BASIC ASSESSMENT PROCESS
for
THE PROPOSED CONSTRUCTION OF THE SEUWE BRIDGE AND ASSOCIATED INFRASTRUCTURE IN THE SEUWE VILLAGE OF THE FETAKGOMO TUBATSE LOCAL MUNICIPALITY, LIMPOPO PROVINCE

DRAFT BASIC ASSESSMENT REPORT

Public Review Period:

29 September 2022 to 31 October 2022

COMPILED BY:
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LIMPOPO
PROVINCIAL GOVERNMENT
REPUBLIC OF SOUTH AFRICA

DEPARTMENT OF
ECONOMIC DEVELOPMENT, ENVIRONMENT & TOURISM

BASIC ASSESSMENT REPORT - EIA REGULATIONS, 2014

Basic Assessment report in terms of the Environmental Impact Assessment Regulations, 2014, promulgated in terms of the National Environmental Management Act, 1998 (Act No. 107 of 1998), as amended.

File Reference Number:	
	(For official use only)
NEAS Reference Number:	
Date Received:	
Due date for acknowledgement:	
Due date for acceptance:	
Due date for decision	

Kindly note that:

1. The report must be compiled by an independent Environmental Assessment Practitioner.

2. The report must be typed within the spaces provided in the form. The size of the spaces provided is not necessarily indicative of the amount of information to be provided. The report is in the form of a table that can extend itself as each space is filled with typing.

3. Where applicable **tick** the boxes that are applicable in the report.

4. The use of "not applicable" in the report must be done with circumspection because if it is used in respect of material information that is required by the Department of Economic Development, Environment and Tourism as the competent authority (Department) for assessing the application, it may result in the rejection of the application as provided for in the regulations.

5. An incomplete report may be returned to the applicant for revision.

Cnr Suid & Dorp Streets, POLOKWANE, 0700, P O Box 55464, POLOKWANE, 0700

6. Unless protected by law, all information in the report will become public information on receipt by the department. Any interested and affected party should be provided with the information contained in this report on request, during any stage of the application process.

7. The Act means the National Environmental Management Act (No. 107 of 1998) as amended.

8. Regulations refer to Environmental Impact Assessment (EIA) Regulations of 2014.

9. The Department may require that for specified types of activities in defined situations only parts of this report need to be completed. No faxed or e-mailed reports will be accepted.

10. This application form must be handed in at the offices of the Department of Economic Development, Environment and Tourism:-

Postal Address:	**Physical Address**:
Central Administration Office Environmental Impact Management P. O. Box 55464 **POLOKWANE** 0700	Central Administration Office Environmental Affairs Building 20 Hans Van Rensburg Street / 19 Biccard Street **POLOKWANE** 0699
Queries should be directed to the Central Administration Office: Environmental Impact Management: - **For attention:** Mr E. V. Maluleke **Mobile:** 082 947 7755 **Email:** malulekeev@ledet.gov.za	

View the Department's website at http://www.ledet.gov.za/ for the latest version of the documents.

I. PROJECT DETAILS

Report Title	:	Basic Assessment Report
Report Status	:	Draft
Review Period	:	29 September 2022 to 31 October 2022
Project Title	:	The Proposed Construction of the Seuwe Bridge and Associated Infrastructure in the Seuwe Village of the Fetakgomo Tubatse Local Municipality, Limpopo Province
Applicant	:	Marula Platinum Pty Ltd
Environmental Consultant	:	Envirolution Consulting (Pty) Ltd
Limpopo DEDET Reference No.:	:	New Application

II. DOCUMENT CONTROL

PREPARED BY:

Sameera Ismail
(MA Environmental Management)

REVIEWED BY:

Karthigesan Govender
(Pr.Sci.Nat. No: 400049/12)

III. DECLARATION

Envirolution Consulting (Pty) Ltd was contracted by OptiMult on behalf of Marula Platinum Pty Ltd as the independent environmental consultant to undertake the Environmental Basic Assessment process for the proposed project. Envirolution Consulting (Pty) Ltd is not a subsidiary of, or affiliated to OptiMult or Marula Platinum Pty Ltd. Furthermore, Envirolution Consulting does not have any interests in secondary developments that may arise out of the authorisation of the proposed project.

IV. APPLICANT DETAILS

Name of applicant:	Marula Platinum Pty Ltd
Applicant Representative:	Moses Motlhageng – Executive: Marula Operations
Contact Person:	Elizabeth Mampuru – Project Manager
Physical address:	118 Winnarshoek, Driekop, 1129

V. ENVIRONMENTAL ASSESSMENT PRACTITIONER (EAP)'s DETAILS

Environmental Assessment Practitioner (EAP):	Karthigesan Govender		
Contact person:	Sameera Ismail		
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Postal code:	2157		
Telephone:	(0861) 444499	Cell:	083 419 8905
E-mail:	gesan@envirolution.co.za	Fax:	(086) 162 62 22
EAP Qualifications	BSc. Honours Botany		
EAP Registrations/ Associations	Registered with the South African Council for Natural Scientific Professions (No: 400049/12) and the Environmental Assessment Practitioners Association of South Africa (No: 2019/317)		

Details of the EAP's expertise to carry out Basic Assessment procedures

The EAPs from Envirolution Consulting who are responsible for this project are (refer to **Appendix H1** for EAP Expertise):

Karthigesan Govender – The principle Environmental Assessment Practitioner (EAP) for this project is a registered Professional Natural Scientist and holds an Honours Degree in Botany. He has over 20 years of experience within the field of environmental management. His key focus is on strategic environmental assessment and advice; management and co-ordination of environmental projects, which includes integration of environmental studies and environmental processes into

larger engineering-based projects and ensuring compliance to legislation and guidelines; compliance reporting; the identification of environmental management solutions and mitigation/risk minimising measures; and strategy and guideline development. He is currently responsible for the project management of EIAs for several diverse projects across the country.

Sameera Ismail – The principle author of this Basic Assessment Report, holds a MA Environmental Management degree from the University of Johannesburg. She has over 5 years of experience consulting in the environmental field. Her key focus is on strategic environmental assessment and advice; management and co-ordination of environmental projects, which includes integration of environmental studies and environmental processes into larger engineering-based projects and ensuring compliance to legislation and guidelines; the identification of environmental management solutions and mitigation/risk minimising measures; and Water Use License processes. Sameera is currently a Project Manager and Environmental Consultant at Envirolution Consulting (Pty) Ltd.

VI. SPECIALIST'S DETAILS

Name of Specialist	**Title of specialist report/s as attached in Appendix G**	**Date issued**
Antoinette Bootsman of Limosella Consulting	Aquatic Biodiversity Assessment	June 2022
Antoinette Eyssell-Knox of Dimela-Eco Consulting	Terrestrial Vegetation Compliance Statement	July 2022
Barbara Kasl	Terrestrial Fauna Assessment: Compliance Statement	August 2022
SiVEST	Floodline Assessment	February 2022
Johnny van Schalkwyk	Phase 1 Cultural Heritage Impact Assessment	May 2022

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ABBREVIATIONS

BAR	Basic Assessment Report
DBAR	Draft Basic Assessment Report
DWS	Department of Water and Sanitation
EAP	Environmental Assessment Practitioner
EMPr	Environmental Management Programme
EIA	Environmental Impact Assessment
FBAR	Final Basic Assessment Report
FTLM	Fetakgomo Tubatse Local Municipality
GA	General Authorisation
GN	Government Notice
HIA	Heritage Impact Assessment
I&AP's	Interested and Affected Parties
IDP	Integrated Development Plan
LEDET	Limpopo Department of Economic Development, Environment and Tourism
LIHRA	Limpopo Heritage Resources Authority
MPPL	Marula Platinum Pty Ltd
NEMA	National Environmental Management Act (No. 107 of 1998) (as amended)
NHRA	National Heritage Resources Act (No. 25 of 1999)
NWA	National Water Act (No. 36 of 1998)
SAHRA	South African Heritage Resources Agency
SDF	Spatial Development Framework
SDM	Sekhukhune District Municipality
SMP	Stormwater Management Plan
WULA	Water Use License Application

SECTION A: ACTIVITY INFORMATION

Has a specialist been consulted to assist with the completion of this section?

YES	

If YES, please complete the form entitled "Details of specialist and declaration of interest" or appointment of a specialist for each specialist thus appointed:

Any specialist reports must be contained in **Appendix D**.

1. ACTIVITY DESCRIPTION

Describe the activity, which is being applied for, in detail[1]:

The Proposed Construction of the Seuwe Bridge and Associated Infrastructure in the Seuwe Village of the Fetakgomo Tubatse Local Municipality, Limpopo Province.

1.1 Background and Scope

Marula Platinum Pty Ltd, as part of its community-based projects, will be providing new paved roads to support the local communities that surround the mine and its associated infrastructure. Marula Platinum thus proposes the construction of a gravel roadway and concrete culvert bridge with gabion protection walls across the main river course passing through the Seuwe village close to Diphale, approximately 40km outside of Burgersfort within the Limpopo Province. The total roadway will be 0.17km in length and run at 6m wide with a varying road reserve on either side. The typical long section of the river crossing is depicted in Figure 1 below.

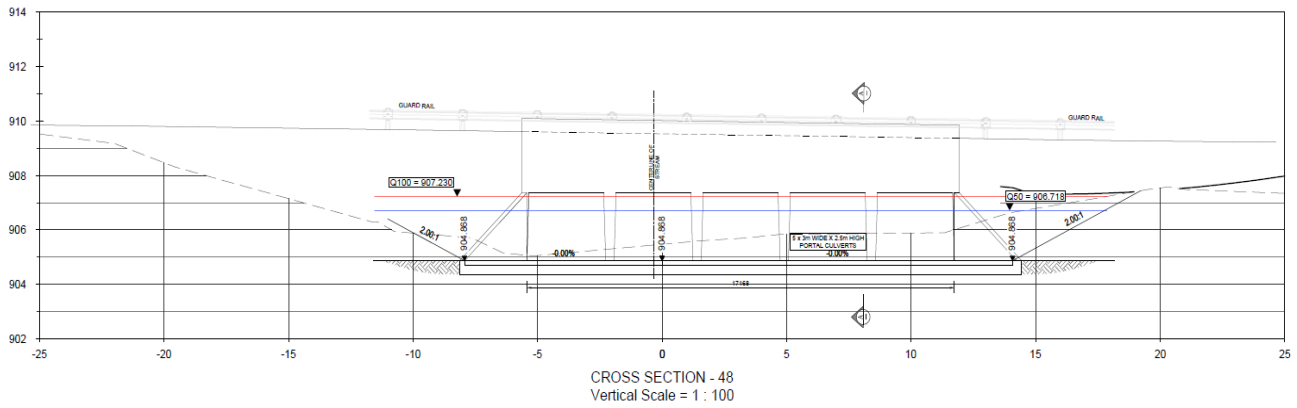


Figure 1: Typical Long Section

[1] Please note that this description should not be a verbatim repetition of the listed activity as contained in the relevant Government Notice, but should be a brief description of activities to be undertaken as per the project description.

The works shall include, but not be limited to:

- Clearance of the road reserve;
- Excavation and spoil of the in-situ material;
- Compaction of the roadbed and culvert base layers;
- Importation of new gravels for the constructed layer works;
- Concrete construction of culvert bases;
- Installation of precast culverts;
- Installation of gabion wall;
- Installation of bridge edge protection; and
- New side drains.

This bridge will strengthen the local road network for use by the local community which will make their commuting easier and the area will be more accessible.

1.2 Relevant Sans Specifications

The following specifications will be applicable to the works:

- SABS 1200 A : General
- SABS 1200 C : Site Clearance
- SABS 1200 D : Earthworks
- SABS 1200 DB : Earthworks (pipe trenches)
- SABS 1200 DM : Earthworks (roads, subgrade)
- SABS 1200 DK : Gabions and Pitching
- SABS 1200 GA : Concrete (small works)
- SABS 1200 LB : Bedding (pipes)
- SABS 1200 LE : Stormwater Drainage
- SABS 1200 M : Roads (general)
- SABS 1200 ME : Subbase
- SABS 1200 MF : Base
- SABS 1200 MM : Ancillary Roadworks

1.3 Hydrological Assessment

The 1:50 and 1:100 year flood levels likely to be reached along the Mogompane river were determined by the Floodline Assessment attached as **Appendix D4**.

1.3.1. Catchment Characteristics

A summary of the catchment characteristics have been included in Table 1 below.

Table 1: Summary of Catchment Characteristics

Weather Service Station :		593015	Ga- Sekhukhundeland		
MAP :		552	mm		
2 / 5 / 10 Year Return Period Daily Rainfall :		49	68	81	mm
20 / 50 / 100 Year Return Period Daily Rainfall :		95	113	129	mm
Ave. Number of Days Thunder was heard :		40			
		m2	Km2	ha	
Catchment Area :	A =	9166882	9.167	916.6882	
		m	Km		
Length of Watercource :	L =	5378	5.378		
Centroid of Catchment :	Lc =	2085	2.085		
Elevation Difference :	H =	677	m		
1085 Height Difference :	1085 =	427	m		
1085 Slope :	1085 =	105.86	m/Km		
Dolomite Area Percentage :	D =	0			
SDF STORM Re-occurance Interval :	T =	100			
Rational Method KERBY 'r' :	r =	0.156			

The catchment delineation has been included in Appendix A of the Floodline Assessment attached as **Appendix D4**.

Based on the current characteristics of the catchment area, the surface characteristic percentages associated with this catchment is outlined in Table 2 below.

Table 2: Catchment Run-off Attributes

UN-DEVELOPED COMPONENT : Run-off Percentages				DEVELOPED COMPONENT: Run-off Percentages			
Surface Slope - Wetlands & Pans	0.03	0.0%	0.000	Lawns - Sandy Flat <2%	0.075	0.0%	0.000
Surface Slope - Flat Areas (3-10%)	0.08	35.0%	0.028	Lawns - Sandy Steep >7%	0.175	0.0%	0.000
Surface Slope - Hilly Areas (10-30%)	0.16	40.0%	0.064	Lawns - Heavy Soil Flat <2%	0.15	0.0%	0.000
Surface Slope - Steep Areas (>30%)	0.26	15.0%	0.039	Lawns - Heavy Soil Steep >7%	0.30	0.0%	0.000
Soil - Very Permeable	0.04	15.0%	0.006	Residential - Houses	0.40	0.0%	0.000
Soil - Permeable	0.08	15.0%	0.012	Residential - Apartments	0.60	0.0%	0.000
Soil - Semi-Permeable	0.16	15.0%	0.024	Industrial - Light	0.70	0.0%	0.000
Soil - Impermeable	0.26	55.0%	0.143	Industrial - Heavy	0.75	0.0%	0.000
Vegetation - Thick Bush/Plantations	0.04	0.0%	0.000	Business - City Centre	0.90	0.0%	0.000
Vegetation - Light Bush/Farm Lands	0.11	0.0%	0.000	Business - Suburban	0.60	0.0%	0.000
Vegetation - Grasslands	0.21	35.0%	0.074	Streets	0.80	0.0%	0.000
Vegetation - No Vegetation	0.28	65.0%	0.182	Impervious Areas	1.00	10.0%	0.100
			0.572				0.100

Q2	Q5	Q10	Q25	Q50	Q100
0.486	0.511	0.537	0.563	0.589	0.614

Rainfall in this catchment is considered to be medium to high, with an average mean annual precipitation (MAP) of +/-552 mm/annum.

1.3.2. Peak Flow Determination

The Deterministic Calculation Methods was used in estimating the peak flows and are tabulated and summarised in Table 3 below. The detailed calculations have been included in Appendix B of the Floodline Assessment attached as **Appendix D4**.

Table 3: Comparison of Peak Flows using Deterministic Methods (m^3/s)

Return Storm Period	Unit Hydrograph Method	Rational Method 'Kerby'	Rational Method 'Emperical'	SDF Method	SCS Method	Kovacs Regional Max.
	(m^3 / s)	(m^3 / s)	(m^3 / s)	(m^3 / s)	(m^3 / s)	(m^3 / s)
1 : 2 year	17.61	22.53	42.32	17.45	37.49	
1 : 5 year	56.18	42.68	75.18	38.39	65.20	
1 : 10 year	77.18	62.30	103.28	59.01	85.86	
1 : 25 year	106.05	90.65	141.92	79.62	109.16	
1 : 50 year	130.81	118.02	175.05	106.77	140.30	115.05
1 : 100 year	157.32	149.40	210.52	135.21	168.78	147.75

From Table 3 above, the Rational Method – KERBY was selected as the preferred Deterministic method for the calculation for the 1:50 and 1:100 year return storm flows respectively.

1.4 Floodline Assessment

A proposed bridge structure below the roadway consisting of 5 N° (3.0m x 2.5m high) portal culverts will be required to allow the 1:100 year return storm flood to pass below the road. This structure will require wing walls at both the inlet and outlet ends of the structure. Thus, the bridge has been designed in accordance with the calculated 1:100 year return storm to pass below it.

Refer to **Appendix D4** for the comprehensive Floodline Assessment which entails the modelling and floodline drawings.

1.5 Locality of study site

The proposed bridge will run across the main river course passing through the Seuwe village close to Diphale, approximately

40km outside of Burgersfort within the Fetakgomo Tubatse Local Municipality in the Sekhukhune District Municipality, Limpopo Province. Figure 2 below shows the location of the proposed bridge.

The coordinates are outlined in Table 4 below.

Table 4: Coordinates

Point	Coordinates
Start	24˚31'05.10"S; 30˚03'14.58"E
Middle	24˚31'04.08"S; 30˚03'11.78"E
End	24˚31'02.55"S; 30˚03'09.27"E

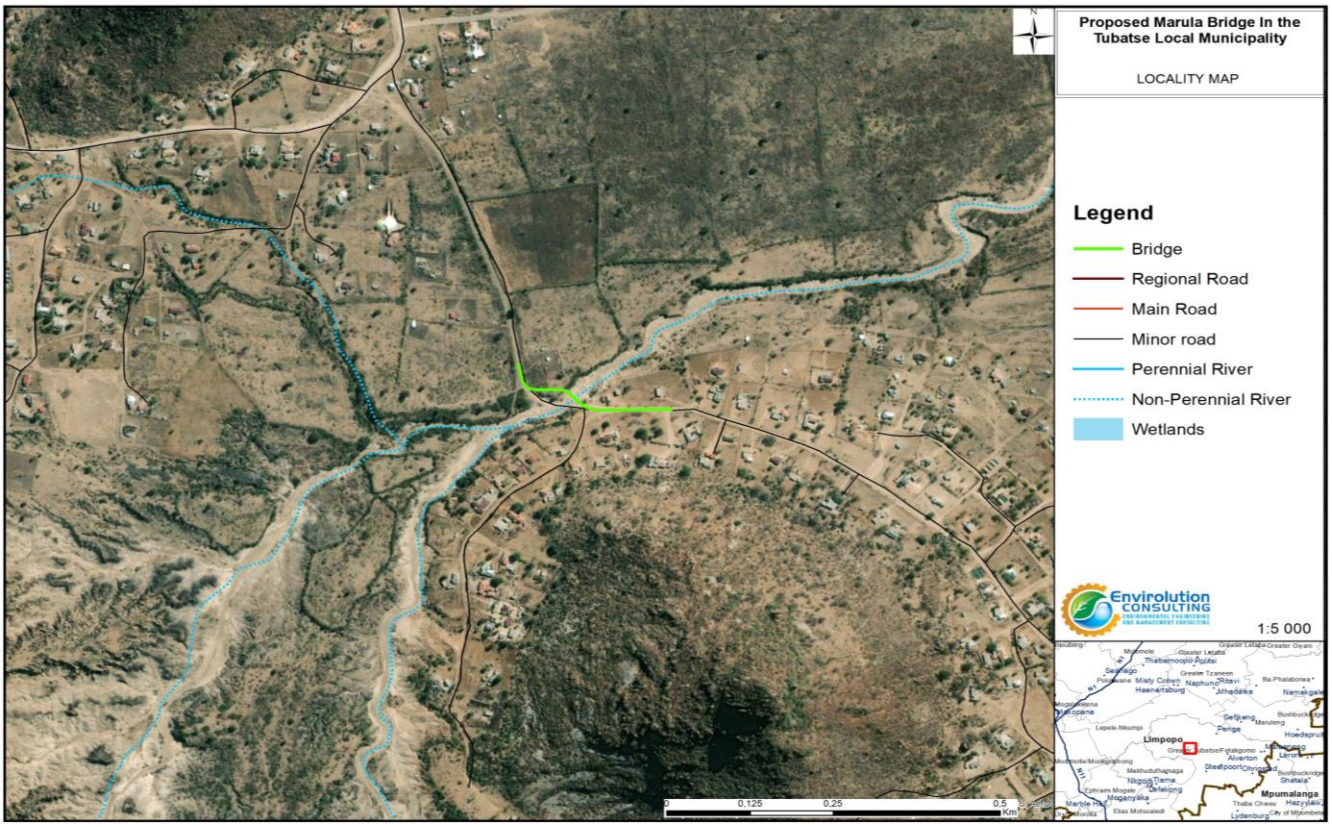


Figure 2: Locality Map

1.6 Listed Activities

In terms of Sections 24(2) and 24D of the National Environmental Management Act (Act No. 107 of 1998), as amended, and as read with the Environmental Impact Assessment (EIA) Regulations of Government Notices R 324 to 327 in Government Gazette 40772 of 07 April 2017, the development will trigger a Basic Assessment process as per the activities listed in Table 5 below.

Table 5: Listed Activities

Listed activities	Description of project activity that triggers listed activity
GNR 327 Listing Notice 1 (7 April 2017) Activity 19: 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 grit, pebbles or rock of more than 10 cubic metres from a watercourse.	*The proposed bridge will result in infilling or removal of more than 10m³ or more of material into/from a watercourse during the construction of the bridge, approach road, gabions and associated infrastructure.*
GNR 324 Listing Notice 3 (7 April 2017) Activity 12: The clearance of an area of 300 square metres or more of indigenous vegetation except where such clearance of indigenous vegetation is required for maintenance purposes undertaken in accordance with a maintenance management plan. e. Limpopo ii. Within critical biodiversity areas identified in bioregional plans.	*There is vegetation coverage along the proposed works areas (and as a result of the wetland area). The clearance of vegetation of approximately 300 square metres may occur within the wetland and buffer area for the development of the bridge, approach road, gabions and associated infrastructure. The site is located within an Ecological Support Area.*
GNR 324 Listing Notice 3 (7 April 2017) Activity 14: The development of:– (iii) bridges exceeding 10 square metres in size; (xii) infrastructure or structures with a physical footprint of 10 square meters or more – where such development occurs - a) within a watercourse; e. Limpopo i. Outside urban areas: (ff) Critical biodiversity areas or ecosystem service areas as identified in systematic biodiversity plans adopted by the competent authority or in bioregional plans.	*The physical combined footprint of the proposed works (the bridge, approach road, gabions and associated infrastructure) is over ± 10m² within a wetland area, an area identified as sensitive area and an Ecological Support Area by the Limpopo Conservation Plan.* *The development will occur within a wetland area which is regarded as a sensitive area protected by the National Water Act (Act No. 36 of 1998).*

The above listed activities may not commence without an Environmental Authorization from the Competent

Authority (LEDET).

The aim of the Environmental Impact Assessment is to ensure that:

- The potential environmental impacts associated with the proposed project are taken into consideration.
- Public Participation Process is conducted i.e. to afford any Interested and or Affected Parties (I&AP) sufficient opportunity to provide comments.
- Sufficient information is provided to decision makers in order to ensure an informed decision making.

The nature and extent of the proposed project are explored in more detail in this Basic Assessment Report. This report has been compiled in accordance with the requirements of the EIA Regulations and includes details of the activity description; the site, area and property description; the public participation process; the impact assessment; and the recommendations of the Environmental Assessment Practitioner.

2. FEASIBLE AND REASONABLE ALTERNATIVES

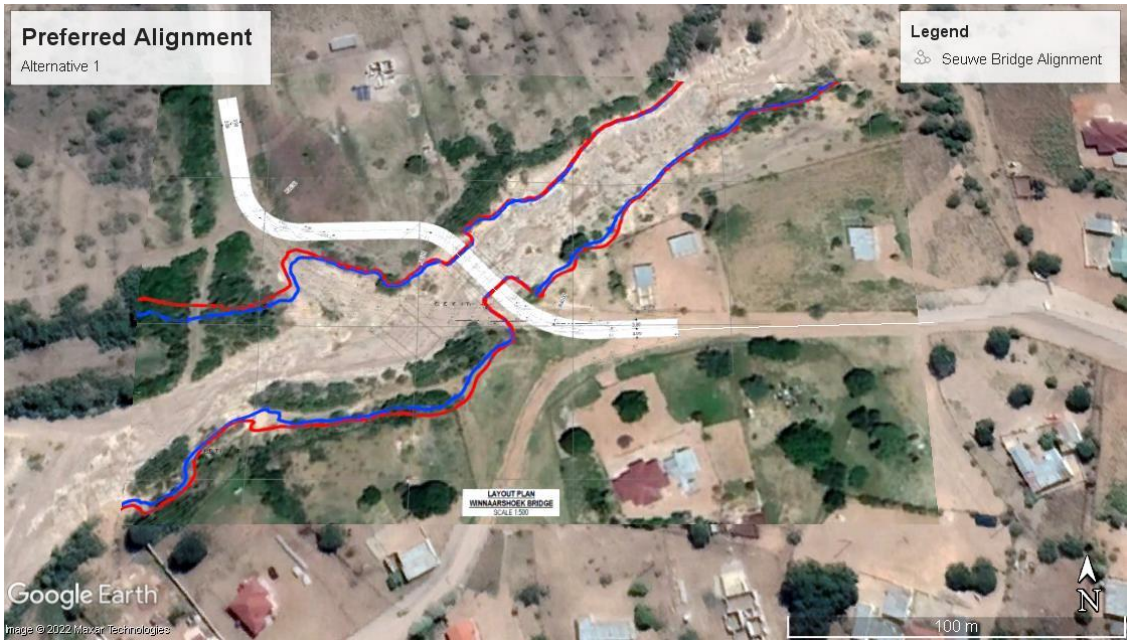
"alternatives", in relation to a proposed activity, means different means of meeting the general purpose and requirements of the activity, which may include alternatives to—

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

Describe alternatives that are considered in this application. Alternatives should include a consideration of all possible means by which the purpose and need of the proposed activity could be accomplished in the specific instance taking account of the interest of the applicant in the activity. The no-go alternative must in all cases be included in the assessment phase as the baseline against which the impacts of the other alternatives are assessed. The determination of whether site or activity (including different processes etc.) or both is appropriate needs to be informed by the specific circumstances of the activity and its environment. After receipt of this report the Department may also request the applicant to assess additional alternatives that could possibly accomplish the purpose and need of the proposed activity if it is clear that realistic alternatives have not been considered to a reasonable extent.

Table 6 below describes the alternatives being assessed in this report for the proposed project.

Table 6: Proposed Alternatives

No./ Alternative Type	Description
1. Alignment Alternatives	**Alignment Alternative 1 (Preferred)** Alignment Alternative 1, as depicted in Figure 3 below, requires some curves on the alignment, however, the crossing of the watercourse, wetland area and floodline is less, thereby reducing the project footprint.  **Figure 3: Alignment Alternative 1 (Preferred)**
	Alignment Alternative 2 (Not Preferred) Alignment Alternative 2, as depicted in Figure 4 below, simplifies the road geometric design as it is a bit straight; however, it spans a larger section of the watercourse, wetland area and floodline.

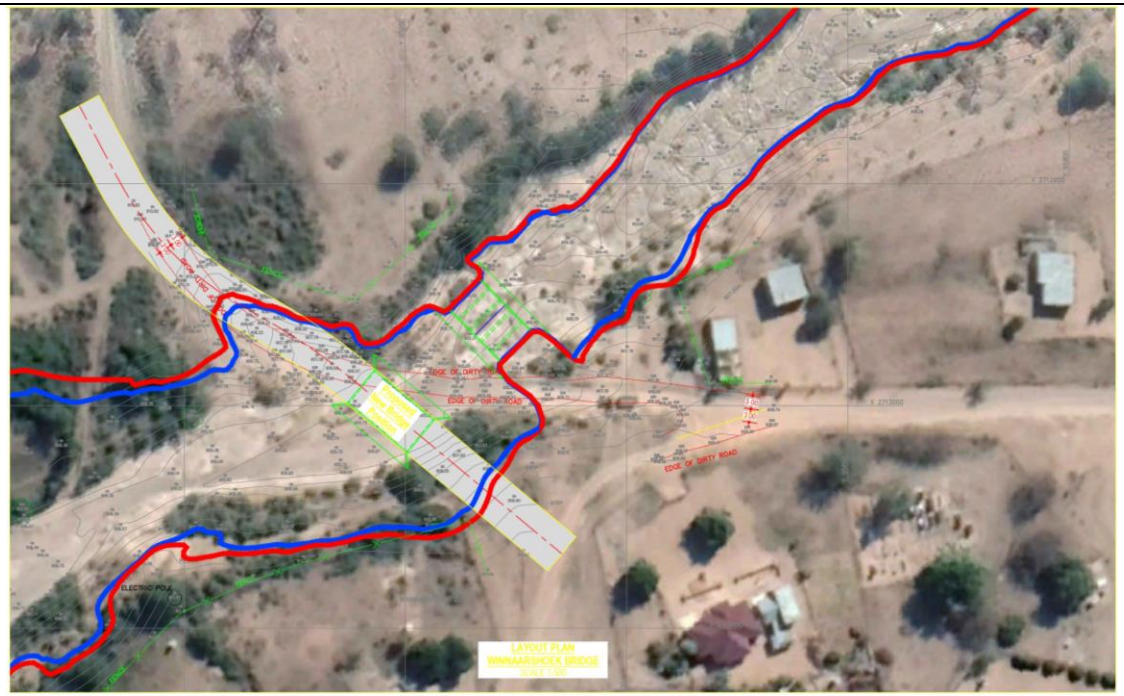


Figure 4: Alignment Alternative 1 (Not Preferred)

Paragraphs 3 – 13 below should be completed for each alternative.

Please note that the alternatives proposed have the same receiving environment and will therefore be assessed together. It is for this reason that Paragraphs 3 – 13 will not be duplicated. Where the alternatives differ, these will be addressed accordingly.

2. ACTIVITY POSITION

Indicate the position of the activity using the latitude and longitude of the centre point of the site for each alternative site. The co-ordinates should be in degrees, minutes and seconds. The projection that must be used in all cases is the Hartebeeshoek 94 WGS84 spheroid in a national or local projection.

List alternative sites, if applicable.

	Latitude (S):			Longitude (E):		
Alternative:						
Alternative S12 (preferred or only site alternative)						
Alternative S2 (if any)						
Alternative S3 (if any)						

In the case of linear activities:

Alternative:	**Latitude (S):**			**Longitude (E):**		
Alignment Alternative 1 (**preferred**)						
• Starting point of the activity	24˚	31'	05.10"	30˚	03'	14.58"
• Middle/Additional point of the activity	24˚	31'	04.08"	30˚	03'	11.78"
• End point of the activity	24˚	31'	02.55"	30˚	03'	09.27"
Alignment Alternative 2 (**not preferred**)						
• Starting point of the activity	24˚	31'	06.24"	30˚	03'	12.78"
• Middle/Additional point of the activity	24˚	31'	05.24"	30˚	03'	10.95"
• End point of the activity	24˚	31'	02.68"	30˚	03'	08.99"
Alternative S3 (if any)						
• Starting point of the activity						
• Middle/Additional point of the activity						
• End point of the activity						

For route alternatives that are longer than 500m, please provide an addendum with co-ordinates taken every 250 meters along the route for each alternative alignment.

[2] "Alternative S.." refer to site alternatives.

