) Such infrastructure is for the bulk transportation of sewage, effluent, process water, wastewater, return water, industrial discharge or slimes inside a road reserve or railway line reserve; or</p> <p>Where such development will occur within an urban area.</p>	<p>The development will include the construction of a Bridge deck across the Town Bush river exceeding 30m in length</p>
	12	<p>(cc) The development of-</p> <p>ii. Infrastructure or structures with a physical footprint of 100 square meters or more;</p> <p>where such development occurs-</p> <p>d. within a watercourse;</p> <p>e. in front of a development setback; or</p> <p>f. if no development setback exists, within 32 metres of a watercourse, measured from the edge of a watercourse; -</p> <p>excluding-</p> <p>aa) the development of infrastructure or structures within existing ports or harbours that will not increase the development footprint of the port or harbour;</p>	<p>The proposed development falls within 32 metres of a watercourse</p>

		<p>bb) where such development activities are related to the development of a port or harbour, in which case activity 26 in Listing Notice 2 of 2014 applies;</p> <p>dd) activities listed in activity 14 in Listing Notice 2 of 2014 or activity 14 in Listing Notice 3 of 2014, in which case that activity applies;</p> <p>where such development occurs within an urban area;</p> <p>or where such development occurs within existing roads or road reserves.</p>	
327	19	<p>b) The infilling or depositing of any material of more than 10 cubic metres into, or the dredging, excavation, removal or moving of soil, sand, shells, shell grit, pebbles or rock of more than 10 cubic metres from-</p> <p>iv. a watercourse;</p> <p>v. the seashore; or</p> <p>vi. the littoral active zone, an estuary or a distance of 100 metres inland of the high-water mark of the sea or an estuary, whichever distance is the greater</p> <p>but excluding where such infilling, depositing, dredging, excavation, removal or moving-</p> <p>c. will occur behind a development setback;</p> <p>d. is for maintenance purposes undertaken in accordance with a maintenance management plan; or;</p> <p>falls within the ambit of activity 21 in this Notice, in which case that activity applies.</p>	The development will include the construction of a Bridge cross the Town Bush river
327	27	<p>The clearance of an area of 1 hectare or more, but less than 20 hectares of indigenous vegetation, except where such clearance of indigenous vegetation is required for-</p> <p>(i) the undertaking of a linear activity; or</p> <p>(ii) maintenance purposes undertaken in accordance with a maintenance management plan.</p>	The proposed development area to be cleared will be approximately 15 Hectares.

324	9	<p>The development and related operation of zipline or foefie slides exceeding 100m in length</p> <p>(d)KwaZulu-Natal</p> <p>(gg) Areas on the watercourse side of the development setback line or within 100m from the edge of the watercourse where no such setback line has been determined.</p> <p>(hh) areas within a watercourse of wetland</p>	<p>A zipline recreational activity is proposed across the site. The site falls within the regulated buffer area of a wetland and a watercourse.</p>
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The abovementioned activities contained in Listing Notice 1 of the EIA Regulations 2014 (GN R. 983, dated 04 December 2014), promulgated in terms of the National Environmental Management Act, must be subjected to a Basic Assessment.

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

Due to the proposed project occurring within the 1:100 year floodline of a watercourse and within 500m radius of a wetland, a Water Use Licence Application (WULA) must be submitted to the Department of Water and Sanitation (DWS) in terms of Section 21 (c) or (i) in accordance with the National Water Act 1998 (Act No. 36 of 1998) (NWA).

The NWA is a legal framework for the effective and sustainable management of water resources in South Africa.

A Water Use Licence/Authorisation is a legislative process governed by the Department of Water and Sanitation (DWS) for the licence/authorisation of all water uses defined in section 21 of the National Water Act, 1998 (Act No 36 of 1998) (NWA).

The following table provides a summary of water uses that apply to this upgrade:

Table 12: Summary of water uses that require a water use licence

Activity Number	Water Use	Description
Section 21 (c) of NWA of 1998	Impeding or diverting the flow of water in a watercourse	<ul style="list-style-type: none"> • Impeding flow means the temporary or permanent obstruction or hindrance to the flow of water into a watercourse by structures built either fully or partially in or across a watercourse. • Diverting flows means a temporary or permanent structure causing the flow of water to be re-routed in a watercourse for any purpose.
Section (i) of NWA of 1998	Altering the bed and banks of a watercourse or characteristics of a watercourse	<ul style="list-style-type: none"> • Altering the bed and banks means any change affecting the resource quality of the watercourse (the area within the riparian habitat or 1:100 year floodline, whichever is greatest).

3.3 Other Applicable Legislation and Guidelines Considered

Other legislation that has possible bearing on the proposed project is captured in the table below.

Table 13: Legislation related to the Proposed Phase 4 of the Liberty Midlands Mall

Title of legislation, policy or guideline	Administering authority
National Environmental Management Act of 1998 (Act 107 of 1998)as amended	Department of Economic Development, Tourism and Environmental Affairs (DEDTEA) (Provincial and Local Authority)
Environmental Impact Assessment Regulations 2014, published in Regulation Gazette No. 38282 under GNR 982,983,984 and 985 (4 December 2014), as amended	DEDTEA (Provincial and Local Authority)
South Africa's Constitution (Act 108 of 1996), specifically the Bill of Rights (Chapter 2, Section 24)	The State
National Water Act (Act 36 of 1998)	Department of Water and Sanitation (DWS)
Water Service Act of 1997 (Act No. 108 of 1997).	DWS
Hazardous Substances Act of 1973 (Act 15 of 1973)	Department of Health (DoH)
The Occupational Health and Safety Act (Act 85 of 1998)	Department of Labour (DoL)
National Environmental Management: Waste Act (Act 59 of 2008)	National or Provincial Department of Economic Development, Tourism and Environmental Affairs
National Environmental Management: Biodiversity Act, (Act 10 of 2004)	Ezemvelo KwaZulu-Natal Wildlife (EKZNW)
Conservation of Agricultural Resources Act (Act 43 of 1983)	Department of Agriculture, Forestry and Fisheries (DAFF)
National Forests Act of 1998 (Act No. 84 of 1998)	DAFF
National Veld and Forest Fire Act of 1998 (Act No. 101 of 1998).	DAFF
National Environmental Management: Protected Areas Act of 2003 (Act No. 57 of 2003)	EKZNW
Alien and Invasive Species Regulations (2014) in terms of section 97(1) of NEMBA	Department of Environmental Affairs (DEA)& EKZNW
Animals Protection Act of 1962 (Act No. 71 of 1962)	DAFF
Natural Heritage Resources Act of 1999 (Act No. 25 of 1999)	AMAFA aKwaZulu-Natali

Spatial Planning and Land Use Management Act (Act 16 of 2013) (SPLUMA)	National Office of the Department of Rural Development & Land Reform
KwaZulu-Natal Planning and Development Act (Act 6 of 2008)	The Department of Cooperative Governance and Traditional Affairs (COGTA)
Minimum requirements for handling, classification and disposal of hazardous waste, second edition, 1998	(DWS)
Minimum requirements for waste disposal by landfill, 2nd addition, 1998.	DWS
KwaZulu-Natal Provincial Roads Act (Act No. 4 of 2001)	KZN Department of Transport (KZN DOT)
National Road Traffic Act (No. 93 of 1996)	KZN DOT
Road Traffic Act of 1989 (Act No. 29 of 1989)	KZNDOT
Integrated Environmental Management (IEM) Guidelines	DEA (EDTEA)
South African Water Quality Guidelines. Volume 8	DWS

SECTION C: INFORMATION ON ASSESSMENT FACTORS

4.1 Geotechnical Investigation

ETL Consulting (Pty) Ltd (in association with Davies Lynn and Partners (Pty) Ltd) was requested by Afzelia Environmental Consultants to undertake a Preliminary Geotechnical Investigation at the site of the proposed new Liberty Mall Phase 4 Development within the Msunduzi Local Municipality, KwaZuluNatal.

Preliminary geotechnical findings emanating from the desktop study indicate that the site of the Liberty Mall Phase 4 development to have the following geotechnical characteristics:

- The site is anticipated to be underlain by variable subsurface conditions, typically ranging from colluvium overlying shallow bedrock across the upper hillside regions, to deeply incised and infilled alluvial sedimentary deposits within the drainage course of the tributary of Msunduzi River, typically comprising complex interlayered sands, silts and clays. Steep slopes and potentially unstable regions are also likely to be encountered across the hillside regions of the site. Potentially active and moderately to highly compressible residual clayey subsoils are also anticipated across the site.
- The distribution of the proposed new structures across the developmental areas would suggest that each of the proposed new structures will likely be subjected to its own specific subsurface conditions and corresponding geotechnical constraints. Accordingly, it will be difficult to provide a generalised geotechnical founding recommendation for the entire area relevant to every proposed and anticipated new structures.
- More detailed investigations will be required during the Phase 1 and Phase 2 geotechnical investigations as per the requirement of the Generic Specifications GFSH 2.
- Of the three locations identified for the link bridge, Location 1 is the most desirable in terms of the associated cost comparison, from a geotechnical perspective, to the other two proposed locations. It should be noted however that detailed investigations of the abovementioned locations are of utmost importance when determining the founding conditions and overall design of the proposed bridge structure.
- In summary, the proposed Liberty Mall Phase 4 site is conducive to an Urban Housing Project provided more detailed Phase 1 and Phase 2 investigations are undertaken.

The main Geotechnical concerns believed to be of Intermediate to High Risk include the following:

1. Swamps and Marshes likely occurring near the River.
2. Moderate soil heave potential.
3. High Soil Compressibility.
4. Rock or hardpan pedocretes between 10% and 40% total volume.
5. Steep Slopes more than 18 degree.
6. Unstable areas Intermediate risk.
7. Areas subject to flooding.

The full report is attached in **Appendix D1**.

1. DESCRIPTION OF THE RECEIVING ENVIRONMENT

1.1 Climate and Rainfall

The climate in the uMgungundlovu District Municipality consist of maximum temperatures vary between 24-28°C in February and 18-22°C in July whilst minimum temperatures are between 14-18°C in February and 4-8°C in July. Rain falls from early to mid-summer with highly infrequent winter rainfall. (Schulze, 1997; DWAF, 2005b).

1.2 Topography, Geology and Soil

The site of the proposed new development is located across a Hillside type landform which is bounded to the south west by a tributary of the Msunduzi River. Elevation rapidly decreases from approximately 702m MASL in the north eastern portion of the site (near the suburb of Woodlands) to approximately 638m MASL near the tributary of the Msunduzi River in the south west. The site is generally moderate to steeply sloping with near vertical scarp faces exposed across the southern and south eastern portions of the site.

The 1: 250 000 published Geological Maps of Southern Africa indicate that the Liberty Mall Phase 4 development is underlain by sedimentary rocks belonging to the Pietermaritzburg Formation, of the Ecca Group which forms part of the larger Karoo Supergroup.

The Pietermaritzburg Formation typically comprises dark Siltstones and Shales, coarsening upwards with pene-contemporaneously deformed sandy and silty beds. The subordinate shales found in this formation are often horizontally bedded. However, horizons that are steeply inclined are increasingly prone to slope instability. The rocks of the Pietermaritzburg Formation generally weather into clay-rich residual soils of high plasticity that can be prone to heave and swell movements with cyclical changes in insitu moisture contents.

Alluvial Quaternary deposits are anticipated to occur within the drainage course of the Msunduzi River tributary. Alluvial deposits typically consist of complex interlayered sequences comprising sand to gravels with pebbles, cobbles and boulders as well as soft highly compressible silt and clay deposits. (ETL Consulting, Geotechnical Investigation, 2019).