3. PHYSICAL SIZE OF THE ACTIVITY

Indicate the physical size of the preferred activity/technology as well as alternative activities/technologies (footprints):

Alternative:	Size of the activity:
Alternative A13 (preferred activity alternative)	
Alternative A2 (if any)	
Alternative A3 (if any)	

or,

for linear activities:

Alternative:	Length of the activity:
Alignment Alternative 1 (**preferred**)	170 m
Alignment Alternative 2 (**not preferred**)	150 m
Alternative A3 (if any)	

Indicate the size of the alternative sites or servitudes (within which the above footprints will occur):

Alternative:	Size of the site/servitude:
Alignment Alternative 1 (**preferred**)	+/-1 500 m²
Alignment Alternative 2 (**not preferred**)	
Alternative A3 (if any)	

4. SITE ACCESS

Does ready access to the site exist?	**YES**
If NO, what is the distance over which a new access road will be built	
Describe the type of access road planned:	
Maximum use of existing roads and properties shall be made.	

Include the position of the access road on the site plan and required map, as well as an indication of the road in relation to the site.

5. SITE OR ROUTE PLAN

A detailed site or route plan(s) must be prepared for each alternative site or alternative activity. It must be attached as Appendix A to this document.

The site or route plans must indicate the following:

6.1 the scale of the plan which must be at least a scale of 1:500;

6.2 the property boundaries and numbers of all the properties within 50 metres of the site;

[3] "Alternative A.." refer to activity, process, technology or other alternatives.

6.3 the current land use as well as the land use zoning of each of the properties adjoining the site or sites;
6.4 the exact position of each element of the application as well as any other structures on the site;
6.5 the position of services, including electricity supply cables (indicate above or underground), water supply pipelines, boreholes, street lights, sewage pipelines, storm water infrastructure and telecommunication infrastructure;
6.6 all trees and shrubs taller than 1.8 metres;
6.7 walls and fencing including details of the height and construction material;
6.8 servitudes indicating the purpose of the servitude;
6.9 sensitive environmental elements within 100 metres of the site or sites including (but not limited thereto):

- rivers;
- the 1:100 year flood line (where available or where it is required by Department of Water Affairs);
- ridges;
- cultural and historical features;
- areas with indigenous vegetation (even if it is degraded or invested with alien species);

6.10 for gentle slopes the 1 metre contour intervals must be indicated on the plan and whenever the slope of the site exceeds 1:10, the 500mm contours must be indicated on the plan; and
6.11 the positions from where photographs of the site were taken.

The Locality Maps, CBA Map, Hydrology Map, Wetland Delineation Map and Vegetation Maps are attached within **Appendix A**.

6. SITE PHOTOGRAPHS

Colour photographs from the centre of the site must be taken in at least the eight major compass directions with a description of each photograph. Photographs must be attached under Appendix B to this form. It must be supplemented with additional photographs of relevant features on the site, if applicable.

Site photographs are attached within **Appendix B**.

7. FACILITY ILLUSTRATION

A detailed illustration of the activity must be provided at a scale of 1:200 as Appendix C for activities that include structures. The illustrations must be to scale and must represent a realistic image of the planned activity. The illustration must give a representative view of the activity.

Facility Illustrations/ layouts are included within **Appendix C**.

8. ACTIVITY MOTIVATION

9(a) Socio-economic value of the activity

What is the expected capital value of the activity on completion?	+/- **R5.5m**
What is the expected yearly income that will be generated by or as a result of the activity?	**N/A**

Will the activity contribute to service infrastructure?	**YES**
Is the activity a public amenity?	**YES**
How many new employment opportunities will be created in the development phase of the activity?	+/- **4-6**
What is the expected value of the employment opportunities during the development phase?	+/- **R3m**
What percentage of this will accrue to previously disadvantaged individuals?	**90%**
How many permanent new employment opportunities will be created during the operational phase of the activity?	**0**
What is the expected current value of the employment opportunities during the first 10 years?	**N/A**
What percentage of this will accrue to previously disadvantaged individuals?	**N/A**

9(b) Need and desirability of the activity

Motivate and explain the need and desirability of the activity (including demand for the activity):

NEED:			
i.	Was the relevant municipality involved in the application?		**NO**
ii.	Does the proposed land use fall within the municipal Integrated Development Plan?	**YES**	
iii.	If the answer to questions 1 and / or 2 was NO, please provide further motivation / explanation:		
	The proposed development is a small-scale bridge within the Seuwe community. The objective of the project is making the area more accessible, which will allow for a safe crossing over the watercourse for the community (motorists, pedestrians and cyclists). The latest IDP of the Fetakgomo Tubatse Local Municipality highlights that the municipality is facing challenges to speed up the provision of basic services like electricity, access roads and bridges, portable water, decent housing and adequate sanitation. Thus the proposed bridge will assist the municipality in attaining a basic service for a local community.		

DESIRABILITY:			
i.	Does the proposed land use / development fit the surrounding area?	**YES**	
ii.	Does the proposed land use / development conform to the relevant structure plans, Spatial development Framework, Land Use Management Scheme, and planning visions for the area?	**YES**	
iii.	Will the benefits of the proposed land use / development outweigh the negative impacts of it?	**YES**	
iv.	If the answer to any of the questions 1-3 was NO, please provide further motivation / explanation:		

	Not Applicable		
v.	Will the proposed land use / development impact on the sense of place?		**NO**
vi.	Will the proposed land use / development set a precedent?	**YES**	
vii.	Will any person's rights be affected by the proposed land use / development?		**NO**
viii.	Will the proposed land use / development compromise the "urban edge"?		**NO**
ix.	If the answer to any of the question 5-8 was YES, please provide further motivation / explanation.		
	Accessibility will allow for more movement in and out of the area which may result in further economic development on a local scale e.g. informal trading.		

BENEFITS:			
i.	Will the land use / development have any benefits for society in general?	**YES**	
ii.	Explain:		
	Roads and bridges are considered basic needs for communities to function adequately. The proposed bridge will allow for the Seuwe community to be more accessible with the provision of a safe crossing over the watercourse. This will also reduce the risk to the locals by having to either cross the river unsafely or travel far distances to get across. The Seuwe community will allow traffic to pass through.		
iii.	Will the land use / development have any benefits for the local communities where it will be located?	**YES**	
iv.	Explain:		
	Roads and bridges are considered basic needs for communities to function adequately. The proposed bridge will allow for the Seuwe community to be more accessible with the provision of a safe crossing over the watercourse. This will also reduce the risk to the locals by having to either cross the river unsafely or travel far distances to get across. Furthermore, employment opportunities will be presented (temporary during the construction phase, but would allow for skills development). Local supplies will also be used for construction. Thus, the activity will boost the local economy.		

9. APPLICABLE LEGISLATION, POLICIES AND/OR GUIDELINES

List all legislation, policies and/or guidelines of any sphere of government that are applicable to the application as contemplated in the EIA regulations, if applicable.

Table 7: Applicable Legislation, Policies and/ or Guidelines

Title of legislation, policy or guideline (Promulgation Date)	Applicable Requirements	Administering Authority	Description of compliance
National Environmental Management Act (Act No. 107 of 1998)	NEMA requires, inter alia, that: o Development must be socially, environmentally, and economically sustainable. o Disturbance of ecosystems and loss of biological diversity are avoided, or, where they cannot be altogether avoided, are minimised and remedied. o A risk-averse and cautious approach is applied, which takes into account the limits of current knowledge about the consequences of decisions and actions. EIA Regulations have been promulgated in terms of Chapter 5. Activities which may not commence without an environmental authorisation are identified within these Regulations. In terms of S24(1) of NEMA, the potential impact on the environment associated with these listed activities must be considered, investigated, assessed and reported on to the competent authority charged by NEMA with granting of the relevant environmental authorisation.	National Department of Forestry, Fisheries and Environment (DFFE) Limpopo Department of Economic Development, Environment and Tourism (LEDET)	The Basic Assessment is undertaken in accordance with the requirements of Government Notice R326 of April 2017, as required in terms of the National Environmental Management Act, 1998 (No. 107 of 1998).
National Environmental Management Act (Act No. 107 of 1998)	A project proponent is required to consider a project holistically and to consider the cumulative effect of potential impacts. In terms of the Duty of Care provision in S28(1) the project proponent must ensure that reasonable measures are taken throughout the life cycle of this project to ensure that any pollution	National Department of Forestry, Fisheries and Environment (DFFE) Limpopo Department of	While no permitting or licensing requirements arise directly, the holistic consideration of the potential impacts of the proposed project has found application in the EIA Phase.

Title of legislation, policy or guideline (Promulgation Date)	Applicable Requirements	Administering Authority	Description of compliance
	or degradation of the environment associated with a project is avoided, stopped or minimised.	Economic Development, Environment and Tourism (LEDET)	The implementation of mitigation measures is included as part of the Project EMPr and will continue to apply throughout the life cycle of the project.
National Water Act (Act No. 36 of 1998)	Section 21 water uses as per the NWA includes: 21(a): Taking water from a water resource; 21(b): Storing water; 21(c): Impeding or diverting the flow of water in a watercourse; 21(d): Engaging in a stream flow reduction activity; 21(e): Engaging in a controlled activity; 21(f): Discharging waste or water containing waste into a water resource through a pipe, canal, sewer or other conduit; 21(g): Disposing of waste in a manner which may detrimentally impact on a water resource; 21(h): Disposing in any manner of water which contains waste from, or which has been heated in any industrial or power generation process; 21(i): Altering the bed, banks, course or characteristics of a watercourse; 21(j): Removing, discharging or disposing of water found underground if it is necessary for the efficient continuation of an activity or for the safety of people; and 21(k): Using water for recreational purposes. For wetland areas, development within a 500m buffer triggers the act. For rivers, development within a 100m buffer triggers the act. Any activity that triggers any of the above water uses will require a Water Use License.	Department of Water and Sanitation (DWS)	The proposed development requires a Water Use License as Section 21 c and i of the NWA are triggered as a result of works taking place within the watercourse and wetland areas. A Water Use License Application is currently being uploaded onto the DWS eWULAAS portal.

Title of legislation, policy or guideline (Promulgation Date)	Applicable Requirements	Administering Authority	Description of compliance
	Given the sensitivity associated with a project, DWS will determine whether the project will follow a General Authorisation process or a Water Use License Application process.		
National Environmental Management: Biodiversity Act 2004 (Act No. 10 of 2004)	This Act provides management and conservation of South Africa's biodiversity within the framework of the National Environmental Management Act107 of 1998; the protection of species and ecosystems that warrant national protection and the sustainable use of indigenous biological resources.	National Department of Forestry, Fisheries and Environment (DFFE)	While no permitting or licensing requirements arise from this legislation, this Act will find application during the construction phase of the project in proper management of the sensitive area (wetland) identified on site.
National Environmental Management: Waste Act (Act No. 59 of 2008)	The NEMA: WA came into effect on the on 1st July 2009. Section 20 of the Environment Conservation Act 73 of 1989, under which waste management was previously governed, was repealed. In general, the act seeks to ensure that people are aware of the impact of waste on their health wellbeing and the environment, and in the process giving effect to Section 24 of the constitution, in ensuring an environment that is not harmful to health and wellbeing.	National Department of Forestry, Fisheries and Environment (DFFE) National Department of Forestry, Fisheries and Environment (DFFE) – lead authority for regulating hazardous waste. Provincial Environmental Department – for regulating general waste	No waste license activities are applicable to this project. The developer will however be required to store and manage waste in accordance with the requirements of this Act and associated Standards.
National Environmental Management: Air Quality Act (Act No. 39 of 2004)	S18, S19 and S20 of the Act allow certain areas to be declared and managed as "priority areas". The Act provides that an air quality officer may require any person to submit an atmospheric impact report if there is reasonable suspicion that the person has failed to comply with the Act. Dust Control Regulation Control Regulations, R. No. 827 of 1	National Department of Forestry, Fisheries and Environment (DFFE)	While no permitting or licensing requirements arise from this legislation for the site, this Act will find application during the construction phase of the project. The implementation of dust mitigation measures are included as part of the project EMPr and will continue to apply throughout the life cycle of the project.

Title of legislation, policy or guideline (Promulgation Date)	Applicable Requirements	Administering Authority	Description of compliance
	November 2013.		Dust control regulations promulgated in November 2013 may require the implementation of a dust management plan.
National Heritage Resource Act, 1999 (Act No. 25 of 1999)	Section 38 states that Heritage Impact Assessments (HIAs) are required for certain kinds of development including the construction of a road, exceeding 300m in length. In accordance with the NHRA, an independent heritage consultant is to conduct a cultural heritage assessment to determine any impact on any sites, features or objects of cultural heritage significance. If none are identified, any archaeological sites or graves to be exposed during construction work must immediately be reported to a heritage practitioner so that an investigation and evaluation of the finds can be made. If a permit is required as per section 34 of the NHRA, no works are to commence before the permit is obtained.	South African Heritage Resources Association (SAHRA) Limpopo Heritage Resources Authority (LIHRA)	Should any heritage sites be unearthed during excavations, a permit would be required to be obtained from SAHRA.
Promotion of Access to Information Act, 2000 (Act No. 2 of 2000)	Legislation that allows the public access to information about activities that influence their well-being and to make contributions to decision making.	National Department of Forestry, Fisheries and Environment (DFFE)	No permitting is required. The act finds applicability during the public participation process phase of the Basic Assessment process.
Occupational Health and Safety (Act No. 85 of 1993)	The Occupational Health and Safety Act provides for the health and safety of persons at work and for the health and safety of persons in connection with the use of plant and machinery; the protection of persons other than persons at work, against hazards to health and safety arising out of or in connection with the activities of persons at work.	Department of Labour	While no permitting or licensing requirements arise from this legislation, this Act will find application during the construction phase of the project. Health and safety precautions measures must be put in place for the construction crew and the general public. E.g. Protection of workers on site through provision of Personal Protective Equipment's; Training and other health and safety amenities.

10. WASTE, EFFLUENT, EMISSION AND NOISE MANAGEMENT

11(a) Solid waste management

Will the activity produce solid construction waste during the construction/initiation phase?	**YES**
If yes, what estimated quantity will be produced per month?	Could not be determined at this stage

How will the construction solid waste be disposed of (describe)?

Construction rubble/ solid waste will be temporarily stored on site in designated waste skips and then removed by an appropriate waste contractor appointed by the main construction contractor to an approved landfill site. This will be managed through the EMPr – **Appendix F1**.

Where will the construction solid waste be disposed of (describe)?

General waste removed from site will be disposed of at a suitably licensed disposal facility. The nearest licensed landfill site shall be utilised. Safe disposal certificates must be obtained and kept on site for the duration of the construction phase.

Will the activity produce solid waste during its operational phase?	**NO**
If yes, what estimated quantity will be produced per month?	

How will the solid waste be disposed of (describe)?

As the proposed development falls under the Fetakgomo Tubatse Local Municipality, the council is expected to collect the waste on a regular basis and dispose of at a registered landfill.

Where will the solid waste be disposed if it does not feed into a municipal waste stream (describe)?

As above.

If the solid waste (construction or operational phases) will not be disposed of in a registered landfill site or be taken up in a municipal waste stream, then the applicant should consult with the department to determine whether it is necessary to change to an application for scoping and EIA.

Can any part of the solid waste be classified as hazardous in terms of the relevant legislation?	**NO**
If yes, inform the department and request a change to an application for scoping and EIA.	

Is the activity that is being applied for a solid waste handling or treatment facility?	**NO**

If yes, then the applicant should consult with the Department to determine whether it is necessary to change to an application for scoping and EIA.

11(b) Liquid effluent

Will the activity produce effluent, other than normal sewage, that will be disposed of in a municipal sewage system? **NO**

If yes, what estimated quantity will be produced per month?

Will the activity produce any effluent that will be treated and/or disposed of on site?

If yes, the applicant should consult with the Department to determine whether it is necessary to change to an application for scoping and EIA.

Will the activity produce effluent that will be treated and/or disposed of at another facility? **NO**

If yes, provide the particulars of the facility:

Facility name:
Contact person:
Postal address:
Postal code:
Telephone: Cell:
E-mail: Fax:

Describe the measures that will be taken to ensure the optimal reuse or recycling of waste water, if any:

11(c) Emissions into the atmosphere

Will the activity release emissions into the atmosphere? **YES**

If yes, is it controlled by any legislation of any sphere of government?

If yes, the applicant should consult with the competent authority to determine whether it is necessary to change to an application for scoping and EIA.

If no, describe the emissions in terms of type and concentration:

During construction, there will be localized liberation of dust due to excavations and the hauling of materials around the site. Localised exhaust emissions will also occur, however a significant increase in concentrations of hydrocarbons, nitrogen oxides and carbon monoxide are not anticipated. During the operation phase there is likely to be localised diesel fumes in the immediate vicinity of the diesel tanks as is characteristic of a typical diesel depot. Increased emissions may occur due to increased traffic in the vicinity to access the diesel depot.

11(d) Generation of noise

Will the activity generate noise? **YES**

If yes, is it controlled by any legislation of any sphere of government? **NO**

If yes, the applicant should consult with the competent authority to determine whether it is necessary to change to an application for scoping and EIA.

If no, describe the noise in terms of type and level:

During the construction phase, increase in noise pollution due to, among others, excavations and site clearing, noise from construction vehicles and construction staff and or drilling activities. Noise pollution caused during construction could potentially be a nuisance to the local community and surrounding areas.

During the operational phase, there is likely to be an increase in noise as a result of an increase of people making use of the bridge.

11. WATER USE

Please indicate the source(s) of water that will be used for the activity by ticking the appropriate box(es)

municipal	water board	groundwater	river, stream, dam or lake	other	the activity will not use water

If water is to be extracted from groundwater, river, stream, dam, lake or any other natural feature, please indicate the volume that will be extracted per month:

Does the activity require a water use permit from the Department of Water Affairs? **NO**

If yes, please submit the necessary application to the Department of Water Affairs and attach proof thereof to this application if it has been submitted.

12. ENERGY EFFICIENCY

Describe the design measures, if any, that have been taken to ensure that the activity is energy efficient:

No particular considerations of energy saving/ conservation were deemed applicable in this project. The scope of work will be structured in a way that, where possible, the use of labour intensive methods will be employed. Not only will it serve the local community but it also saves the use of Pneumatic Equipment that requires a lot of energy input.

Describe how alternative energy sources have been taken into account or been built into the design of the activity, if any:

The proposed development is not an energy-intensive development that will require energy/electricity input for its continued operations and will therefore not consume energy during its operation phase.

SECTION B: SITE/AREA/PROPERTY DESCRIPTION

Important notes:

1. For linear activities (pipelines, etc) as well as activities that cover very large sites, it may be necessary to complete this section for each part of the site that has a significantly different environment. In such cases please complete copies of Section C and indicate the area, which is covered by each copy No. on the Site Plan.

Section C Copy No. (e.g. A):	**A**

2. Paragraphs 1 – 6 below must be completed for each alternative.

Please note that the same would apply for both alternatives proposed thus will be addressed together. It is for this reason that Paragraphs 1 – 6 will not be duplicated. Where the alternatives differ, these will be addressed accordingly.

3. Has a specialist been consulted to assist with the completion of this section? **YES**

If YES, please complete the form entitled "Details of specialist and declaration of interest" for each specialist thus appointed:

All specialist reports must be contained in **Appendix D**.

Property description/physical address:	Winnaarshoek 250, Portion 0, KT Runs across the main river course passing through the Seuwe village close to Diphale, approximately 40km outside of Burgersfort within the Limpopo Province.
	(Farm name, portion etc.) Where a large number of properties are involved (e.g. linear activities), please attach a full list to this application.
	In instances where there is more than one town or district involved, please attach a list of towns or districts to this application.
Current land-use zoning:	Public Open Space
	In instances where there is more than one current land-use zoning, please attach a list of current land use zonings that also indicate which portions each use pertains to , to this application.

Is a change of land-use or a consent use application required?	**NO**
Must a building plan be submitted to the local authority?	**NO**

Locality map: An A3 locality map must be attached to the back of this document, as Appendix A. The scale of the locality map must be relevant to the size of the development (at least 1:50 000. For linear activities of more than 25 kilometres, a smaller scale e.g. 1:250 000 can be used. The scale must be indicated on the map.) The map must indicate the following:

- an indication of the project site position as well as the positions of the alternative sites, if any;
- road access from all major roads in the area;
- road names or numbers of all major roads as well as the roads that provide access to the site(s);
- all roads within a 1km radius of the site or alternative sites; and
- a north arrow;
- a legend; and
- locality GPS co-ordinates (Indicate the position of the activity using the latitude and longitude of the centre point of the site for each alternative site. The co-ordinates should be in degrees, minutes and seconds. The projection that must be used in all cases is the WGS84 spheroid in a national or local projection)

1. GRADIENT OF THE SITE

Indicate the general gradient of the site.

Alternative S1:

The project site is situated at an elevation of about 1123m and slopes slightly southward.

Flat	**1:50 – 1:20**	1:20 – 1:15	1:15 – 1:10	1:10 – 1:7,5	1:7,5 – 1:5	Steeper than 1:5

Alternative S2 (if any):

Flat	1:50 – 1:20	1:20 – 1:15	1:15 – 1:10	1:10 – 1:7,5	1:7,5 – 1:5	Steeper than 1:5

Alternative S3 (if any):

Flat	1:50 – 1:20	1:20 – 1:15	1:15 – 1:10	1:10 – 1:7,5	1:7,5 – 1:5	Steeper than 1:5

2. LOCATION IN LANDSCAPE

Indicate the landform(s) that best describes the site:

2.1 Ridgeline		2.6 Plain	**X**
2.2 Plateau		2.7 Undulating plain / low hills	
2.3 Side slope of hill/mountain		2.8 Dune	
2.4 Closed valley		2.9 Seafront	
2.5 Open valley			

3. GROUNDWATER, SOIL AND GEOLOGICAL STABILITY OF THE SITE

Is the site(s) located on any of the following (tick the appropriate boxes)?

	Alternative S1:		Alternative S2 (if any):		Alternative S3 (if any):	
Shallow water table (less than 1.5m deep)	**YES**		YES	NO	YES	NO
Dolomite, sinkhole or doline areas		**NO**	YES	NO	YES	NO
Seasonally wet soils (often close to water bodies)	**YES**		YES	NO	YES	NO
Unstable rocky slopes or steep slopes with loose soil		**NO**	YES	NO	YES	NO
Dispersive soils (soils that dissolve in water)		**NO**	YES	NO	YES	NO
Soils with high clay content (clay fraction more than 40%)	**YES**		YES	NO	YES	NO
Any other unstable soil or geological feature		**NO**	YES	NO	YES	NO
An area sensitive to erosion	**YES**		YES	NO	YES	NO

If you are unsure about any of the above or if you are concerned that any of the above aspects may be an issue of concern in the application, an appropriate specialist should be appointed to assist in the completion of this section. (Information in respect of the above will often be available as part of the project information or at the planning sections of local authorities. Where it exists, the 1:50 000 scale Regional Geotechnical Maps prepared by the Council for Geo Science may also be consulted).

Topography

Mainly semi-arid plains and open valleys between chains of hills and small mountains running parallel to the escarpment. Predominantly short, open to closed thornveld with an abundance of Aloe species and other succulents. Heavily degraded in places and overexploited by man for cultivation, mining and urbanisation. Both man-made and natural erosion dongas occur in areas containing clays rich in heavy metals. Encroachment by indigenous microphyllous trees and invasion by alien species is common throughout the area.

Climate

The area has summer rainfalls with very dry winters and has a Mean Annual Precipitation (MAP) of about 400–600mm.

Hydrology

As per the Screening Report attached as **Appendix G3**, Aquatic Biodiversity holds a low sensitivity which is depicted in Figure 5 below. In terms of the Aquatic Ecoregions of South Africa, the site falls within the Highveld Ecoregion. The site also falls within the Central Bushveld Group 7 Wetland Ecosystem Type.

Figure 5: Aquatic Sensitivity Map

The site is situated in quaternary catchment B71E of the second Water Management Area (WMA), the Olifants WMA. The stream associated with the proposed bridge is classified as a non-perennial river called Mogompane River. This river forms the upper reaches of a side-branch of the Olifants River into which it flows approximately 30km north of the study site. This is depicted in the Hydrology Map below. There are no National Freshwater Ecosystem Priority Area (NFEPA) Wetlands recorded in the region. The project is not located within a Strategic Water Source Areas (SWSA). The project is located about 19km to the south of the closest SWSA, namely the Northern Lowveld Escarpment Groundwater SWSA.

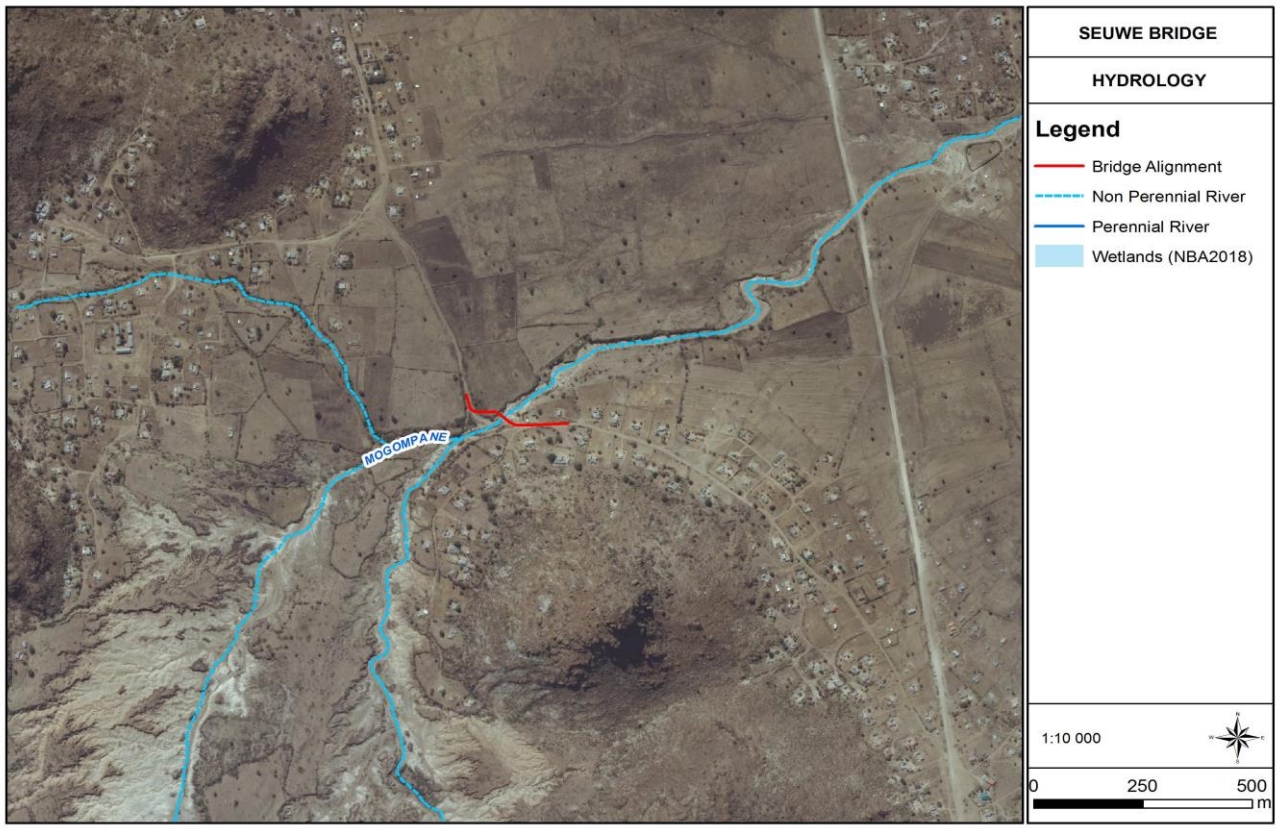


Figure 6: Hydrology Map

Drainage Line

The drainage line itself in the upper reaches does not have a defined watercourse as it meanders down the mountain slopes; however, at the base of the mountain slopes it flattens out mimicking a wide river bed. This wide flat river bed continues towards the bridge structure (analysing point) where it is channelled more into a defined river stream, passing through the structure.

Watercourse Classification and Delineation

The watercourse associated with the bridge crossing is classified as Non-Perennial Ephemeral River that likely flows for only between 3-6 months of the year depending on the rainfall. Due to the steep slopes of the catchment, the flow of the river is expected to be lotic (free-flowing), although it is likely to create some standing pools during the rainfall season. The proposed bridge gives access to parts of the community that are somewhat isolated, although other access roads are available. Due to the extensive erosion present, erosion protection structures should be considered during construction. It should also be noted that the bridge is planned approximately 100m east of the confluence of two very large alluvial fans as well as other smaller tributaries and flash flooding is thus highly likely where the bridge is planned.

A 70m buffer zone was calculated for the river, based on site specific characteristics and the expected risks associated with the proposed bridge construction, following Macfarlane *et al*., (2015). This buffer zone is relevant to authorisation from DWS. Figure 7 below presents the delineated watercourse and its associated buffer zones.

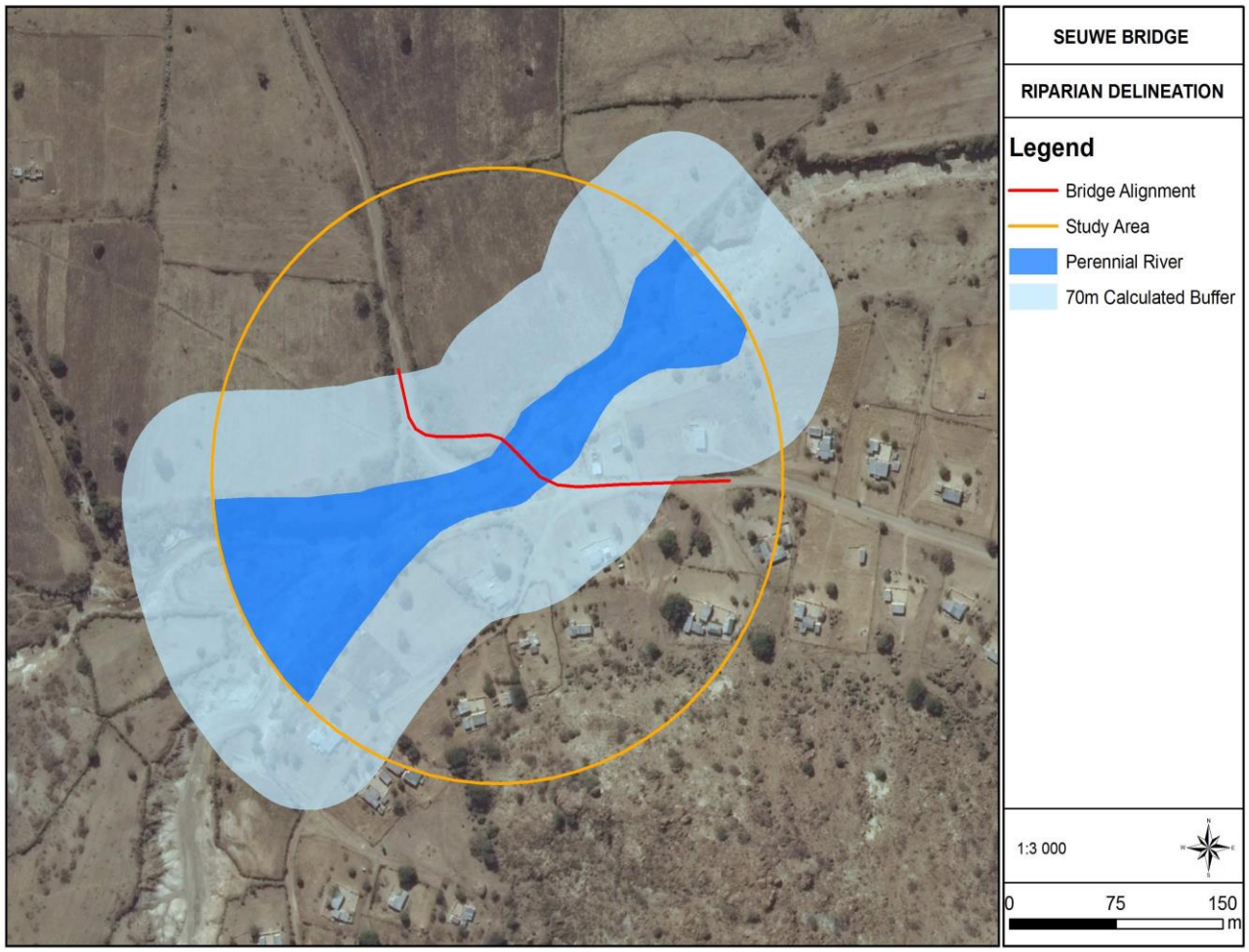


Figure 7: Wetland Delineation Map

Watercourse Functional Assessment

The Riparian Vegetation Response Assessment Index (VEGRAI) assessment was done do determine the Ecological Category (EC) for the vegetation component of the section of Mogompane River.

Riparian Vegetation Response Assessment Index (VEGRAI)

The riparian zone is significantly disturbed by current and historical erosion both from natural and anthropogenic causes including cultivation, grazing, urbanisation, and invasive alien species growth. However, the watercourse still provides important ecological functions such as water transport, dispersal corridors and specialised habitat for many animals. The

vegetation cover of the riparian zone is changed from historical conditions and the vast majority of the woody and the non-woody vegetation are exotic. Channel vegetation cover is very low with sparsely occurring patches of hydrophytes. The combined Ecological Category (EC) scores for the riparian area on the study site is a **D – Largely Modified**. A large loss of natural habitat, biota and basic ecosystem functions has occurred. Refer to Tables 8 and 9 below.

Table 8: Results and brief discussion of the Ecosystem Services provided by the section of the Mogompane River discussed in this report

LEVEL 3 ASSESSMENT					
METRIC GROUP	**CALCULATED RATING**	**WEIGHTED RATING**	**CONFIDENCE**	**RANK**	**% WEIGHT**
MARGINAL	68.6	19.6	2.5	2.0	40.0
NON MARGINAL	35.2	25.2	2.5	1.0	100.0
	2.0				140.0
LEVEL 3 VEGRAI (%)				44.8	
VEGRAI EC				**D**	
AVERAGE CONFIDENCE				2.5	

Table 9: QHI for the Episodic Stream

QUATERNARY CATCHMENT	RIVER	(0-5)	Flow modification (0-5)	Inundation (0-5)	Riparian/Bank condition (0-5)	modification (0-5)	DESKTOP HABITAT INTEGRITY	INSTREAM EC%	INSTREAM EC	Vegetation rating (0-5)	ECOSTATUS %	ECOSTATUS EC	CONFIDENCE (1-5)
B71E	Ephemeral Stream	4	3	2.5	4	3	**44**	**44**	**D**	3	**46.0**	**D**	3

Ecosystem Services (ES) – WET-EcoServices Version 2

The ecosystem services provided by the section of the Mogompane River associated with the study site is summarised in Table 10 and Figure 8 below. Scores are **Very Low** overall since the river is very eroded and does not support much indigenous vegetation. The highest score is for cultivated food as the area is in a rural area with high reliance on the river

for cultivation and livestock.

Table 10: Ecosystem Services provided by the Mogompane River

		Present State			
ECOSYSTEM SERVICE		**Supply**	**Demand**	**Importance Score**	**Importance**
REGULATING AND SUPPORTING SERVICES	Flood attenuation	0.5	0.0	0.0	Very Low
	Stream flow regulation	-	-	-	-
	Sediment trapping	0.0	1.5	0.0	Very Low
	Erosion control	0.2	4.0	0.7	Very Low
	Phosphate assimilation	0.0	1.5	0.0	Very Low
	Nitrate assimilation	0.0	1.5	0.0	Very Low
	Toxicant assimilation	0.0	0.8	0.0	Very Low
	Carbon storage	0.3	0.0	0.0	Very Low
	Biodiversity maintenance	2.2	0.0	0.7	Very Low
PROVISIONING SERVICES	Water for human use	0.6	3.3	0.8	Very Low
	Harvestable resources	1.0	1.3	0.2	Very Low
	Food for livestock	1.0	1.3	0.2	Very Low
	Cultivated foods	2.8	1.3	1.9	Moderate
CULTURAL SERVICES	Tourism and Recreation	0.2	0.0	0.0	Very Low
	Education and Research	0.8	0.3	0.0	Very Low
	Cultural and Spiritual	2.0	0.7	0.8	Low

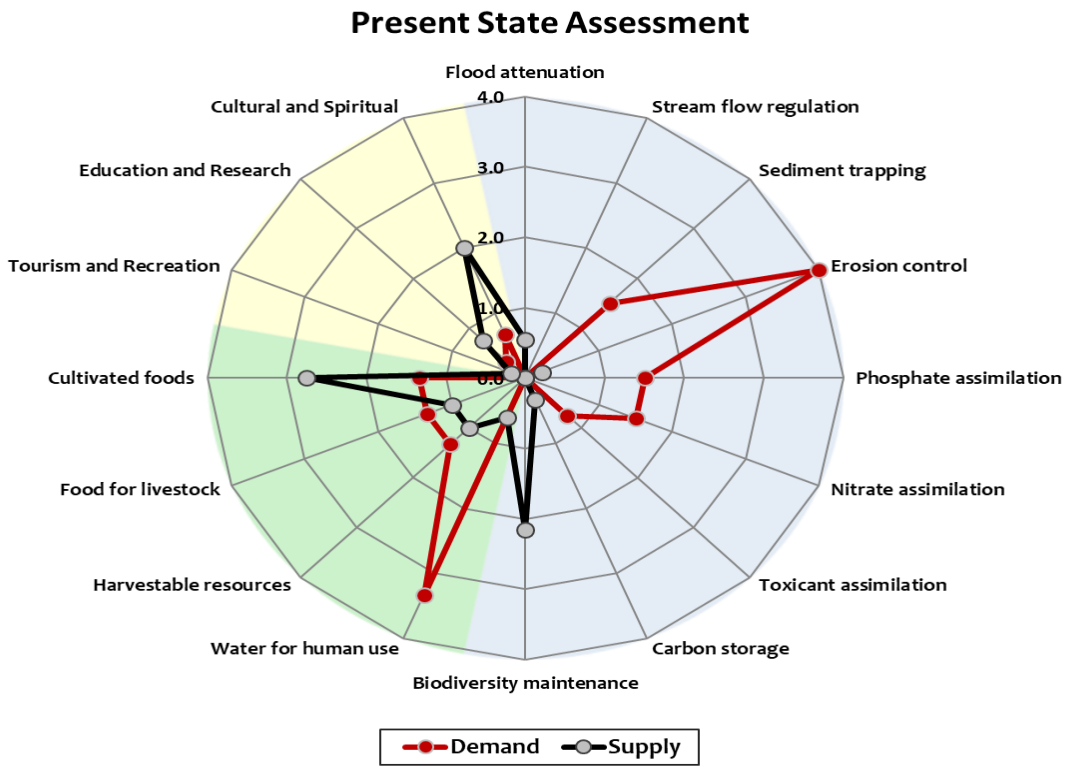


Figure 8: Ecosystem Services of the current state of the Ephemeral River

Recommended Ecological Category (REC)

Following the method set out in Rountree *et al.*, (2013), the VEGRAI value of D and Low EIS class, leads to the identification of an REC to of **D**. This means that the development should be done in such a way as to at a minimum maintain the EC values as D.

Geology and Soils

- Soils (ENPAT) – One or more of: vertic, melanic, red structured diagnostic horizons, undifferentiated.
- Geology – Underlain by Gabbro.

Refer to **Appendix G1** for the comprehensive Aquatic Biodiversity Assessment Report.

4. GROUNDCOVER

Indicate the types of groundcover present on the site:

The location of all identified rare or endangered species or other elements should be accurately indicated on the site plan(s).

Natural veld - good condition[E]	Natural veld with scattered aliens[E]	**Natural veld with heavy alien infestation[E]**	**Veld dominated by alien species[E]**	Gardens
Sport field	Cultivated land	Paved surface	Building or other structure	**Bare soil**

If any of the boxes marked with an "[E] "is ticked, please consult an appropriate specialist to assist in the completion of this section if the environmental assessment practitioner doesn't have the necessary expertise.

Agriculture

According to the Screening Report, with regards to Agriculture in the development area, the sensitivity is considered High as sections of the proposed area falls within Subsistence Farming;Land capability;06. Low-Moderate/07. Low-Moderate/08. Moderate. There are also Medium sensitivity sections which falls within Land capability;06. Low-Moderate/07. Low-Moderate/08. Moderate; and Low sensitivity sections which falls within Land capability;01. Very low/02. Very low/03. Low-Very low/04. Low-Very low/05. Low. This is depicted in Figure 9 below. In terms of land cover, the site and surroundings is classified as small scale agriculture and grazing, open and/or near natural and large erosion gullies where the proposed bridge is to cross. Thus, the actual section of works has a very low risk to agriculture potential.

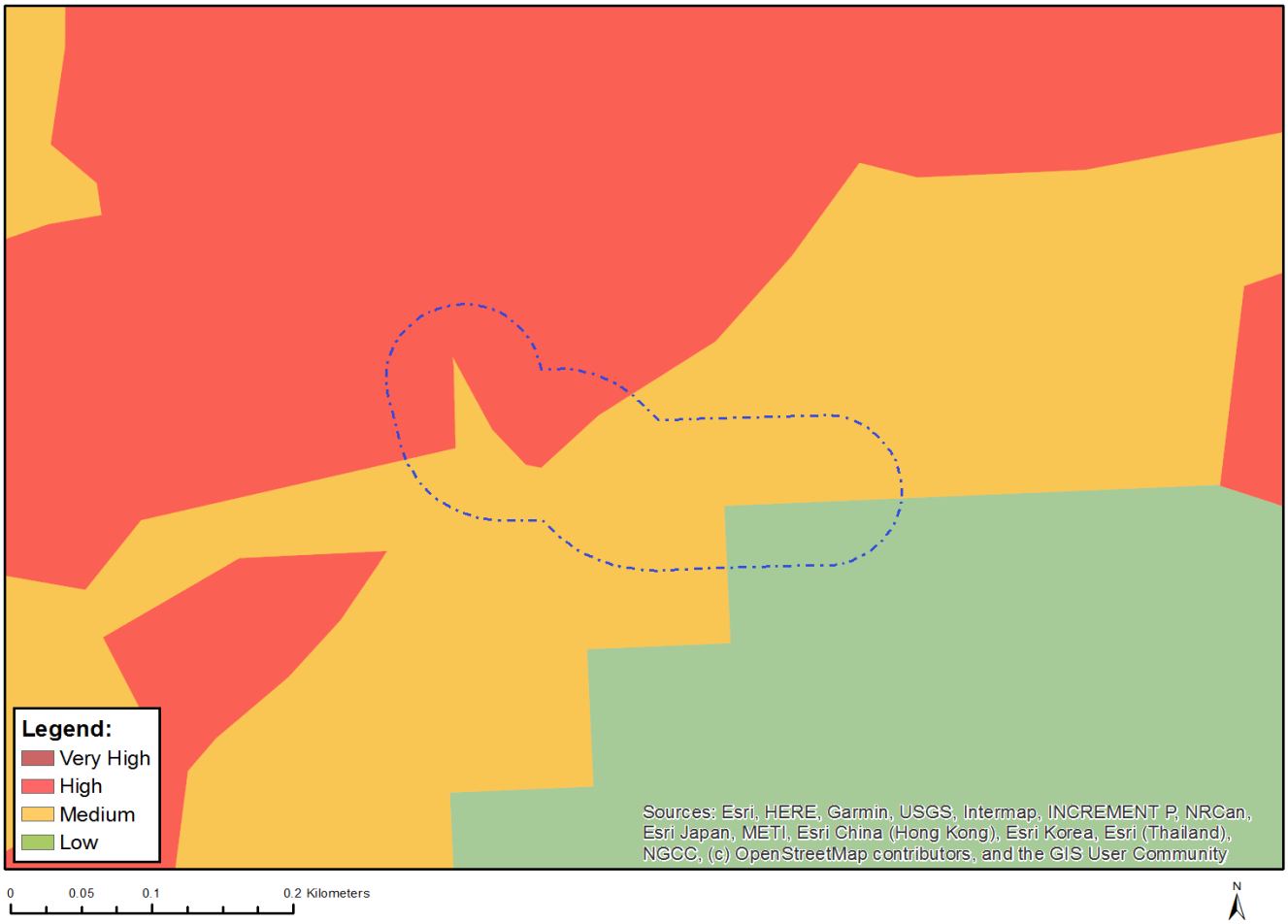


Figure 9: Agriculture Sensitivity Map

Land Use

The study site and surroundings has been utilised for small scale agriculture and grazing from as early as 1938 and rapidly expanded through urbanisation although large sections remain open and/or near natural. Figures 10 and 11 compares the historical image of 1938 to a recent image of 2021 both indicating large scale erosional features while the latter also shows a large increase in urbanisation. An evident feature is the large erosion gullies in the upper reaches of the Mogompane River where the proposed bridge is to cross. As stated by Mucina & Rutherford (2006) the area is overexploited through antropogenic activities including mining, urbanisation and cultivation. Erosion, both man-made and natural, as observed in the study site and surroundings, is high in areas containing clay rich in metals. They also state that much of the erosion is due to the inherent edaphic properties of the soil. Another possible contributing factor to the erosion is the steep slopes (Google earth, Elevation Profile, 2022) of the catchment area (Figure 12).

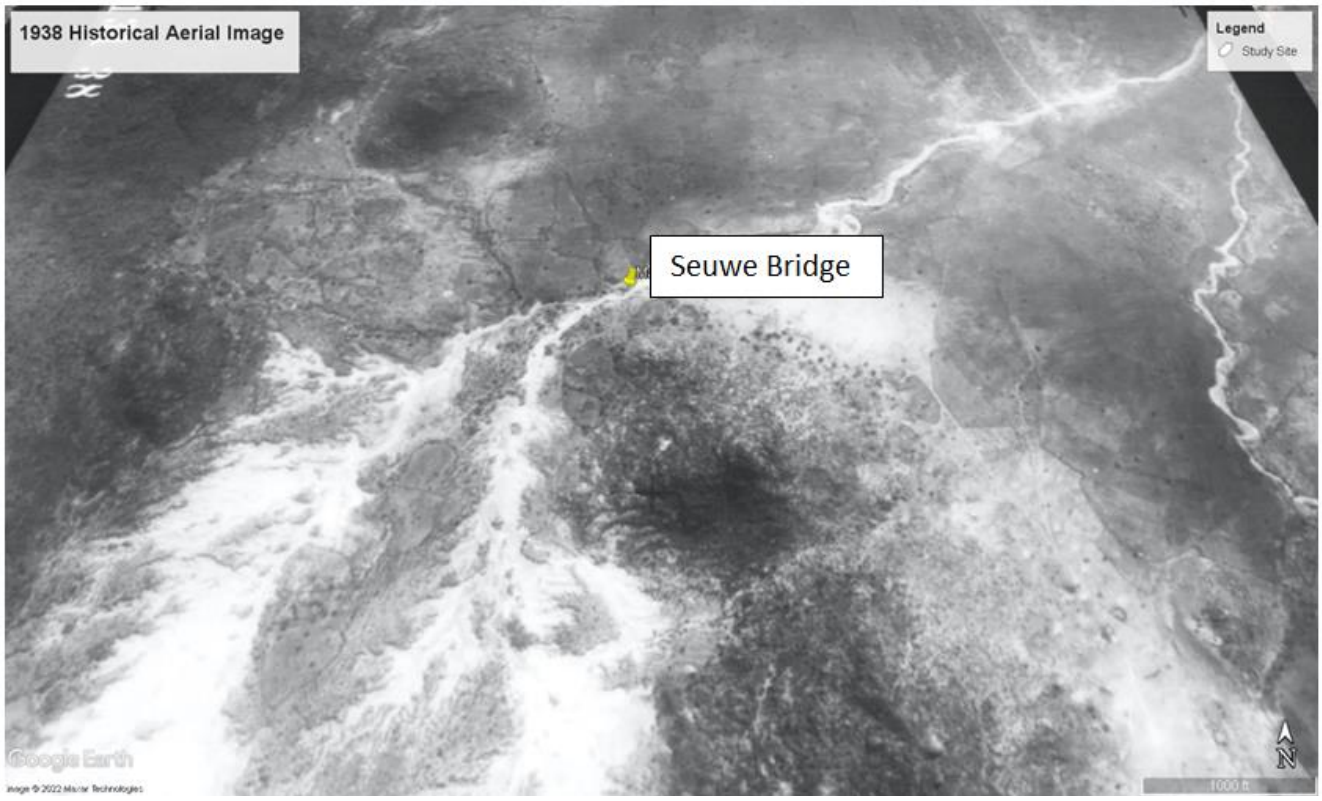


Figure 10: Historical Image of 1938

Figure 11: Recent Image of 2021

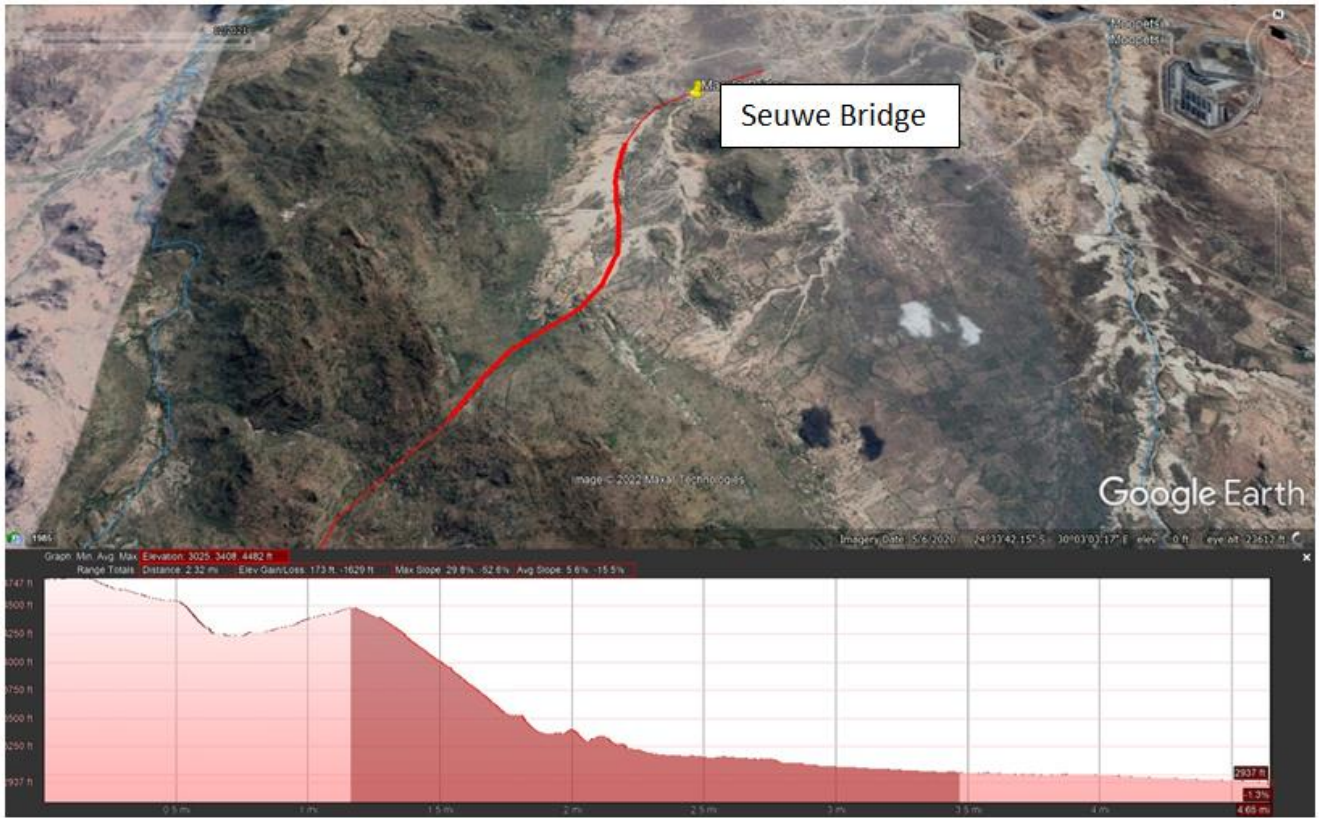


Figure 12: Steep slope (Elevation Profile) of the Mogompane River catchment

Limpopo Biodiversity Assessment and Conservation Plan

The site falls within an Ecological Support Area 2 (ESA) as depicted in Figure 13 below. ESAs play an important role in supporting the ecological functioning of a protected area or Critical Biodiversity Area, in delivering ecosystem services. In most cases ESA2 sites are those with degradation, whereas ESA1 are near-natural to natural. Such areas must be maintained in a functional state and intensification of land uses must be avoided.

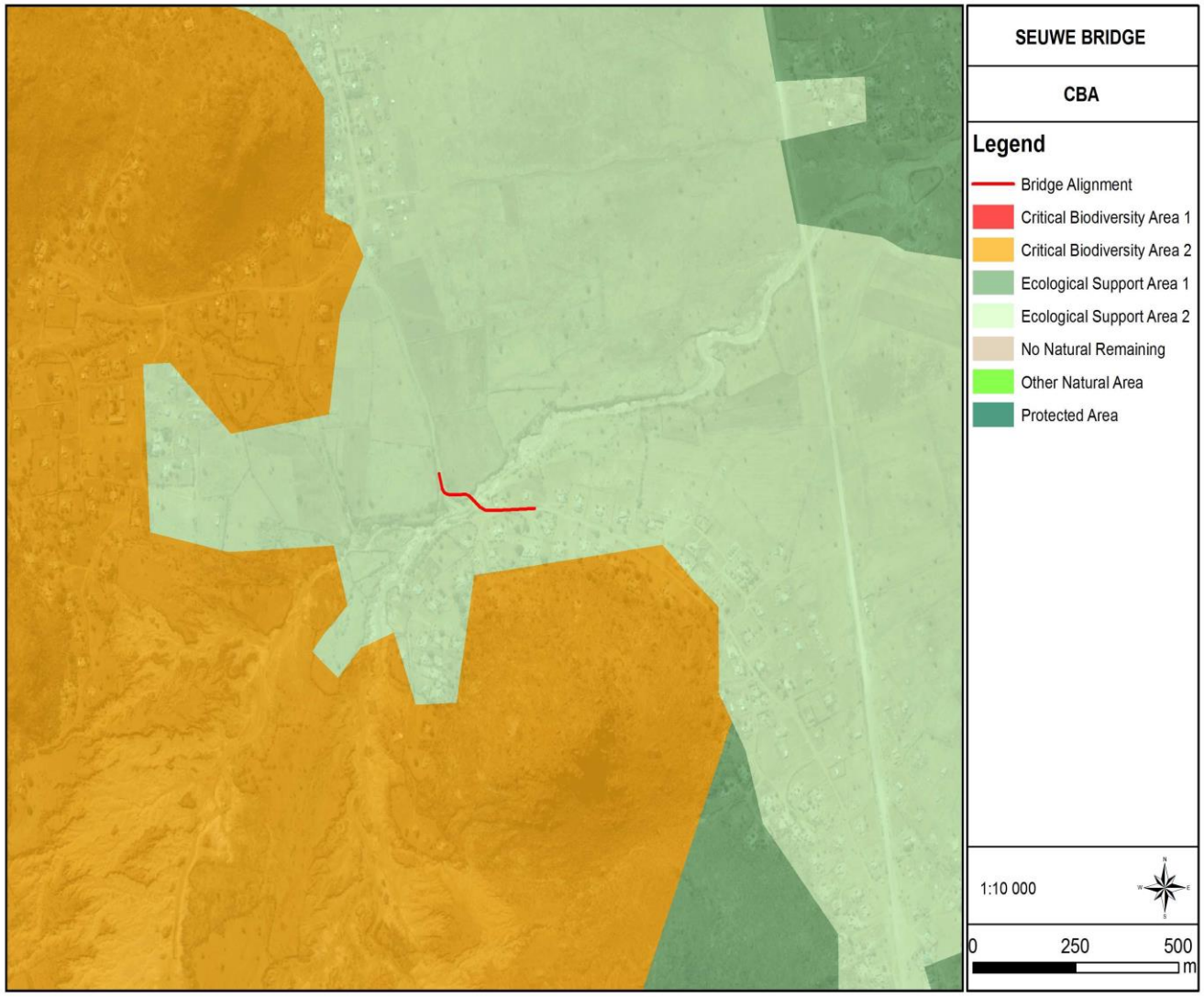


Figure 13: Limpopo Conservation Plan classification of the study area and surroundings

Regional Vegetation

According to the Screening Report, with regards to Plant Species in the development area, the sensitivity is considered Medium as a result of Sensitive species 1252, Sensitive species 1033, *Asparagus fourei*, *Asparagus sekukuniensis*, Sensitive species 303, *Polygala sekhukhuniensis* and *Searsia batophylla*. SANBI has withheld the name of the species as it may be prone to illegal harvesting and must be protected. This is depicted in Figure 14 below.

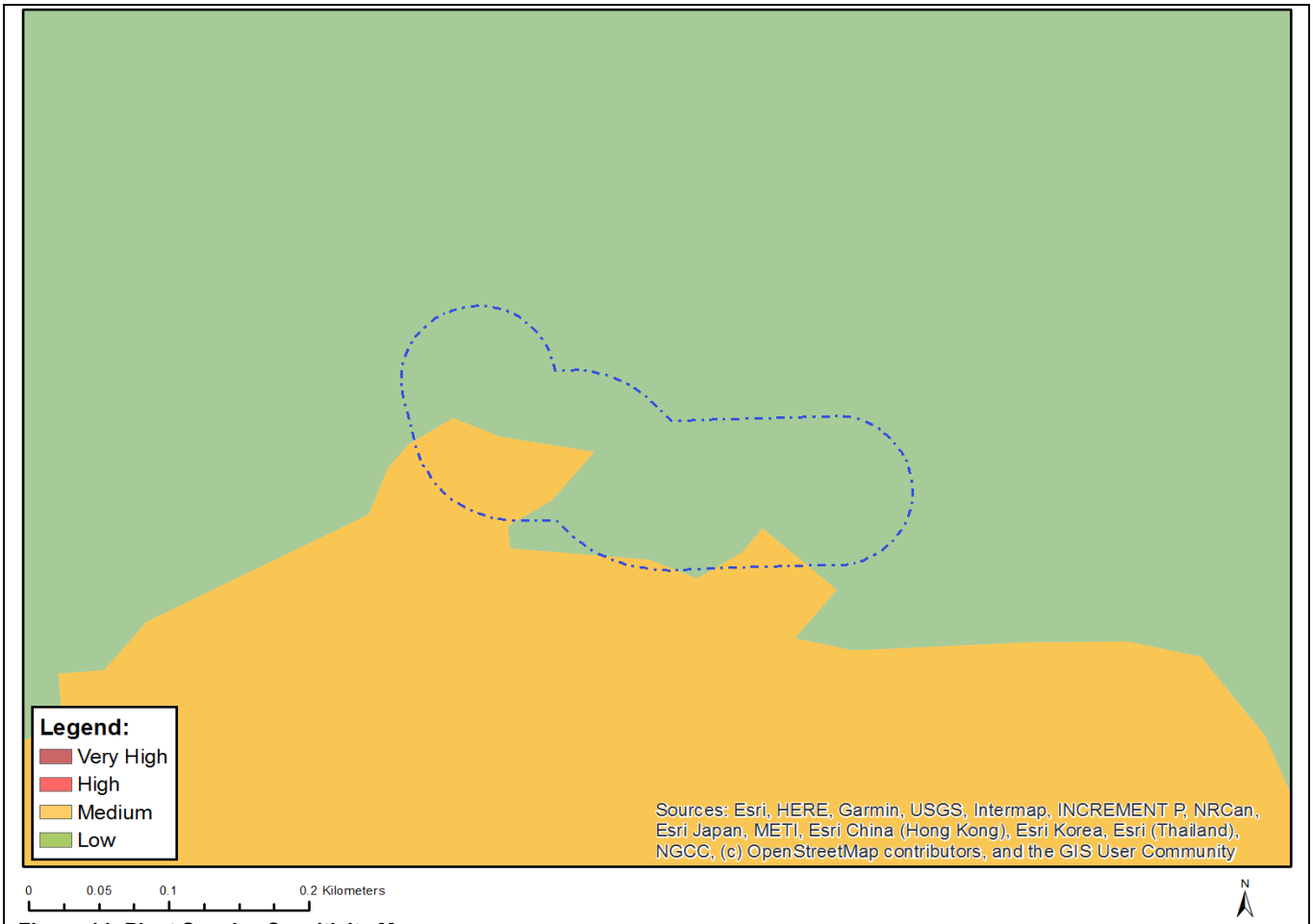


Figure 14: Plant Species Sensitivity Map

Vegetation

The proposed bridge is situated within the Sekhukhune Plains Bushveld (SVcb 27) Broad Vegetation Unit, which grows within the semi-arid plains between hills and mountains. It comprises short, open-to closed thornveld with several succulent species. The deeper soils were used for cultivation and grazing, leading to the encroachment of indigenous microphyllous vegetation and alien invasive plant species. The vegetation was considered Vulnerable in terms of Conservation Status. In terms of Protected areas, the proposed site is not itself within a protected area but the Potlake provincial Nature Reserve is situated about 29km north of the proposed bridge site.

Listed and Threatened ecosystems

According to the 2011 Listed Ecosystems, the site falls within the historic extent of the Sekhukhune Plains Bushveld which was not a threatened ecosystem at the time (Government Gazette 34809, Government Notice 1002, and 9 December 2011). Although the National List of Threatened Terrestrial Ecosystems published in terms of the Biodiversity Act in 2011 remains in

legal force, the data contained in the National Biodiversity Assessment (NBA) 2018 represents an update of the assessment of threat status for terrestrial ecosystems.

According to the NBA, the site is situated between remnant patches of the Sekhukhune Plains Bushveld, which is Endangered.

While the 2018 assessment of ecosystem threat status represents the best available science, the 2011 published list of threatened terrestrial ecosystems remains the official National List of Ecosystems that are Threatened and in Need of Protection. Until such time as the 2011 national list of threatened terrestrial ecosystems is replaced by a new list published in terms of NEMBA based on the updated 2018 assessment, SANBI encourages reference to both the 2011 and 2018 datasets.

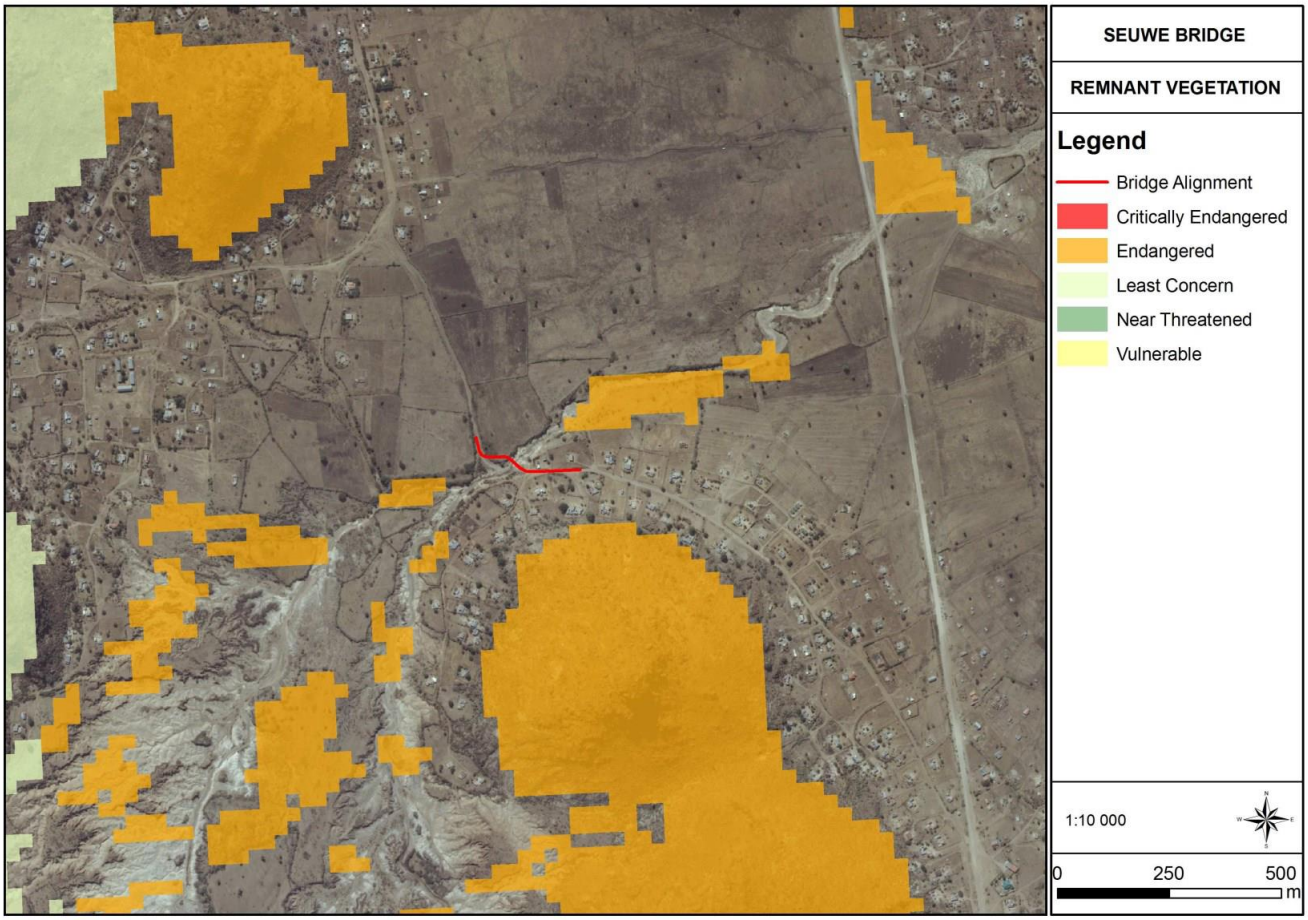


Figure 15: Remnant Vegetation

Potential sensitivities

The project site falls within the Sekhukhuneland Centre of Plant Endemism (SCPE). The topography of the SCPE is very

heterogeneous and the heavy-metal rich and relatively toxic soils, may have served as further stimulus for the diversification of plant life. The vegetation on ultramafic soils contains a high concentration of edaphic specialists. The distribution of the endemics of the SCPE is positively correlated with the occurrence of ultramafic rock. Mining activities in the region are causing some endemic species to be threatened with extinction. Furthermore, there are 58 endemic and approximately another 70 near-endemic plant taxa in Sekhukhuneland.