1.3 Vegetation

The proposed site falls within a region that is classified as Dry Coast Hinterland Grassland, Moist Coast Hinterland Grassland and Highveld Alluvial Vegetation.

The descriptions of these vegetation types by Mucina and Rutherford (2006) are as follows:

Dry Coast Hinterland Grassland (Gs19)

This vegetation type occurs on KwaZulu-Natal and Eastern Cape Provinces on undulating plains and hilly areas associated with dry coast hinterland valleys in the rain shadow of the weather systems from the east coast. It comprises a sparse, sour wiry grassland dominated by *Aristida junciformis* and low species diversity overall. In good condition this grassland is dominated by *Themeda triandra* and *Tristachys leucothrix*. Wooded areas can be found in valleys at lower altitudes and on termite mounds and comprise species such as *Vachellia* species, *Cussonia spicata*, *Ehretia rigida*, *Grewia occidentalis* and *Coddia rudis*. Some of this vegetation is statutorily conserved in the Oribi Gorge nature reserve.

Moist Coast Hinterland Grassland (Gs20)

This vegetation type occurs in KwaZulu-Natal and the Eastern Cape just below the Midlands Mistbelt Grassland on rolling and hilly landscapes. It comprises a dense, tall sourveld dominated by *Aristida junciformis* and in good condition by *Themeda triandra* and *Tristachya leucothrix*. Diversity of forbs tends to be higher than in Dry Coast Hinterland Grassland. Some of this vegetation type is conserved in the Vernon Crookes and Entumeni Nature Reserves.

Highveld Alluvial Vegetation (Aza5)

This vegetation type has a broad distribution across the Free State, North-West, Mpumalanga and Gauteng as well as Lesotho and Swaziland. It occurs in Alluvial drainage lines and floodplains along rivers within the grassland biome. It comprises flat topography and supports riparian thickets dominated by *Vachellia karroo* as well as seasonally inundated grasslands and disturbed herblands, often dominated by alien plant species. Important species include *Salix mucronata*, *Ziziphus mucronata*, *Celtis Africana*, *Searsia lancea*, *Gymnosporia buxifolia*, *Ehretia rigida*, *Grewia flava*, and *Panicum maximum*, among others. This vegetation type is considered Least Threatened with a conservation target of 31% and almost 10% statutorily conserved in the Barberspan, Bloemhof and other nature reserves. Over 25% has been transformed for cultivation and dams. These areas are also prone to alien invasion.

1.4 Watercourses and Catchment Characteristics

According to the Aquatic Assessment the proposed development falls within quaternary catchment U20J which forms part of the greater Pongola - Mtamvuna Water Management Area. The proposed development is located within the sub-quaternary reach (SQR) U20J – 04364.SQR. U20J – 04364 comprises a 23.9 km section of the Msunduzi River which terminates at the confluence of the uMsunduzi River and Mpushini River near Ashburton. The Town Bush Stream, which flows immediately adjacent to the proposed site, is a left-hand bank tributary of the Dorpspruit which flows into the uMsunduzi River approximately 3km south of the study site. (Afzelia Environmental Consultant, Aquatic Assessment for the Liberty Midlands Mall Park Run and Bike Track)

The SQR is considered to be in a seriously modified or Class E state, whilst the ecological integrity (EI) and ecological sensitivity (ES) are rated as moderate and very high, respectively (DWS, 2014). Primary impacts to the SQR include the prevalence of rural

settlements within the catchment, a weir without a fish ladder, industry (including oil industry), stormwater run-off, upstream chicken farming, road crossings as well as pollution emanating from the Baynespruit catchment as well as the Darvill Waste Water Treatment Works (WWTW) (DWS, 2014).



Photograph 1: View of Stream identified on site



Photograph 2: View of stream on site



Photograph 3: View of site facing East



Photograph 4: View of site facing West



Photograph 5: View of site facing North



Photograph 6: View of site facing South



Photograph 7: Rear view of the current Liberty Midlands Mall



Photograph 8 : View of structures observed on site.

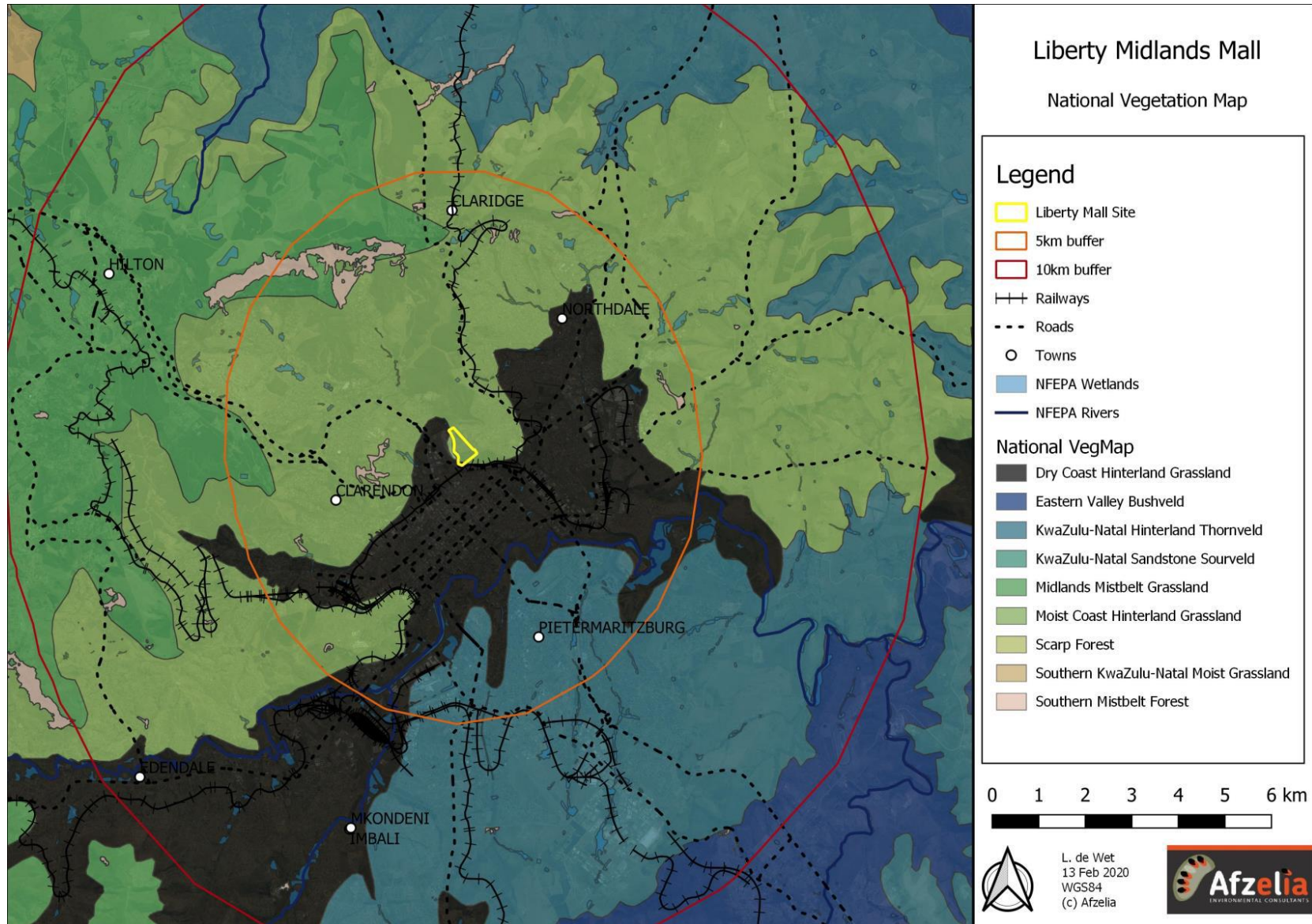


Figure 9: Vegetation map for Liberty Midlands Mall Park Run and Bike Track

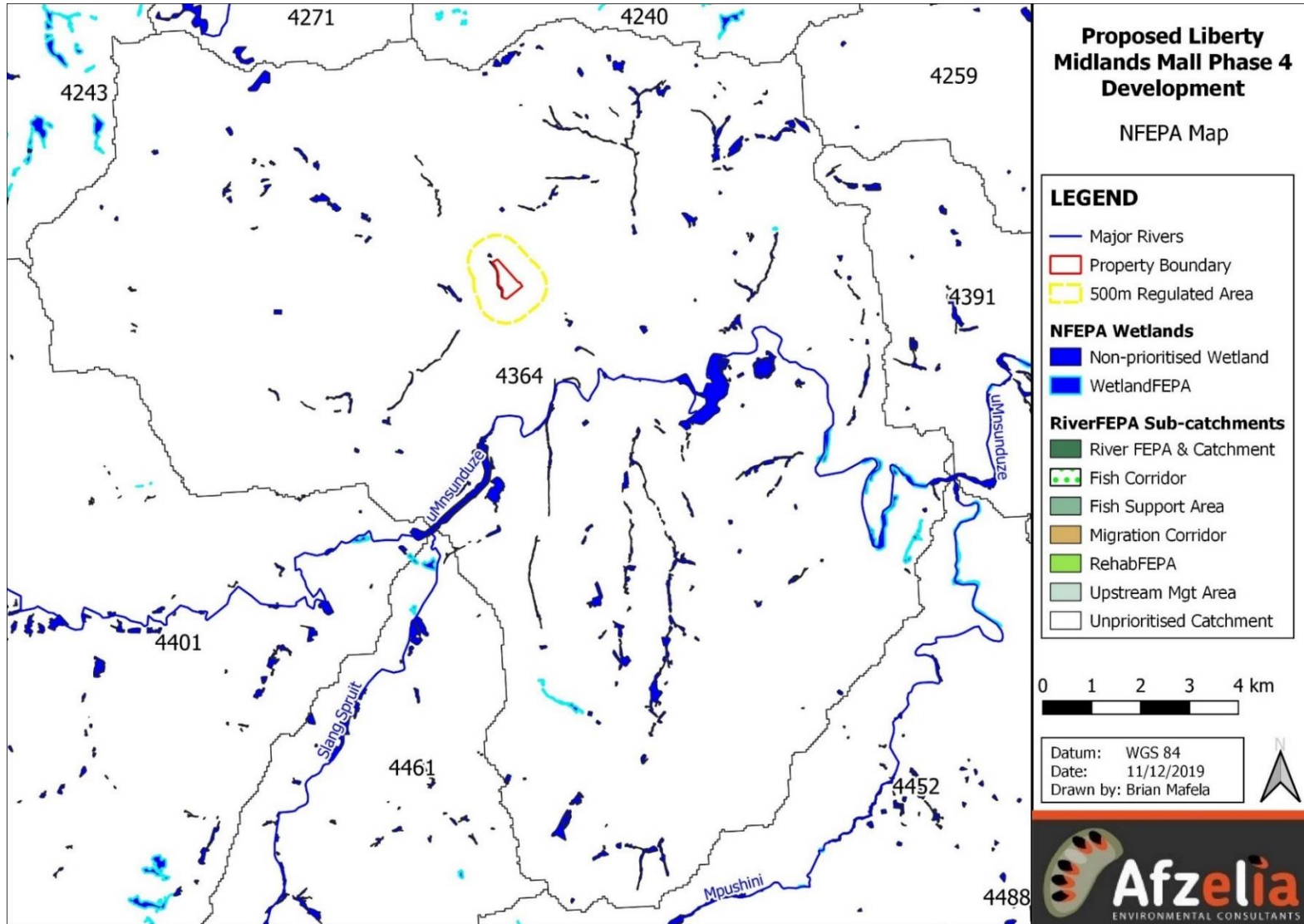


Figure 10: NFEPA wetland within 500m of the proposed development site

2. SOCIO-ECONOMIC ASPECT OF THE RECEIVING ENVIRONMENT

2.1 Current Land Use / Character of Surrounding Area

The proposed development area is 15 878m². The proposed development is planned for the vacant land opposite the existing Liberty Midlands Mall and across the Town Bush River. The site is approximately 1.9km away from the centre of Pietermaritzburg and lies on the western boundary of the Woodlands residential area. The site is approximately 300 meters from the National Highway (N3), however there is no direct access from the property onto the highway

Residents near the proposed site will be affected by the increase in dust and noise levels; visual impacts, and construction related traffic delays during the construction phase. The anticipated positive impacts of the activities during both its construction and operational phase will be employment opportunities and increased recreational activities and eventually improved access and road safety, and reduced dust and erosion risks.

The wetland assessment was conducted by Afzelia Environmental Consultants. The wetland specialist identified a single artificial wetland unit (Unit AW1) located along the northern boundary of the development site and numerous river habitats.

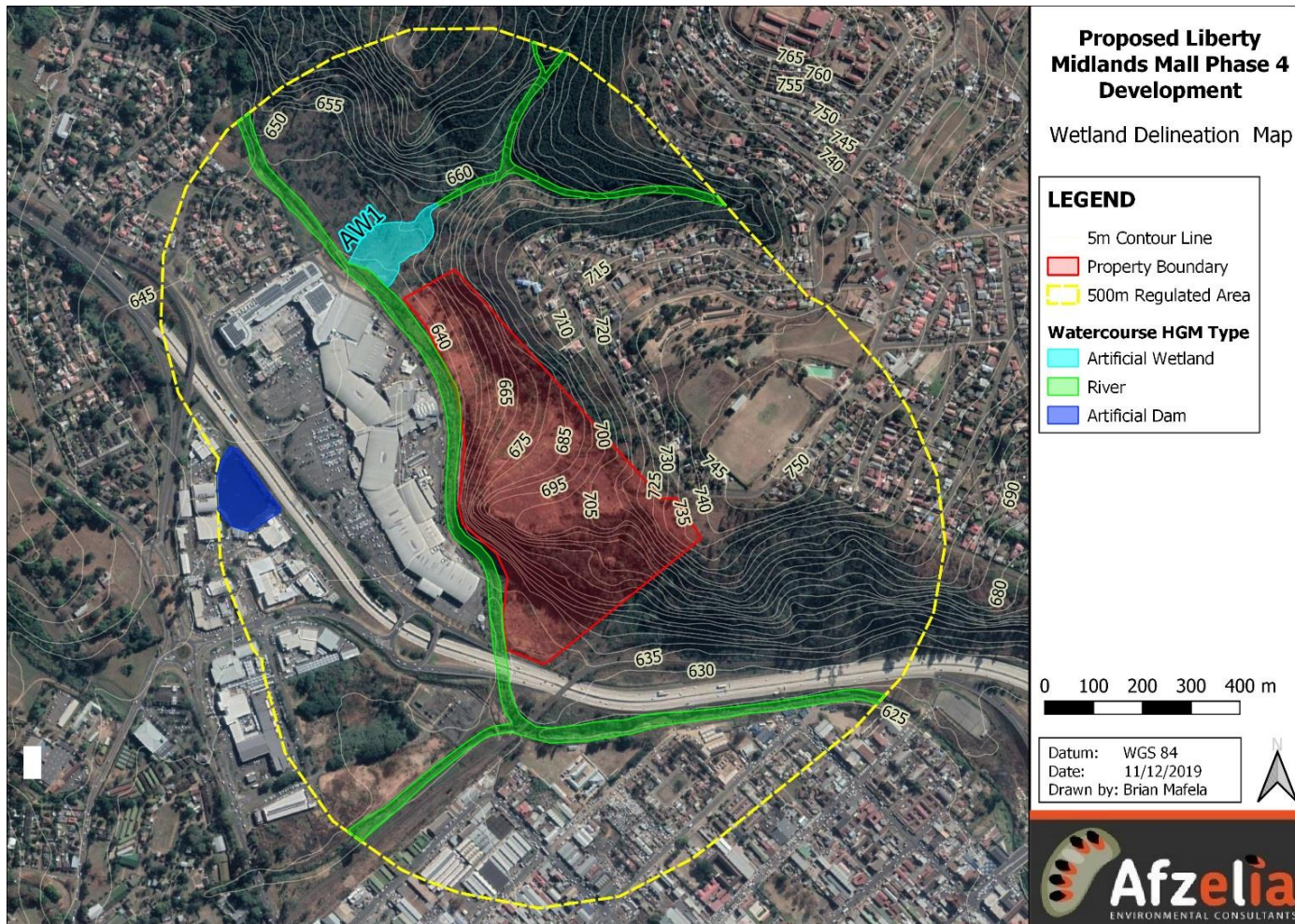


Figure 11: Wetland Delineation Map within 500m buffer

The site comprises disturbed areas with stands of dense vegetation dominated by alien shrub and tree species and areas of indigenous grassland with scattered bushclumps. Disturbed and degraded areas have high numbers of alien invasive plants and large open areas that have been terraced and paved in the past. Some areas of the site accessible to the general public are used as dumping areas. (Afzelia Environmental Consultants, Ecological assessment, 2020)

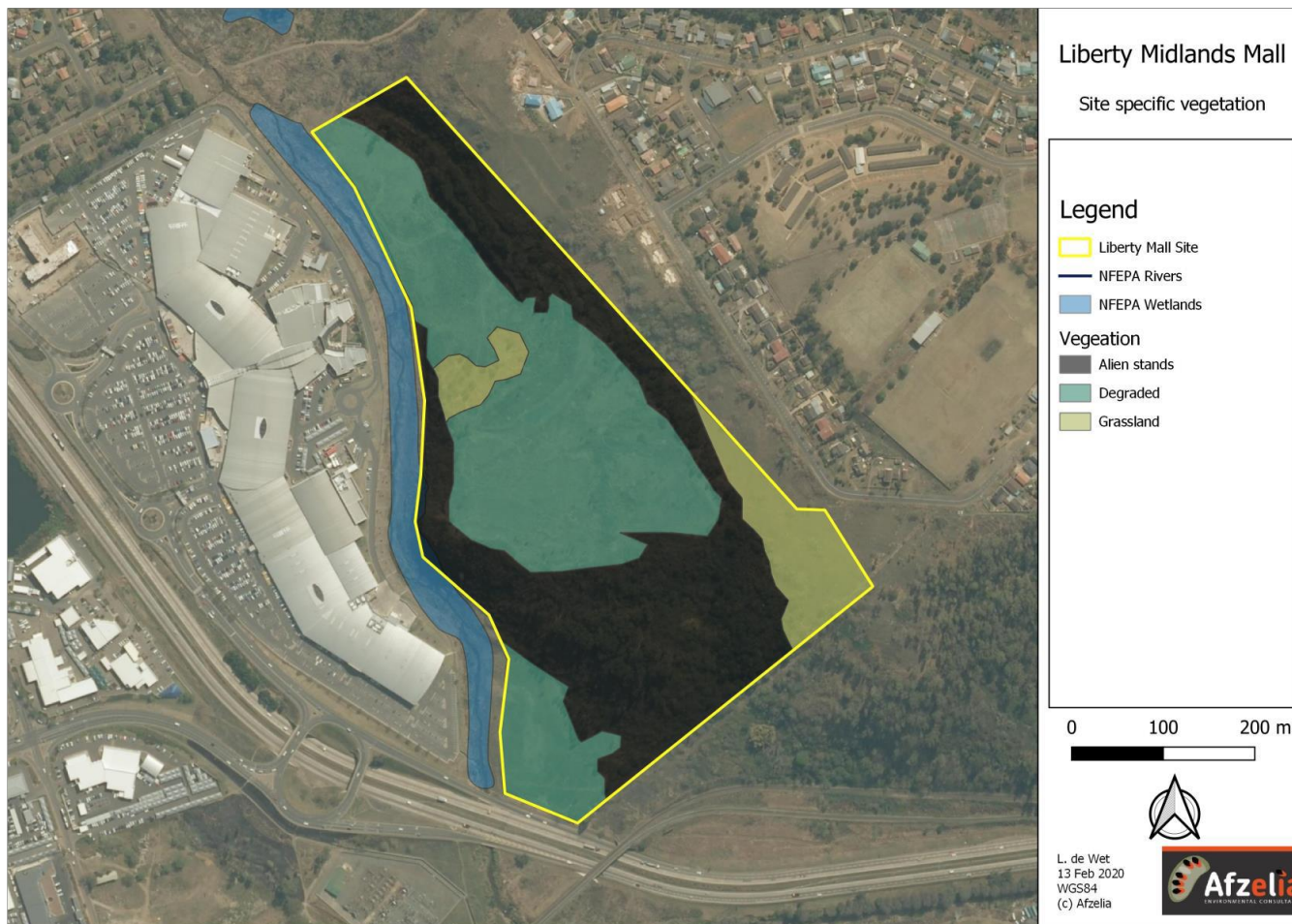


Figure 12: Site Specific Vegetation Map

3. Waste, Effluent, Emission and Noise Management

3.1 Dust Emissions

There will be increased dust levels as a result of construction activities near the Liberty Midlands Mall which will cause nuisance on the surrounding. However, this is expected to be within acceptable limits and measures to reduce dust will be contained in the EMPr attached in **Appendix F** and must be adhered to. Dust suppression must be done, through dampening with water or spraying from a water tanker to control dust created and released into the atmosphere and working environment. Potable or treated water must not be used for dust suppression.

3.2 Noise Consideration

Noise levels in the area will be increased during the construction phase due to the operation of heavy machinery, construction equipment and the movement of large trucks transporting concrete, rock, sand and gravel to the site. However, measures to reduce noise will be contained in the EMPr; attached in **Appendix F** and relevant legislation guideline levels as per SANS 10103 regarding noise levels must be adhered to. Some of the measures to reduce noise include but not limited to :

- Working during normal working hours from Monday to Saturday 07:00 to 17:00. and
- Ensuring construction equipment and machinery are regularly inspected for unusual levels of noise.
-

3.3 Solid Waste Management

The different types of waste which will be generated during the construction activities may include:

- Solid waste – e.g. Plastics, metal, wood, stone, construction rubble, concrete, discarded stormwater pipes and general domestic waste.
- Chemical waste – e.g. Petrochemicals, resins, paints and herbicides
- Sewage and waste water:
 - Chemical toilets have the potential to contaminate the environment if not appropriately managed. Portable chemical toilets must be provided along the working route and within the construction camp site. An independent registered chemical waste company, such as Just loo or SANITECH will be used to service and remove waste from chemical toilets at least weekly on site. Certificates of service must be retained as proof.
 - Wastewater from construction activities may be contaminated and can result in the pollution of the surrounding environment. This would mainly relate to storm water being contained within bunded areas where spillages may have occurred. Contaminated water associated with construction activities must be contained in separate bunded areas and must not be allowed to enter into the natural drainage system.

Facilities for solid waste collection will be provided by the appointed contractor on site. The construction solid waste must be collected in skips placed within the construction camp. Solid waste containers must be made available where and when required along the construction front, and taken to the construction camp at the end of each day. These must be 200litre drums and

clearly identified as the point for waste disposal. These waste receptacles with suitable covers or lid must be provided and conveniently placed to prevent wind-blown rubbish and scavenging by people and animals. All the waste receptacles must be removed from the site for disposal at a commercial facility licensed for this purpose.