Project area of influence (PAOI)

The Project Area of Influence (PAOI) should be defined as per the Species Environmental Assessment Guideline (SANBI, 2020). The PAOI is based on the development footprint and the potential extent of the impacts (e.g., edge effects) of the project activities.

The proposed bridge and road portion were considered the primary PAOI, while a surrounding buffer of 50m was assessed as the secondary PAOI (area wherein secondary impacts (edge effects) could extent further than the proposed primary area of influence) (Figure 16). Some tertiary impacts may take place downstream of the bridge, although due to the dry climate, it is unlikely. The extent of impact will depend on the activity and waterflow at the time of the impact.

Figure 16: Project Area of Influence (PAOI)

Vegetation at the bridge crossing and immediate surrounds

In its natural state, the Sekhukhune Plains Bushveld comprises short, open to closed thornveld with an abundance of *Aloe* species and other succulents. However, this vegetation unit has been heavily degraded in places and overexploited by man for cultivation, mining, and urbanisation. Both man-made and natural erosion dongas occur in areas containing clays rich in heavy metals. Encroachment by indigenous microphyllous trees and invasion by alien species is common throughout the area.

The vegetation within the primary PAOI comprised modified riparian vegetation, while the surrounding areas comprised secondary bushveld on historic cultivated land or cattle camps, and residential yards.

1. **Modified and Degraded Riparian Vegetation**

The proposed bridge traverses the river in an area devoid of good condition vegetation and on sandy and highly dispersive

soils. Although the site verification was undertaken in winter, some grass tufts can usually be found. However, the area was almost devoid of a grass layer and limited indigenous tree and shrub species were present (Photo Plate 1).

Photo Plate 1: Degraded vegetation around the proposed bridge crossing

Other than edge effects from the village, grazing and erosion, the area north and west of the crossing was historically divided into various plots as cattle camps or cultivation. Large portions of the area comprised bare soils that are being encroached by microphyllous species such as *Vachellia tortilis subsp. heteracantha, Senegalia mellifera* and *V luderitzii*. The succulent *Euphorbia tirucalii* (kraal/tree *Euphorbia*) were abundant and likely even planted to form kraals for cattle. Other shrubs included *Dodonea viscosa* subsp *angustifolia* (sand olive), *Terminalia prunioides* (purple-pod cluster-leaf), the weedy *Gomphocarpus fructicosus* (milkweed) and *Psidia punctulata* Although the vegetation was degraded, interesting succulent and provincially protected species are likely present e.g., *Stapelia* species and *Taversia barklyi* (devil's trumpet).

Several invasive plant species also occurred. Most prominent was the category 2 species *Agave sisaliana* which was historically planted to fence in cattle or cultivated areas, as well as the category 1b species *Senna didymobotrya* (peanut

butter cassia), *Ipomoea carnea* subsp. *fistulosa* (morning glory bush) and *Opuntia* species (Photo Plate 2).

Photo Plate 2: Various category 1 and 2 invasive species (arrows) around the proposed bridge crossing

The vegetation downstream of the proposed bridge footprint was also degraded and sparsely vegetated (Photo Plate 3).

Photo Plate 3: Riparian vegetation about 900m downstream of the site

2. Secondary Plains Bushveld

Historical camps that were cultivated or planted with pasture was dominated by weedy species and encroached by indigenous microphyllous trees (e.g., *Vachellia* and *Senegalia* species), as well as weedy hardy, pioneer shrub and herbaceous species that colonised the disturbed soils e.g., *Gomphocarpus fructicosus, Lycium cinereum,* and the category 1b invasive species *Ipomoea carnea subsp. fistulosa* (morning glory bush) (Photo Plate 4).

Photo Plate 4: Sparsely vegetated, secondary plains bushveld

3. Residential Yards

Residential yards within the secondary PAOI included some indigenous trees. However, the yards were mostly devoid of natural vegetation (Photo Plate 5).

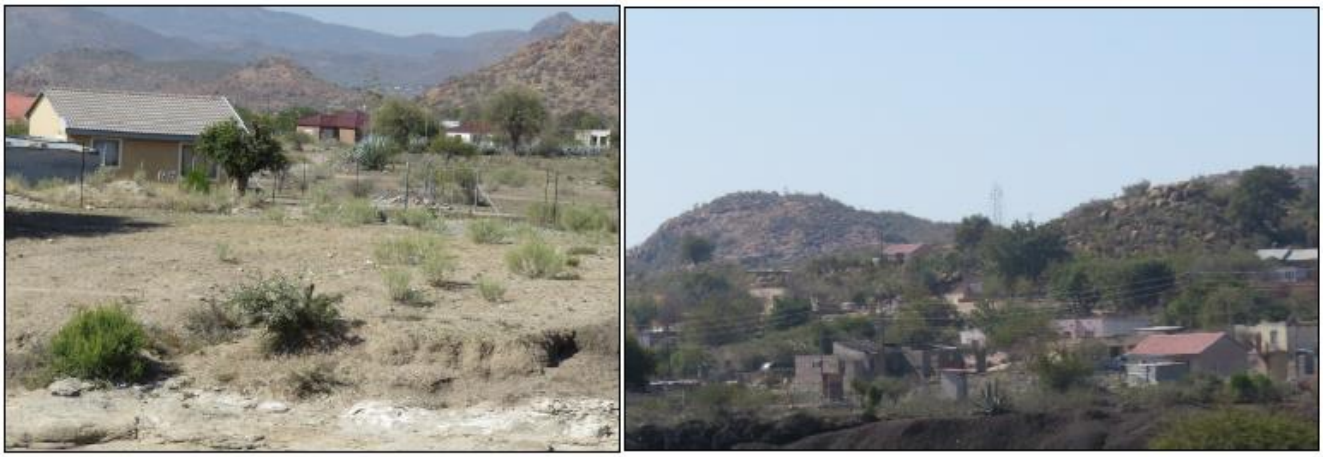


Photo Plate 5: Residential yards were sparsely vegetated but could include protected tree species

Plant Species of Conservation Concern Compliance Statement

A list of 16 species was short listed to potentially occur in the greater study area (Refer to Appendix A of the Terrestrial Vegetation Compliance Statement attached as **Appendix D2**). Suitable habitat is present on the site for three of the species listed in Appendix A, however, the possibility of occurring was considered low and medium to low. Due to the historical impacts, none of these species are expected to be present. In addition, the Screening Report attached as **Appendix G3** indicates the site to be of low plant species sensitivity, indicating that it is highly unlikely for sensitive plant species to be present.

Protected Plants

It is unlikely that a TOP species is present within the proposed footprint. However, there is suitable habitat for such species in the rocky areas near the site.

Provincially Protected Plants

Several plants are provincially protected by the Limpopo Environmental Management Act 2003 (Act 7 of 2003). These plants are not to be removed, damaged, or destroyed without a permit from the Limpopo Department of Economic Development Environment and Tourism. The species listed in Table 11 were previously recorded by the specialist in similar habitat in the Sekhukhune Plains Bushveld and may thus be present.

Table 11: Provincially Protected Species

Species Name	Vegetation group
Tavaresia barklyi	Plains bushveld
Spirostachys africana	Along watercourses in the plains bushveld

Stapelia cf gettliffei	Plains bushveld and low open to closed bushveld

National Protected Trees

At least four national protected trees could be present around the proposed bridge site and are listed in Table 12 below.

Table 12: Protected Trees likely to occur

Species Name	Common Name
Balanites subsp.maughamii	Torchwood
Boscia albitrunca	Shepherd's tree
Sclerocarya birrea subsp caffra	Morula
Vachellia erioloba	Camel thorn

Vegetation and Species of Conservation Concern (SCC) Compliance Statement

Much of the vegetation around the proposed bridge site was modified from the reference state of Sekhukhune Plains Bushveld and in a poor ecological condition. These areas, including the residential yards and secondary plains bushveld, are regarded as low sensitivity to the proposed project (Figure 17). The vegetation structure and composition have been compromised and are not representative of the reference state of Sekhukhune Plains Bushveld. These areas are of a poor to fair ecological condition. No plant species of conservation concern are expected to be present. However, provincially protected succulent species, as well as national protected trees may be present, and the authorisation of this project needs to include the removal, relocation, or destruction of such species.

The modified vegetation along the riparian area, although disturbed and degraded, plays a role in flood attenuation, stabilising soils and probably assist in taking up pollutants. Pollution from the proposed project could flow downstream and negatively impact the vegetation. Other than a functional role such as mammal habitat and corridors (ESA) along the watercourse and soil stabilisation, the vegetation was low in species diversity and in a modified state. Although, the vegetation is in a poor ecological condition, the vegetation has a medium sensitivity to the proposed development due to its functional role along a watercourse.

The Terrestrial Vegetation Compliance Statement (**Appendix D2**) confirms the low terrestrial biodiversity (vegetation) sensitivity, as well as the low plant species sensitivity as per the result of the Screening Report (**Appendix G3**). The proposed development could positively impact on the watercourse by removing alien invasive plant species and limiting the current damage and impacts to the watercourse due to pedestrians and vehicles crossing through the river. The development of will likely have a positive impact on the vegetation on site and downstream thereof. Therefore, the vegetation compliance statement has no objection to the continuation of this project, provided mitigation measures are implemented to prevent direct and indirect impacts to downstream vegetation.

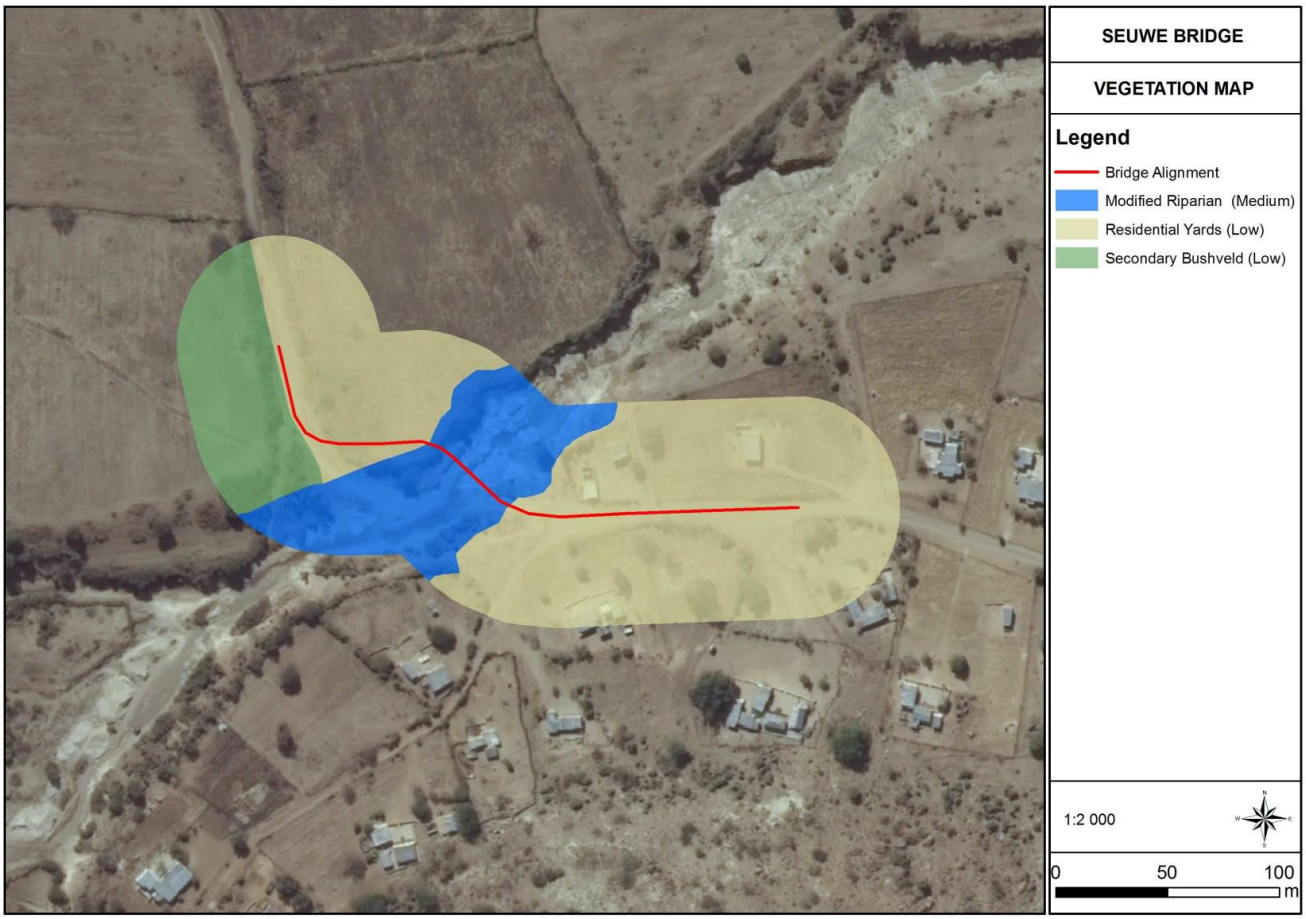


Figure 17: Vegetation and land use within the PAOI and sensitivity to the proposed bridge development

Fauna

According to the Screening Report, with regards to Animal Species in the development area, the sensitivity is considered Medium as a result of *Mammalia-Crocidura maquassiensis*, *Reptilia-Kinixys lobatsiana* and *Invertebrate-Aroegas fuscus*. SANBI has withheld the name of the species as it may be prone to illegal harvesting and must be protected. This is depicted in Figure 18 below.

Figure 18: Animal Species Sensitivity Map

Important Bird Areas (IBAs) (Plan 3)

The Wolkberg Forest Belt IBA, is the nearest IBA just over 25km north of the project area. Main threats to the IBA include threat from the spread of alien trees from existing plantations and the activities within these plantations. Infrastructure such as power lines and roads and tourism activities may have a negative impact on the IBA's trigger species.

The Blyde River Canyon IBA lies over 40km east of the project area. Main threats to this IBA include the indiscriminate development of recreational facilities and expansion of rural villages, water use by the existing forest plantations, alien invasive plant infestation, pollution of rivers from mining, uncontrolled fires, and poor land management and conservation (specifically cattle grazing in the Stanleybush Kop area).

No direct impacts expected to IBAs. There may be very limited and insignificant (given the cumulative contribution over the distances) indirect impact through potential siltloading and contamination to the river which eventually drains into the Olifants River which is shared by both IBAs. The proposed development will not contribute to other threats faced by IBAs. The

project area is not considered as habitat to IBA trigger species or their prey and will not serve as satellite habitat to dispersing species and will add little value to conservation of trigger species within the IBAs. Activity should be prioritized over the dry season when no / limited flow is expected in the river. Stormwater management must be applied on site and potentially contaminating / friable material handled properly on site.

Protected Areas (PA) (Plan 3)

No protected areas occur within 10km of site. Most nearby PAs (nearest is more than 25km north of site) are associated with or very close to the IBAs discussed above and also fall within the Olifants River catchment. There is limited to no direct terrestrial connectivity along the riverine areas and the project area is not likely to serve as a satellite habitat for dispersing species form the PAs.

NPAES targeting the protection of the Northeast Escarpment occur approximately 9km north-west of the project area and upslope of site (outside the potential area of influence).

No direct or significant indirect impacts expected to PAs, NPAES and PA buffer zones. The site is also unlikely to be a significant satellite habitat for species dispersing from PAs. Any potential contamination to the river must be managed as per IBAs, as outlined above.

Biome and Ecosystem

The area falls within the Savanna Biome and the Sekhukhune Plains Bushveld vegetation type, which is not a TOP ecosystem (NEM:BA, GN1002, 2011). The project area incorporates a highly eroded non-perennial river, villages and agricultural land with most significant remnant patch of natural bushveld limited to a koppie infringing the far southern extent of the project area (Plan 4). The bushveld habitat can be considered as modified or destroyed within the designated project area.

No impacts are expected to TOP ecosystems or habitats of importance to significant fauna species. No impacts are expected to habitat for existing generalist fauna species. Some benefit may be expected in terms of man-made habitats associated with bridges.

Koppies and Ridges

The project area just intersects the koppies south of site which support rocky bushveld vegetation which appears to be the least disturbed and most natural habitat within the project area.

No direct or indirect impacts are expected to the koppies south of site, as long as staff and contractors remain outside of

these areas. They must be designated as “no-go” areas and no activity is allowed within the koppies near site.

TOP Fauna

- **Mammals**

The trigger mammal SCC, Maquassie Musk Shrew (*Crocidura maquassiensis*) (RL Vulnerable), has been listed as possible species in the project area as a cautionary measure due to lack of of information. There is little conclusive information about the species, but the species is linked to moist habitats with dense matted vegetation associated with wetlands (absent in the project area).

- Threats to the species include loss or degradation of moist, productive areas such as wetlands and rank grasslands within suitable habitat due to abstraction of surface water and draining of wetlands through industrial and residential expansion and overgrazing of moist grasslands. The proposed development and activity is not going to contribute significantly or cumulatively to these threats.
- Although the project area is within the expected distribution range of the species, there are no recent records for the species in the area.
- Furthermore, the high likelihood of domestic animal activity (dogs and cats) and day-to-day anthropogenic activity in the project area due to the village further reduces the likelihood of the small mammal on site.

No TOP mammals have been recorded over the last decade for the QDGS.

Two TOP species with distribution over the area cannot be excluded from the project area due to availability of appropriate habitat or their wide habitat tolerances. The day-to-day anthropogenic activity and highly likely activity of domesticated animals are likely to keep these species from remaining in the area. The following are considered likely based on habitat:

- Honey Badger (*Mellivora capensis*) (GN151 Protected). Main threats to the species arise from conflict and persecution by bee farmers.
- Brown Hyaena (*Parahyaena brunnea*) (GN151 Protected). They are often shot, poisoned, trapped, snared and hunted with dogs in an attempt to reduce livestock predation events.

The site is not part of an area of endemism for mammals.

- **Birds**

No Bird SCCs are listed for the area on the DFFE Screening Report.

One TOP bird previously recorded in the area cannot be excluded as a resident from the project area, although more likely to remain within the natural habitat units of the Koppies to the south of the project area:

- Lanner Falcon (*Falco biarmicus*) (RL Vulnerable). Threats include loss and degradation of grassland habitat through agriculture and afforestation, which reduces its prey numbers. Also threatened by poisoning, collisions with powerlines, persecution by fowl farmers and pigeon enthusiasts.

TOP species with distribution over the area that cannot be excluded from site include:

- Lesser Kestrel (*Falco naumanni*) (GN151 Vulnerable). Mainly faces threats in Europe and Asia, but also threatened by control of insects through pesticides, felling of tall trees and collisions with vehicles.

The limited on-site aquatic and wetland features limit the presence of congregatory water birds. Limited species may temporarily utilise the river and ponds created during the rainy season. Previously recorded and likely endemic birds (South African Cliff Swallow, Cape Weaver and Cape White-eye) are fairly common with large distribution ranges in South Africa and the site is not part of an area of endemism for birds.

- **Reptiles**

Sensitive Species 12 (sensitive species are threatened by collection for trade and names cannot be disclosed to the public – Appendix C) is the only reptilian SCC and is a rocky habitat species. The site supports some rocky areas, but these are largely within the river bed. The rocky habitats are also fragmented by the developments in the village. This coupled with the fact that the species are hunted for trade and food means the species is likely to have been eliminated from the project area. Furthermore no recent records occur for the species in the QDGS. The species is considered as a possible species in the project area, more likely within the rocky koppies south of the project area.

No TOP reptiles have been recorded over the last decade for the QDGS. No other TOP reptiles with distribution across site are considered as likely to occur on site.

The Sekhukhune Flat Lizard (restricted endemic of the Sekhukhune area escarpment) and Van Dam's Dragon Lizard (also restricted, although more extensive distribution than the prior species) occupy similar habitat and are confirmed for the QDGS. The site does not support suitable habitat and significant populations are not expected on site due to the disturbed nature of the project area. The project area is, however, considered within an area for restricted endemic reptile species, but the area is unlikely to be of significance for the long-term conservation or survival of said species.

- **Frogs**

No frog SCCs are listed for the area. No TOP frogs were recorded for the QDGS. No other TOP frogs have been identified as likely to occur on site. Swarming bullfrog juveniles may find their way to site if bullfrogs are present in the greater surrounds, but are not considered as highly likely within the disturbed project area. The site is not part of an area of endemism for frogs.

- **Invertebrates**

Aroegas fuscus is the only trigger invertebrate SCCs for the project area. According to SANBI species status data, A. fuscus occurs in mesic grassland above 1200mamsl. It is considered unlikely to occur on site. No TOP scorpions, spiders, butterflies or dragonflies have been recorded for the QDGS / general area. No provincially protected invertebrates have been recorded for the QDGS / general area.

No Alien invasive species were recorded in the QDGS / Pentad.

Terrestrial Biodiversity

According to the Screening Report, Terrestrial Biodiversity Sensitivity on the proposed site is considered Low as depicted in Figure 18 below.

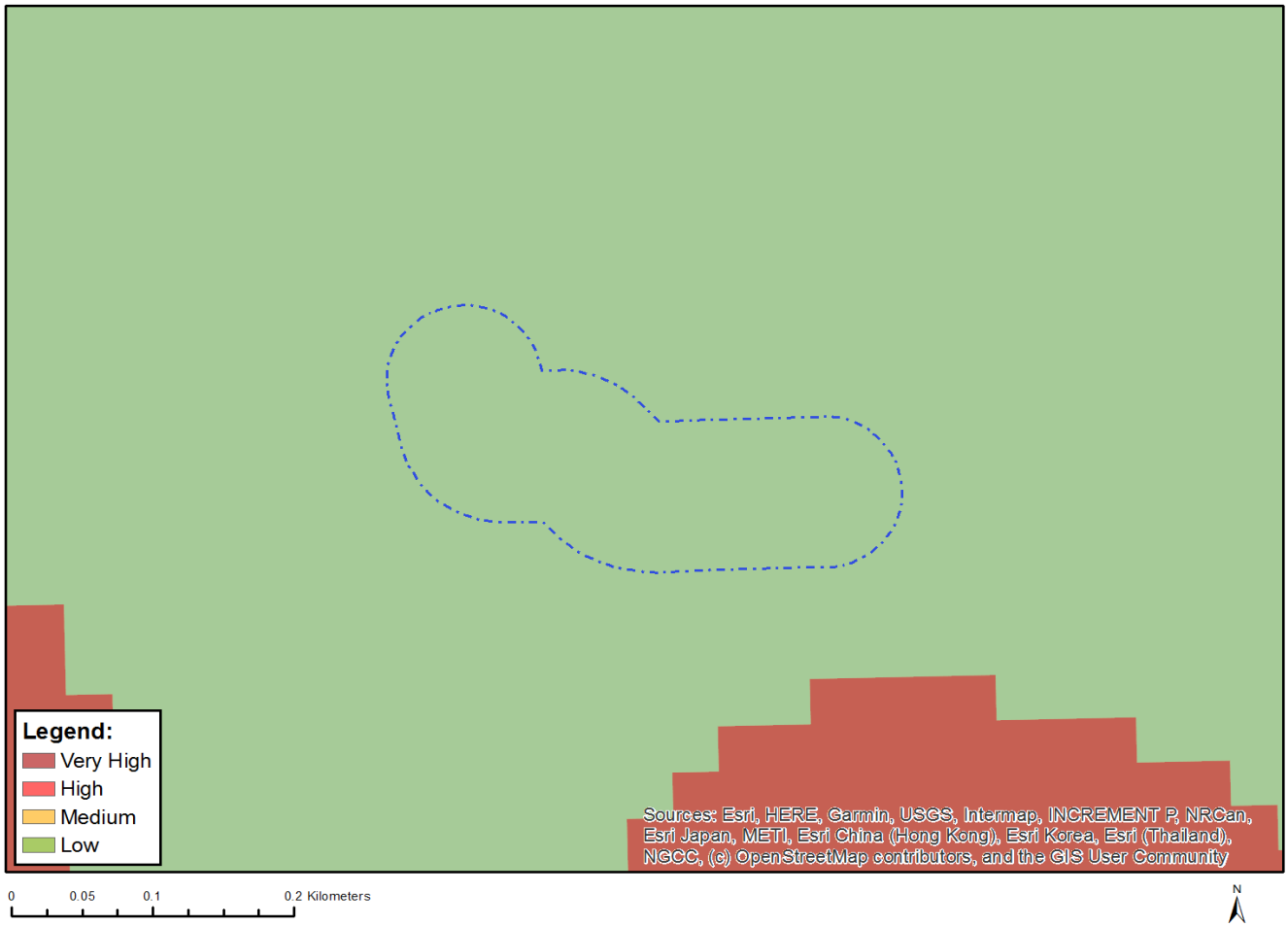


Figure 19: Terrestrial Biodiversity Sensitivity Map

5. LAND USE CHARACTER OF SURROUNDING AREA

Indicate land uses and/or prominent features that does currently occur within a 500m radius of the site and give description of how this influences the application or may be impacted upon by the application:

5.1 Natural area	**X**	5.22 School	
5.2 Low density residential	**X**	5.23 Tertiary education facility	
5.3 Medium density residential		5.24 Church	
5.4 High density residential		5.25 Old age home	
5.5 Medium industrial [AN]		5.26 Museum	
5.6 Office/consulting room		5.27 Historical building	
5.7 Military or police base/station/compound		5.28 Protected Area	
5.8 Spoil heap or slimes dam [A]		5.29 Sewage treatment plant [A]	
5.9 Light industrial		5.30 Train station or shunting yard [N]	
5.10 Heavy industrial [AN]		5.31 Railway line [N]	

5.11 Power station		5.32 Major road (4 lanes or more)	
5.12 Sport facilities		5.33 Airport [N]	
5.13 Golf course		5.34 Harbour	
5.14 Polo fields		5.35 Quarry, sand or borrow pit	
5.15 Filling station [H]		5.36 Hospital/medical centre	
5.16 Landfill or waste treatment site		**5.37 River, stream or wetland**	**X**
5.17 Plantation	**X**	5.38 Nature conservation area	
5.18 Agriculture	**X**	**5.39 Mountain, koppie or ridge**	**X**
5.19 Archaeological site		5.40 Graveyard	
5.20 Quarry, sand or borrow pit		**5.41 River, stream or wetland**	**X**
5.21 Dam or Reservoir		5.42 Other land uses (describe)	

If any of the boxes marked with an "[A]" are ticked, how will this impact / be impacted upon by the proposed activity.

If YES, specify and explain:	[redacted]
If NO, specify:	

If any of the boxes marked with an "[N] "are ticked, how will this impact / be impacted upon by the proposed activity?

If YES, specify and explain:	[redacted]
If NO, specify:	

If any of the boxes marked with an "[An]" are ticked, how will this impact / be impacted upon by the proposed activity?

If YES, specify and explain:	[redacted]
If NO, specify:	

If any of the boxes marked with an "[H]" are ticked, how will this impact / be impacted upon by the proposed activity.

If YES, specify and explain:	[redacted]
If NO, specify:	

6. CULTURAL/HISTORICAL FEATURES

Are there any signs of culturally or historically significant elements, as defined in section 2 of the National Heritage Resources Act, 1999, (Act No. 25 of 1999), including Archaeological or palaeontological sites, on or close (within 20m) to the site?	[redacted] **NO**
If YES, explain:	[redacted]

If uncertain, conduct a specialist investigation by a recognised specialist in the field to establish whether there is such a feature(s) present on or close to the site.

Briefly explain the findings of the specialist:

Archaeological and Cultural Heritage

As per the Screening Report, the Archaeological and Cultural Heritage Sensitivity on the proposed development area is considered low sensitive as depicted in Figure 20 below.

Figure 20: Archaeological and Cultural Heritage Sensitivity Map

The results of the HIA are presented in Table 13 and Figure 21 below and can be summarised as follows:

- Stone Age tools, dating to the MSA and LSA occur as low-density scatters on some outcrops to the south in the larger region;
- Sites dating to the Early Iron Age are known to occur all over, especially on the colluvial and colluvial soils near river;
- Stone walled sites dating to the dating the Late Iron Age occur to the far east of the project area;
- Historic structures, inclusive of buildings, monuments and bridges, occur mostly in an urban environment, although they also found sporadically on farms in the region;
- Formal and informal burial sites occur sporadically throughout the region.

Based on the above assessment, the probability of cultural heritage sites, features and objects occurring in the project area is considered to be **possible**.