Under no circumstances is waste to be buried or burnt.

Solid waste, hazardous waste and wastewater must be disposed of at the nearest licensed and operational municipal landfill site or municipal waste stream collection areas. Any hazardous waste must be separated from the non-hazardous waste before being disposed of. Waybills for all such disposal are to be kept by the Contractor on site for record purpose and review.

The Contractor is to implement a daily litter collection programme. The collected waste is to be disposed of regularly and proportionately to its generation at a site designed for waste disposal. Communication and education material on the waste management system must be part of site induction program and weekly toolbox talks. Solid Waste Management has been addressed adequately in the EMPr attached in **Appendix F**.

PLEASE NOTE: NO SPOIL SITES ARE TO BE USED FOR THE DISPOSAL OF WASTE MATERIAL OR EXCESS MATERIAL GENERATED BY THIS PROJECT

4. FINDINGS OF THE SPECIALIST ASSESSMENTS

Specialists were consulted during the completion of this section. The full reports are attached in **Appendix D**.

4.2 Heritage Impact Assessment

A Phase 1 heritage assessment was compiled by JLB Consulting and the full report attached in **Appendix D2** (JLB Consulting, 2020). The main findings of this report and recommendations have been summarised below:

- Most of the site was inspected on foot shortly after a shower of rain. The area is thickly overgrown and there is steep topography in some places. The remains of a number of quarries or one large quarry are still visible. The area of the Midlands Mall used to be the Coronation / Corobrik brick yard. The area of the quarries/quarry was strewn with both broken and intact clay bricks. It is assumed that the quarries are related to the brick yard and possibly to road construction. No remains of structures were noted during the site inspection apart from several sewage manholes and pipeline markers on the eastern boundary of the site.
- Based on the nature of the project, surface activities may impact upon the fossil heritage if preserved in the development footprint. The geological structures suggest that the rocks are not of the correct environmental setting to contain fossils, except for some invertebrate trace fossils. Furthermore, the rocks are covered with soils and modern vegetation that would not preserve fossils. Since there is an extremely small chance that trace fossils from the Pietermaritzburg Formation may be disturbed when excavations into the underlying rocks commence, a Fossil Chance Find Protocol, provided in the desktop report, must be included in the Environmental Management Programme (EMPr).

- Based on the nature of the project, surface activities may impact upon the fossil heritage if preserved in the development footprint. The geological structures suggest that the rocks are not of the correct environmental setting to contain fossils, except for some invertebrate trace fossils. Furthermore, the rocks are covered with soils and modern vegetation that would not preserve fossils. Since there is an extremely small chance that trace fossils from the Pietermaritzburg Formation may be disturbed when excavations into the underlying rocks commence.
- From a heritage perspective, layout Option 4 is the preferred option as it has the least development footprint hence the risk of the proposed development impacting on heritage resources is lower with Option 4 than with the other three layout options. The second preferred option would be Option 3.
- If the project is authorised, the KwaZulu Natal Amafa and Research Institute requires monitoring of the site by a heritage practitioner during site clearance and initial earth-moving activities to curb the possibility of disturbing, damaging or destroying heritage resources. The heritage specialist must be on site when clearing of vegetation takes place (prior to excavation) to ensure that heritage sites (if any), especially in thickets of dense bush and trees, are not damaged or destroyed. If such sites are found then the heritage specialist will evaluate the find and recommend the way forward.
- The Fossil Chance Find Protocol provided in the desktop palaeontological report must be included in the EMPr and implemented if chance fossil finds are made during excavations for the proposed development.

4.3 Paleontological Impact Assessment

A palaeontological Impact Assessment was requested for the proposed construction of Phase 4 of the Midlands Mall, Pietermaritzburg is attached as **Appendix D3**. To comply with the South African Heritage Resources Agency (SAHRA) in terms of Section 38(8) of the National Heritage Resources Act, 1999 (Act No. 25 of 1999) (NHRA), a desktop Palaeontological Impact Assessment (PIA) was completed for the proposed development. The report was compiled by Prof Marion Bamford. The main findings of this report have been summarised below:

- The proposed site lies entirely on the shales of the deep to shallow marine Pietermaritzburg Formation (Ecca Group, Karoo Supergroup). There are rare occurrences of fragmentary plant fossils in borehole cores, and trace fossils of invertebrates, such as Skolithos in the palaeo-coastal settings. The site lies on soils with dense vegetation. No fossils will be preserved in the soils but there is a very small chance that trace fossils occur in the rocks below and might be disturbed by the excavations for foundations. Therefore, a Fossil Chance Find Protocol should be added to the EMPr. Based on this information, it is recommended that no palaeontological site visit is required unless the responsible person finds fossils once the excavations have commenced.

4.4 Ecological Assessment

Afzelia Environmental Consultants (Pty) Ltd undertook the ecological assessment for this project on the 17 January 2020 and the full report has been included in **Appendix D4** (Afzelia Environmental Consultants, Ecological assessment, 2020).

The main findings of this report have been summarised below:

- In order to correctly classify the site, a desktop assessment was undertaken. Desktop assessments are based on available information for the area, and several databases and datasets were checked.
- The study area was explored on foot within the footprint, with the most sensitive areas walked, and dominant, invasive or SCC species of plants found were identified and recorded
- The vegetation of the study site is comprised of largely transformed or degraded vegetation, with some areas remaining of indigenous grassland. It is located in a Vulnerable ecosystem but does not contain any Critical Biodiversity areas.
- Overall impacts are medium to high, with mitigation measures resulting in the reduction to low in most cases. Of all of the options, option 4 has the least impacts on the terrestrial ecology, with Options 1, 2 and 3 having similar impacts.
- All mitigation measures stated in the ecological report must be included in the Environmental Management Programme and must be implemented fully and effectively during the construction and operations phase to minimise impacts that will be caused by the road and infrastructure upgrade.

4.5 Aquatic Ecological Assessment

Afzelia Environmental Consultants (PTY) Ltd were appointed by Four Winds Project Management (PTY) Ltd to undertake an aquatic ecological baseline assessment of aquatic and riparian habitat that will likely receive impacts from the proposed Liberty Midlands Mall Phase 4 Development located within Pietermaritzburg, Msunduzi Local Municipality, KwaZulu-Natal.

A desktop analysis of the site provided key information on the climate, vegetation, soils and geology within the vicinity of the proposed mixed-use development as well as information on key conservation plans and other spatial data. The main findings of this report are listed below :

- No National Freshwater Ecosystem Priority Area (NFEPA) wetlands, River FEPAs or regional Critical Biodiversity Areas/ Ecological Support Areas (ESAs) were found within the proposed development boundary or associated 500m buffer (Department of Water and Sanitation regulated area for watercourses).
- The results from the DWS risk assessment model indicate that there are moderate 'risks' associated with the construction and operational activities under a best practice mitigation scenario, primarily related to the destruction of riparian and instream habitat for the placement of new bridge and related infrastructure (i.e. abutments and wingwalls). The proposed mixed-use development will therefore require a Water Use License (WUL) as per Section 21 of the National Water Act No. 36 of 1998.
- In support of the above, the General Authorisation does not apply to projects which include the "construction, installation or maintenance of any sewerage pipelines", although, the risk of operational sewerage infrastructure within the development area was rated as "low" in the case of industry best-practice measures being applied when implementing and maintaining the sewerage infrastructure.
- Four development layout alternatives were evaluated, from an aquatic perspective, where it was determined that the differences in impact significance and potential water use licensing processes were largely negligible for each alternative. In the case that best practice mitigation is implemented for the duration of the project and key

recommendations are adhered to, it is the opinion of the aquatic specialist that no fatal flaws are applicable to the preferred layout option of the proposed mixed-use development, in terms of potential impacts to the riverine and aquatic environment.

The full report has been included in **Appendix D5**.

4.6 Wetland Assessment

Afzelia Environmental Consultants were appointed to conduct the Wetland Assessment for the proposed project. The assessment included a Desktop and a ground truthing exercise. This entailed undertaking infield wetland delineation, focusing on soil and vegetation sampling as well as recording of diagnostic topographic features such as breaks in slope, river banks, toe of fill embankments etc. The main findings of the wetland assessment are listed below :

- The wetland specialist identified a single artificial wetland (Unit AW1) located along the northern boundary of the development site and numerous river habitats. The wetland is at least 38m away from the proposed development area.
- Detailed review of the 4 layout alternatives indicated that Alternatives 1, 2 and 3 were likely to have a similar impact on Wetland Unit AW1 which is located at least 38m away from the development site. Layout alternative 4, however, will likely result in a much-reduced impact on Wetland Unit AW1 due to its limited development footprint and being located further away from the wetland. If the construction and operational phases of the development are managed properly, Alternative 4 could have no impact on the wetland habitat.
- This assessment has enabled the identification, delineation and assessment of a single artificial wetland units located at least 38m away from the proposed development area. The wetland was found to be of low EIS and delivered ecosystem services, particularly water quality enhancement benefits, at moderate to high level. Other services were supplied at a very low to low level. Although artificial in nature, the wetland is important in terms of purifying water and should be conserved. Water purification is important in Pietermaritzburg given that most aquatic resources are highly stressed from industrial and sewage waste inputs.
- The impact significance assessment results presented the full report attached as Appendix Dxx.1 indicate that without mitigation, the construction and operational phase will result in no loss of freshwater habitat and a “medium impact significance” on the “degradation of freshwater habitat” and “soil and water pollution.” This is influenced by the wetland being located at least 38m away from the proposed development area. With implementation of effective mitigation measures, the significance of identified construction and operational phase impacts can be reduced to a “negligible” level. A suite of mitigation measures has been proposed for implementation during the planning, construction and operational phase of the development.

SECTION D: PUBLIC PARTICIPATION PROCESS

1. OVERVIEW

It is stated in the Environmental Impact Assessment Regulations (2014) under the National Environmental Management Act, 1998 (Act No. 107 of 1998) as amended; that a public participation process must be conducted as part of the basic assessment process. Public participation is currently being carried out in accordance with Section 24 (J), (O) of the National Environmental Management Act as amended in the EIA regulations, 2014.

The primary objectives of the public participation process are to:

- Inform and notify potentially Interested and Affected Parties (I&APs) of the proposed application (explain steps that were taken to achieve this);
- Initiate or promote meaningful and timeous participation of I&APs by providing proof that notice boards, advertisements and notices notifying potentially interested and affected parties of the proposed application have been displayed, placed or given;
- Maintain a list of all persons, organisation and organs of state that were registered as interested and affected parties in relation to the application;
- Identify issues and concerns of key stakeholders and I&APs with regards to the application for the proposed project;
- Provide a summary of the issues raised by interested and affected parties, the date of receipt of and the response of the EAP to those issues; and
- Provide responses to I&AP queries.

2. AUTHORITY CONSULTATION

The competent authority which is the KZN DEDTEA - Environmental Impact Assessment (Umgungundlovu District) is required to provide an environmental authorisation (either positive or negative) for the project.

No pre-application meeting was undertaken with KZN DEDTEA for the EIA application or with Department of Water and Sanitation for the Water Use Licence Application process due the COVID19 pandemic and National Lockdown.

The Heritage Impact Assessment Study, Background Information Document (BID) and DBAR will be uploaded into the AMAFA website for the purpose of this application for comment in terms of section 38(8) of the National heritage legislation and NEMA.

3. IDENTIFICATION OF INTERESTED AND AFFECTED PARTIES

Afzelia Environmental Consultants (Pty) Ltd has developed an initial I&AP's database comprising of key stakeholders, I&AP's and Organ of States. This database will be maintained and updated throughout duration of the public participation process of the project. **Table 10** below lists all the key stakeholders, I&AP's and Organ of States identified.

Table 14: Key stakeholders identified with respect to the PPP

NAME	ORGANISATION
Mavis Padayachee	KwaZulu Natal Department of Economic Development, Tourism & Environmental Affairs
Kreigan	KwaZulu Natal Department of Economic Development, Tourism & Environmental Affairs
Karen Moodley	Department of Agriculture, Forestry & Fisheries
Bernadet Pawandiwa	AMAFA kwaZulu Natali
Dominic Wieners	Ezemvelo KZN Wildlife
Colleen Moonsamy	Department of Water and Sanitation
Judy Reddy	KZN Department of Transport
Suewellan Ellis	Ingonyama Trust Board
Shannon Farnsworth	Msunduzi Municipality
Michele Nicol	Eskom
Najma Ahmed	Local Ward Councillor

4. PUBLIC NOTICES / SITE NOTICES, ADVERTISEMENTS AND BID

Interested and Affected Parties (I&AP's) were notified of the project through the following ways:

- Fixing a notice board at a place conspicuous to and accessible around the proposed site
- Written notice has been given to I&AP's, property and business owners, persons in control of and occupiers of land adjacent to the proposed site*, municipal councillors, municipality, applicable government departments. This has been done through email and hand delivered notices;
- Placing of an English and isiZulu newspaper advertisements in local newspapers.

The notices put up and information given out include the following information:

- Details of the proposed application / project;
- What procedure is being undertaken, i.e. Basic Assessment and Water Use License;
- The nature and location of the proposed activity;
- Where further information on the application can be obtained; and
- Contact details for the person whom represents the applicant/Proponent.

A background information document (BID) was sent to the key stakeholders via email which are included In **Appendix E4**.

A total of ten (10) site notices were erected along the proposed road route which displayed the details of the proposed project, location and application process. The Environmental Assessment Practitioners details were also displayed. These notices served to inform I&AP's of the project and afforded them the opportunity to comment and are attached in **Appendix E6**.

An advert will be placed in the Ilanga and the Witness.

5. PUBLIC AND AUTHORITY REVIEW OF THE DRAFT BASIC ASSESSMENT REPORT

The draft BAR will be made available for Authority and public review for a total of 30 legislated days from **11 December 2020 to 03 February 2021** and upon request from the EAP. In order to distribute the information regarding the proposed project to the broader public and to ensure that all potential I&AP's were given the opportunity to comment. A commenting period of 30 days were given with regards to the Draft Basic Assessment process and 60 days for the water use license application processes.

The report was made available at the following public locations within the study area, which are all readily accessible to I&APs:

- Msunduzi Municipal Library;
- Liberty Midlands Mall Management Office; and
- Afzelia Environmental Consultants website: www.afzelia.co.za

6. COMMENTS AND RESPONSE REPORT

The purpose of the Comments and Responses Report is to record comments received from Organs of State and Interested and Affected Parties (I&APs) during the initial public participation process undertaken for the proposed project. Numerous comments have been received from the residents of the Chasedene area. These comments have been attached as Appendix E7. A consolidated comments and response report is attached as Appendix E8 which addresses all concerns raised by I&APs.

SECTION E: IMPACT ASSESSMENT AND MITIGATION

1. OVERVIEW

This section focuses on the environmental impacts that could potentially be caused by the proposed Phase 4 of the Liberty Midlands Mall Park Run and Bike Track during the pre-construction, construction, operational and decommissioning phases of the project. Maintenance of infrastructure is addressed as part of the operational phase impact assessment.

The Impact assessment must take account of the interactions between all aspects and associated activities of the project nature, scale and duration of effects on the environment, whether such effects are positive (beneficial) or negative (detrimental).

The Impact Assessment of the project's activities is determined by identifying the environmental aspects and then undertaking an environmental risk assessment to determine the significant environmental impacts. The significant scoring of this environmental impact assessment is focussed only on the construction, operational phase and the decommissioning of existing storm water pipes.

2. IMPACT ASSESSMENT METHODOLOGY USED FOR THE RISK ASSESSMENT

The potential environmental impacts associated with the project have been evaluated according to the description of the scoring process outlined below.

2.1 Calculation and interpretation of the overall significance of impacts and mitigation

The significance score assesses and predicts the significance of environmental impacts through the evaluation of the following factors; probability of the impact; duration of the impact; extent of the impact; and magnitude of the impact. The significance of environmental impacts is then assessed taking into account any proposed mitigations. The significance of the impact “**without mitigation**” is the prime determinant of the nature and degree of mitigation required¹. Each of the below impact factors have been used to assess each potential impact using ranking scales.

Significance Scoring is calculated based on the following formula:

$$\text{Significance Scoring (SS)} = (\text{Magnitude} + \text{Duration} + \text{Scale}) \times \text{Probability}$$

The significance of the impact is calculated according **table 15** below.

Table 15: Significance ratings used for each potential impact

<i>Probability</i>	<i>Duration</i>
1 - very improbable	1 –Immediate (very short term)

¹Impact scores given “with mitigation” are based on the assumption that the mitigation measures recommended in this assessment are implemented correctly and rehabilitation of the site is undertaken. Failure to implement mitigation measures during and after construction will keep the impact at an unacceptably high level.

2 - improbable	2 - Short Term (0-5 years)
3 - probable	3 - Medium Term (5-15 years)
4 - highly probable	4 - Long Term (>15 years) (ceases with operation life)
5 - definite	5 – Permanent/ Unknown
Scale / Extent	Magnitude
1 - limited to the site only (Site)	2 – Minor
2 - limited to the local area (Local)	4 – Low
3 - limited to the region (Regional)	6 – Moderate
4 - National	8 – High
5 - International	10 – Very high / Don't know

The interpretation of the overall significance of impacts is presented in **table 18** and **19** below.

Table 16: Significance rating of negative impact results.

Low significance (<30 significance points)	Low environmental significance	Impacts with real little effect and which should not have an influence on or require modification of the project design.
Medium significance (31-59 significance Points)	Moderate environmental significance	An impact or benefit which is sufficiently important to require management and which could have an influence on the decision unless mitigated.
High significance (>60significance points)	High environmental significance	An impact which could influence the decision about whether or not to proceed with the project regardless of any possible mitigation.

Table 17: Significance rating of positive impact results

Low significance (<30significance points)	Low environmental significance	Impacts with real little positive effect and which should not have an influence on or require modification of the project design.
----------------------------------------------	--------------------------------	-----------------------------------------------------------------------------------------------------------------------------------

Medium significance (31-59 significance Points)	Moderate environmental significance	A positive impact or benefit which is sufficiently important to which could have an influence on the decision taking into consideration set mitigation measures.
High significance (>60significance points)	High environmental significance	A positive impact which could influence the decision in a positive way about whether to proceed with the project regardless taking into consideration set mitigation measures.

2.2 Precautionary Principle

The significance scoring follows the Precautionary Principle. The Precautionary Principle is based on the following statement: *When the information available to an evaluator is uncertain as to whether or not the impact of a proposed development on the environment will be adverse, the evaluator must accept as a matter of precaution, that the impact will be detrimental. It is a test to determine the acceptability of a proposed development. It enables the evaluator to determine whether enough information is available to ensure that a reliable decision can be made.*

In addition, the Proponent is obliged to adhere to the requirements of Section 28 of the NEMA (Duty of Care and Remediation of Environmental Damage) which states that:

Duty of care and remediation of environmental damage: "(1) Every person who causes has caused or may cause significant pollution or degradation of the environment must take reasonable measures to prevent such pollution or degradation from occurring, continuing or recurring, or, in so far as such harm to the environment is authorised by law or cannot be reasonably be avoided or stopped, to minimise and rectify such pollution or degradation of the environment".

For the purpose of this assessment, the impact significance for each identified impact was evaluated according to the following key criteria outlined in the sub-sections below.

3. POTENTIAL IMPACTS AND SIGNIFICANCE AND PROPOSED MITIGATIONS

The following sections will provide a description of the potential impacts as identified by the specialists, EAP and through the PPP as well as the assessment according to the criteria described from **Table 15** to **Table 17** inclusive. All potential impacts associated with the proposed project through the construction, operation and decommissioning of the project life-cycle have been considered and assessed in the following sections including mitigation measures.

3.1 POTENTIAL ENVIRONMENTAL IMPACTS DURING THE CONSTRUCTION PHASE

Soil, Erosion and Sediment Control

Activity

- Stripping of topsoil
- Excavation & Bulk Earthworks
- Site preparation
- Compacting of the gravel layer
- Pavement layers of gravel material
- Culvert foundation

Nature of potential impact

- Physical disturbance of soil.
- Soil loss
- Soil compaction
- Disturbance of surface geology.
- Soil Erosion and sedimentation

Significance rating

Impact	Without mitigation					With mitigation				
	Probability	Duration	Extent	Magnitude	Rating	Probability	Duration	Extent	Magnitude	Rating
Soil and geology	4	2	2	6	40 Medium	3	1	1	4	18 Low

Mitigation Measures –

- In the case that soil is excavated for the sewer pipeline trench, the topsoil and subsoil must be separated. The pipeline should be buried at least 0.5m below the surface, where possible, as an insufficient burial depth may lead to unnecessary erosion.
- Pipelines that will potentially cross the Town Bush Stream must be aligned perpendicularly to the natural flow of the watercourse instead of at an angle. This will reduce the potential for bank erosion within the riparian areas.
- During the replacement of soil within the trenches, replacement of subsoil must precede the topsoil replacement, and all material must be well compacted.
- In the case that soil is excavated for the sewer pipeline trench, the topsoil and subsoil must be separated. The pipeline should be buried at least 0.5m below the surface, where possible, as an insufficient burial depth may lead to unnecessary erosion.
- Pipelines that will potentially cross the Town Bush Stream must be aligned perpendicularly to the natural flow of the watercourse instead of at an angle. This will reduce the potential for bank erosion within the riparian areas.
- Do not allow surface water or storm water to be concentrated, or to flow down cut or fill slopes without erosion protection measures being in place.
- Install sediment barriers across the entire construction right of way at the edge of the riverine areas, where applicable, to prevent excess sediment flow into these areas;
- Any necessary temporary access roads must be aligned along the natural contour of the slopes and sufficient stormwater controls must be in place in order to avoid the road acting as a preferential flow path for water runoff.
- Potential bank erosion within the Town Bush Stream must be monitored at regular intervals during the construction and operational phase in order to assess whether further river bank protection/stabilisation works are required.
- Storm water and any runoff must flow through energy dissipation structures prior to being discharged back into the natural water courses (such as retention ponds or areas with rock riprap / grassed with indigenous vegetation to encourage the trapping of silt and attenuation of flows). Storm water attenuation must take place outside the recommended buffer zones.
- Permeable surfaces should be used, where possible, throughout the mixed-use development in order to assist with rainwater infiltration which will reduce the intensity of and volume of storm water runoff
- Soft or 'green' engineering practices should be employed, where viable, to allow for reduced run-off from the hardened surfaces associated with development. Recommended soft engineering practices include the reshaping and re-vegetation (i.e. landscaping) of disturbed areas as well as the construction of vegetated swales and infiltration trenches as opposed to concrete v-drains.