Table 13: Pre-Feasibility Assessment

Category	Period	Probability	Reference
Landscapes			
Natural/Cultural		Low	General Staff War Office (1907); Historic maps & aerial photographs
Early hominin	Pliocene – Lower Pleistocene		
	Early hominin	None	-
Stone Age	Lower Pleistocene – Holocene		
	Early Stone Age	Low	Plug (1978); Van Schalkwyk (2016)
	Middle Stone Age	Low	Plug (1978); Van Schalkwyk (2007a, 2016); Verster & van Rooyen (1999)
	Later Stone Age	Low	Heritage Atlas Database; Plug (1978); Verster & van Rooyen (1999)
	Rock Art	Low	Heritage Atlas Database
Iron age	Holocene		
	Early Iron Age	None	Huffman (2004/2005; 2007); Van Schalkwyk (2007a; 2007b; 2009, 2016)
	Middle Iron Age	None	-
	Late Iron Age	Low	Huffman (2007); Van Schalkwyk (2007a, 2016); Van Schalkwyk & Teichert (2008)
Colonial period	Holocene		
	Contact period/Early historic	Possible	General Staff War Office (1907); Hunt (1931); Kinsey (1973a, 1973bSmith (1967);
			Van Coller (1949); Van Schalkwyk (2014/2015)
	Recent history	Possible	Pistorius (2006, 2007); Van Schalkwyk (2009; 2016)
	Industrial heritage	Low	Grabe (n.d.); Heritage Atlas Database; Machens (2009); Van Schalkwyk (2009; 2016)

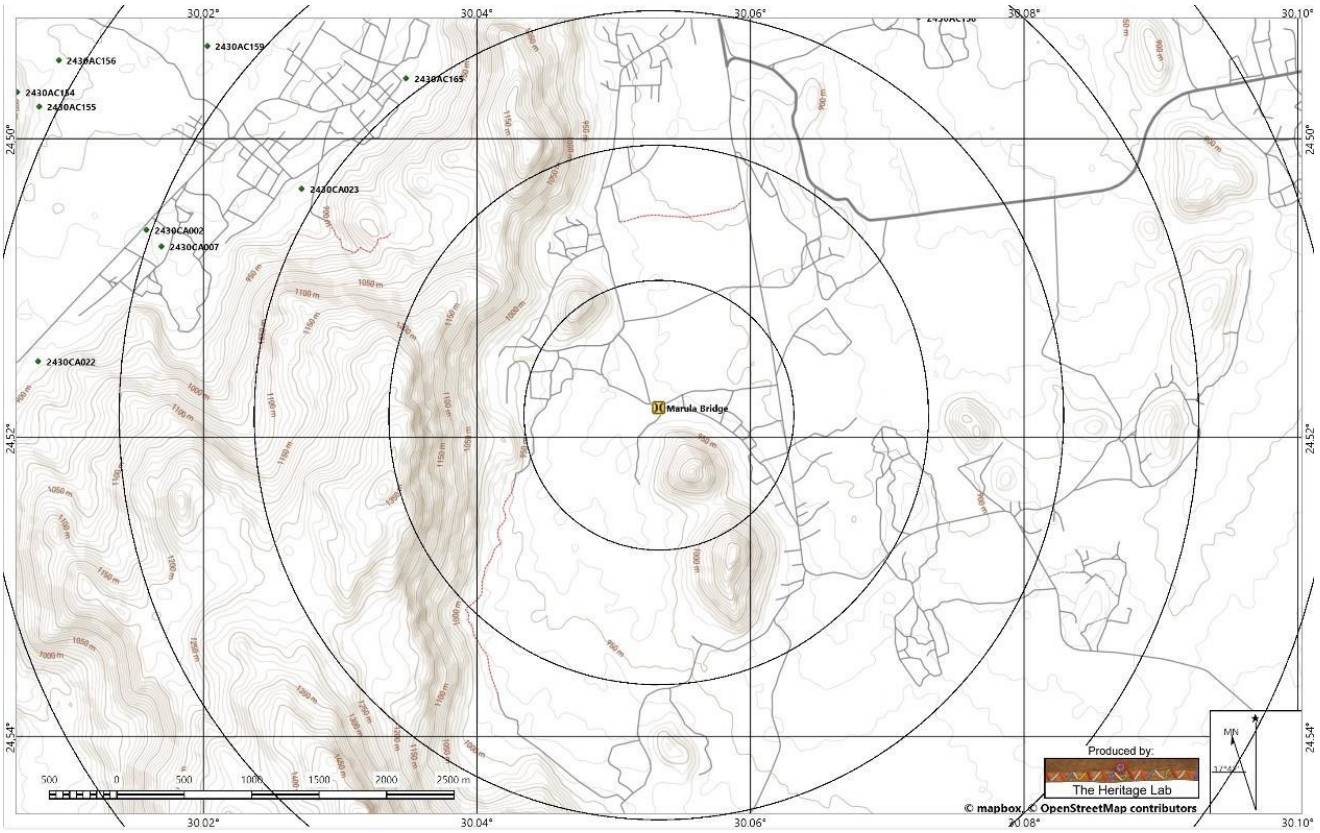


Figure 21: Location of known heritage sites and features in relation to the project area (Circles spaced at 1km: heritage sites = coded green dots)

Cultural Landscape

- **Stone Age**

Bushman Rock Shelter, one of the more important archaeological sites in the region is found approximately 30km to the east. Here, in this large, south facing rock shelter, archaeological excavations have revealed that early humans had lived here, discontinuously, for thousands of years, from the Early Stone Age, through the Middle Stone Age, and into the Late Stone Age (Pug 1978).

Unfortunately, no such sealed, stratified site occurs in the Steelpoort River valley. However, that Stone Age people occupied the Steelpoort River valley is evidenced by the presence of large numbers of stone tools dating to all phases of the Stone Age.

Although some tools occur on the current land surface, most artefacts are usually found in heavily eroded areas. These eroded areas or gullies are created by the Steelpoort River and its tributaries as they cut back upstream. The net result of this deflation of layers is that the density of stone tools increases, giving a compressed, and therefore false version of a

long period of deposition. But even though the material is preserved in a deflated context, it still provides us with a set of archaeological signatures that contribute to an overall picture of Stone Age occupation in the region.

Ninety nine percent of the identified stone tools can be placed in the Middle Stone Age. Based on a visual inspection of the patination, it can be determined that some have been exposed much longer than others, even though they might occur in close proximity to each other. Only a few samples showed the results of washing, indicating that the majority occurred in close proximity of where they were found.

Late Stone Age (LSA) people had even more advanced technology than the MSA people and therefore succeeded in occupying even more diverse habitats. Also, for the first time we now get evidence of people's activities derived from material other than stone tools. Ostrich eggshell beads, ground bone arrowheads, small, bored stones and wood fragments with incised markings are traditionally linked with the LSA.

- **Iron Age**

A significant number of settlement sites dating to the Early Iron Age have been identified in the Steelpoort River valley and beyond. Based on the density of the distribution of sites identified in areas that have been surveyed, it is postulated that there would be many more which would only be revealed through a systematic survey of the region.

Sites belonging to this period in the Steelpoort River valley have been radiocarbon dated, with the results clustering in the range of AD 880 to 1040, which is well within that of AD 750 to 1000 given by Huffman (2007) for other known Doornkop sites outside the valley. Although the dates span a period of more than 200 years, it cannot be interpreted that an individual site was occupied for that length of time. The dates should rather be seen as a guideline indicating that the site could have been occupied for a considerable period of time.

From an analysis of the pottery recovered, most of the sites that were investigated can be classified as belonging to the Doornkop facies of the Kalundu Tradition of the Early Iron Age. This, according to Huffman (2007), is a group of people that entered the region from the northwest - from the direction of what is now the DRC. The Doornkop people are famous for the set of remarkable clay masks found near Lydenburg in the 1960s. These people proliferated in the Steelpoort River valley and in the larger Sekhukhuneland region as well.

On some of these sites, linked to a second facies called Mzonjani, was also identified. According to Huffman (2007), the Mzonjani facies is linked to Doornkop. The former group originally formed part of the Kwale Branch of the Urewe Tradition, and usually predate the Doornkop people. However, new evidence seems to indicate that they were no longer separate groups by the time of the settlement of the Steelpoort Valley sites, indicating fluidity in their ability on political and cultural

level to renegotiate their identity on an on-going basis.

Based on the material assemblages recovered and the location and layout of the villages, it can be deduced that these early communities experienced a life of peace and plenty. They were well adapted to their environment, producing food crops, herding domesticated stock and utilised various available resources to establish sustainable livelihoods. They also probably interacted with contiguous communities, for example the San.

As time passed, these early communities either left the region by their own accord or were displaced or assimilated by later people moving into the area. What type of contact this was is not clear, but as the new settlements are still located out in the open it seems as if they were living in peace with each other.

However, all of this was set to change. During the middle of the 18th century, developments that started to take place on a subcontinent scale, climatic change and economic and political factors, also touched the Steelpoort River valley and its people. New people, in many cases refugees from other parts of the country, entered the valley. Competition for land and its resources gave rise to situations of stress and conflict. This can be seen by the fact that people were now abandoning sites in the open areas, settling on the various hills and at the foot of the mountains, where they built sites that are clearly defensive in nature. A new element encountered on sites dating to this period is stonewalling.

This is also the period where we encounter oral histories, praise poems and such, sources that recount the lives of people and events, for the first time giving us a direct voice from the people involved. It is also the period where we get the first written documents on the people and the region. Settlers of European descent entered the valley looking for land and resources – farmers, missionaries, traders, teachers and prospectors - all came and influenced the people and used the land according to their own needs and ambitions. Inevitably it put people on opposite sides, sides that were to become clearer over time, when the history of the next few decades were already starting be written.

Sotho-speakers

The area currently known as Sekhukhuneland, i.e. to the west of the Steelpoort River, was originally occupied by a group of people known as the Kwena of Mangatane. They entered the area from the north and, upon arriving at the Olifants River (Lepelle River), split into two groups. One group did not cross the Olifants River, but trekked upstream and eventually settled in what is today known as the Nebo magisterial district and became known as the Kopa of Ramupudu and the Kopa of Matsepe. The second group crossed the Olifants River under chief Mašabela and changed their totem from *phuti* (duiker) to that of *kwena* (crocodile). Their over-lordship as first arrivals had to be recognised by later arrivals such as the Pedi.

Groups known as the Phaša, settled somewhat later. They are related to the Mašabela but retained their original totem (*phuti*). They also call themselves Roka, which is probably an indication of their origin, north east of their current territory.

Other groups are also known as Roka, although they do not share a history with the former groups and some of them are taken to be of Ndebele-speaking origin.

The Roka were soon followed by various Koni groups, which apparently took their name form the Bokoni area in the vicinity of Lydenburg from which they came. They were followed by the various Tau groups, who, according to some, are Sotho people who originally lived in the northern parts of what is today Swaziland.

The Pedi had moved into the area by 1650. Originally of Kgatla (Tswana) origin in the Brits region in North West Province, they entered the area from the southwest and subsequently changed their totem from *kgabo* (vervet monkey) to *noko* (porcupine). On arrival, they first paid tribute to the groups already settled in the area but over time as they grew stronger, they exerted their power over other groups and eventually came to dominate the political landscape and people started to paying tribute to the Pedi.

- **Historic Period**

Andries Hendrik Potgieter and his fellow Trekkers is said to have trekked through the Steelpoort River valley in 1845. Their first meeting with the Pedi, then under the rule of chief Sekwati, was at Molahlegi, near Rooibokkop on the Olifants River. According to all accounts, this encounter was a friendly one. From here the Trekkers passed over Magnet Heights onwards and eventually settled at what was to become Andries-Ohrigstad. Due to the prevalence of malaria, they decided to move away and in 1850 established a new town, Lydenburg, some 50 km to the south. A few years later, in 1857 the Lydenburg Republic seceded from the Transvaal Republic. However, this did not last long and in April 1860 they re-joined the Transvaal Republic.

Earliest whites to settle permanently in the region were missionaries, mostly of the *Berliner Missionsgesellschaft* (BMS), for example Alexander Merensky (father of the famous geologist Hans Merensky), Gustav Eiselen, Otto Kahl, Gustav Mars, etc. Things did not always go well from them and their history in the region is one of starting new stations, abandoning them due to strife between local communities of tribal leaders who saw them as a threat to their authority, eventually returning and starting all over again. The Berliners were also fighting amongst themselves. Chief of this was Johannes Winter who rebelled against the strict, dogmatic approach of the *Gesellschaft*, and especially against Alexander Merensky. To make a long story short, he broke away from the mainstream Berliner society and established his own version, including much of traditional indigenous beliefs in his doctrine. This became known as the Bapedi Lutheran Christian Church, which is still active in the region.

Two events that took place in the larger region probably also had an impact on the valley. The first is the so-called Sekhukhune Wars (1876, 1879), a number of sites dating to this event which can be found in the larger region and include

the old battle site, a number of fortifications and graves.

The run-up to these events began somewhat earlier with the death of Chief Thulare who had two sons, the half-brothers Sekwati and Malekutu. On the death of Thulare the latter took over the chieftainship and ruled for a number of years. On his death he was succeeded by his half-brother Sekwati who was to act as regent up to the point where the real successor, Mampuru would be able to take over as chief.

Sekwati had a son called Sekhukhune, who, as the son of the regent had no claim to the chieftainship. However, Sekhukhune is said to have been very aggressive and on his father's death he forcefully seized the chieftainship, forcing Mampuru to flee. His success over Mampuru, as well as other events made Sekhukhune very ambitious and he eventually started to challenge the ZAR government on various levels. This led to the first conflict in 1876. After a short period of siege by the ZAR forces, he was forced to surrender. For his trouble he was fined a large number of cattle, which he immediately vowed not to pay in full.

In April 1877, Sir Theophilus Shepstone annexed the ZAR on behalf of the British Empire. Soon Sekhukhune indicated that he was not going to obey the British either, and an expedition under Sir Garnet Wolseley was despatched to subjugate him. This objective was eventually achieved only after both sides suffered heavy losses.

The second event, largely following on the former, is the co-called Mapoch War of 1883. On 13 August 1882, Mampuru and some of his followers assassinated Sekhukhune while he was asleep. As the ZAR government feared that this would cause problems in the region, which was still very unstable as a result of the preceding Sekhukhune War, they sent out a small commando to apprehend Mampuru. He, however, went into hiding with the Ndebele under Nyabela and when the latter was asked to give Mampuru up, it was refused. It was therefore decided to capture him by force, something that seemed easier said than done. It took a large contingent of men and the building of an extensive series of fortifications to lay siege to the Ndebele over a period of many months before the Nyabele agreed to surrender and hand Mampuru over to the ZAR forces. Both leaders, with a number of their councillors were arrested and taken to Pretoria where, after a short trail, both leaders were found guilty and condemned to death. Fortunately for him, Nyabela's sentence was commuted to life imprisonment, but Mampuru was executed a short while later by hanging on 22 November 1883.

One cannot think about the Steelpoort River valley and not think of mining. Probably the biggest impact the river had was to cut through the earth's natural layers and expose the rich mineral wealth hidden below. Platinum, chromite, vanadium, iron, manganese and magnetite are but a few of the minerals that were exposed in this way. This has played such an important role that one such cutting in the Dwars River - one of the larger tributaries - was declared a national monument. There the river cuts through the various chromite bands and anorthosite, allowing the relationship between these layers to be studied in detail. Although identified as early as 1909 by the well-known geologist Dr A.L. Hall, it was only after it drew the attention

of the American geologist Edward Sampson in 1929 that its significance became clear.

In his description of the discovery of platinum deposits and chromium in the eastern lobe of the Bushveld Complex, Grabe (n.d.) mentions that as early as 1906 a Mr William Betel had assayed several samples of chrome-iron ore that contained up to 1,2 dwts (Penny Weights per Short Ton) of platinum. Two years later a similar discovery was made in Sekhukhuneland and the Rustenburg area by Drs A.L. Hall and W.A. Humphrey. In 1923, A. Erasmus discovered the Waterberg Load, which led to the establishment of the first platinum mine in South Africa.

In the next year, September 1924, platinum was also discovered in a section of a small stream close to the southern boundary of the farm Maandagshoek, at the foot of the Leolu Mountains by A.F. Lombard, a local farmer. He sent the samples to Hans Merensky, who was so convinced of its importance that he set up the L.P. Syndicate with four partners with the aim of exploiting this discovery. These letters actually stood for Lydenburg Platinum Syndicate but, as Merensky was worried about possible competitors, they kept their activities secret. In October of that year Merensky stated that the same ore body was found to exist south of the Steelpoort River. The source of the platinum panned by Lombard was traced to small kopjes on the farm Mooihoek. Soon afterwards, the dunite pipe Willemskop on the farm Driekop was also discovered. Further work led to the discovery of the Merensky Reef. In 1927 the Mooihoek Dunite Pipe was opened and started producing metallic concentrates. F.W. Blaine discovered the Onverwacht Platinum Pipe and the mine opened in 1926. Although over sixty separate occurrences of hortonolite-dunite had been discovered, only three were found to be lucrative, viz. Driekop, Mooihoek and Onverwacht.

- **Site Specific Review**

Stone Age

A single side-struck flake, probably dating to the Middle Stone Age, was identified as surface material on the riverbank. This artefact is viewed as having very low significance and no further action is required.

Iron Age

No sites, features or objects of cultural significance dating to the Iron Age were identified in the project area.

Historic Period

No sites, features or objects of cultural significance dating to the historic period were identified in the project area.

Palaeontology

In terms of Palaeontology, the Screening Report indicates that the palaeontology sensitivity of the area is medium as depicted in Figure 22 below.

Figure 22: Paleontology Sensitivity Map

According to the HIA, the Palaeontological Sensitivity Map indicates that the project area (Figure 23) has a low sensitivity of fossil remains to be found and therefore no palaeontological assessment is required. However, a protocol for finds is required.

Colour	Sensitivity	Required Action
RED	VERY HIGH	field assessment and protocol for finds is required
ORANGE/YELLOW	HIGH	desktop study is required and based on the outcome of the desktop study, a field assessment is likely
GREEN	MODERATE	desktop study is required
BLUE	LOW	no palaeontological studies are required however a protocol for finds is required
GREY	INSIGNIFICANT/ZERO	no palaeontological studies are required
WHITE/CLEAR	UNKNOWN	these areas will require a minimum of a desktop study. As more information comes to light, SAHRA will continue to populate the map.

Figure 23: Palaeontological Sensitivity Map

Should archaeological sites or graves be exposed during construction work, it must immediately be reported to a heritage practitioner so that an investigation and evaluation of the finds can be made.

Refer to **Appendix D5** for the comprehensive Phase 1 Cultural Heritage Impact Assessment.

Will any building or structure older than 60 years be affected in any way?	**NO**
Is it necessary to apply for a permit in terms of the National Heritage Resources Act, 1999 (Act 25 of 1999)?	**NO**

If yes, please submit or, make sure that the applicant or a specialist submits the necessary application to SAHRA or the relevant provincial heritage agency and attach proof thereof to this application if such application has been made.

SECTION C: PUBLIC PARTICIPATION

According to EIA Regulations of 2014, minimum public participation requirements are as follows:

1. ADVERTISEMENT

The person conducting a public participation process must take into account any guidelines applicable to public participation as contemplated in section 24J of the Act and must give notice to all potential interested and affected parties of the application which is subjected to public participation by—

(a) fixing a notice board (of a size at least 60cm by 42cm; and must display the required information in lettering and in a format as may be determined by the department) at a place conspicuous to the public at the boundary or on the fence of—
  (i) the site where the activity to which the application relates is or is to be undertaken; and
  (ii) any alternative site mentioned in the application;

(b) giving written notice to—
  (i) the owner or person in control of that land if the applicant is not the owner or person in control of the land;
  (ii) the occupiers of the site where the activity is or is to be undertaken or to any alternative site where the activity is to be undertaken;
  (iii) owners and occupiers of land adjacent to the site where the activity is or is to be undertaken or to any alternative site where the activity is to be undertaken;
  (iv) the municipal councillor of the ward in which the site or alternative site is situated and any organisation of ratepayers that represent the community in the area;
  (v) the municipality which has jurisdiction in the area;
  (vi) any organ of state having jurisdiction in respect of any aspect of the activity; and
  (vii) any other party as required by the department;

(c) placing an advertisement in—
  (i) one local newspaper; or
  (ii) any official *Gazette* that is published specifically for the purpose of providing public notice of applications or other submissions made in terms of these Regulations;

(d) placing an advertisement in at least one provincial newspaper or national newspaper, if the activity has or may have an impact that extends beyond the boundaries of the local municipality in which it is or will be undertaken: Provided that this paragraph need not be complied with if an advertisement has been placed in an official *Gazette* referred to in subregulation 54(c)(ii); and

(e) using reasonable alternative methods, as agreed to by the department, in those instances where a person is desiring of but unable to participate in the process due to—
  (i) illiteracy;
  (ii) disability; or
  (iii) any other disadvantage.

2. CONTENT OF ADVERTISEMENTS AND NOTICES

A notice board, advertisement or notices must:

(a) indicate the details of the application which is subjected to public participation; and

(b) state—

  (i) that the application has been submitted to the department in terms of these Regulations, as the case may be;

  (ii) whether basic assessment or scoping procedures are being applied to the application, in the case of an application for environmental authorisation;

  (iii) the nature and location of the activity to which the application relates;

  (iv) where further information on the application or activity can be obtained; and

  (v) the manner in which and the person to whom representations in respect of the application may be made.

3. PLACEMENT OF ADVERTISEMENTS AND NOTICES

Where the proposed activity may have impacts that extend beyond the municipal area where it is located, a notice must be placed in at least one provincial newspaper or national newspaper, indicating that an application will be submitted to the department in terms of these regulations, the nature and location of the activity, where further information on the proposed activity can be obtained and the manner in which representations in respect of the application can be made, unless a notice has been placed in any *Gazette* that is published specifically for the purpose of providing notice to the public of applications made in terms of these Regulations.

Advertisements and notices must make provision for all alternatives.

4. DETERMINATION OF APPROPRIATE MEASURES

The practitioner must ensure that the public participation is adequate and must determine whether a public meeting or any other additional measure is appropriate or not based on the particular nature of each case. Special attention should be given to the involvement of local community structures such as Ward Committees, ratepayers associations and traditional authorities where appropriate. Please note that public concerns that emerge at a later stage that should have been addressed may cause the department to withdraw any authorisation it may have issued if it becomes apparent that the public participation process was inadequate.

5. COMMENTS AND RESPONSE REPORT

The practitioner must record all comments and respond to each comment of the public before the application is submitted. The comments and responses must be captured in a comments and response report as prescribed in these Regulations and be attached to this application. The comments and response report must be attached under Appendix E.

6. AUTHORITY PARTICIPATION

Please note that a complete list of all organs of state and or any other applicable authority with their contact details must be appended to the basic assessment report or scoping report, whichever is applicable.

Authorities are key interested and affected parties in each application and no decision on any application will be made before the relevant local authority is provided with the opportunity to give input.

7. CONSULTATION WITH OTHER STAKEHOLDERS

Note that, for linear activities, or where deviation from the public participation requirements may be appropriate, the person conducting the public participation process may deviate from the requirements of that subregulation to the extent and in the manner as may be agreed to by the department.

Proof of any such agreement must be provided, where applicable.

Has any comment been received from stakeholders?	[redacted]	**NO**

If "YES", briefly describe the feedback below (also attach copies of any correspondence to and from the stakeholders to this application):

[redacted]

The following activities will take place during the public participation process:

- **Identification of Key Stakeholders**

As required by the EIA Regulations of 2014, relevant local, provincial and national authorities, local forums and representatives as well as surrounding land owners and occupants must be notified of the environmental process, proof of this notification will be included in the Final Basic Assessment Report (FBAR).

Relevant government authorities (organs of state) have been automatically registered as IAPs. In accordance with the EIA Regulations of 2014, all other persons must request in writing to be placed on the register, submit written comments or attend meetings in order to be registered as stakeholders and included in future communication regarding the project; the advertisement and notifications advise that IAPs register as such. All respondents are then to be placed on the project database. This database is supplemented by IAPs who contacts the project manager to be included on the database. The database is used throughout the process to inform the stakeholders of the project. The stakeholder database will be updated throughout the process.

- **Stakeholder Database**

All relevant stakeholder and I&AP information has been recorded within a database of affected parties (refer to **Appendix E4**). While I&APs were encouraged to register their interest in the project from the onset of the process undertaken by Envirolution Consulting, the identification and registration of I&APs will be on-going for the duration of the EIA process.

- **Placement of Site Notices and Newspaper Advertisement**

Site notices will be displayed in different points within the study area. This will be included in the Final BAR to be submitted to LEDET. Refer to **Appendix E1** for site notice wording. A newspaper advertisement will run in the Steelburger inc. Lydenburg News on the 29th September 2022. Proof of the newspaper advert will be included in the Final BAR to be submitted to LEDET. Refer to **Appendix E3** for newspaper advert wording.

- **Written Notifications**

Access to all information that could influence interested and affected parties has been initiated by the project announcement, which includes the placement of site notices and distribution of written notifications in the form of a i) email distribution to registered I&APs and ii) a “knock and drop” exercise during visits to surrounding areas. Proof of written notification will be included in the Final BAR. Refer to **Appendix E2** for written notification letter wording.

- **Review of the Draft Basic Assessment Report**

Stakeholder: The Basic Assessment Report has been made publically available to all registered I&AP's from **29 September 2022 to 31 October 2022** at the following locations:

- Municipal Satellite Offices
- Dropbox link sent to registered I&APs via email
- Email copy of the BA report document (without appendices) sent to all registered I&APs via email

Authority: The Draft Basic Assessment Report was sent to (amongst others):

- Provincial Authorities
- Local and District Municipality
- Ward Cllr

- **Summary of Issues Raised by I&AP's**

Comments are anticipated during the 30-day review period. All comments received will be responded to and proof will be included in the Final BAR to be submitted to LEDET.

- **Public Consultation**

In order to provide information regarding the proposed project and the EIA process, a written notification letter for the project was compiled at the outset of the process. In order to accommodate the varying needs of stakeholders and I&APs within the study area, as well as capture their views, issues and concerns regarding the project, various opportunities will be provided in order for I&APs to have their issues noted. I&APs will be consulted through the following means:

- Focus Group Meeting (FGM) (pre-arranged and stakeholders invited to attend – included ward councillor, ward committee, chiefs, etc)
- Telephonic consultation sessions
- Written, faxed or e-mail correspondence
- Public meeting (if requested in the FGM)

Proof of all communications will be included in the Final BAR to be submitted to LEDET.

- **Comments and Responses Report**

At the end of the 30 day review period, all comments/input from stakeholders and I&AP's, will be captured in the Comments and Response Report (CRR) which formed part of the Final BAR. The Comments and Response Report includes responses from members of the EIA project team and/or the project proponent.

SECTION D: IMPACT ASSESSMENT

The assessment of impacts must adhere to the minimum requirements in the EIA Regulations, 2014, and should take applicable official guidelines into account. The issues raised by interested and affected parties should also be addressed in the assessment of impacts.

1. ISSUES RAISED BY INTERESTED AND AFFECTED PARTIES

List the main issues raised by interested and affected parties.

Comments are expected during the current 30 day DBAR review period. These concerns/ issues will be addressed and incorporated into the impact assessment section of the FBAR.

Response from the practitioner to the issues raised by the interested and affected parties (A full response must be given in the Comments and Response Report that must be attached to this report as Annexure E):

As above.

2. IMPACTS THAT MAY RESULT FROM THE PLANNING AND DESIGN, CONSTRUCTION, OPERATIONAL, DECOMMISSIONING AND CLOSURE PHASES AS WELL AS PROPOSED MANAGEMENT OF IDENTIFIED IMPACTS AND PROPOSED MITIGATION MEASURES

List the potential direct, indirect and cumulative property/activity/design/technology/operational alternative related impacts (as appropriate) that are likely to occur as a result of the planning and design phase, construction phase, operational phase, decommissioning and closure phase, including impacts relating to the choice of site/activity/technology alternatives as well as the mitigation measures that may eliminate or reduce the potential impacts listed.

Impact Assessment Methodology

The impact assessment methodology used to assess the alternatives for this project is as follows:

The following methodology and criteria was used in assessing impacts related to the proposed development.

- The **Nature**, a description of what causes the effect, what will be affected, and how it will be affected.

- The **Extent**, wherein it is indicated whether:

  - 1 is limited to the immediate area or site of development
  - 2 is the local area
  - 3 is regional
  - 4 is national
  - 5 is international

- The **Duration**, wherein it is indicated whether:

  - The lifetime of the impact will be of a very short duration (0–1 years) – assigned a score of 1;
  - The lifetime of the impact will be of a short duration (2-5 years) - assigned a score of 2;
  - Medium-term (5–15 years) – assigned a score of 3;
  - Long term (> 15 years) - assigned a score of 4; or;
  - Permanent - assigned a score of 5.

- The **Magnitude**, quantified on a scale from 0-10, where a score is assigned:

  - 0 is small and will have no effect on the environment;
  - 2 is minor and will not result in an impact on processes;
  - 4 is low and will cause a slight impact on processes;
  - 6 is moderate and will result in processes continuing but in a modified way;
  - 8 is high (processes are altered to the extent that they temporarily cease); and
  - 10 is very high and results in complete destruction of patterns and permanent cessation of processes.

- The **Probability** of occurrence, which describes the likelihood of the impact actually occurring. Probability is

estimated on a scale, and a score assigned:

- Assigned a score of 1–5, where 1 is very improbable (probably will not happen);
- Assigned a score of 2 is improbable (some possibility, but low likelihood);
- Assigned a score of 3 is probable (distinct possibility);
- Assigned a score of 4 is highly probable (most likely); and
- Assigned a score of 5 is definite (impact will occur regardless of any prevention measures).

➢ The **Significance**, which is determined through a synthesis of the characteristics described above (refer formula below) and can be assessed as low, medium or high.

- The status, which is described as **positive**, **negative** or **neutral**.
- The degree to which the impact can be reversed.
- The degree to which the impact may cause irreplaceable loss of resources.
- The degree to which the impact can be mitigated.

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

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

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

The significance weightings for each potential impact are as follows:

- **< 30 points:** **Low** (i.e. where this impact would not have a direct influence on the decision to develop in the area),
- **31-60 points:** **Medium** (i.e. where the impact could influence the decision to develop in the area unless it is effectively mitigated),
- **> 60 points:** **High** (i.e. where the impact must have an influence on the decision process to develop in the area).

3. IMPACT ASSESSMENT

Alignment Alternatives

Construction Phase

Table 14: Construction Impacts

<table>
<tr><th>POTENTIAL IMPACTS</th><th>PROPOSED MITIGATION</th><th>RISK OF THE IMPACT MITIGATION NOT BEING IMPLEMENTED</th></tr>
<tr>
<td>Nature of Impact: Impacts to hydrological function at a landscape level.

Source: Impacts on hydrological functioning at a landscape level and across the site which can arise from changes to flood regimes (e.g. suppression of floods, loss of flood attenuation capacity, unseasonal flooding or destruction of floodplain processes) as well as the extent of the modification in relation to the overall aquatic ecosystem (i.e. at the source, upstream or downstream portion, in the temporary, seasonal, permanent zone of a wetland, in the riparian zone or within the channel of a watercourse, etc.). Changes to base flow and hydroperiod.

Alternative 1
<table>
<tr><th>Description</th><th>Without Mitigation</th><th>With Mitigation</th></tr>
<tr><td>Probability</td><td>Definite (5)</td><td>Probable (3)</td></tr>
<tr><td>Duration</td><td>Medium term (3)</td><td>Short term (2)</td></tr>
<tr><td>Extent</td><td>Local (2)</td><td>Local (2)</td></tr>
<tr><td>Magnitude</td><td>Moderate (6)</td><td>Low (4)</td></tr>
<tr><td>Significance</td><td>55 (Medium)</td><td>24 (Low)</td></tr>
<tr><td>Status (positive or negative)</td><td>Negative</td><td>Negative</td></tr>
</table>
Alternative 2
</td>
<td>

Vertical gabions are not ideal for watercourse function since they do not support vegetation establishment, niche habitats and can result in further canalisation and erosion. The design of slope stabilisation structures should reflect considerations of alternatives and should demonstrate how they will affect downstream hydrology (particularly erosion) and local biodiversity.
A review of stormwater structures associated with the roads should be done to ensure that culverts are suitable and contribute to the control of erosion along the downslope watercourse, rather than increases it.
Designs should consider soil properties, slopes and runoff energy with the aim of having a neural effect on the regional hydrograph and prevent scouring, erosion or sedimentation.
Design of erosion control structures must mimic natural slopes and strictly avoid vertical gabion walls. But rather comprise of vegetated material that support local biotopes and must be based on a thorough understanding of the hydrology of the watercourse as demonstrated through a Mitigation Hierarchy assessment
Use of SANRAL road standards in terms of drainage and stormwater
A temporary fence or demarcation must be erected around No-Go Areas outside the proposed works area prior to any construction taking place as part of the contractor planning phase when compiling work method statements to prevent access to the adjacent portions of the watercourse.

</td>
<td>Impacts to the flow characteristics of this watercourse are likely to be permanent unless mitigated and/ or rehabilitated.</td>
</tr>
</table>

<table>
<tr><th>POTENTIAL IMPACTS</th><th>PROPOSED MITIGATION</th><th>RISK OF THE IMPACT MITIGATION NOT BEING IMPLEMENTED</th></tr>
<tr>
<td>
<table>
<tr><th>Description</th><th>Without Mitigation</th><th>With Mitigation</th></tr>
<tr><td>Probability</td><td>Definite (5)</td><td>Highly Probable (4)</td></tr>
<tr><td>Duration</td><td>Long term (4)</td><td>Medium term (3)</td></tr>
<tr><td>Extent</td><td>Local (2)</td><td>Local (2)</td></tr>
<tr><td>Magnitude</td><td>Moderate (6)</td><td>Low (4)</td></tr>
<tr><td>Significance</td><td>60 (Medium)</td><td>36 (Medium)</td></tr>
<tr><td>Status (positive or negative)</td><td>Negative</td><td>Negative</td></tr>
</table>
</td>
<td>

Effective stormwater management should be a priority during the construction phase. This should be monitored as part of the EMPr.
High energy stormwater input into the watercourses should be prevented at all cost.
Implement a long-term monitoring plan to highlight unintended negative affected of altered hydrology, for example erosion downstream of the new bridge
Effective stabilisation and revegetation of disturbed slopes should be a priority.