- In the case that coffer dams are used to temporarily impound flow for construction purposes, these structures should be temporary in nature and removed from the watercourse immediately after the required construction has been completed. The dewatering process from the coffer dams should involve piping the water within the active channel as, or if, required.
- The construction of an artificial channel outside of the active channel for water diversion purposes is not permitted, as this could lead to unnecessary erosion.
- During the operation phase it is recommended that disturbed riparian / in-stream habitats and rehabilitated areas are monitored for potential erosion. This should initially take place immediately after construction, thereafter quarterly for two years and thereafter annually.
- A storm water management plan must be compiled for the proposed mixed-use development which must include site specific mitigation measures in addition to the mitigation presented above.
- Implement effective topsoil management practices (stripping topsoil, stockpiling and reuse during rehabilitation of disturbed areas).
- Topsoil² must be stockpiled separately from subsoil³.
- Strip topsoil from all areas where permanent or temporary structures, or new access tracks and stockpile areas are to be established.
- Make sure that at no time is topsoil mixed with subsoil, spoil, and building rubble.
- Topsoil must be handled twice only – once to strip and stockpile, and secondly to replace, level, shape and scarify/cut.
- Maintain topsoil stockpiles in a weed free condition.
- Avoid handling soils when wet as this may result in the loss of soil structure and lead to compaction.
- subsoil must be removed to a depth instructed by the Engineer and stored separately to the topsoil if not used on rehabilitation of the site. This soil must be replaced in the excavation in the original order that it was found.

Direct Habitat Disturbance

Activity

- Installation of bridge

²Topsoil is defined as the A horizon of the soil profile. Topsoil is the upper layer of soil from which plants obtain their nutrients for growth. It is often darker in colour, due to the organic fraction. Where topsoil is referred to, it is deemed to be both the soil and grass/ground cover fraction. Subsoil is defined as the B horizon of the soil profile.

³Subsoil is the soil horizons between the topsoil (A horizon) and the underlying parent rock. Subsoil often has more clay-like material than topsoil. Subsoil is of less value to plants, in terms of nutrients (food) and oxygen supply, than topsoil. When subsoil is exposed it tends to erode fairly easily.

- Construction of storm-water infrastructure (culverts and storm-water pipes).
- Construction of all proposed features
- Clearance of vegetation.
- Installation of pipes and culvert for stream crossings
- Temporary in-stream diversion

Nature of potential impact

- Disturbance of riparian habitat;
- Disturbance of vegetation and sensitive areas.

Significance rating

Impact	Without mitigation					With mitigation				
	Probability	Duration	Extent	Magnitude	Rating	Probability	Duration	Extent	Magnitude	Rating
Habitat Disturbance impact	5	2	2	6	55 High	3	2	1	4	21 Medium

Mitigation Measures –

- A buffer of at least 15m is recommended from the edge of the delineated river habitat and should be enforced for the duration of the project. The buffer must be clearly demarcated onsite to ensure no unnecessary incursions by vehicles and unnecessary clearing taking place within sensitive areas.
- The extent of infilling and habitat destruction within any in-stream and riparian habitat deemed necessary for the implementation of planned bridge and ancillary infrastructure must be minimised as far as practically possible.
- Vegetation clearing within the delineated watercourse must only take place when construction activity is actually being undertaken in the area. These cleared areas must be rehabilitated as soon as construction in an area is complete or near complete and not left until the end of the project to be rehabilitated (i.e. progressive rehabilitation).
- The use of existing tracks and roads to gain access to the work area must be prioritised as far as practically possible.
- Vehicular digging of the banks of the riverine areas must only be implemented when absolutely necessary.

- There shall be no mining of soil, sand or rock required for construction purposes from the banks of riverine areas. Soil must be brought in, as/if needed, for construction purposes. The rock and soils stockpiles must be located at least 30m away from the riverine units.
- Additional soil stockpiling related mitigation includes the following;
 - The soil stockpiles should be stored at a maximum height of 2m to avoid compaction and loss of micro-organisms.
 - Soil stockpiles should also be kept free of weeds and potential alien plant invasion.
- In the case that the sewer pipelines will cross nearby watercourses, pipe bridges can be utilised to cross the Town Bush Stream as opposed to burying the pipeline beneath the nearby watercourse. This will minimise disturbance to the bed, banks and vegetation associated with the watercourse.
- An Environmental Control Officer (ECO) must be appointed to monitor compliance with mitigation onsite.
- A method statement must be compiled prior to construction activities within the riverine unit where special attention must be given to:
 - The precise methods of excavation and bridge/culvert construction within the riverine/stream units
 - The proposed use and implementation of water diversion measures such as coffer dams
- Proposed rehabilitation and monitoring measures
- A detailed rehabilitation plan must be compiled with focus on the rehabilitation of the watercourse crossings after the construction of the bridges onsite.
- An aquatic biomonitoring survey which includes an assessment of water quality, habitat assessment, SASS v5 and fish must be conducted within one month after the construction of the bridges over the Town Bush Stream to determine the impacts, if any, and implement adaptive management, if required.
- A copy of the Environmental Management Programme (EMPr) should be available at the site camps or offices during the construction phase of the proposed development.

Impact on water resources and soil

Activity

- Construction of surfaced roads.
- Bulk Earthworks to achieve specified levels and construction of buildings.
- Construction of pavement layers.
- Use of heavy machinery .
- Construction of stormwater infrastructure (culverts and stormwater pipes).

Nature of potential impact

- Pollution of sensitive riverine environments.

Significance rating

Impact	Without mitigation					With mitigation				
	Probability	Duration	Extent	Magnitude	Rating	Probability	Duration	Extent	Magnitude	Rating
Pollution of water resources and soil	5	2	2	10	24 Medium	5	2	1	8	8 Low

Mitigation Measures –

- All waste must be disposed of at an appropriate licensed facility and proper management and disposal of construction waste must occur throughout the construction phase.
- All solid waste generated during construction is to be disposed of as per the EMP.
- Waste bins must be provided at the site camp for solid waste purposes. Note that refuse generated by workers and construction related waste should not be mixed.
- No washing of paint brushes, containers, wheelbarrows, spades, picks or any other equipment adjacent to, or within, riparian or in-stream areas is permitted. Washing of implements must take place within a bunded area at least 30m away from the delineated boundary of the riverine unit.
- No disposal of any substance, such as cement, oil or bitumen, within the nearby watercourse is permitted.
- Spillages of fuels, oils and other potentially harmful chemicals must be cleaned up immediately and contaminants properly drained and disposed of using suitable licensed solid/hazardous waste facilities (not to be disposed of within the natural environment). Any contaminated soil must be removed, and the affected area rehabilitated immediately. A spill response plan must be drafted and communicated to all onsite staff in this regard.
- The site camp, fuel depots and equipment lay-down areas are not to be located within delineated riparian or wetland areas. These must be located at least 50m from the edge of the riparian zone on a relatively flat area, if possible. The proposed location of the site camp, fuel depots, equipment lay-down areas must be approved by the Engineer under advisement from the ECO before commencing their use.

- Bunded areas must be created and suitably maintained onsite for storage of all hazardous liquids. All refuelling and storage of harmful chemicals, shall take place within these areas to ensure that no harmful run-off reaches the watercourses. It is also important for heavy machinery operating onsite to be routinely checked for fuel leaks or malfunctions to minimise the risk of a pollutant spill. If such leaks are found the subject plant shall be removed from site immediately.
- Portable toilets must be placed on impervious level surfaces that are bunded to prevent potential leakages. The portable toilets must be located at least 30 m away from the edge of any riparian zone.
- The portable toilets must be serviced weekly by a specialist contractor. The service records should be available for the ECO in this regard.
- Education of workers must be undertaken to employ sound pollution prevention practices. Training programs must be provided and contain information on the handling of hazardous materials, spill prevention and emergency spill response.
- Any abstraction from the riverine units for construction purposes must be approved by the Department of Water and Sanitation (DWS) prior to the commencement of construction.
- During the construction phase aquatic biomonitoring must be undertaken on a quarterly basis, with one assessment post-construction.
- The contractor must utilise industry best-practice measures when implementing and maintaining the sewerage infrastructure onsite.
- An environmental contingency plan is recommended for the proposed development to ensure that potential environmental incidents or emergencies, such as malfunctioning sewerage infrastructure, can be quickly and effectively resolved.

Impact as a result of spread of alien invasive species

Activity

- Newly disturbed areas will be susceptible to colonisation by opportunistic alien plants and weeds.

Nature of potential impact

- Encroachment into riparian and instream sensitive areas.
- Alien species out compete indigenous species.
- Ecological threat to habitat structure.

Significance rating

Impact	Without mitigation					With mitigation				
	Probability	Duration	Extent	Magnitude	Rating	Probability	Duration	Extent	Magnitude	Rating
Encroachment of alien invasive plant	5	2	2	8	36 Medium	5	2	2	6	8 Low

Mitigation Measures –

- An alien invasive management programme must be incorporated into the EMPr for the eradication of potential alien invasive species which may colonise newly disturbed areas as a result of construction activities. Note that rehabilitation of in-stream and riparian activities can only take place once a water use authorisation has been issued which contains specific reference to proposed rehabilitation initiatives.
- Ongoing alien plant control must be undertaken within the development footprint, particularly within the disturbed in-stream / riparian areas and associated buffer. Areas which have been disturbed by construction activities will be quickly colonised by invasive alien species. These species must be removed as they emerge.
- During the operation phase it is recommended that disturbed riparian / in-stream habitats and rehabilitated areas are monitored for potential alien plant colonisation. This should initially take place immediately after construction, thereafter monthly for 12 months, thereafter annually.
- Monitoring must be supervised by a specialist team, preferably from the area, who are well practiced in the domain of alien recruitment monitoring, alien plant removal and general vegetation rehabilitation initiatives.
- Precise alien vegetation removal techniques must be included in the alien invasive management programme. Herbicides should only be utilised for alien plant control if absolutely necessary. The ECO and monitoring team must provide clarity in this regard.

Impact on Freshwater habitat

Activity

- Trenching in close proximity to the wetland during construction of the sewer pipeline.
- Stockpiling raw materials and excavated soil in close proximity to the wetland.
- Failing to rehabilitate disturbed areas appropriately.
- Poor management of storm water generated by the proposed development.

Nature of potential impact

- Increased risk of erosion and sedimentation.
- Alteration of wetland water flow patterns.

Significance rating

Impact	Without mitigation	With mitigation
	Rating	Rating
Impact on Freshwater habitat	24 Medium	8 Low

Mitigation Measures –

- All proposed development activities with the exception of pipeline crossings must be established outside the 1 in 100-year flood line.
- A 1 in 100-year flood line assessment must be commissioned prior to finalisation of the development layout.
- Prior to commencement of construction all watercourses (wetland and river habitats) must be demarcated using wooden pegs and an orange safety net or danger tape.
- The demarcation fence must be signed off by the Environmental Control Officer (ECO).
- The fence must be maintained throughout the construction phase.

Soil and water Pollution*Activity*

- Construction camp site establishment.
- Construction of storm water infrastructure (bridge culvert and storm water pipes).
- Temporary in-stream diversion.
- Asphalt or Seal Surfacing.

- Blinding of the base to the specified thickness using materials complying with specifications and of approved mix design.
- Reinforcement and Formwork.
- Batching and mixing.
- Placing of culverts on top of constructed floor slab.
- Curing and backfilling.
- Finishing off.
- Movement of vehicles and use of construction heavy machinery.

Nature of potential impact

- Alterations of the sediment balance.
- Disturbance to freshwater habitat.
- Disturbance to many aquatic biota or faunal species.
- Inputs of organic and toxic heavy metal contaminants.
- Contamination of soil and surface water resource.
- Increase in turbidity.
- Mismanagement of waste and pollutants like hydrocarbons, construction waste and hazardous substances resulting in these substances entering and polluting sensitive natural environments either directly through surface runoff, or subsurface water movement.
- Oil / fuel leaks from vehicles and portable construction equipment such as generators will result in soil, surface / groundwater contamination.