</td>
<td></td>
</tr>
<tr>
<td>Nature of Impact: <u>Changes in sediment regime.</u>

Changes in sediment regimes of the aquatic ecosystem and its sub-catchment by for example sand movement, meandering river mouth/ estuary, changing flooding or sedimentation patterns.

Source: Construction and maintenance activities will result in earthworks and soil disturbance as well as the disturbance of natural vegetation. This could result in the loss of topsoil, sedimentation of the watercourse and increase the turbidity of the water. Possible sources of the impacts include:

• Earthwork activities during construction.
• Clearing of surface vegetation will expose the soils, which in rainy events would wash through the watercourse, causing sedimentation. In addition, indigenous vegetation communities are unlikely to colonise eroded soils successfully and seeds from proximate alien invasive trees can spread easily into these eroded soil.
• Disturbance of soil surface.</td>
<td>

Use of SANRAL road standards in terms of drainage and stormwater
Consider the various methods and equipment available and select whichever method(s) that will have the least impact on watercourses.
Construction in and around watercourses must be restricted to the dryer winter months where possible.
Retain vegetation and soil in position for as long as possible, removing it immediately ahead of construction / earthworks in that area.
Where sedimentation has been observed, effective rehabilitation with a focus on the long term control of alien invasive plants should be done.
Monitoring should target the culverts and with outlets in the riparian zone to ensure that no habitat degradation results from these structures during the operational phase.
Remove only the vegetation where essential for construction and do not allow any disturbance to the adjoining natural vegetation cover.
Rehabilitation plans must be submitted and approved for rehabilitation of damage during construction and that plan must be implemented immediately upon completion of construction.
Cordon off areas that are under rehabilitation as no-go areas using danger tape and steel droppers. If necessary, these areas should be fenced off to

</td>
<td>Expected to be limited provided that the mitigation measures are implemented correctly and effective rehabilitation of the site is undertaken where necessary.</td>
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</table>

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<tr><th>POTENTIAL IMPACTS</th><th>PROPOSED MITIGATION</th><th>RISK OF THE IMPACT MITIGATION NOT BEING IMPLEMENTED</th></tr>
<tr><td>

- Disturbance of slopes through creation of roads and tracks adjacent to the watercourse.
- Erosion (e.g. gully formation, bank collapse).

Alternative 1

Description	Without Mitigation	With Mitigation
Probability	Highly Probable (4)	Probable (3)
Duration	Medium term (3)	Short term (2)
Extent	Regional (3)	Regional (3)
Magnitude	High (8)	Low (4)
Significance	**56 (Medium)**	**27 (Low)**
Status (positive or negative)	Negative	Negative

Alternative 2

Description	Without Mitigation	With Mitigation
Probability	Highly Probable (4)	Probable (3)
Duration	Long term (4)	Medium term (3)
Extent	Regional (3)	Regional (3)
Magnitude	High (8)	Medium (6)
Significance	**60 (Medium)**	**36 (Medium)**
Status (positive or negative)	Negative	Negative

</td><td>prevent vehicular, pedestrian and livestock access.

- During the construction phase measures must be put in place to control the flow of excess water so that it does not impact on the surface vegetation.
- Protect all areas susceptible to erosion and ensure that there is no undue soil erosion resultant from activities within and adjacent to the construction camp and work areas.
- Runoff from the construction area must be managed to avoid erosion and pollution problems.
- Monitoring should be done to ensure that sediment pollution is timeously dressed.</td><td></td></tr>
<tr><td>Nature of impact: <u>Introduction and spread of alien vegetation.</u>

Source: The moving of soil and vegetation resulting in opportunistic invasions after disturbance and the introduction of seed in building materials and on vehicles. Invasions of alien plants can impact on hydrology, by reducing the quantity of water entering a watercourse, and</td><td>

- Undertake an Alien Plant Control Plan which specifies actions and measurable targets.
- Retain vegetation and soil in position for as long as possible, removing it immediately ahead of construction/ earthworks in that area and returning it where possible afterwards.
- Long-term monitoring for the establishment of alien invasive species within</td><td>Expected to be limited provided that the mitigation measures are implemented correctly and effective rehabilitation of the site is undertaken where necessary.</td></tr>
</table>

<table>
<tr><th>POTENTIAL IMPACTS</th><th>PROPOSED MITIGATION</th><th>RISK OF THE IMPACT MITIGATION NOT BEING IMPLEMENTED</th></tr>
<tr><td>outcompete natural vegetation, decreasing the natural biodiversity. Once in a system alien invasive plants can spread through the catchment. If allowed to seed before control measures are implemented alien plans can easily colonise and impact on downstream users.

Alternative 1
<table>
<tr><th>Description</th><th>Without Mitigation</th><th>With Mitigation</th></tr>
<tr><td>Probability</td><td>Probable (3)</td><td>Probable (3)</td></tr>
<tr><td>Duration</td><td>Long term (4)</td><td>Short term (2)</td></tr>
<tr><td>Extent</td><td>Regional (3)</td><td>Local (2)</td></tr>
<tr><td>Magnitude</td><td>Moderate (6)</td><td>Low (4)</td></tr>
<tr><td>Significance</td><td>39 (Medium)</td><td>24 (Low)</td></tr>
<tr><td>Status (positive or negative)</td><td>Negative</td><td>Negative</td></tr>
</table>
Alternative 2
<table>
<tr><th>Description</th><th>Without Mitigation</th><th>With Mitigation</th></tr>
<tr><td>Probability</td><td>Highly Probable (4)</td><td>Probable (3)</td></tr>
<tr><td>Duration</td><td>Long term (4)</td><td>Medium term (3)</td></tr>
<tr><td>Extent</td><td>Regional (3)</td><td>Local (2)</td></tr>
<tr><td>Magnitude</td><td>Moderate (6)</td><td>Moderate (5)</td></tr>
<tr><td>Significance</td><td>52 (Medium)</td><td>30 (Low)</td></tr>
<tr><td>Status (positive or negative)</td><td>Negative</td><td>Negative</td></tr>
</table></td><td>the areas affected by the construction and maintenance and take immediate corrective action where invasive species are observed to establish, as specified in the Alien Vegetation Management Plan.
• Rehabilitate or revegetate disturbed areas.</td><td></td></tr>
<tr><td>Nature of the Impact: Loss and disturbance of riparian habitat.

Loss and disturbance of watercourse habitat and fringe vegetation including impact on fixed and dynamic ecological processes and impact on key ecosystem regulating and supporting services.</td><td>• Where construction occurs in the demarcated watercourse and buffer, extra precautions should be implemented to so as to minimise watercourse loss.
• Other than approved and authorized structure, no other development or maintenance infrastructure is allowed within the delineated watercourse or associated buffer zones.</td><td>Expected to be limited provided that the mitigation measures are implemented correctly and effective rehabilitation of the site is undertaken where necessary.</td></tr>
</table>

<table>
<tr><th>POTENTIAL IMPACTS</th><th>PROPOSED MITIGATION</th><th>RISK OF THE IMPACT MITIGATION NOT BEING IMPLEMENTED</th></tr>
<tr><td>

Source: Loss and disturbance of watercourse habitat and fringe vegetation due to direct development on the watercourse as well as changes in management, fire regime and habitat fragmentation.

Alternative 1

Description	Without Mitigation	With Mitigation
Probability	Highly Probable (4)	Highly Probable (4)
Duration	Medium term (3)	Short term (2)
Extent	Local (2)	Local (2)
Magnitude	High (8)	Low (4)
Significance	**52 (Medium)**	**32 (Medium)**
Status (positive or negative)	Negative	Negative

Alternative 2

Description	Without Mitigation	With Mitigation
Probability	Highly Probable (4)	Highly Probable (4)
Duration	Long term (4)	Medium term (3)
Extent	Local (2)	Local (2)
Magnitude	High (8)	Medium (6)
Significance	**56 (Medium)**	**44 (Medium)**
Status (positive or negative)	Negative	Negative

</td><td>

- Demarcate the watercourse areas and buffer zones to limit disturbance, clearly mark these areas as no-go areas
- Where sedimentation has been observed, effective rehabilitation with a focus on the long term control of alien invasive plants should be done.
- Ensure that movement corridors enable fauna to migrate through the system.
- Monitoring should target the two minor culverts with outlets in the riparian zone to ensure that no habitat degradation results from these structures during the operational phase.
- Monitor rehabilitation and the occurrence of erosion twice during the rainy season for at least two years and take immediate corrective action where needed.
- Monitor the establishment of alien invasive species within the areas affected by the construction and take immediate corrective action where invasive species are observed to establish.

</td><td></td></tr>
<tr><td>

Nature of the Impact: Loss of aquatic biota.

Loss of instream habitat, deposition of wind-blown sand, loss of fringing vegetation and erosion, alteration in natural fire regimes and subsequent loss of non-marginal and marginal vegetation. Increase in invasive species due to disturbance. Change in water quality. Changes in flow.

</td><td>

- Ensure that no additional vegetation is removed,
- Avoid unnecessary aquatic ecosystem crossing - limit work within the stream, river or wetland. The use of single access points for crossings.
- Other than approved and authorized structure, no other development or maintenance infrastructure is allowed within the delineated wetland and riparian areas or their associated buffer zones.

</td><td>Expected to be limited provided that the mitigation measures are implemented correctly and effective rehabilitation of the site is undertaken where necessary.</td></tr>
</table>

<table>
<tr><th>POTENTIAL IMPACTS</th><th>PROPOSED MITIGATION</th><th>RISK OF THE IMPACT MITIGATION NOT BEING IMPLEMENTED</th></tr>
<tr>
<td>

Source: Loss and disturbance of biota due to direct development on the watercourse as well as changes in habitat including water quality, the water column, increased sediment, increased alien vegetation fire regime and habitat fragmentation.

Since this watercourse is non-perennial, impacts to aquatic habitats are largely restricted to altered hydrology and downstream changes resulting from sediment pollution and further erosion.

Alternative 1

Description	Without Mitigation	With Mitigation
Probability	Highly Probable (4)	Probable (3)
Duration	Medium term (3)	Medium term (3)
Extent	Local (2)	Local (2)
Magnitude	Moderate (6)	Low (4)
Significance	**44 (Medium)**	**27 (Low)**
Status (positive or negative)	Negative	Negative

Alternative 2

Description	Without Mitigation	With Mitigation
Probability	Highly Probable (4)	Probable (3)
Duration	Long term (4)	Medium term (3)
Extent	Local (2)	Local (2)
Magnitude	High (8)	Moderate (6)
Significance	**56 (Medium)**	**33 (Medium)**
Status (positive or negative)	Negative	Negative

</td>
<td>

- Mark all areas which don't form part of the proposed development within wetlands and riparian areas as no-go areas.
- The toe of the new bridge must be constructed at water level with no drops to assist additionally with the migration.
- Sections of pools must be retained as this will provide protection for aquatic fauna. Monitor the establishment of alien invasive species within the areas affected by the construction and maintenance of the proposed infrastructure and take immediate corrective action where invasive species are observed to establish.
- All management procedures listed above for the change in water quality.

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<table>
<tr><th>POTENTIAL IMPACTS</th><th>PROPOSED MITIGATION</th><th>RISK OF THE IMPACT MITIGATION NOT BEING IMPLEMENTED</th></tr>
<tr>
<td>
Nature of the Impact: Clearing of vegetation and exposure to erosion.

Source: The removal of surface vegetation will expose the soils, which in rainy events would wash down into the channel, causing erosion and downstream sedimentation. In addition, indigenous vegetation communities are unlikely to colonise eroded soils successfully and seeds from proximate alien invasive plant species can spread easily into these eroded soils.

Alternative 1
<table>
<tr><th>Description</th><th>Without Mitigation</th><th>With Mitigation</th></tr>
<tr><td>Probability</td><td>Definite (5)</td><td>Definite (5)</td></tr>
<tr><td>Duration</td><td>Short term (2)</td><td>Short term (2)</td></tr>
<tr><td>Extent</td><td>Site and surrounds (2)</td><td>Site (1)</td></tr>
<tr><td>Magnitude</td><td>Moderate (6)</td><td>Low (4)</td></tr>
<tr><td>Significance</td><td>50 (Medium)</td><td>35 (Medium)</td></tr>
<tr><td>Status (positive or negative)</td><td>Negative</td><td>Positive</td></tr>
</table>
Alternative 2
<table>
<tr><th>Description</th><th>Without Mitigation</th><th>With Mitigation</th></tr>
<tr><td>Probability</td><td>Definite (5)</td><td>Definite (5)</td></tr>
<tr><td>Duration</td><td>Medium term (3)</td><td>Short term (2)</td></tr>
<tr><td>Extent</td><td>Site and surrounds (2)</td><td>Site (1)</td></tr>
<tr><td>Magnitude</td><td>High (8)</td><td>Moderate (6)</td></tr>
<tr><td>Significance</td><td>65 (High)</td><td>45 (Medium)</td></tr>
<tr><td>Status (positive or negative)</td><td>Negative</td><td>Positive</td></tr>
</table>
</td>
<td>
• Activities should take place during winter to minimise the risk of pollution.
• Erosion from the development footprint could increase sedimentation in already degraded watercourses. Retain vegetation and soil in position for as long as possible, removing it immediately ahead of construction/ earthworks in that area (DWAF, 2005).
• Runoff from roads/ footpath must be managed to avoid erosion and pollution problems.
• Ensure that runoff from compacted or sealed surfaces is slowed down and dispersed sufficiently to prevent accelerated erosion from being initiated
• Protect all areas susceptible to erosion and ensure that there is no undue soil erosion resultant from activities within and adjacent to the construction camp and work areas.
• After construction clear any temporarily impacted areas of all foreign materials, re-apply and/or loosen topsoils and landscape to surrounding level.
</td>
<td>Expected to be limited provided that the mitigation measures are implemented correctly and effective rehabilitation of the site is undertaken where necessary.</td>
</tr>
</table>

<table>
<tr><th>POTENTIAL IMPACTS</th><th>PROPOSED MITIGATION</th><th>RISK OF THE IMPACT MITIGATION NOT BEING IMPLEMENTED</th></tr>
<tr><td>Nature of the Impact: Alien and invasive plant species.

Alternative 1
<table>
<tr><th>Description</th><th>Without Mitigation</th><th>With Mitigation</th></tr>
<tr><td>Probability</td><td>Probable (3)</td><td>Improbable (2)</td></tr>
<tr><td>Duration</td><td>Medium term (3)</td><td>Short term (2)</td></tr>
<tr><td>Extent</td><td>Site (1)</td><td>Site (1)</td></tr>
<tr><td>Magnitude</td><td>Moderate (6)</td><td>Moderate (6)</td></tr>
<tr><td>Significance</td><td>30 (Low)</td><td>18 (Low)</td></tr>
<tr><td>Status (positive or negative)</td><td>Negative</td><td>Negative</td></tr>
</table>
Alternative 2
<table>
<tr><th>Description</th><th>Without Mitigation</th><th>With Mitigation</th></tr>
<tr><td>Probability</td><td>Highly Probable (4)</td><td>Probable (3)</td></tr>
<tr><td>Duration</td><td>Medium term (3)</td><td>Short term (2)</td></tr>
<tr><td>Extent</td><td>Site (1)</td><td>Site (1)</td></tr>
<tr><td>Magnitude</td><td>High (8)</td><td>Moderate (6)</td></tr>
<tr><td>Significance</td><td>48 (Medium)</td><td>27 (Low)</td></tr>
<tr><td>Status (positive or negative)</td><td>Negative</td><td>Negative</td></tr>
</table></td><td>• Alien invasive species, in particular category 1b species t, must be removed from the development footprint and immediate surrounds, prior to construction or soil disturbances. By removing these species, the spread of seeds will be prevented into disturbed soils which could thus have a positive impact on the surrounding natural vegetation, as well as the vegetation downstream of the site.
• The removed vegetation must be destroyed to prevent any regrowth or germination of seeds. Dispose of the eradicated plant material at an approved solid waste disposal site.
• All alien seedlings and saplings must be removed as they become evident for the duration of construction / rehabilitation efforts.
• Rehabilitate all areas cleared of invasive plants as soon as practically possible, utilising specified methods and species.
• If filling material is to be used, this should be sourced from areas free of invasive species.
• Monitor all sites disturbed by the proposed activities for colonisation by exotics or invasive plants and control these as they emerge. Monitoring should continue for at least two years after construction is complete and should be done in accordance with an alien and invasive management plan.
• Follow manufacturer's instruction when using chemical methods, especially in terms of quantities, time of application etc.
• Ensure that only properly trained people handle and make use of chemicals.
• Only indigenous plant species naturally occurring in the area should be used during the rehabilitation of the areas affected by the construction activities.
• Once activities are complete, monitor all sites disturbed by the proposed activities for colonisation by exotics or invasive plants and control these as they emerge. Monitoring should continue for at least two years after activities were completed.</td><td>Expected to be limited provided that the mitigation measures are implemented correctly and effective rehabilitation of the site is undertaken where necessary.</td></tr>
<tr><td>Nature of the Impact: Degradation of downstream vegetation and</td><td>• Alien invasive species, in particular category 1b species t, must be removed</td><td>Expected to be limited provided that the mitigation measures are</td></tr>
</table>

<table>
<tr><th>POTENTIAL IMPACTS</th><th>PROPOSED MITIGATION</th><th>RISK OF THE IMPACT MITIGATION NOT BEING IMPLEMENTED</th></tr>
<tr>
<td>habitats.

Post rehabilitation activities, the soils could erode or be colonised by alien invasive plant species. The establishment of indigenous vegetation is likely the most important stage in rehabilitation of vegetation and the spillway This will restore and enhance the vegetation functionality, as well as provide suitable habitat to biodiversity on the site.

Alternative 1
<table>
<tr><th>Description</th><th>Without Mitigation</th><th>With Mitigation</th></tr>
<tr><td>Probability</td><td>Probable (3)</td><td>Improbable (2)</td></tr>
<tr><td>Duration</td><td>Long term (4)</td><td>Short term (2)</td></tr>
<tr><td>Extent</td><td>Site and downstream (2)</td><td>Site (1)</td></tr>
<tr><td>Magnitude</td><td>Moderate (6)</td><td>Low (4)</td></tr>
<tr><td>Significance</td><td>36 (Medium)</td><td>14 (Low)</td></tr>
<tr><td>Status (positive or negative)</td><td>Negative</td><td>Positive</td></tr>
</table>
Alternative 2
<table>
<tr><th>Description</th><th>Without Mitigation</th><th>With Mitigation</th></tr>
<tr><td>Probability</td><td>Probable (3)</td><td>Improbable (2)</td></tr>
<tr><td>Duration</td><td>Long term (4)</td><td>Medium term (3)</td></tr>
<tr><td>Extent</td><td>Site and downstream (2)</td><td>Site (1)</td></tr>
<tr><td>Magnitude</td><td>Moderate (6)</td><td>Low (4)</td></tr>
<tr><td>Significance</td><td>36 (Medium)</td><td>16 (Low)</td></tr>
<tr><td>Status (positive or negative)</td><td>Negative</td><td>Positive</td></tr>
</table>
</td>
<td>from the development footprint and immediate surrounds, prior to construction or soil disturbances. By removing these species, the spread of seeds will be prevented into disturbed soils which could thus have a positive impact on the surrounding natural vegetation, as well as the vegetation downstream of the site.
• The removed vegetation must be destroyed to prevent any regrowth or germination of seeds. Dispose of the eradicated plant material at an approved solid waste disposal site.
• All alien seedlings and saplings must be removed as they become evident for the duration of construction / rehabilitation efforts.
• Rehabilitate all areas cleared of invasive plants as soon as practically possible, utilising specified methods and species.
• If filling material is to be used, this should be sourced from areas free of invasive species.
• Monitor all sites disturbed by the proposed activities for colonisation by exotics or invasive plants and control these as they emerge. Monitoring should continue for at least two years after construction is complete and should be done in accordance with an alien and invasive management plan.
• Follow manufacturer's instruction when using chemical methods, especially in terms of quantities, time of application etc.
• Ensure that only properly trained people handle and make use of chemicals.
• Only indigenous plant species naturally occurring in the area should be used during the rehabilitation of the areas affected by the construction activities.
• Once activities are complete, monitor all sites disturbed by the proposed activities for colonisation by exotics or invasive plants and control these as they emerge. Monitoring should continue for at least two years after activities were completed.</td>
<td>implemented correctly and effective rehabilitation of the site is undertaken where necessary.</td>
</tr>
</table>

<table>
<tr><th>POTENTIAL IMPACTS</th><th>PROPOSED MITIGATION</th><th>RISK OF THE IMPACT MITIGATION NOT BEING IMPLEMENTED</th></tr>
<tr>
<td>

Nature of the Impact: Pollution during proposed activities.

The use of machinery and construction material could cause pollution of the ground water and water within the channel. This could inhibit successful rehabilitation and cause pollution to flow downstream.

Alternative 1

Description	Without Mitigation	With Mitigation
Probability	Highly Probable (4)	Probable (3)
Duration	Long term (4)	Short term (2)
Extent	Local (2)	Site (1)
Magnitude	High (8)	Low (4)
Significance	**56 (Medium)**	**21 (Low)**
Status (positive or negative)	Negative	Negative

Alternative 2

Description	Without Mitigation	With Mitigation
Probability	Highly Probable (4)	Probable (3)
Duration	Long term (4)	Medium term (3)
Extent	Local (2)	Site (1)
Magnitude	High (8)	Moderate (6)
Significance	**56 (Medium)**	**30 (Low)**
Status (positive or negative)	Negative	Negative

</td>
<td>

- In the case of pollution of any surface or groundwater, the Regional Representative of the Department of Water Affairs must be informed immediately.
- Prevent spillage of construction material, oils or other chemicals, strictly prohibit other pollution. Ensure there is a method statement in place to remedy any accidental spillages immediately.
- Pollution of the surface and groundwater. Mitigation for this potential impact includes:
  - In the case of pollution of any surface or groundwater, the Regional Representative of the Department of Water Affairs must be informed immediately;
  - Store all litter carefully so it cannot be washed or blown into the nearby water course;
  - Construction vehicles are to be maintained in good working order to reduce the probability of leakage of fuels and lubricants;
  - A walled concrete platform, dedicated store with adequate flooring or bermed area should be used to accommodate chemicals such as fuel, oil, paint, herbicide and insecticides, as appropriate, in well-ventilated areas;
  - Storage of potentially hazardous materials should be above any 100-year flood line or the functional wetland boundary (and its associated buffer zone). These materials include fuel, oil, cement, bitumen etc.;
  - Surface water draining off contaminated areas containing oil and petrol would need to be channelled towards a sump which will separate these chemicals and oils;
  - Concrete is to be mixed on mixing trays only, not on exposed soil;
  - Concrete and tar shall be mixed only in areas which have been specially demarcated for this purpose;
  - After all the concrete / tar mixing is complete all waste concrete /

</td>
<td>Expected to be limited provided that the mitigation measures are implemented correctly and effective rehabilitation of the site is undertaken where necessary.</td>
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</table>

<table>
<tr><th>POTENTIAL IMPACTS</th><th>PROPOSED MITIGATION</th><th>RISK OF THE IMPACT MITIGATION NOT BEING IMPLEMENTED</th></tr>
<tr><td></td><td>tar shall be removed from the batching area and disposed of at an approved dumpsite;
o All construction materials liable to spillage are to be stored in appropriate structures with impermeable flooring; Portable septic toilets are to be provided and maintained for construction crews. Maintenance must include their removal without sewage spillage;
o Under no circumstances may ablutions occur outside of the provided facilities; and
• No uncontrolled discharges from the construction crew camps to any surface water resources shall be permitted. Any discharge points need to be approved by the relevant authority.</td><td></td></tr>
<tr><td>Nature of the Impact: Soil compaction.

The movement of heavy machinery over vegetated areas during construction and maintenance will result in soil compaction that will modify habitats, destroy vegetation, and inhibit re-vegetation. Soil compaction because of vehicles and traffic, could lead to a decrease of water infiltration and an increase of water runoff. Such areas are more likely to be colonised by pioneer, alien invasive plant species, than indigenous species. This will further transform the vegetation of the area. The health of the topsoil is imperative for re-vegetation. Incorrect stripping, handling and storage could lead to failed rehabilitation.

Alternative 1
<table>
<tr><th>Description</th><th>Without Mitigation</th><th>With Mitigation</th></tr>
<tr><td>Probability</td><td>Probable (3)</td><td>Improbable (2)</td></tr>
<tr><td>Duration</td><td>Medium term (3)</td><td>Short term (2)</td></tr>
<tr><td>Extent</td><td>Local (2)</td><td>Site (1)</td></tr>
<tr><td>Magnitude</td><td>Moderate (6)</td><td>Low (4)</td></tr>
<tr><td>Significance</td><td>33 (Medium)</td><td>14 (Low)</td></tr>
</table></td><td>• Vehicles and machinery may not veer from the dedicated roads.
• Once activities are complete, obsolete roads should be obliterated by breaking the surface crust and erecting earth embankments to prevent erosion, while the natural species composition should be re-established.
• Prior to construction, the topsoil must be removed and stored separately from subsoil. The topsoil is imperative for the successful re-establishment of indigenous vegetation, and it carries seed from the existing vegetation
• Topsoil (the upper 25 cm of soil) is an important natural resource; where it must and can be stripped, never mix it with subsoil or any other material, store and protect it separately until it can be re-applied, minimise handling of topsoil.
• Topsoil is typically stored in berms with a width of 150 – 200 cm, and a maximum height of 100 cm, preferably lower, ideally in a disturbed but weed-free area. Place berms along contours or perpendicular to the prevailing wind direction.
• Rapid decomposition of organic material in warm, moist topsoils decreases microbial activity necessary for nutrient cycling, and reduces the number of beneficial micro-organisms in the soil. Therefore, topsoil should therefore not be stored for extensive periods, and it is recommended that the reapplication</td><td>Expected to be limited provided that the mitigation measures are implemented correctly and effective rehabilitation of the site is undertaken where necessary.</td></tr>
</table>

<table>
<tr><th>POTENTIAL IMPACTS</th><th>PROPOSED MITIGATION</th><th>RISK OF THE IMPACT MITIGATION NOT BEING IMPLEMENTED</th></tr>
<tr><td>
<table>
<tr><td>Status (positive or negative)</td><td>Negative</td><td>Negative</td></tr>
</table>
Alternative 2
<table>
<tr><th>Description</th><th>Without Mitigation</th><th>With Mitigation</th></tr>
<tr><td>Probability</td><td>Highly Probable (4)</td><td>Probable (3)</td></tr>
<tr><td>Duration</td><td>Medium term (3)</td><td>Short term (2)</td></tr>
<tr><td>Extent</td><td>Local (2)</td><td>Site (1)</td></tr>
<tr><td>Magnitude</td><td>Moderate (6)</td><td>Low (4)</td></tr>
<tr><td>Significance</td><td>44 (Medium)</td><td>21 (Low)</td></tr>
<tr><td>Status (positive or negative)</td><td>Negative</td><td>Negative</td></tr>
</table>
</td><td>of topsoil takes place as soon as possible. Adhere to the following general rule: the larger the pile of topsoil storage needs to be, the shorter should be the time it is stored
• Topsoil handling should be limited to stripping, piling (once), and re-application.
• Any movement of heavy machinery or vehicles over stored topsoils must be strictly prohibited.</td><td></td></tr>
<tr><td>
Nature of the Impact: Lack of rehabilitation with indigenous species.

Alternative 1
<table>
<tr><th>Description</th><th>Without Mitigation</th><th>With Mitigation</th></tr>
<tr><td>Probability</td><td>Probable (3)</td><td>Improbable (2)</td></tr>
<tr><td>Duration</td><td>Medium term (3)</td><td>Short term (2)</td></tr>
<tr><td>Extent</td><td>Local (2)</td><td>Site (1)</td></tr>
<tr><td>Magnitude</td><td>Moderate (6)</td><td>Low (4)</td></tr>
<tr><td>Significance</td><td>33 (Medium)</td><td>14 (Low)</td></tr>
<tr><td>Status (positive or negative)</td><td>Negative</td><td>Negative</td></tr>
</table>
Alternative 2
<table>
<tr><th>Description</th><th>Without Mitigation</th><th>With Mitigation</th></tr>
<tr><td>Probability</td><td>Highly Probable (4)</td><td>Probable (3)</td></tr>
<tr><td>Duration</td><td>Medium term (3)</td><td>Short term (2)</td></tr>
<tr><td>Extent</td><td>Local (2)</td><td>Site (1)</td></tr>
</table>
</td><td>• A vegetation rehabilitation plan should already be implemented and include the following:
o Only remove indigenous vegetation where necessary. The removed plants must be kept under suitable growing conditions and reused during rehabilitation if possible.
o Grasses that naturally occur in the area should be planted in the disturbed footprint (e.g. Cenchrus ciliaris, Urochloa mosambicensis, Schmidtia pappophoroides, Stipagrostis hirtigluma subsp. patula)
o The following indigenous trees can be planted:
– Grewia bicolor
– Ehretia rigida subsp. Rigida
– Ziziphus mucronata
– Balanites maughamii
– Combretum imberbe
• Rehabilitate with an indigenous grass seed mix, representative of the natural species composition. Only indigenous plant species may be used for rehabilitation.</td><td>Expected to be limited provided that the mitigation measures are implemented correctly and effective rehabilitation of the site is undertaken where necessary.</td></tr>
</table>

POTENTIAL IMPACTS			PROPOSED MITIGATION	RISK OF THE IMPACT MITIGATION NOT BEING IMPLEMENTED
Magnitude	Moderate (6)	Low (4)	• Cordon off areas that are under rehabilitation as no-go areas using danger tape and steel droppers. If necessary, these areas should be fenced off to prevent vehicular or pedestrian access. • After planting and reseeding, no soil compaction (vehicles, pedestrians and animals) should be allowed until such time that re-vegetation as successful. • Establishment of the vegetation should be monitored for at least two years and after flooding events, for at least another two years. If die back is noted, a specialist should be consulted, and corrective action taken as soon as possible. • Rehabilitation will be successful when the indigenous vegetation and planted indigenous trees are attained as a minimum. • The following steps must form part of site preparation and the subsequent maintenance of the re-vegetated areas: o Remove all building rubble, equipment and material; o Rip and / or scarify all disturbed areas o Do not rip and / or scarify areas under wet conditions, as the soil will not break up and it could result in further compaction. o Planting should preferably be done during the rainy season. o Cordon off areas that are under rehabilitation as no-go areas using danger tape and steel droppers. If necessary, these areas should be fenced off to prevent any access. o Allow for a maintenance and monitoring period of at least two years following completion. o The ratio of the seed mix used for re-vegetation is usually specified by the supplier and based on site conditions, however, an average of 3kg/ha is recommended per species o Perennial species should form the basis of the grass mix, while at least one species used must provide rapid and dense ground cover during the establishment season. This is likely to include annual, fast-growing species.	
Significance	**44 (Medium)**	**21 (Low)**		
Status (positive or negative)	**Negative**	**Negative**		

<table>
<tr><th>POTENTIAL IMPACTS</th><th>PROPOSED MITIGATION</th><th>RISK OF THE IMPACT MITIGATION NOT BEING IMPLEMENTED</th></tr>
<tr><td></td><td>o Seeds must be thoroughly mixed before applying.
o The seeds must be applied according to the required rates.
o Application rates can be increased in areas that are unfavourable or steep, but no more than double the recommendations.
o Seeds can be mixed with a spreading agent such as river sand, bran or finely sifted kraal to ensure even distribution.
o Manure or agricultural lime and granular fertiliser mix can be applied prior to reseeding.
o Once complete, the seeded area must be watered and patted down gently.
• After planting and reseeding, no soil compaction (vehicles, pedestrians and animals) should be allowed until such time that re-vegetation as successful.
• Establishment of the vegetation should be monitored for at least two years post relocation. If die back is noted, a specialist should be consulted, and corrective action taken as soon as possible.</td><td></td></tr>
<tr><td>Nature of the Impact: Impact to the koppies.