Significance rating

Impact	Without mitigation	With mitigation
	Rating	Rating
Soil and water pollution	16 Low	8 Low

Mitigation Measures –

- Prior to commencing with earthworks, the topsoil must be stripped and stockpiled separately from subsoil.
- Topsoil must be kept for use during rehabilitation of landscaped areas.
- Topsoil stockpiles must not exceed 2m in height.
- All stockpiles must be kept free of weeds and alien invasive plants.
- If at risk of being eroded, all stockpiles must be secured with sandbags around the base of the soil stockpile.
- All stockpiles must be established at least 50m away from all watercourses and on flat ground.
- Any soil contaminated by hydrocarbons (fuel and oils) must be removed by a suitable specialist contractor and the affected area rehabilitated immediately.
- Chemical toilets must be provided to workers during the construction phase. A single chemical toilet must be provided for every 10 employees. Separate toilets must be provided for male and female employees.
- Chemical toilets must be serviced regularly by a registered service provider and waybills must be retained as proof of servicing.
- Fuel must be stored in a bunded structure with a roof. The bund must be able to contain at least 110% of the volumes of fuel.
- Mixing and/or decanting of all chemicals and hazardous substances must take place on a tray, shutter boards or on an impermeable surface
- Drip trays must be utilised at all fuel dispensing areas.
- A chemical spill kit must be present onsite at all times and once used it must be disposed of at a registered hazardous landfill site.
- All solid waste must be collected and placed in bins.

Impacts on vegetation communities

Activity

- Removal of vegetation within the construction footprint.
- Bulk Earthworks to achieve specified levels.
- Movement of construction vehicles, equipment and heavy machineries.

Nature of potential impact

- Potential to destroy to disturb, harm or injure faunal species inhabiting the site directly.

- Reduce habitat quality and species diversity.

Significance rating

Impact	Without mitigation					With mitigation				
	Probability	Duration	Extent	Magnitude	Rating	Probability	Duration	Extent	Magnitude	Rating
Disturbance of vegetation communities	5	4	2	8	24 Medium	5	2	2	6	16 Low

Mitigation Measures –

- The construction and operational footprint of the development must not extent past the site outline, and lay down areas should be placed outside of grassland areas where these will not be impacted by the proposed development;
- Grassland areas intersected by the development (in the form of hiking and cycling paths) shall be maintained as natural areas and managed as such including:
 - Management of litter by placement of bins in strategic locations
 - Management of the grassland area as a conservation area
 - Management of alien invasive plants in this area;
- Management and control of alien invasive species within and surrounding the proposed development.

.Loss of Species of Conservation Concern and Biodiversity

Activity

- Removal of vegetation within the construction footprint.
- Clearance of vegetation within the riparian zone.

Nature of potential impact

- Disturbance of indigenous vegetation.

- Alteration of habitat structure.
- Lower biodiversity.
- change nutrient cycling and productivity and modify food webs.

Significance rating

Impact	Without mitigation					With mitigation				
	Probability	Duration	Extent	Magnitude	Rating	Probability	Duration	Extent	Magnitude	Rating
Loss of Species of Conservation Concern and Biodiversity	5	4	3	8	52 High	5	2	1	4	12 Low

Mitigation Measures –

- Removal and replanting/ relocation to a nursery of existing SCC;
- A qualified specialist must be present on site during construction to help in locating and relocation of burrowing animals and reptiles;
- Maintenance of the grassland areas in which cycling and hiking paths are located as conservation areas; and
- Planting of additional individuals of specific SCC within the gardens associated for the proposed development.

Loss of Ecosystem Function and Process

Activity

- Removal of vegetation within the construction footprint.
- Clearance of vegetation within the riparian zone.

Nature of potential impact

- Invasion by alien flora species can result in the change of vegetation and the loss of function, especially when a grassland is converted to woodland, resulting in the reduction of available water and the drying up of wetlands and streams.

.Significance rating

Impact	Without mitigation					With mitigation				
	Probability	Duration	Extent	Magnitude	Rating	Probability	Duration	Extent	Magnitude	Rating
Loss of Ecosystem function and Process	5	4	3	5	33 Medium	5	2	1	6	Low

Mitigation Measures –

- Development and application of an alien invasive management plan to prevent spread and new invasions by alien invasive plant species over the full site for both the construction and operational phases of the proposed development;
- Keeping the disturbance footprint as small as possible; and
- Rehabilitation must take place as soon as possible after construction is completed

Socio-economic Impacts

Noise Pollution

Activity

- Construction of surfaced roads and infrastructure.
- Bulk Earthworks to achieve specified levels.
- Movement of construction vehicles, equipment and heavy machineries.
- Sourcing of construction materials.

Nature of potential impact

- Noise levels along the road will increase during the construction activities due to the use of heavy machinery and vehicles.

During the operational phase – noise levels in this area are likely to increase permanently – new residents who were not there before are likely to cause an increase in noise levels. Increased noise levels are likely to result from the use of the development as well as an increase in traffic levels.

Significance rating

Impact	Without mitigation					With mitigation				
	Probability	Duration	Extent	Magnitude	Rating	Probability	Duration	Extent	Magnitude	Rating
Increase in noise	5	4	2	8	Low	5	14	1	2	Low

Mitigation Measures –

- All machinery must be serviced at regular intervals in order to ensure that they do not emit unnecessary noise.
- Vegetation along the road servitude must not be removed unnecessarily in order to maintain a vegetative barrier which will assist in helping to mitigate noise from traffic.
- During construction keep noise levels within acceptable limits in compliance with all relevant guidelines and regulations such as SANS 10103: 2008.
- All vehicles and machinery must be fitted with appropriate silencing technology that must be properly maintained.
- The use of all plant and machinery must be appropriate to the task required in order to reduce noise levels.
- Increased attention to maintenance of tools and equipment will reduce worksite noise levels.
- Use light equipment or machinery such as the hand-held (“jackhammers”) and machine breakers (“woodpeckers”).
- Plant vegetation strategically to ensure buffers are created between the development and neighbouring receptors.

Elevated dust level

Activity

- Construction of surfaced roads and infrastructure.
- Bulk Earthworks to achieve specified levels.
- Movement of construction vehicles, equipment and heavy machineries.
- Sourcing of construction materials.

Nature of potential impact

- General construction activities will result in increased dust pollution.

Significance rating

Impact	Without mitigation					With mitigation				
	Probability	Duration	Extent	Magnitude	Rating	Probability	Duration	Extent	Magnitude	Rating
Elevated dust level	5	4	2	6	Medium	5	2	1	4	Low

Mitigation Measures –

- Dust suppression must be implemented by dampening with water or spraying from a water tanker along the road during construction to prevent dust from being blown from the project site into neighbouring properties and from causing visibility problems for users on the road. Potable water must not be used for dust suppression.
- Heavy machinery and vehicles must not exceed a speed limit of 30 km/hr along the area under construction.
- During transport, loads of loose material (such as sand, gravel etc.) on trucks must be covered and/or dampened.
- Do not exceed the freeboard levels when transporting construction related materials.
- Camp construction areas / Access road / work faces – that have been stripped of vegetation must be effectively dampened to avoid excessive dust. This must apply particularly in instances of high wind speed or when dust is seen to be generated in significant quantities.
- Cover construction materials, skips and stockpiled soils if they are a source of dust.

Road safety and disturbance of traffic*Activity*

- Construction of surfaced roads and infrastructure.
- Requirement of work servitude.
- Bulk Earthworks to achieve specified levels.
- Movement of construction vehicles, equipment and heavy machineries.

- Sourcing of construction materials.
- Construction of storm water infrastructure (bridge culvert and storm water pipes).
- Placing of culverts lifted by the Crane or Excavator and placed on top of constructed floor slab.

Nature of potential impact

- Temporary disturbance for movement of pedestrians and vehicular traffic in the area.
- Construction activities and vehicles may pose safety risks to the people in the community.
- Site access points and construction areas will result in increased road safety issues to members of the public.
- Hazardous areas such as excavations and chemical storage areas pose a potential safety risk to members of the public as well as site workers.

Significance rating

Impact	Without mitigation					With mitigation				
	Probability	Duration	Extent	Magnitude	Rating	Probability	Duration	Extent	Magnitude	Rating
Temporary pedestrians and vehicular disturbance	5	2	2	8	Medium	5	2	1	6	12 Low

Mitigation Measures –

- Warning signs regarding the construction activities must be erected to warn pedestrians and drivers in the area for all the detour.
- The necessary traffic safety warning signage must be erected during construction as per the engineers' specifications to warn motorists and pedestrians of the potential dangers of the construction site
- Road safety measures must be adequately defined with the necessary road warning signage or Stop/Go controls.
- Construction site workers must remain within the designated construction zone at all times unless otherwise authorised by the resident engineer under advisement from the ECO.
- Construction workers / construction vehicles to take heed of normal road safety regulations. A courteous and respectful driving manner must be maintained so as not to cause injury to livestock or people.

- Flagmen must be used to control the traffic flow.
- Additional signage must be kept in storage on the construction site for replacement of missing and damaged signage.
- Areas used to store hazardous substances must be suitably signed, fenced and access controlled; residents living adjacent to the construction site must be notified of the existence of the hazardous storage area.
- Potentially hazardous areas such as excavated trenches or pits / storage areas are to be securely demarcated (not with hazard tape only) and made clearly visible at ALL times.

3.2 POTENTIAL ENVIRONMENTAL IMPACTS DURING THE OPERATION PHASE

Increased impervious area (Hardened surfaces)

Activity

- Operation of Liberty Midlands Park run and Bike Track
- Operation of storm water infrastructure (bridge culvert and storm water pipes).

Nature of potential impact

- Erosion and increase in sediment inputs & turbidity.
- Alterations in hydrological regimes as a result of increased storm water flood-peaks.
- Increased storm water run-off volume and velocity.

Significance rating

Impact	Without mitigation					With mitigation				
	Probability	Duration	Extent	Magnitude	Rating	Probability	Duration	Extent	Magnitude	Rating
Increased impervious area	5	4	2	8	Medium	5	4	1	4	Low

Mitigation Measures –

Attenuation of storm water from the road upgrade is important to control the velocity of runoff towards the stream. Attenuation structures must be placed between the road upgrade and the stream i.e. storm water must not be directly deposited into the stream.

- Address increased run-off volumes at source.
- Disturbed area must be rehabilitated as soon as maintenance in an area is complete or near complete and not left until the end to be rehabilitated (progressive rehabilitation).
- Bank erosion must be monitored at regular intervals during the operational phase.
- Areas sensitive to erosion must be identified, and monitored to ensure that erosion risks are minimised through active management.
- Any erosion features must be stabilised following defection of storm water infrastructures with soft engineering (preferred over hard engineering options) such as re-sloping and stabilising. Where risks are high, unstable/eroding banks must be reinforced/stabilised using appropriate engineering works such as gabions/rock pack/geotextile bags.
- Stockpiled topsoil must be replaced following construction activities and be shaped to match the natural topography of the site. All stripped topsoil MUST be appropriately replaced on the site.

Pollution of water resources and soil

Activity

- Operation of Liberty Midlands Park Run and Bike Track.
- Operation of storm water infrastructure (bridge culvert and storm water pipes).
- Routine maintenance inspections.