Alternative 1
<table>
<tr><th>Description</th><th>Without Mitigation</th><th>With Mitigation</th></tr>
<tr><td>Probability</td><td>Probable (3)</td><td>Possible (2)</td></tr>
<tr><td>Duration</td><td>Permanent (4)</td><td>Permanent (4)</td></tr>
<tr><td>Extent</td><td>Site (1)</td><td>Site (1)</td></tr>
<tr><td>Magnitude</td><td>Moderate (6)</td><td>Low (4)</td></tr>
<tr><td>Significance</td><td>33 (Medium)</td><td>18 (Low)</td></tr>
<tr><td>Status (positive or negative)</td><td>Negative</td><td>Negative</td></tr>
</table>
Alternative 2
<table>
<tr><th>Description</th><th>Without Mitigation</th><th>With Mitigation</th></tr>
<tr><td>Probability</td><td>Highly Probable (4)</td><td>Probable (3)</td></tr>
</table></td><td>• The koppies south of site must be designated as “no-go” areas and no activity is allowed within the Koppies near site.</td><td>Low risk anticipated provided that the mitigation measures are implemented correctly.</td></tr>
</table>

<table>
<tr><th>POTENTIAL IMPACTS</th><th>PROPOSED MITIGATION</th><th>RISK OF THE IMPACT MITIGATION NOT BEING IMPLEMENTED</th></tr>
<tr><td>
<table>
<tr><td>Duration</td><td>Permanent (5)</td><td>Permanent (4)</td></tr>
<tr><td>Extent</td><td>Site (1)</td><td>Site (1)</td></tr>
<tr><td>Magnitude</td><td>Moderate (6)</td><td>Moderate (5)</td></tr>
<tr><td>Significance</td><td>48 (Medium)</td><td>30 (Low)</td></tr>
<tr><td>Status (positive or negative)</td><td>Negative</td><td>Negative</td></tr>
</table>
</td><td></td><td></td></tr>
<tr><td>Nature of the Impact: Loss and disturbance of cultural heritage sites and artefacts due to the development.

All Alternatives
<table>
<tr><th>Description</th><th>Without Mitigation</th><th>With Mitigation</th></tr>
<tr><td>Probability</td><td>Very improbable (1)</td><td>Very improbable (1)</td></tr>
<tr><td>Duration</td><td>Permanent (5)</td><td>Permanent (5)</td></tr>
<tr><td>Extent</td><td>Site (1)</td><td>Site (1)</td></tr>
<tr><td>Magnitude</td><td>Minor (2)</td><td>Minor (2)</td></tr>
<tr><td>Significance</td><td>8 (Low)</td><td>8 (Low)</td></tr>
<tr><td>Status (positive or negative)</td><td>Negative</td><td>Negative</td></tr>
</table>
</td><td>• Should graves, fossils or any archaeological artefacts be identified during construction, work on the area where the artefacts were found, must cease immediately and it should immediately be reported to a heritage practitioner or local museum so that an investigation and evaluation of the finds can be made.</td><td>Low risk anticipated provided that the mitigation measures are implemented correctly.</td></tr>
<tr><td>Nature of the Impact: Loss and disturbance of palaeontology sites and artefacts due to the development.

All Alternatives
<table>
<tr><th>Description</th><th>Without Mitigation</th><th>With Mitigation</th></tr>
<tr><td>Probability</td><td>Very improbable (1)</td><td>Very improbable (1)</td></tr>
<tr><td>Duration</td><td>Permanent (5)</td><td>Permanent (5)</td></tr>
<tr><td>Extent</td><td>Site (1)</td><td>Site (1)</td></tr>
<tr><td>Magnitude</td><td>Minor (2)</td><td>Minor (2)</td></tr>
</table>
</td><td>• Should any palaeontology features be identified during maintenance, work on the area where the artefacts were found, must cease immediately and it should immediately be reported to a specialist so that an investigation and evaluation of the finds can be made.
• Chance find protocol must be in place.</td><td>Low risk anticipated provided that the mitigation measures are implemented correctly.</td></tr>
</table>

<table>
<tr><th>POTENTIAL IMPACTS</th><th>PROPOSED MITIGATION</th><th>RISK OF THE IMPACT MITIGATION NOT BEING IMPLEMENTED</th></tr>
<tr><td>
<table>
<tr><td>Significance</td><td>8 (Low)</td><td>8 (Low)</td></tr>
<tr><td>Status (positive or negative)</td><td>Negative</td><td>Negative</td></tr>
</table>
</td><td></td><td></td></tr>
<tr><td>Nature of Impact: Visual

Surface disturbances and the presence of a construction team are uncharacteristic events in the study area and may cause unsightly views as a result of the activity.

Introduction of construction equipment, ground staff, construction vehicles and equipment that is unfamiliar in the baseline environment.

Source of Impact:
• Construction vehicles.
• Construction material.
• Barricading and fencing.
• Rubble on site.
• Construction crew.

All Alternatives
<table>
<tr><th>Description</th><th>Without Mitigation</th><th>With Mitigation</th></tr>
<tr><td>Probability</td><td>Definite (5)</td><td>Highly Probable (4)</td></tr>
<tr><td>Duration</td><td>Long term (4)</td><td>Medium term (2)</td></tr>
<tr><td>Extent</td><td>Local (2)</td><td>Local (2)</td></tr>
<tr><td>Magnitude</td><td>High (8)</td><td>Moderate (6)</td></tr>
<tr><td>Significance</td><td>70 (High)</td><td>40 (Medium)</td></tr>
<tr><td>Status (positive or negative)</td><td>Negative</td><td>Negative</td></tr>
</table>
</td><td>• Construction vehicles should only park in designated areas.
• Waste to be kept only at specific sites on site and to be removed weekly.
• Do not locate the construction camp or laydown yards within 1km from any residential area or tourist attraction, unless it can be completely screened from sensitive viewpoints. Preferably, construction camps should be in a dedicated construction camp in the industrial area, in an area that is already disturbed.
• Avoid the construction of additional access roads by keeping to existing roads where possible.
• Avoid removal of any large trees or shrubs that may open views to the construction site and compromise the natural screening capacity of the study area.
• Clearly demarcate the construction site to limit the area of disturbance.
• Keep dust levels down by regularly wetting dirt roads and exposed soil areas.
• Remove rubble and other waste that is generated by the construction process as soon as possible and dispose at an appropriate dump site.
• Keep the construction camp neat and tidy at all times. Remove any waste from the site or contain it in an enclosed area out of sight from sensitive viewpoints.
• Enhance screening of the construction camps by erecting a temporary fence with a 3m high shade cloth to limit the intrusive nature of such a site.</td><td>The site will not be visually appealing during the construction phase.</td></tr>
<tr><td>Nature of Impact: Dust Generation</td><td>• Vegetation clearance should be kept to a minimum (only where necessary).
• Wet all unprotected cleared areas and stockpiles with water to suppress</td><td>Medium risk (as the amount of dust emitted into the air will be of high</td></tr>
</table>

<table>
<tr><th>POTENTIAL IMPACTS</th><th>PROPOSED MITIGATION</th><th>RISK OF THE IMPACT MITIGATION NOT BEING IMPLEMENTED</th></tr>
<tr><td>Construction machinery and heavy vehicles which are likely to make use of the existing gravel roads to transport equipment and material to the construction site, are likely to generate dust which is likely to be perceptible by adjacent residents. Trucks may potentially distribute dust along internal access roads as well as into the watercourse given the nature of the activities.

Source of Impact:
• Clearing of vegetation.
• Construction vehicles.

All Alternatives
<table>
<tr><th>Description</th><th>Without Mitigation</th><th>With Mitigation</th></tr>
<tr><td>Probability</td><td>Definite (5)</td><td>Highly Probable (4)</td></tr>
<tr><td>Duration</td><td>Long term (4)</td><td>Medium term (2)</td></tr>
<tr><td>Extent</td><td>Local (2)</td><td>Local (2)</td></tr>
<tr><td>Magnitude</td><td>High (8)</td><td>Moderate (6)</td></tr>
<tr><td>Significance</td><td>70 (High)</td><td>40 (Medium)</td></tr>
<tr><td>Status (positive or negative)</td><td>Negative</td><td>Negative</td></tr>
</table></td><td>dust pollution during dry and windy periods.
• Warning barricading should be placed around open trenches and should be suitable for high winds.
• Speed limits should be enforced to ensure that the generation of dust by construction vehicles are limited.
• Dust suppression at least twice a day; morning and before the end of the working day.
• A continuous dust monitoring process needs to be undertaken during construction.
• All vehicles transporting friable materials such a sand, rubble etc must be covered by a tarpaulin or wet down.
• Construction work to be undertaken during weekdays as far as practical.</td><td>volumes); unless mitigation measures are implemented.</td></tr>
<tr><td>Nature of Impact: Crime, safety and security

Source of Impact:
• Lack of security.
• Easy access.
• Construction area not enclosed.
• Poorly trained personnel using equipment and vehicles.

All Alternatives
<table>
<tr><th>Description</th><th>Without Mitigation</th><th>With Mitigation</th></tr>
</table></td><td>• Ensure that the construction vehicles as well as equipment are under the control of competent personnel and are in proper working order.
• Ensure that the contact details of the police or security company and ambulance services are available on site.
• Limit access to the construction camp to construction workers through access control.
• Comply with the requirements of the Occupational Health and Safety Act, 1993 (Act No.85 of 1993) requirements.
• Ensure that the handling of equipment and materials is supervised and adequately instructed.</td><td>If not mitigated, medium risk to personnel as well as the construction site if safety measures are not put in place before construction commences.</td></tr>
</table>

<table>
<tr><th>POTENTIAL IMPACTS</th><th>PROPOSED MITIGATION</th><th>RISK OF THE IMPACT MITIGATION NOT BEING IMPLEMENTED</th></tr>
<tr><td>
<table>
<tr><td>Probability</td><td>Highly Probable (4)</td><td>Probable (3)</td></tr>
<tr><td>Duration</td><td>Long term (4)</td><td>Medium term (3)</td></tr>
<tr><td>Extent</td><td>Local (2)</td><td>Local (2)</td></tr>
<tr><td>Magnitude</td><td>Moderate (6)</td><td>Low (2)</td></tr>
<tr><td>Significance</td><td>48 (Medium)</td><td>21 (Low)</td></tr>
<tr><td>Status (positive or negative)</td><td>Negative</td><td>Negative</td></tr>
</table>
</td><td>

Vehicular traffic during construction activities must be limited to a maximum speed limit of 30 km/hr.
The security fence around the development site must be completed before construction commences internally.

</td><td></td></tr>
<tr><td>
Nature of Impact: Noise

Source of Impact:

Construction vehicles.
Equipment and machinery.

All Alternatives
<table>
<tr><th>Description</th><th>Without Mitigation</th><th>With Mitigation</th></tr>
<tr><td>Probability</td><td>Definite (5)</td><td>Highly Probable (4)</td></tr>
<tr><td>Duration</td><td>Long term (4)</td><td>Medium term (2)</td></tr>
<tr><td>Extent</td><td>Local (2)</td><td>Local (2)</td></tr>
<tr><td>Magnitude</td><td>High (8)</td><td>Moderate (6)</td></tr>
<tr><td>Significance</td><td>70 (High)</td><td>40 (Medium)</td></tr>
<tr><td>Status (positive or negative)</td><td>Negative</td><td>Negative</td></tr>
</table>
</td><td>

Construction and the use of construction machinery should be limited between 06h00 and 18h00 on weekdays only.
Institute noise control measures throughout the construction phase for all applicable activities, including the construction times.
Ensure that noise licensers are installed on the construction vehicles and machineries to reduce the noise level.
Inform residents of nearby residential areas of planned noisy activities outside the timeframes stated above.
No construction should occur during weekends, unless the adjacent residents have been notified in writing at least three days in advance.
Construction activities must abide by the national noise laws and the municipal noise by-laws with regard to the abatement of noise caused by mechanical equipment.

</td><td>High risk as construction vehicles and equipment causes noise pollution.</td></tr>
<tr><td>
Nature of impact: Socioeconomic

Source of Impact:

Job creation for local skilled labour, general labour and suppliers.

All Alternatives
<table>
<tr><th>Description</th><th>Without Enhancement</th><th>With Enhancement</th></tr>
</table>
</td><td>

General and skilled locals must be considered for employment during construction (contractor and construction crew).
Local suppliers must be considered for the purchase of construction material.

</td><td>Medium</td></tr>
</table>

POTENTIAL IMPACTS			PROPOSED MITIGATION	RISK OF THE IMPACT MITIGATION NOT BEING IMPLEMENTED
Probability	Probable (3)	Highly Probable (4)		
Duration	Short term (2)	Medium term (3)		
Extent	Local (2)	Local (2)		
Magnitude	Low (4)	Moderate (6)		
Significance	**24 (Low)**	**44 (Medium)**		
Status (positive or negative)	Positive	Positive		

Operational Phase

Table 15: Operational Impacts

<table>
<tr><th>POTENTIAL IMPACTS</th><th>PROPOSED MITIGATION</th><th>RISK OF THE IMPACT MITIGATION NOT BEING IMPLEMENTED</th></tr>
<tr><td>Nature of Impact: Impacts to hydrological function at a landscape level.

Alternative 1
<table>
<tr><th>Description</th><th>Without Mitigation</th><th>With Mitigation</th></tr>
<tr><td>Probability</td><td>Definite (5)</td><td>Probable (3)</td></tr>
<tr><td>Duration</td><td>Long term (4)</td><td>Medium term (3)</td></tr>
<tr><td>Extent</td><td>Regional (3)</td><td>Regional (3)</td></tr>
<tr><td>Magnitude</td><td>Low (4)</td><td>Low (4)</td></tr>
<tr><td>Significance</td><td>55 (Medium)</td><td>30 (Low)</td></tr>
<tr><td>Status (positive or negative)</td><td>Negative</td><td>Negative</td></tr>
</table>
Alternative 2
<table>
<tr><th>Description</th><th>Without Mitigation</th><th>With Mitigation</th></tr>
<tr><td>Probability</td><td>Definite (5)</td><td>Highly Probable (4)</td></tr>
<tr><td>Duration</td><td>Long term (4)</td><td>Medium term (3)</td></tr>
<tr><td>Extent</td><td>Regional (3)</td><td>Regional (3)</td></tr>
<tr><td>Magnitude</td><td>Moderate (6)</td><td>Low (4)</td></tr>
<tr><td>Significance</td><td>65 (High)</td><td>40 (Medium)</td></tr>
<tr><td>Status (positive or negative)</td><td>Negative</td><td>Negative</td></tr>
</table></td><td>• Effective stormwater management should be a priority during both construction and operational phase. This should be monitored as part of the EMPr. High energy stormwater input into the watercourses should be prevented at all cost. Changes to natural flow of water (surface water as well as water flowing within the soil profile) should be taken into account.
• Ensure that the activity does not result in downstream erosion or sedimentation.</td><td>Impacts to the flow characteristics of this watercourse are likely to be permanent unless rehabilitated.</td></tr>
<tr><td>Nature of Impact: Changes in sediment regime

Alternative 1
<table>
<tr><th>Description</th><th>Without Mitigation</th><th>With Mitigation</th></tr>
<tr><td>Probability</td><td>Highly Probable (4)</td><td>Possible (2)</td></tr>
</table></td><td>• Monitoring should target the culverts and with outlets in the riparian zone to ensure that no habitat degradation results from these structures during the operational phase.
• Monitoring should target the culverts and with outlets in the riparian zone to</td><td>Expected to be limited provided that the mitigation measures are implemented correctly and effective rehabilitation of the site is undertaken where necessary.</td></tr>
</table>

<table>
<tr><th>POTENTIAL IMPACTS</th><th>PROPOSED MITIGATION</th><th>RISK OF THE IMPACT MITIGATION NOT BEING IMPLEMENTED</th></tr>
<tr><td>

Duration	Medium term (3)	Medium term (3)
Extent	Regional (3)	Local (2)
Magnitude	High (8)	Low (4)
Significance	**56 (Medium)**	**18 (Low)**
Status (positive or negative)	Negative	Negative

Alternative 2

Description	Without Mitigation	With Mitigation
Probability	Highly Probable (4)	Probable (3)
Duration	Medium term (3)	Medium term (3)
Extent	Regional (3)	Local (2)
Magnitude	High (8)	Moderate (6)
Significance	**56 (Medium)**	**33 (Medium)**
Status (positive or negative)	Negative	Negative

</td><td>ensure that no habitat degradation results from these structures during the operational phase.</td><td></td></tr>
<tr><td>

Nature of impact: Introduction and spread of alien vegetation

Alternative 2

Description	Without Mitigation	With Mitigation
Probability	Probable (3)	Possible (2)
Duration	Medium term (3)	Medium term (3)
Extent	Regional (4)	Local (2)
Magnitude	Low (4)	Low (4)
Significance	**33 (Medium)**	**18 (Low)**
Status (positive or negative)	Negative	Negative

Alternative 2

Description	Without Mitigation	With Mitigation

</td><td>

- Weed control in buffer zone.
- Monitor the establishment of alien invasive species within the areas affected by the construction and take immediate corrective action where invasive species are observed to establish.
- Operational activities should not take place within watercourses or buffer zones, nor should edge effects impact on these areas.
- Operational activities should not impact on rehabilitated or naturally vegetated areas.

</td><td>Expected to be limited provided that the mitigation measures are implemented correctly and effective rehabilitation of the site is undertaken where necessary.</td></tr>
</table>

<table>
<tr><th>POTENTIAL IMPACTS</th><th>PROPOSED MITIGATION</th><th>RISK OF THE IMPACT MITIGATION NOT BEING IMPLEMENTED</th></tr>
<tr><td>
<table>
<tr><td>Probability</td><td>Probable (3)</td><td>Probable (3)</td></tr>
<tr><td>Duration</td><td>Medium term (3)</td><td>Medium term (3)</td></tr>
<tr><td>Extent</td><td>Regional (4)</td><td>Local (2)</td></tr>
<tr><td>Magnitude</td><td>Moderate (6)</td><td>Low (4)</td></tr>
<tr><td>Significance</td><td>39 (Medium)</td><td>27 (Low)</td></tr>
<tr><td>Status (positive or negative)</td><td>Negative</td><td>Negative</td></tr>
</table>
</td><td></td><td></td></tr>
<tr><td>Nature of the Impact: Loss and disturbance of riparian habitat

Alternative 1
<table>
<tr><th>Description</th><th>Without Mitigation</th><th>With Mitigation</th></tr>
<tr><td>Probability</td><td>Probable (3)</td><td>Probable (3)</td></tr>
<tr><td>Duration</td><td>Medium term (3)</td><td>Short term (2)</td></tr>
<tr><td>Extent</td><td>Local (2)</td><td>Local (2)</td></tr>
<tr><td>Magnitude</td><td>Low (4)</td><td>Low (4)</td></tr>
<tr><td>Significance</td><td>27 (Low)</td><td>24 (Low)</td></tr>
<tr><td>Status (positive or negative)</td><td>Highly Probable (4)</td><td>Probable (3)</td></tr>
</table>
Alternative 2
<table>
<tr><th>Description</th><th>Without Mitigation</th><th>With Mitigation</th></tr>
<tr><td>Probability</td><td>Probable (3)</td><td>Probable (3)</td></tr>
<tr><td>Duration</td><td>Medium term (3)</td><td>Short term (2)</td></tr>
<tr><td>Extent</td><td>Local (2)</td><td>Local (2)</td></tr>
<tr><td>Magnitude</td><td>Moderate (6)</td><td>Low (4)</td></tr>
<tr><td>Significance</td><td>33 (Medium)</td><td>24 (Low)</td></tr>
<tr><td>Status (positive or negative)</td><td>Highly Probable (4)</td><td>Probable (3)</td></tr>
</table>
</td><td>• Monitoring should target the two minor culverts with outlets in the riparian zone to ensure that no habitat degradation results from these structures during the operational phase.
• Monitor rehabilitation and the occurrence of erosion twice during the rainy season for at least two years and take immediate corrective action where needed.
• Monitor the establishment of alien invasive species within the areas affected by the construction and take immediate corrective action where invasive species are observed to establish
• Operational activities should not impact on rehabilitated or naturally vegetated areas.</td><td>Expected to be limited provided that the mitigation measures are implemented correctly and effective rehabilitation of the site is undertaken where necessary.</td></tr>
<tr><td>Nature of the Impact: Changes in water quality due to input of foreign</td><td>• Ensure that no operational activities impact on the watercourse or buffer</td><td>Expected to be limited provided that</td></tr>
</table>

<table>
<tr><th>POTENTIAL IMPACTS</th><th>PROPOSED MITIGATION</th><th>RISK OF THE IMPACT MITIGATION NOT BEING IMPLEMENTED</th></tr>
<tr><td>materials.

Alternative 1
<table>
<tr><th>Description</th><th>Without Mitigation</th><th>With Mitigation</th></tr>
<tr><td>Probability</td><td>Probable (3)</td><td>Probable (3)</td></tr>
<tr><td>Duration</td><td>Medium term (3)</td><td>Medium term (2)</td></tr>
<tr><td>Extent</td><td>Local (2)</td><td>Local (2)</td></tr>
<tr><td>Magnitude</td><td>Low (4)</td><td>Low (4)</td></tr>
<tr><td>Significance</td><td>27 (Low)</td><td>24 (Low)</td></tr>
<tr><td>Status (positive or negative)</td><td>Negative</td><td>Negative</td></tr>
</table>
Alternative 2
<table>
<tr><th>Description</th><th>Without Mitigation</th><th>With Mitigation</th></tr>
<tr><td>Probability</td><td>Probable (3)</td><td>Probable (3)</td></tr>
<tr><td>Duration</td><td>Medium term (3)</td><td>Medium term (2)</td></tr>
<tr><td>Extent</td><td>Local (2)</td><td>Local (2)</td></tr>
<tr><td>Magnitude</td><td>Moderate (6)</td><td>Low (4)</td></tr>
<tr><td>Significance</td><td>33 (Medium)</td><td>24 (Low)</td></tr>
<tr><td>Status (positive or negative)</td><td>Negative</td><td>Negative</td></tr>
</table></td><td>area. This includes edge effects.
• Control of waste discharges and do not allow dirty water from operational activities to enter the watercourse.
• Treatment of pollution identified should be prioritized accordingly.</td><td>the mitigation measures are implemented correctly and effective rehabilitation of the site is undertaken where necessary.</td></tr>
<tr><td>Nature of the Impact: Loss of aquatic biota

Alternative 1
<table>
<tr><th>Description</th><th>Without Mitigation</th><th>With Mitigation</th></tr>
<tr><td>Probability</td><td>Possible (3)</td><td>Possible (2)</td></tr>
<tr><td>Duration</td><td>Medium term (3)</td><td>Short term (2)</td></tr>
<tr><td>Extent</td><td>Regional (3)</td><td>Local (2)</td></tr>
<tr><td>Magnitude</td><td>Moderate (4)</td><td>Minor (2)</td></tr>
<tr><td>Significance</td><td>36 (Medium)</td><td>12 (Low)</td></tr>
</table></td><td>• Weed control in aquatic ecosystem and buffer zone.
• Monitor the establishment of alien invasive species within the areas affected by the construction and maintenance of the proposed infrastructure and take immediate corrective action where invasive species are observed to establish.</td><td>Expected to be limited provided that the mitigation measures are implemented correctly and effective rehabilitation of the site is undertaken where necessary.</td></tr>
</table>

<table>
<tr><th>POTENTIAL IMPACTS</th><th>PROPOSED MITIGATION</th><th>RISK OF THE IMPACT MITIGATION NOT BEING IMPLEMENTED</th></tr>
<tr><td>

Status (positive or negative)	Negative	Negative

Alternative 2

Description	Without Mitigation	With Mitigation
Probability	Probable (3)	Possible (2)
Duration	Medium term (3)	Short term (2)
Extent	Regional (3)	Local (2)
Magnitude	Moderate (4)	Low (4)
Significance	**36 (Medium)**	**16 (Low)**
Status (positive or negative)	Negative	Negative

</td><td></td><td></td></tr>
<tr><td>

Nature of the Impact: Alien and invasive plant species

Alternative 1

Description	Without Mitigation	With Mitigation
Probability	Probable (3)	Improbable (2)
Duration	Short term (2)	Very short (1)
Extent	Site (1)	Site (1)
Magnitude	Moderate (6)	Low (4)
Significance	**27 (Low)**	**12 (Low)**
Status (positive or negative)	Negative	Positive, replacement of non-indigenous vegetation with indigenous vegetation

Alternative 2

Description	Without Mitigation	With Mitigation
Probability	Probable (3)	Improbable (2)

</td><td>

- Monitor all sites disturbed by the proposed activities for colonisation by exotics or invasive plants and control these as they emerge. Monitoring should continue for at least two years after construction is complete and should be done in accordance with an alien and invasive management plan.
- Only indigenous plant species naturally occurring in the area should be used during the rehabilitation of the areas affected by the construction activities.
- Once activities are complete, monitor all sites disturbed by the proposed activities for colonisation by exotics or invasive plants and control these as they emerge. Monitoring should continue for at least two years after activities were completed.

</td><td>Expected to be limited provided that the mitigation measures are implemented correctly and effective rehabilitation of the site is undertaken where necessary.</td></tr>
</table>

<table>
<tr><th>POTENTIAL IMPACTS</th><th>PROPOSED MITIGATION</th><th>RISK OF THE IMPACT MITIGATION NOT BEING IMPLEMENTED</th></tr>
<tr><td>
<table>
<tr><td>Duration</td><td>Medium term (3)</td><td>Short term (2)</td></tr>
<tr><td>Extent</td><td>Site (1)</td><td>Site (1)</td></tr>
<tr><td>Magnitude</td><td>Moderate (6)</td><td>Low (4)</td></tr>
<tr><td>Significance</td><td>30 (Low)</td><td>14 (Low)</td></tr>
<tr><td>Status (positive or negative)</td><td>Negative</td><td>Positive, replacement of non-indigenous vegetation with indigenous vegetation</td></tr>
</table>
</td><td></td><td></td></tr>
<tr><td>
Nature of the Impact: Clearing of vegetation and exposure to erosion

Alternative 1
<table>
<tr><th>Description</th><th>Without Mitigation</th><th>With Mitigation</th></tr>
<tr><td>Probability</td><td>Probable (3)</td><td>Improbable (3)</td></tr>
<tr><td>Duration</td><td>Short term (3)</td><td>Very short term (1)</td></tr>
<tr><td>Extent</td><td>Local (2)</td><td>Site (1)</td></tr>
<tr><td>Magnitude</td><td>Moderate (6)</td><td>Moderate (6)</td></tr>
<tr><td>Significance</td><td>33 (Medium)</td><td>24 (Low)</td></tr>
<tr><td>Status (positive or negative)</td><td>Negative</td><td>Positive – re-establish topsoils and landscape</td></tr>
</table>
Alternative 2
<table>
<tr><th>Description</th><th>Without Mitigation</th><th>With Mitigation</th></tr>
<tr><td>Probability</td><td>Probable (3)</td><td>Improbable (3)</td></tr>
<tr><td>Duration</td><td>Short term (3)</td><td>Very short term (1)</td></tr>
<tr><td>Extent</td><td>Local (2)</td><td>Site (1)</td></tr>
<tr><td>Magnitude</td><td>Moderate (6)</td><td>Moderate (6)</td></tr>
<tr><td>Significance</td><td>33 (Medium)</td><td>24 (Low)</td></tr>
<tr><td>Status (positive or</td><td>Negative</td><td>Positive – re-</td></tr>
</table>
</td><td>

- After construction clear any temporarily impacted areas of all foreign materials, re-apply and/or loosen topsoils and landscape to surrounding level.