Nature of potential impact

- Pollutants from vehicle using the road and bridge culvert would be discharged directly into the stream.
- General waste produced by activities has the potential to pollute and contaminate the environment around the point source and further afield.
- Litter and other contaminants may enter the water system during the operation phase of the road.
- Increased inputs of organic/ heavy metal contaminants due to increased traffic on the road.
- Contamination of wetland resources through toxic organic and/or heavy metals.
- Pollution of aquatic resources.

Significance rating

Impact	Without mitigation					With mitigation				
	Probability	Duration	Extent	Magnitude	Rating	Probability	Duration	Extent	Magnitude	Rating
Pollution of water resources and soil	5	4	3	10	Medium	5	4	1	6	Low

Mitigation Measures –

- The drainage provisions identified in design must be established early during the construction period and each provision must then be assessed after construction, and inspected after the first major storm event, to ensure there are no unexpected consequences.
- All disturbed soil must be rehabilitated with endemic plant species to ensure that alien vegetation does not invade the area.
- All soils compacted as a result of construction activities must be ripped and profiled to original levels.
- Regular maintenance and checking of the infrastructure must take place over the lifespan of the project and necessary remedial / management actions undertaken to ensure its continued operation.
- Strategically placed rubbish bins during the construction period and remove all waste from the work front on a daily basis. Remove all domestic and organic waste from site on a weekly basis. All construction waste must be removed from site prior to practical completion of the construction contract. All waste to be removed to a suitably licensed municipal landfill site unless approved in writing by the Engineer under advisement from the ECO. All waste bins to be covered to prevent wind blow and access by vermin.
- Installation of silt / grease traps at appropriate positions in the storm water drainage system to prevent contaminates and silt affecting watercourses.
- Any specific waste management to be implemented at the residences proposed ????

Spread of Alien invasive species*Activity*

- Operation Liberty Midlands Park Run and Bike Track
- Impact of storm water infrastructure (bridge and storm water pipes).
- Repair and maintenance works.

- Routine maintenance inspections.

Nature of potential impact

- Infestation of alien vegetation post construction poses an ecological threat as they alter habitat structure, lower biodiversity, change nutrient cycling and productivity, and modification of food webs.
- Destruction of indigenous species; increased in inflammable biomass with high fire intensity and erosion; clogging of waterways such as small streams and drainage channels causing decreased stream flows and incision of stream beds and banks.
- Overall impact on the hydrological functioning of the system.

Significance rating

Impact	Without mitigation					With mitigation				
	Probability	Duration	Extent	Magnitude	Rating	Probability	Duration	Extent	Magnitude	Rating
Spread of Alien invasive species	5	5	3	8	Medium	4	5	1	4	Low

Mitigation Measures –

- During the operation phase it is recommended that disturbed riparian / in-stream habitats and rehabilitated areas are monitored for potential alien plant colonisation. This should initially take place immediately after construction, thereafter monthly for 12 months, thereafter annually.

3.3 POTENTIAL POSITIVE ENVIRONMENTAL IMPACTS

Improved local tourism possibilities

The proposed development is likely to increase local tourism potential due to the increased recreational activities.

Impact	During operation				
	Probability	Duration	Extent	Magnitude	Rating

Improved local tourism possibility	5	4	2	10	* 80 High
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* Positive outcome

On-going Recommendations –

- It is the responsibility of the applicant to inspect the development on a regular basis to ensure that it is maintained in a manner that is not causing any environmental harm.
- Ensure that relevant information is published and sign posts installed to create public knowledge and encourage visitors.

Reduction in soil erosion

Hardening of the road surface will reduce soil erosion. Formalised storm water management will also help to reduce soil erosion .

Impact	Without mitigation				
	Probability	Duration	Extent	Magnitude	Rating
Reduction in soil erosion	5	4	2	10	* 80 High

* Positive outcome

On-going Recommendations –

- Stormwater management must be inspected regularly to ensure that any faults are reported and repaired.
- Road maintenance must occur in order to ensure that the road is maintained.
- Any reports regarding storm water management damages or deterioration of the road must be addressed as soon as practicably possible to ensure that the positive impact created is maintained.

Temporary and permanent employment and skills development

Through the need of local workforce for construction related activities and opportunity for employment during the operation phase of the project for maintenance, management and operation. This short-term employment will lead to long term skills development.

Impact	Without mitigation
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	Probability	Duration	Extent	Magnitude	Rating
Creation of temporary employment	5	2	2	6	* 50 Moderate
Skills development	5	4	2	6	60 High

* Positive outcome

Reduction in air pollution (dust)

Once the site has been hard topped and areas re-grassed, dust emitted into the area and surrounding residential properties will be reduced if not eliminated.

Impact	Without mitigation				
	Probability	Duration	Extent	Magnitude	Rating
Reduction in air pollution – dust eliminated due to hard topped surface	4	4	2	8	* 56 Moderate

* Positive outcome

SECTION F: PROPOSED MONITORING, CONTROL AND AUDITING

- The National Environmental Management Act 107 of 1998 (NEMA) requires that an Environmental Management Programme (EMPr) be submitted where an environmental impact assessment must be utilised as the basis for a decision on an application for environmental authorisation.
- An EMPr has been compiled for this application and has been attached in **Appendix F**. This EMPr is fundamental to the BA process and must ensure that commitments given at a project's planning and assessment stage are effectively implemented through the construction and operation stage.
- The following monitoring and auditing strategies are recommended for the proposed development
 - An experienced and independent Environmental Control Officer (ECO) must be appointed by the Proponent prior to commencement of any construction activities to ensure that the environmental conditions are implemented and that compliance with the provisions of the EMPr attached in **Appendix F** are implemented by the Engineer and appointed Contractor.
 - The ECO must ensure that all mitigation measures are implemented, and effective rehabilitation undertaken. The site mitigation and rehabilitation measures must be achieved.
 - The ECO is to be on site twice a month – once for a site visit or project progress meeting and once for auditing. These visits must be two weeks apart.
 - The ECO must be able to make recommendations on the ground as the project unfolds and possible new issues arise.
- Indigenous trees removed during construction must be replaced at a ratio of 1:5 (5 trees must be planted for every 1 tree removed). Protected tree species removed must be replaced at a rate of 1:10, i.e. ten trees planted for every one tree removed.
- An invasive alien plant control programme must be implemented to prevent the further spread of these species as per the legislative requirements specified under the Conservation of Agricultural Resources Act, 1983 amended in 2001 and the National Environmental Management: Biodiversity Act 2004 (Act No, 10 of 2004). Invasive Alien plant Control Programme (IAPCP) must be undertaken at least 4 times a year post-construction during the first 5 years to ensure that invasive alien plants are actively managed and eradicated from the site and thereafter twice yearly for the lifespan of the project, with adequate monitoring and follow-up measures.
- Storm water control measures must be implemented and monitored to ensure water running off the site does not cause erosion to the surrounding environment.
- The first post construction inspection must be conducted upon hand-over, and must be conducted jointly by the applicant's staff, project manager, environmental control officer and engineers responsible for design. The second inspection must take place 12 months after hand over, in order to assess:
 - the extent to which natural re-growth is possible;
 - the erosion resulting from the preceding season, taking into consideration the amount of rainfall; and
 - the need for additional erosion protection or re-vegetation.
 - Successful management of alien invasive vegetation.
- One (1) Environmental audit report must be submitted to the relevant DEDTEA Compliance Control Environmental Officer: Compliance Monitoring and Enforcement (CME) Component every month during construction.

- On completion of construction activities, a post construction phase audit must be conducted to ensure the rehabilitation efforts have been implemented. This audit must be conducted one month after construction and rehabilitation work has been completed.
- The Proponent is required to ensure that follow up assessments for six (6) months post construction are undertaken by an ECO, to determine the success of the re-vegetation process and to check the condition of the banks around the project site during the operation and signing off where no erosion has been observed for one (1) year during operation.

SECTION G: ENVIRONMENTAL IMPACT STATEMENT

The proposed development is planned for vacant land opposite the existing Liberty Midlands Mall that has been maintained by Liberty Midlands Mall. The area currently consists of an old quarry, rock outcrops and maintained grasslands. The proposed development area is 15 878 square meters. The idea behind the development is to merge the environment with a recreational area to provide a fun activities and create space for locals and visitors to enjoy. The addition of residential blocks will see the creation of an eco-estate type of living.

From the 4 different site layout options proposed by the applicant, it is anticipated that option 4 will have the least impact due to its smaller footprint, however provided that mitigation measures proposed are implemented the preferred option 1 is not anticipated to have any fatal flaws.

The primary key concerns with regard to the biophysical environment identified for the proposed project, which will require careful management, are:

- Direct impacts to wetlands;
- Direct impacts to aquatic habitat;
- Direct impacts to terrestrial and riparian vegetation;
- Hydrological impacts (flow-related modifications);
- Increase storm water flows of the new hardened surface; and
- Alien plant infestation post-disturbance.

It is the view of the Environmental Assessment Practitioner that the preferred option 1 for the Liberty Midlands Park Run and Bike Track is biophysically acceptable, socially beneficial and will maximise the purpose and the need of the application.

It is recommended that the Proposed Liberty Midlands Park Run and Bike Track Option 1 Road is granted authorisation.

This report is accompanied by an EMPr, which includes recommendations and mitigation measures made by the specialists. This EMPr must be approved by the DEDTEA to give it legal standing.

The proposed project will result in short term negative impacts to the stream, wetlands, vegetation, residents and surrounding land owners, however, these negative impacts are only expected during the construction phase and possibly the early stages of rehabilitation. These impacts can be reduced to an acceptable level provided that the mitigation measures as proposed in this BAR, specialist reports, wetland rehabilitation report and the accompanying EMPr are effectively implemented.

The overall significance of positive socio-economic and environmental impacts is beneficial as it should improve employment opportunities and recreational and tourism potential of the area.

SECTION H: CONCLUSION AND EAP'S RECOMMENDATION

Based on the balance of social, economic and environmental considerations, the impacts that will be caused by the proposed Liberty Midlands Park Run and Bike Track is considered to be within acceptable limits of change, as long as the appropriate mitigation measures outlined in this report and the site specific EMPr attached in **Appendix F** are effectively implemented.

The following conditions should form part of the Environmental Authorisation should a positive decision be granted by the Competent Authority/ies:

- Financial provision must be set aside prior to construction commencing for the implementation of the EMPr attached in **Appendix F** for the rehabilitation of the disturbed ecosystems after completion of construction activities including monitoring, auditing and maintenance during construction and operational phase of the proposed project.
- The Proponent must appoint an independent and suitably experienced ECO for the construction and rehabilitation phases of the development to ensure compliance with the provision of the EMPr and for auditing purpose.
- Cognisance and compliance must be taken of the recommended mitigation and rehabilitation measures in the Specialist Geotechnical report, Wetland Delineation Report, Aquatic Assessment report, Ecological Assessment report, and Wetland Rehabilitation report (See attached in Appendix D) including all the mitigation measures recommended in this report and the site specific EMPr.
- All parties involved in the construction and ongoing maintenance of the development and associated storm water infrastructures (including contractors, engineers, and administrators) are, in terms of NEMA's "Duty of Care" and "Remediation of Damage" requirements (Section 28), required to prevent any pollution or degradation of the environment, be responsible for preventing impacts occurring, continuing or recurring and for the costs of repair of the environment.
- Removal of alien invasive plants must occur with specific follow-up control measures and management of soil erosion within the proposed project site (this is an ongoing requirement in terms of national legislation).
- Surrounding landowners, business owners and I&APs must be notified of the start of the construction phase as well as the progress of the various phases of the project in order for them to make the necessary arrangements.

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