</td><td>Expected to be limited provided that the mitigation measures are implemented correctly and effective rehabilitation of the site is undertaken where necessary.</td></tr>
</table>

<table>
<tr><th>POTENTIAL IMPACTS</th><th>PROPOSED MITIGATION</th><th>RISK OF THE IMPACT MITIGATION NOT BEING IMPLEMENTED</th></tr>
<tr><td>
<table>
<tr><td>negative)</td><td></td><td>establish topsoils and landscape</td></tr>
</table>
</td><td></td><td></td></tr>
<tr><td>
Nature of the Impact: Degradation of downstream vegetation and habitats

Both Alternatives
<table>
<tr><th>Description</th><th>Without Mitigation</th><th>With Mitigation</th></tr>
<tr><td>Probability</td><td>Probable (3)</td><td>Improbable (3)</td></tr>
<tr><td>Duration</td><td>Short term (3)</td><td>Very short term (1)</td></tr>
<tr><td>Extent</td><td>Local (2)</td><td>Site (1)</td></tr>
<tr><td>Magnitude</td><td>Moderate (6)</td><td>Moderate (6)</td></tr>
<tr><td>Significance</td><td>33 (Medium)</td><td>24 (Low)</td></tr>
<tr><td>Status (positive or negative)</td><td>Negative</td><td>-</td></tr>
</table>
</td><td>During Maintenance:

• Prevent sedimentation
• Prevent pollution of water within the channel as well as groundwater.
• Prevent spillage of construction material, oils, or other chemicals, strictly prohibit other pollution. Ensure there is a method statement in place to remedy any accidental spillages immediately.
• No vehicles may be washed on site.
• Do no use downstream vegetation for construction related activities</td><td>Expected to be limited provided that the mitigation measures are implemented correctly and effective rehabilitation of the site is undertaken where necessary.</td></tr>
<tr><td>
Nature of the Impact: Pollution during operation and maintenance
Alternative 1
<table>
<tr><th>Description</th><th>Without Mitigation</th><th>With Mitigation</th></tr>
<tr><td>Probability</td><td>Probable (3)</td><td>Improbable (3)</td></tr>
<tr><td>Duration</td><td>Short term (3)</td><td>Very short term (1)</td></tr>
<tr><td>Extent</td><td>Local (2)</td><td>Site (1)</td></tr>
<tr><td>Magnitude</td><td>Moderate (6)</td><td>Moderate (6)</td></tr>
<tr><td>Significance</td><td>33 (Medium)</td><td>24 (Low)</td></tr>
<tr><td>Status (positive or negative)</td><td>Negative</td><td>Negative</td></tr>
</table>
Alternative 2
<table>
<tr><th>Description</th><th>Without Mitigation</th><th>With Mitigation</th></tr>
<tr><td>Probability</td><td>Probable (3)</td><td>Improbable (3)</td></tr>
<tr><td>Duration</td><td>Medium term (3)</td><td>Short term (2)</td></tr>
<tr><td>Extent</td><td>Local (2)</td><td>Site (1)</td></tr>
</table>
</td><td>
• In the case of pollution of any surface or groundwater, the Regional Representative of the Department of Water Affairs must be informed immediately.
• Prevent spillage of maintenance material, oils or other chemicals, strictly prohibit other pollution. Ensure there is a method statement in place to remedy any accidental spillages immediately.
• Pollution of the surface and groundwater. Mitigation for this potential impact includes:
  ○ In the case of pollution of any surface or groundwater, the Regional Representative of the Department of Water Affairs must be informed immediately;
  ○ Store all litter carefully so it cannot be washed or blown into the nearby water course;
  ○ Maintenance vehicles are to be maintained in good working order to reduce the probability of leakage of fuels and lubricants;
  ○ A walled concrete platform, dedicated store with adequate flooring</td><td>Expected to be limited provided that the mitigation measures are implemented correctly and effective rehabilitation of the site is undertaken where necessary.</td></tr>
</table>

<table>
<tr><th>POTENTIAL IMPACTS</th><th>PROPOSED MITIGATION</th><th>RISK OF THE IMPACT MITIGATION NOT BEING IMPLEMENTED</th></tr>
<tr><td>
<table>
<tr><td>Magnitude</td><td>Moderate (6)</td><td>Moderate (6)</td></tr>
<tr><td>Significance</td><td>33 (Medium)</td><td>27 (Low)</td></tr>
<tr><td>Status (positive or negative)</td><td>Negative</td><td>Negative</td></tr>
</table>
</td><td>or bermed area should be used to accommodate chemicals such as fuel, oil, paint, herbicide and insecticides, as appropriate, in well-ventilated areas;
○ Storage of potentially hazardous materials should be above any 100-year flood line or the functional wetland boundary (and its associated buffer zone). These materials include fuel, oil, cement, bitumen etc.;
○ Surface water draining off contaminated areas containing oil and petrol would need to be channelled towards a sump which will separate these chemicals and oils;
○ Concrete is to be mixed on mixing trays only, not on exposed soil;
○ Concrete and tar shall be mixed only in areas which have been specially demarcated for this purpose;
○ After all the concrete / tar mixing is complete all waste concrete / tar shall be removed from the batching area and disposed of at an approved dumpsite;
○ All maintenance materials liable to spillage are to be stored in appropriate structures with impermeable flooring; Portable septic toilets are to be provided and maintained for construction crews. Maintenance must include their removal without sewage spillage;
○ Under no circumstances may ablutions occur outside of the provided facilities; and
• No uncontrolled discharges from the construction crew camps to any surface water resources shall be permitted. Any discharge points need to be approved by the relevant authority.</td><td></td></tr>
<tr><td>Nature of the Impact: Soil compaction

Both Alternatives
<table>
<tr><th>Description</th><th>Without Mitigation</th><th>With Mitigation</th></tr>
<tr><td>Probability</td><td>Probable (3)</td><td>Improbable (3)</td></tr>
</table>
</td><td>During Maintenance:
• Vehicles and machinery may not veer from the dedicated roads.</td><td>Expected to be limited provided that the mitigation measures are implemented correctly and effective rehabilitation of the site is undertaken where necessary.</td></tr>
</table>

<table>
<tr><th>POTENTIAL IMPACTS</th><th>PROPOSED MITIGATION</th><th>RISK OF THE IMPACT MITIGATION NOT BEING IMPLEMENTED</th></tr>
<tr><td>
<table>
<tr><td>Duration</td><td>Short term (3)</td><td>Very short term (1)</td></tr>
<tr><td>Extent</td><td>Local (2)</td><td>Site (1)</td></tr>
<tr><td>Magnitude</td><td>Moderate (6)</td><td>Moderate (6)</td></tr>
<tr><td>Significance</td><td>33 (Medium)</td><td>24 (Low)</td></tr>
<tr><td>Status (positive or negative)</td><td>Negative</td><td>Negative</td></tr>
</table>
</td><td></td><td></td></tr>
<tr><td>
Nature of the Impact: <u>Lack of rehabilitation with indigenous species.</u>
Alternative 1
<table>
<tr><th>Description</th><th>Without Mitigation</th><th>With Mitigation</th></tr>
<tr><td>Probability</td><td>Probable (3)</td><td>Improbable (3)</td></tr>
<tr><td>Duration</td><td>Short term (3)</td><td>Very short term (1)</td></tr>
<tr><td>Extent</td><td>Local (2)</td><td>Site (1)</td></tr>
<tr><td>Magnitude</td><td>Moderate (6)</td><td>Moderate (6)</td></tr>
<tr><td>Significance</td><td>33 (Medium)</td><td>24 (Low)</td></tr>
<tr><td>Status (positive or negative)</td><td>Negative</td><td>Negative</td></tr>
</table>
Alternative 3
<table>
<tr><th>Description</th><th>Without Mitigation</th><th>With Mitigation</th></tr>
<tr><td>Probability</td><td>Probable (3)</td><td>Improbable (3)</td></tr>
<tr><td>Duration</td><td>Medium term (3)</td><td>Short term (2)</td></tr>
<tr><td>Extent</td><td>Local (2)</td><td>Site (1)</td></tr>
<tr><td>Magnitude</td><td>Moderate (6)</td><td>Moderate (6)</td></tr>
<tr><td>Significance</td><td>33 (Medium)</td><td>27 (Low)</td></tr>
<tr><td>Status (positive or negative)</td><td>Negative</td><td>Negative</td></tr>
</table>
</td><td>During Maintenance:
• A vegetation rehabilitation plan should already be implemented.
• Rehabilitate with an indigenous grass seed mix, representative of the natural species composition. Only indigenous plant species may be used for rehabilitation.
• Cordon off areas that are under rehabilitation as no-go areas using danger tape and steel droppers. If necessary, these areas should be fenced off to prevent vehicular or pedestrian access.
• After planting and reseeding, no soil compaction (vehicles, pedestrians and animals) should be allowed until such time that re-vegetation as successful.
• Establishment of the vegetation should be monitored for at least two years and after flooding events, for at least another two years. If die back is noted, a specialist should be consulted, and corrective action taken as soon as possible.
• Rehabilitation will be successful when the indigenous vegetation and planted indigenous trees are attained as a minimum.
• The following steps must form part of site preparation and the subsequent maintenance of the re-vegetated areas:
o Remove all building rubble, equipment and material;
o Rip and / or scarify all disturbed areas
o Do not rip and / or scarify areas under wet conditions, as the soil will not break up and it could result in further compaction.
o Planting should preferably be done during the rainy season.</td><td>Expected to be limited provided that the mitigation measures are implemented correctly and effective rehabilitation of the site is undertaken where necessary.</td></tr>
</table>

POTENTIAL IMPACTS	PROPOSED MITIGATION	RISK OF THE IMPACT MITIGATION NOT BEING IMPLEMENTED
	○ Cordon off areas that are under rehabilitation as no-go areas using danger tape and steel droppers. If necessary, these areas should be fenced off to prevent any access. ○ Allow for a maintenance and monitoring period of at least two years following completion. ○ The ratio of the seed mix used for re-vegetation is usually specified by the supplier and based on site conditions, however, an average of 3kg/ha is recommended per species ○ Perennial species should form the basis of the grass mix, while at least one species used must provide rapid and dense ground cover during the establishment season. This is likely to include annual, fast-growing species. ○ Seeds must be thoroughly mixed before applying. ○ The seeds must be applied according to the required rates. ○ Application rates can be increased in areas that are unfavourable or steep, but no more than double the recommendations. ○ Seeds can be mixed with a spreading agent such as river sand, bran or finely sifted kraal to ensure even distribution. ○ Manure or agricultural lime and granular fertiliser mix can be applied prior to reseeding. ○ Once complete, the seeded area must be watered and patted down gently. • After planting and reseeding, no soil compaction (vehicles, pedestrians and animals) should be allowed until such time that re-vegetation as successful. • Establishment of the vegetation should be monitored for at least two years post relocation. If die back is noted, a specialist should be consulted, and corrective action taken as soon as possible.	
Nature of the Impact: Impact to the koppies. **Alternative 1**	• The koppies south of site must be designated as "no-go" areas and no maintenance activity is allowed within the Koppies near site.	Low risk anticipated provided that the mitigation measures are implemented correctly.

<table>
<tr><th>POTENTIAL IMPACTS</th><th>PROPOSED MITIGATION</th><th>RISK OF THE IMPACT MITIGATION NOT BEING IMPLEMENTED</th></tr>
<tr><td>

Description	Without Mitigation	With Mitigation
Probability	Probable (3)	Possible (2)
Duration	Permanent (4)	Permanent (4)
Extent	Site (1)	Site (1)
Magnitude	Moderate (6)	Low (4)
Significance	**33 (Medium)**	**18 (Low)**
Status (positive or negative)	Negative	Negative

Alternative 2

Description	Without Mitigation	With Mitigation
Probability	Highly Probable (4)	Probable (3)
Duration	Permanent (5)	Permanent (4)
Extent	Site (1)	Site (1)
Magnitude	Moderate (6)	Low (4)
Significance	**48 (Medium)**	**27 (Low)**
Status (positive or negative)	Negative	Negative

</td><td></td><td></td></tr>
<tr><td>

Nature of the Impact: Loss and disturbance of **cultural heritage sites and artefacts**

Both Alternatives

Description	Without Mitigation	With Mitigation
Probability	Very improbable (1)	Very improbable (1)
Duration	Permanent (5)	Permanent (5)
Extent	Site (1)	Site (1)

</td><td>

- Should graves, fossils or any archaeological artefacts be identified during maintenance, work on the area where the artefacts were found, must cease immediately and it should immediately be reported to a heritage practitioner or local museum so that an investigation and evaluation of the finds can be made.

</td><td>Low risk anticipated provided that the mitigation measures are implemented correctly.</td></tr>
</table>

<table>
<tr><th>POTENTIAL IMPACTS</th><th>PROPOSED MITIGATION</th><th>RISK OF THE IMPACT MITIGATION NOT BEING IMPLEMENTED</th></tr>
<tr><td>
<table>
<tr><td>Magnitude</td><td>Minor (2)</td><td>Minor (2)</td></tr>
<tr><td>Significance</td><td>8 (Low)</td><td>8 (Low)</td></tr>
<tr><td>Status (positive or negative)</td><td>Negative</td><td>Negative</td></tr>
</table>
</td><td></td><td></td></tr>
<tr><td>Nature of the Impact: Loss and disturbance of palaeontology sites and artefacts due to the development

Both Alternatives
<table>
<tr><th>Description</th><th>Without Mitigation</th><th>With Mitigation</th></tr>
<tr><td>Probability</td><td>Very improbable (1)</td><td>Very improbable (1)</td></tr>
<tr><td>Duration</td><td>Permanent (5)</td><td>Permanent (5)</td></tr>
<tr><td>Extent</td><td>Site (1)</td><td>Site (1)</td></tr>
<tr><td>Magnitude</td><td>Minor (2)</td><td>Minor (2)</td></tr>
<tr><td>Significance</td><td>8 (Low)</td><td>8 (Low)</td></tr>
<tr><td>Status (positive or negative)</td><td>Negative</td><td>Negative</td></tr>
</table>
</td><td>• Should any palaeontology features be identified during maintenance, work on the area where the artefacts were found, must cease immediately and it should immediately be reported to a specialist so that an investigation and evaluation of the finds can be made.
• Chance find protocol must be in place.</td><td>Low risk anticipated provided that the mitigation measures are implemented correctly.</td></tr>
<tr><td>Nature of Impact: Dust Generation

Both Alternatives
<table>
<tr><th>Description</th><th>Without Mitigation</th><th>With Mitigation</th></tr>
<tr><td>Probability</td><td>Probable (3)</td><td>Possible (2)</td></tr>
<tr><td>Duration</td><td>Medium term (3)</td><td>Short term (2)</td></tr>
<tr><td>Extent</td><td>Local (2)</td><td>Local (2)</td></tr>
<tr><td>Magnitude</td><td>Moderate (6)</td><td>Low (4)</td></tr>
<tr><td>Significance</td><td>33 (Medium)</td><td>16 (Low)</td></tr>
<tr><td>Status (positive or negative)</td><td>Negative</td><td>Negative</td></tr>
</table>
Alternative 2</td><td>• Dust suppression and wet spraying should be implemented during maintenance works.

• Limit maintenance hours to daytime and weekdays.

• Speed limits should be enforced to ensure that the generation of dust by construction vehicles during maintenance are limited.</td><td>Medium risk (as the amount of dust emitted into the air will be of high volumes); unless mitigation measures are implemented.</td></tr>
</table>

<table>
<tr><th>POTENTIAL IMPACTS</th><th>PROPOSED MITIGATION</th><th>RISK OF THE IMPACT MITIGATION NOT BEING IMPLEMENTED</th></tr>
<tr><td></td><td></td><td></td></tr>
<tr><td>Nature of Impact: Noise

Both Alternatives
<table>
<tr><th>Description</th><th>Without Mitigation</th><th>With Mitigation</th></tr>
<tr><td>Probability</td><td>Probable (3)</td><td>Possible (2)</td></tr>
<tr><td>Duration</td><td>Medium term (3)</td><td>Short term (2)</td></tr>
<tr><td>Extent</td><td>Local (2)</td><td>Local (2)</td></tr>
<tr><td>Magnitude</td><td>Moderate (6)</td><td>Low (4)</td></tr>
<tr><td>Significance</td><td>33 (Medium)</td><td>16 (Low)</td></tr>
<tr><td>Status (positive or negative)</td><td>Negative</td><td>Negative</td></tr>
</table></td><td>• Inform residents of planned maintenance works.
• Maintenance and the use of construction machinery should be limited between 06h00 and 18h00 on weekdays only.
• Institute noise control measures throughout maintenance periods.
• Maintenance activities must abide by the national noise laws and the municipal noise by-laws with regard to the abatement of noise caused by mechanical equipment.
• Speed limits must be adhered to.</td><td>High risk as construction vehicles and equipment causes noise pollution.</td></tr>
<tr><td>Nature of Impact: Visual

Both Alternatives
<table>
<tr><th>Description</th><th>Without Enhancement</th><th>With Enhancement</th></tr>
<tr><td>Probability</td><td>Highly Probable (4)</td><td>Definite (5)</td></tr>
<tr><td>Duration</td><td>Long term (4)</td><td>Permanent (5)</td></tr>
<tr><td>Extent</td><td>Local (2)</td><td>Local (2)</td></tr>
<tr><td>Magnitude</td><td>Moderate (6)</td><td>High (8)</td></tr>
<tr><td>Significance</td><td>48 (Medium)</td><td>75 (High)</td></tr>
<tr><td>Status (positive or negative)</td><td>Positive</td><td>Positive</td></tr>
</table></td><td>• Regular clearing of debris from watercourse.
• Maintenance of bridge, road and gabions.</td><td>The site will not be visually appealing during the construction phase.</td></tr>
<tr><td>Nature of Impact: Community Accessibility

Both Alternatives
<table>
<tr><th>Description</th><th>Without Enhancement</th><th>With Enhancement</th></tr>
</table></td><td>• Maintenance of bridge, road and gabions.</td><td>Medium</td></tr>
</table>

<table>
<tr><th>POTENTIAL IMPACTS</th><th>PROPOSED MITIGATION</th><th>RISK OF THE IMPACT MITIGATION NOT BEING IMPLEMENTED</th></tr>
<tr><td>
<table>
<tr><td>Probability</td><td>Highly Probable (4)</td><td>Definite (5)</td></tr>
<tr><td>Duration</td><td>Long term (4)</td><td>Permanent (5)</td></tr>
<tr><td>Extent</td><td>Local (2)</td><td>Local (2)</td></tr>
<tr><td>Magnitude</td><td>Moderate (6)</td><td>High (8)</td></tr>
<tr><td>Significance</td><td>48 (Medium)</td><td>75 (High)</td></tr>
<tr><td>Status (positive or negative)</td><td>Positive</td><td>Positive</td></tr>
</table>
</td><td></td><td></td></tr>
<tr><td>Nature of Impact: Safety

In terms of crossing the watercourse.

Both Alternatives
<table>
<tr><th>Description</th><th>Without Enhancement</th><th>With Enhancement</th></tr>
<tr><td>Probability</td><td>Highly Probable (4)</td><td>Definite (5)</td></tr>
<tr><td>Duration</td><td>Long term (4)</td><td>Permanent (5)</td></tr>
<tr><td>Extent</td><td>Local (2)</td><td>Local (2)</td></tr>
<tr><td>Magnitude</td><td>Moderate (6)</td><td>High (8)</td></tr>
<tr><td>Significance</td><td>48 (Medium)</td><td>75 (High)</td></tr>
<tr><td>Status (positive or negative)</td><td>Positive</td><td>Positive</td></tr>
</table>
</td><td>• Maintenance of bridge, road and gabions.
• Maintenance must comply with safety regulations.
• Regular clearing of debris to prevent clogging and overtop flooding.</td><td>Medium</td></tr>
<tr><td>Nature of the Impact: Embankment and Erosion Protection and Stability

Both Alternatives
<table>
<tr><th>Description</th><th>Without Enhancement</th><th>With Enhancement</th></tr>
<tr><td>Probability</td><td>Highly Probable (4)</td><td>Definite (5)</td></tr>
<tr><td>Duration</td><td>Medium term (3)</td><td>Long term (4)</td></tr>
<tr><td>Extent</td><td>Local (2)</td><td>Local (2)</td></tr>
</table>
</td><td>• Erosion protection measures.
• Cordon off areas that are under rehabilitation as no-go areas using danger tape and steel droppers. If necessary, these areas should be fenced off to prevent vehicular, pedestrian and livestock access.
• After construction, the land must be cleared of rubbish, surplus materials, and equipment, and all parts of the land must be left in a condition as close as possible to that prior to construction and maintenance.</td><td>Medium</td></tr>
</table>

<table>
<tr><th>POTENTIAL IMPACTS</th><th>PROPOSED MITIGATION</th><th>RISK OF THE IMPACT MITIGATION NOT BEING IMPLEMENTED</th></tr>
<tr><td>
<table>
<tr><td>Magnitude</td><td>Moderate (6)</td><td>High (8)</td></tr>
<tr><td>Significance</td><td>44 (Medium)</td><td>70 (High)</td></tr>
<tr><td>Status (positive or negative)</td><td>Positive</td><td>Positive</td></tr>
</table>
</td><td>• Monitor rehabilitation and ensure that alien invasive species are removed and dealt with in accordance to the Environmental Management Programme.
• Maintenance workers or operational activities may not trample natural vegetation and work should be restricted to previously disturbed footprint. In addition, mitigation measures as set out for the construction phase should be adhered to.</td><td></td></tr>
<tr><td>Nature of impact: Socioeconomic

Source of Impact:
• Safer crossing over the watercourse.
• Overall upliftment of the area.

Both Alternatives
<table>
<tr><th>Description</th><th>Without Enhancement</th><th>With Enhancement</th></tr>
<tr><td>Probability</td><td>Highly Probable (4)</td><td>Definite (5)</td></tr>
<tr><td>Duration</td><td>Long term (4)</td><td>Permanent (5)</td></tr>
<tr><td>Extent</td><td>Local (2)</td><td>Local (2)</td></tr>
<tr><td>Magnitude</td><td>Moderate (6)</td><td>High (8)</td></tr>
<tr><td>Significance</td><td>48 (Medium)</td><td>75 (High)</td></tr>
<tr><td>Status (positive or negative)</td><td>Positive</td><td>Positive</td></tr>
</table>
</td><td>• Maintenance of bridge, road and gabions.
• Maintenance must comply with safety regulations.
• Regular clearing of debris to prevent clogging and overtop flooding.</td><td>Medium</td></tr>
</table>

4. NO-GO

This is the option of **not constructing the Seuwe Bridge, approach roads and gabions** which will result in no impacts occurring on the biophysical environment (i.e. biodiversity, soils), and will result in no visual or social impact hence the project site status quo remains. However, should the infrastructure not be developed as proposed, community upliftment will fail to occur. This is an undesirable option for the project as it will pose negative impacts on the social and economic perspective and is not considered desirable. The negative impacts of the no go option alternative are considered to outweigh the positive impacts of this alternative. **The no go option is therefore not preferred.**

5. CUMULATIVE IMPACTS

Cumulative impacts can result from actions which may not be significant on their own but which are significant when added to the impact of other similar actions. The anticipated cumulative impacts of this development (for all alternatives) include the following:

- **Impacts on the Wetland**

Impacts associated with construction could increase the significance of this impact already present as a result of other activities in the area such as dumping; erosion and pollution input and infilling are amongst the most significant impact.

- **Cumulative visual impacts**

A new bridge will be aesthetically appealing and thus enhance the visual impact within the local area.

- **Increased socio-economic upliftment as a result of the proposed development**

Constructing the proposed development will result in direct jobs being created during the construction of the bridge and associated infrastructure. The bridge will be safer for motorists, pedestrians and cyclists to cross over a watercourse.

Responsible environmental management will be required during the entire project life cycle. These management measures should be guided by the Environmental Management Programme (EMPr), attached as **Appendix F1**.

6. ENVIRONMENTAL IMPACT STATEMENT

The proposed activities assessed within this Basic Assessment Report are required to provide essential information associated with the proposed development of the bridge and associated infrastructure that may impact on the environment. In summary, the Basic Assessment has assessed potential impacts and identified appropriate management and mitigation measures. No environmental fatal flaws and no significant negative impacts have been identified to be associated with the proposed activities. The Impact Assessment section of this report indicates that the identified environmental impacts associated can be effectively mitigated to have a low significance impact rating provided the recommended mitigation and management measures are adequately implemented.

Environmental cost that can be expected to arise as a result of the project proceeding for both alternatives include:

Disturbance of the wetland

- Riparian areas will be disrupted.

Benefits of the project include the following:

- Protection of the environment in the vicinity of the bridge.
- Improved relations (social and business alike) between local communities.
- Safer road network and area in general for the community.
- The proposed development will result in important economic benefits at the local and regional scale through job creation, procurement of materials for construction and provision of services and other associated downstream economic development at local and regional scale. These will extend beyond the site and would be experienced at local and regional scale.

The benefits of the project are expected to outweigh the costs.

A number of mitigation and monitoring measures have been identified which would allow for the minimisation and management of potential environmental impacts associated with the proposed development, which have been incorporated into the EMPr (**Appendix F1**) for the project, which will be further developed during the detailed planning and construction phase of the project.

It is the opinion of Envirolution Consulting (Pty) Ltd that the proposed project will not have a significant environmental impact and is therefore preferred as it is considered to be sustainable from an environmental perspective.

7. IMPACT SUMMARY

Table 16: Alignment Alternatives – Impact Summary

Construction Phase				
Negative Environmental Impacts	**Alignment Alternative 1 (Preferred)**		**Alignment Alternative 2 (Not Preferred)**	
	Without Mitigation	**With Mitigation**	**Without Mitigation**	**With Mitigation**
Impacts to hydrological function at a landscape level	**Medium**	**Low**	**Medium**	**Medium**
Changes in sediment regime	**Medium**	**Low**	**Medium**	**Medium**
Introduction and spread of alien vegetation	**Medium**	**Low**	**Medium**	**Low**
Loss and disturbance of riparian habitat	**Medium**	**Medium**	**Medium**	**Medium**
Loss of aquatic biota	**Medium**	**Low**	**Medium**	**Medium**
Clearing of vegetation and exposure to erosion	**Medium**	**Medium**	**High**	**Medium**
Alien and invasive plant species	**Low**	**Low**	**Medium**	**Low**
Degradation of downstream vegetation and habitats	**Medium**	**Low**	**Medium**	**Low**
Pollution during proposed activities	**Medium**	**Low**	**Medium**	**Low**
Soil compaction	**Medium**	**Low**	**Medium**	**Low**
Lack of rehabilitation with indigenous species	**Medium**	**Low**	**Medium**	**Low**
Impact to the koppies	**Medium**	**Low**	**Medium**	**Low**
Loss and disturbance of cultural heritage sites and artefacts due to the development	**Low**	**Low**	**Low**	**Low**
Loss and disturbance of palaeontology sites and artefacts due to the development	**Low**	**Low**	**Low**	**Low**
Visual impact	**High**	**Medium**	**High**	**Medium**
Dust generation	**High**	**Medium**	**High**	**Medium**
Crime, safety and security	**Medium**	**Low**	**Medium**	**Low**
Noise	**High**	**Medium**	**High**	**Medium**

Operational Phase				
Nature of Impact	**Alignment Alternative 1 (Preferred)**		**Alignment Alternative 2 (Not Preferred)**	
	Without Mitigation	**With Mitigation**	**Without Mitigation**	**Without Mitigation**
Impacts to hydrological function at a landscape level	**Medium**	**Low**	**High**	**Medium**
Changes in sediment regime	**Medium**	**Low**	**Medium**	**Medium**
Introduction and spread of alien vegetation	**Medium**	**Low**	**Medium**	**Low**
Loss and disturbance of riparian habitat	**Low**	**Low**	**Medium**	**Low**
Changes in water quality due to input of foreign materials	**Low**	**Low**	**Medium**	**Low**
Loss of aquatic biota	**Medium**	**Low**	**Medium**	**Low**
Alien and invasive plant species	**Low**	**Low**	**Low**	**Low**
Clearing of vegetation and exposure to erosion	**Medium**	**Low**	**Medium**	**Low**
Degradation of downstream vegetation and habitats	**Medium**	**Low**	**Medium**	**Low**
Pollution during operation and maintenance	**Medium**	**Low**	**Medium**	**Low**
Soil compaction	**Medium**	**Low**	**Medium**	**Low**
Lack of rehabilitation with indigenous species	**Medium**	**Low**	**Medium**	**Low**
Impact to the koppies	**Medium**	**Low**	**Medium**	**Low**
Loss and disturbance of heritage sites due to the development	**Low**	**Low**	**Low**	**Low**
Loss and disturbance of palaeontology sites and artefacts due to the development	**Low**	**Low**	**Low**	**Low**
Dust generation	**Medium**	**Low**	**Medium**	**Low**
Noise	**Medium**	**Low**	**Medium**	**Low**

Positive Environmental Impacts	Alignment Alternative 1 (Preferred)		Alignment Alternative 2 (Not Preferred)	
	Without Enhancement	With Enhancement	Without Enhancement	With Enhancement
Socioeconomic impacts anticipated during construction phase	Low	Medium	Low	Medium
Visual impacts anticipated during operational phase	Medium	High	Medium	High
Community Accessibility	Medium	High	Medium	High
Safety during operational phase	Medium	High	Medium	High
Embankment and Erosion Protection and Stability	Medium	High	Medium	High
Socioeconomic impacts anticipated during operational phase	Medium	High	Medium	High

SECTION E: RECOMMENDATION OF PRACTITIONER

Is the information contained in this report and the documentation attached hereto sufficient to make a decision in respect of the activity applied for (in the view of the environmental assessment practitioner)?

YES	

If "NO", indicate the aspects that should be assessed further as part of a Scoping and EIA process before a decision can be made (list the aspects that require further assessment):

If "YES", please list any recommended conditions, including mitigation measures that should be considered for inclusion in any authorisation that may be granted by the department in respect of the application:

A number of mitigation and monitoring measures have been identified which would allow for the minimisation and management of potential environmental impacts associated with the proposed development. These have been incorporated into the EMPr attached as **Appendix F1**.

This Report has identified and assessed the potential impacts on the environment associated with the proposed construction of the bridge and associated infrastructure such as the gravel approach roads and the gabions. It is therefore proposed that authorisation is granted as the proposed project entails a service to the Seuwe community.

The project will result in some unavoidable environmental impacts during construction but this is not a fatal flaw. The nature of the project has been planned in such a way that there are minimal negative environmental impacts. None of these adverse impacts are considered unacceptably significant and all can be managed to acceptable levels through the effective implementation of the recommended mitigation measures. In addition, the project will provide benefits to the local community in terms of service provision, safety in terms of crossing the watercourse and local employment opportunities.

Envirolution is in favour of Alignment Alternative 1 (Preferred) over Alignment Alternative 2 (Not Preferred). Alignment Alternative 1 requires some curves on the alignment and is slightly longer than Alignment Alternative 2; however, the crossing of the watercourse, wetland area and floodline is less, thereby reducing the project footprint which implies less environmental impacts in relation to Alignment Alternative 2 which has a larger development footprint in terms of environmental impacts as more works required in the watercourse, wetland area and floodline area; despite Alignment Alternative 2 having a more simplified road geometric design as it is a bit straight. Both Alignment Alternatives have the same operational output, i.e. it provides a safe crossing over the watercourse for the Seuwe Community, it makes the community more accessible, it stabilises the river embankments, it caters for

flow of 1:100 year flood events and allows for local employment opportunities and local supplies. In terms of maintenance, Alternative 2 would still impact a larger sensitive environmental area because of the structure covering a larger area within the floodplain.

Based on the assumption Envirolution believes through effective implementation of the stipulated mitigation measures, the adverse impacts can be reduced. With the proposed mitigation measures, LEDET may agree that the project's benefits outweigh the potential negative impacts.

General Recommendations

Envirolution Consulting (Pty) Ltd recommends that Alignment Alternative 1 (Preferred), be considered for approval subject to the following general recommendations:

1. Implementing the EMPr to guide construction and operational activities to provide a framework for the on-going assessment of environmental performance.
2. Water Use License: The relevant authorisations and Water Use Licenses must be obtained from the Department of Water and Sanitation prior to the commencement of construction activities.
3. No development other than the authorized activities will be allowed within a watercourse or 30m buffer of the watercourse measured from the edge of the watercourse.
4. Provincially protected succulent species, as well as national protected trees may be present, and the authorisation of this project needs to include the removal, relocation, or destruction of such species.
5. An independent ECO must be appointed/ designated to ensure that regular inspections are performed during the construction phase and to ensure the implementation of mitigation measures. Furthermore, an ECO must monitor compliance with all the conditions of the EMPr and the environmental authorization once issued.
6. There is continued consultation with relevant stakeholders through an appointed Community Liaison Officer during construction.
7. Reports on the status of construction and legal compliance are submitted to LEDET at stipulated intervals.
8. Clearance of the area should be as minimal as possible and construction activities be confined to areas where construction will take place (development footprint) to prevent negative impacts onto the surrounding environment.
9. Avoid, as far as reasonably possible, disturbing the wetlands. Similarly, restore wetlands that will remain intact if they have been affected by construction activity – this project constitutes construction within a watercourse.
10. Adequate measures must be put in place to prevent polluted runoff water from entering the, wetland and soil,

thus preventing surface and groundwater pollution.

11. Servicing/maintenance/washing of vehicles must not be carried on the construction site and only emergency repairs can be done on site.
12. In the event of a major incident (e.g. fire causing damage to property and environment, major spill or leak of contaminants), the relevant authorities should be notified as per the notification of emergencies/ incidents, as per the requirements of NEMA.
13. Construction noise on site must not exceed 85 decibels (DB) as stipulated in the Occupation Health and Safety Act.
14. All relevant legislation and requirements of other government departments (National, Provincial), in particular of Section 28 (duty of care) of NEMA, must be complied with.
15. Compliance with all legal requirements in relation to environmental management and conditions of the authorisation issued by LEDET.
16. Maximise the employment of local people and the procurement of local resources during the construction and maintenance phases to ensure maximum benefit to the provincial/local economy.
17. Implement the recommendations made in the specialist studies and EMPr.
18. The EMPr should form part of the contractor's tender documentation.

On completion of the project, the site must be rehabilitated, all litter and construction debris must be removed from the site immediately. All waste must be disposed of at a registered or permitted waste disposal site for the type of waste produced.

From the impact assessment, it is evident that prior to mitigation, impacts associated with the proposed bridge development are generally moderate. Thus, based on the specialist recommendations, it is the opinion that the project be considered favourably and environmental authorisation granted for the proposed activities, provided the essential and recommended mitigation measures as defined in this report are strictly adhered to.

Is an EMPr attached?

YES	

The EMPr must be attached as **Appendix F**.

SECTION F: APPENDIXES

The following appendixes must be attached as appropriate:

Appendix A: Maps

Appendix B: Site Photographs

Appendix C: Facility Illustrations

Appendix D: Specialist Reports

Appendix E: Public Participation

Appendix F: Management Programmes

Appendix G: Other information

SECTION G: DECLARATION BY THE ENVIRONMENTAL ASSESSMENT PRACTITIONER

I, Karthigesan Govender, declare that I –

(a) act as the independent environmental practitioner in this application;
(b) do not have and will not have any financial interest in the undertaking of the activity, other than remuneration for work performed in terms of the Environmental Impact Assessment Regulations, 2014;
(c) do not have and will not have a vested interest in the proposed activity proceeding;
(d) have no, and will not engage in, conflicting interests in the undertaking of the activity;
(e) undertake to disclose, to the competent authority, any material information that has or may have the potential to influence the decision of the competent authority or the objectivity of any report, plan or document required in terms of the Environmental Impact Assessment Regulations, 2006;
(f) will ensure that information containing all relevant facts in respect of the application is distributed or made available to interested and affected parties and the public and that participation by interested and affected parties is facilitated in such a manner that all interested and affected parties will be provided with a reasonable opportunity to participate and to provide comments on documents that are produced to support the application;
(g) will ensure that the comments of all interested and affected parties are considered and recorded in reports that are submitted to the Department in respect of the application, provided that comments that are made by interested and affected parties in respect of a final report that will be submitted to the Department may be attached to the report without further amendment to the report;
(h) will keep a register of all interested and affected parties that participated in a public participation process; and
(i) will provide the Department with access to all information at my disposal regarding the application, whether such information is favourable to the applicant or not.

Signature of the Environmental Assessment Practitioner:

Envirolution Consulting (Pty) Ltd

Name of company:

22 September 2022

Date: