DRAFT
ENVIRONMENTAL MANAGEMENT PROGRAMME

FOR
BOKONI PLATINUM MINES: COMMUNITY BRIDGE PROJECT

Bokoni PLATINUM

ON
FARM MIDDELPUNT 420 KS
LIMPOPO PROVINCE

JUNE 2022

Red Kite
Environmental Solutions

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1. INTRODUCTION

1.1. Purpose of the Environmental Management Programme

This Environmental Management Programme (EMPr) is prepared as part of the requirements of the Environmental Impact Assessment (EIA) Regulations (7 April 2017, as amended) promulgated under the National Environmental Management Act (NEMA) (Act 107 of 1998, as amended). The purpose of this Environmental Management Programme (EMPr) is to ensure "good environmental practice" by taking a holistic approach to the management and mitigation of environmental impacts during the construction and operation phase of the proposed Community Bridge. This EMPr therefore sets out the methods by which environmental controls are to be implemented by the project's management.

This EMPr is submitted to the Limpopo Department of Economic Development, Environment and Tourism (LEDET) as part of the Environmental Authorisation Application for the proposed Bokoni Platinum Mines: Community Bridge on the farm Middelpunt 420 KS, between Polokwane and Burgersfort off the R37.

This EMPr can be updated as new information becomes available during the construction, operational and decommissioning phases, if applicable, of the development.

Mitigations measures need to be implemented as provided for in this EMPr, except where they are not applicable, and additional measures should be considered when necessary. The EMPr identifies the following:

(i) Construction and Operation activities that will impact on the environment;
(ii) Specifications with which the facility's management shall comply in order to protect the environment from the identified impacts; and
(iii) Actions that shall be taken in the event of non-compliance.

This EMPr incorporates management plans for the construction and operation phases of the project, which consist of the following components:

(iv) **Impact**: The potential positive or negative impact of the development that needs to be enhanced, mitigated or eliminated.
(v) **Objectives**: The objectives necessary in order to meet the goal; these take into account the findings of the specialist studies.
(vi) **Mitigation/Management Actions**: The actions needed to achieve the objectives, taking into consideration factors such as responsibility, methods, frequency, resources required and prioritisation.
(vii) **Monitoring**: The key monitoring actions required to check whether the objectives are being achieved, taking into consideration responsibility, frequency, methods and reporting.

Mitigation measures for the operations will be provided for two phases of the development: construction phase and operational phase.

Decommissioning and/or closure phase is not expected to occur for the proposed bridge infrastructure. Should there be plans to close down the facility; a closure plan will be submitted to the competent authority for approval and it will comply with the relevant legislation at the time of closure.

1.2. Contents of the EMPr

This EMPr specifies the management actions necessary to ensure minimal environmental impacts, as well as procedures for monitoring these impacts associated with the activity. In terms of legal compliance, this EMPr aims to satisfy appendix 4 of Government Notice Regulation 326 of 7 April 2017, presented in Table 1 below.

Table 1: Compliance with Appendix 4 of GNR.982 of 4 December 2014 [as amended] and Section 24N of the National Environmental Management Act 107 of 1998

Requirements according to Appendix 4 of GNR.982 of 4 December 2014 [as amended]	Section
(1) An EMPr must comply with section 24N of the Act and include- a) details of - (i) the EAP who prepared the EMPr; and (i) the expertise of that EAP to prepare an EMPr, including a curriculum vitae;	Section 1.3
b) a detailed description of the aspects of the activity that are covered by the EMPr as identified by the project description;	Section 2
c) a map at an appropriate scale which superimposes the proposed activity, its associated structures, and infrastructure on the environmental sensitivities of the preferred site, indicating any areas that any areas that should be avoided, including buffers;	Section 2.1
d) a description of the impact management objectives, including management statements, identifying the impacts and risks that need to be avoided, managed and mitigated as identified through the environmental impact assessment process for all phases of the development including-	Section 6
(i) planning and design;	Section 6
(ii) pre-construction activities;	Section 6
(iii) construction activities;	Section 6
(iv) rehabilitation of the environment after construction and where applicable post closure; and	Section 6
(v) where relevant, operation activities;	Section 6
e) a description and identification of impact management outcomes required for the aspects contemplated in paragraph (d);	Section 6

Requirements according to Appendix 4 of GNR.982 of 4 December 2014 [as amended]	Section
f) description of proposed impact management actions, identifying the manner in which the impact management objectives and outcomes contemplated in paragraphs (d) and (e) will be achieved, and must, where applicable, include actions to – (i) avoid, modify, remedy, control or stop any action, activity or process which causes pollution or environmental degradation;	Section 6
(ii) comply with any prescribed environmental management standards or practices;	Section 6
(iii) comply with any applicable provisions of the Act regarding closure, where applicable; and	Not applicable (closure is not expected)
(iv) comply with any provisions of the Act regarding financial provisions for rehabilitation, where applicable;	Not applicable
g) the method of monitoring the implementation of the impact management actions contemplated in paragraph (f);	Section 6
h) frequency of monitoring the implementation of the impact management actions contemplated in paragraph (f);	Section 6
i) an indication of the persons who will be responsible for the implementation of the impact management actions;	Section 5 & 6
j) the time periods within which the impact management actions contemplated in paragraph (f) must be implemented;	Section 6
k) the mechanism for monitoring management actions contemplated in paragraph (f);	Section 6
l) a program for reporting on compliance, taking into account the requirements as prescribed by the Regulations;	Section 6 & 7
m) an environmental awareness plan describing the manner in which- (i) the applicant intends to inform his or her employees of any environmental risk which may result from their work; and (ii) risks must be dealt with in order to avoid pollution or the degradation of the environment; and	Section 8
n) Any specific information that may be required by the competent authority.	Not applicable

1.3. Environmental Assessment Practitioner

Name	Nicole
Surname	Upton
Company	Red Kite Environmental Solutions (Pty) Ltd
Position	Director – Environmental Assessment Practitioner (EAP)
Postal address	PostNet Suite 0111, Private Bag X37, Lynnwood Ridge, 0040
Email	nicole@redkiteconsulting.co.za
Telephone Number	079 555 24334
Education	BSc Honors Animal, Plant and Environmental Sciences
Professional affiliation(s):	• South African Council for Natural Scientific Professions (SACNASP) o (Registration Number: 121030) • Water Institute of Southern Africa (WISA) o (Membership No: 39243) • International Association for Impact Assessments (IAIAsa) o (No. 6185)
Professional summary	Ms. Upton has a qualification in B.Sc. (Hons) Animal, Plants and Environmental Science (Appendix 1) and has 12 years of applicable experience as a project manager on a number of Environmental Impact Assessments (EIAs) and environmental authorisations for predominately industrial and mining clients in the South African market. Nicole has extensive integrated environmental management experience, including, EIAs, implementation of environmental management programmes, environmental monitoring, compliance auditing and monitoring, project management and general environmental support. Refer to Appendix 2 for further details.
Skills	• Mine Closure financial quantum determination, mine rehabilitation. • Management and coordination of environmental compliance aspects for mining operations. • Alien Invasive Plant monitoring, control and reporting. • Water quality monitoring, measurement, reporting and data analyses including surface water, ground water, process water, sewage water and biological indicators. • Legal compliance auditing and reporting in accordance with the National Environmental Management Acts and other associated environmental related legislation (NEMA listed activities, Water Use Licensing, Waste Licensing, etc.) • Environmental impact assessments and Integrated Water Use License Applications, including rehabilitations plans and IWWMPs. • Environmental Control Officer Site inspections and associated reporting and compliance. • Specialist impact assessments for surface water and ecology. • Conceptual and operational water balances and Water Conservation and Demand Management Plans

2. DESCRIPTION OF ACTIVITY

Bokoni Platinum Mines (Pty) Ltd proposes to construct a bridge over a non-perennial tributary of the Rapholo River. The bridge construction is being undertaken as part of the Social and Labour Plan initiatives of BPM.

The proposed bridge will replace the current dirt road crossing the drainage line. Due to the current crossing being a dirt road across the river, the community including school children and workers cannot cross over the river during rainy days as the river gets flooded and hence, they cannot go to school, health facilities, work, shops, etc. Furthermore, the dirt road crossing often becomes damaged during rain events, leading to difficulties traversing the road until the road has been repaired.

The proposed bridge is situated on the farm Middelpunt 420 KS, between Polokwane and Burgersfort off the R37. The project area is located in the Fetakgomo Tubatse Local Municipality of the Sekhukhune District Municipality.

Description of the Proposed Project Activities

The proposed project entails the construction of a two-way vehicular and two-way pedestrian's walkway bridge over a non-perennial tributary of the Rapholo River as follows:

- The size of the proposed bridge will be approximately 52 m in length, 17 m width and 4 m in height (top of handrail).
- Installation of three 2500 mm x 2000 mm portal culverts (52 m)
- Construction (upgrade) of 450 m access road (gravel).
    - Two (2) traffic lanes of 3.5 m width
    - Two (2) pedestrian sidewalks, each effectively 1,3 m wide
- Installation of gabions and reno mattress
- Construction of wing wall and headwalls
- Stone pitching
- Installation of steel guardrails along the deck edges, extended to provide a pedestrian steel handrail
- Erection of road signs
- The total footprint of the project which includes the proposed bridge and road upgrade is approximately 9 600 m^2 in extent.
    - The footprint of the proposed bridge is 1 200 m^2
    - The proposed road upgrade is 450 m in length and the footprint is 8 400 m^2

Study Area / Site Description

The proposed bridge is situated on the farm Middelpunt 420 KS, between Polokwane and Burgersfort off the R37. The project area is located in the Fetakgomo Tubatse Local Municipality of the Sekhukhune District Municipality, Limpopo Province. The village nearest to the proposed bridge is the Malomanye village. Refer to the figures below and Appendix

A for Locality Map. The properties fall outside an urban area. The current land use of the area comprises the river, natural bushveld used for extensive livestock grazing, subsistence agriculture and residences.

The proposed project site is accessible from the existing dirt road crossing the river from the Maandagshoek Road to Malomanye village.

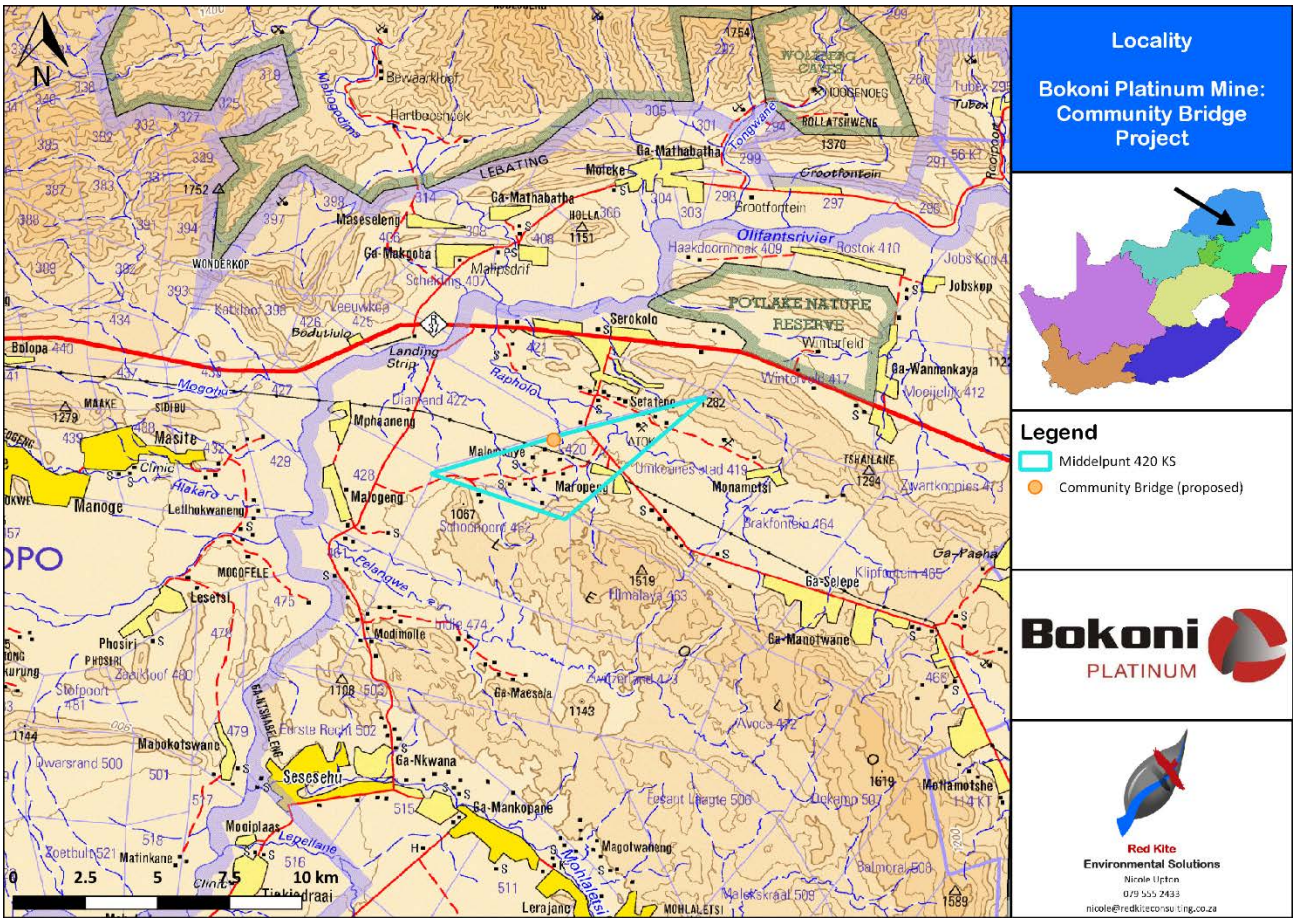

Figure 1: Regional locality of the study area

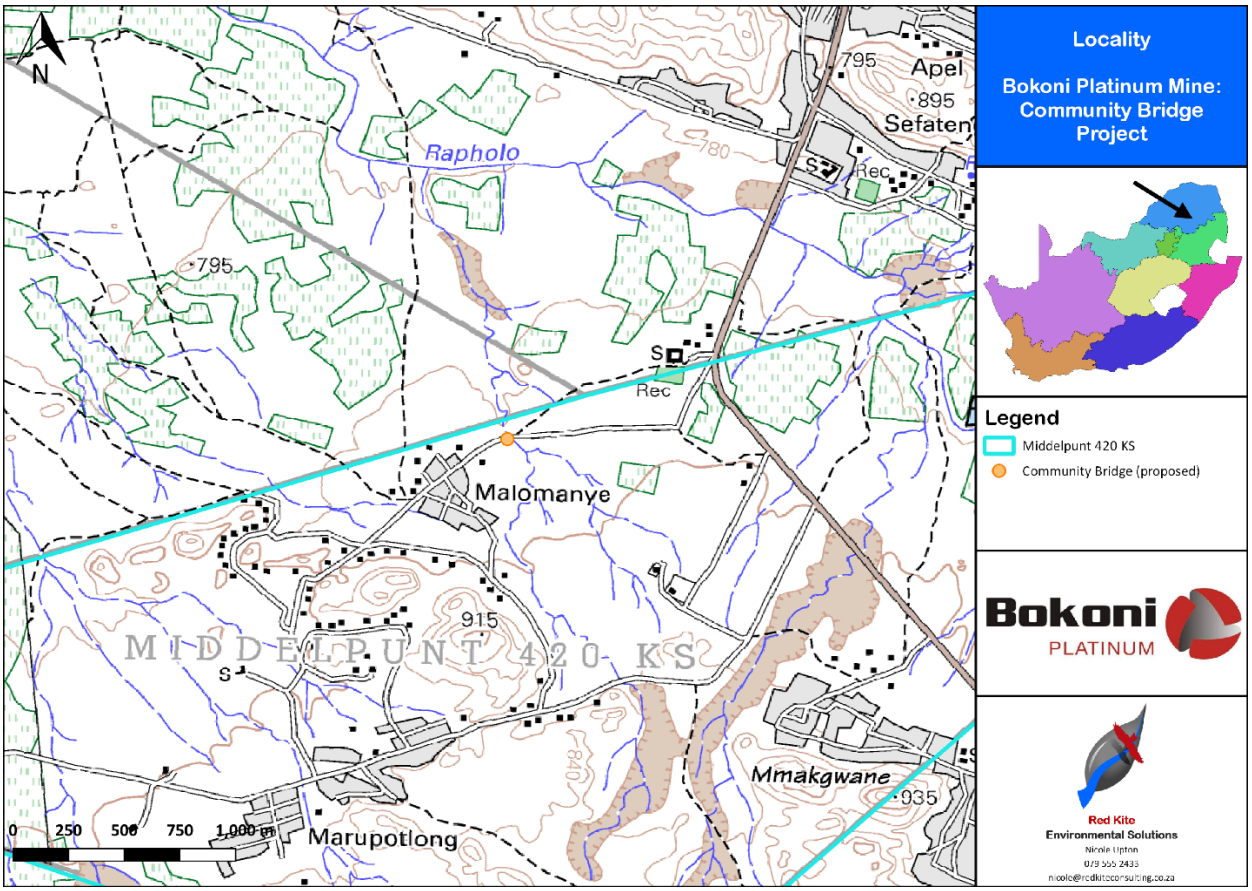

Figure 2: Locality of the project area

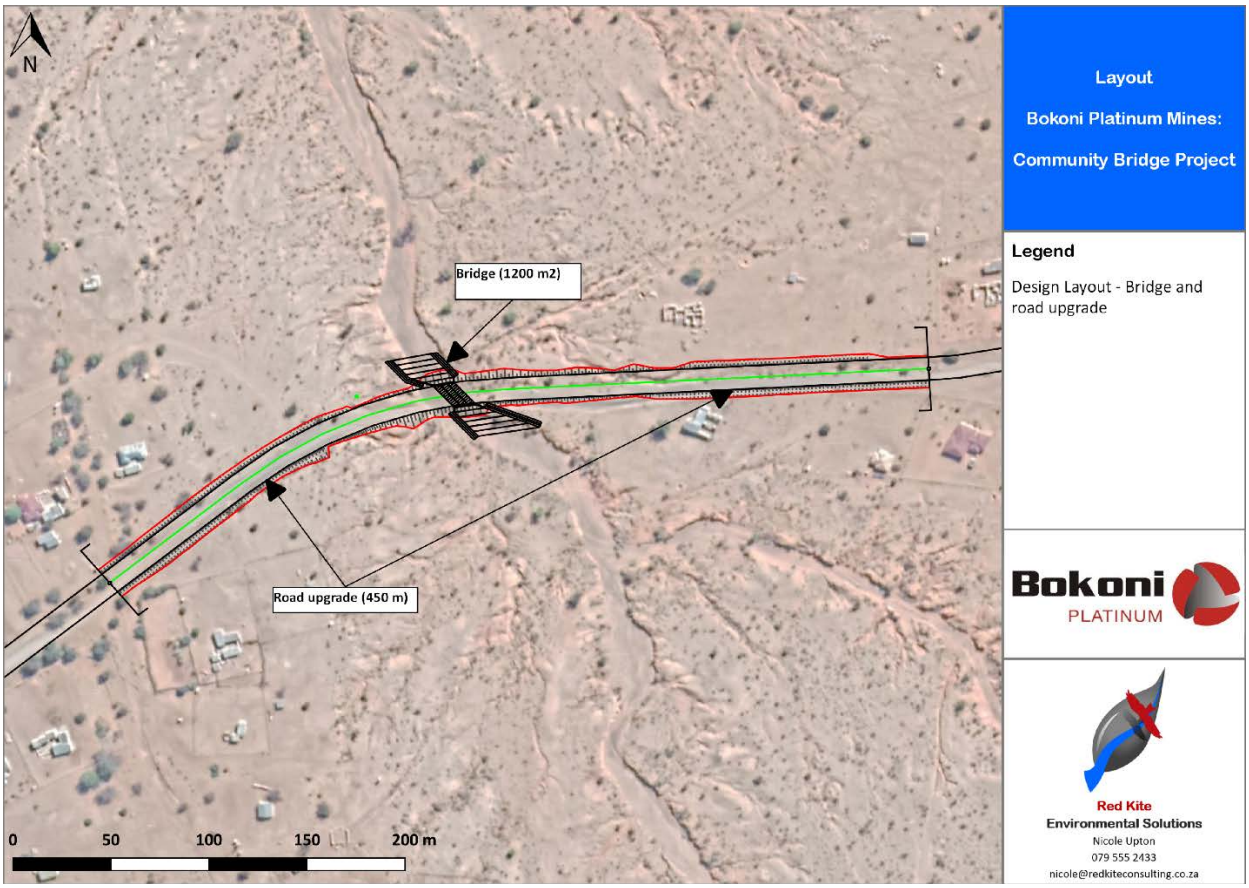

Figure 3: Satellite image of the study area

Detailed Project Description

Pre-Construction and Construction process for the proposed development

A description of the activities which forms part of the proposed construction of the bridge is provided below:

- Site camp establishment – site camp will be established in close proximity to the site, where all equipment to be used during the construction of the proposed bridge will be kept;
- Site clearance – clearance of vegetations and site preparation will be done on the area earmarked for the construction of the proposed bridge;
- Temporary diversion of river flow through the construction area using low earth berms with protection in the form of sandbags where applicable.
- The culverts will be founded on a cast in situ concrete slab. Infill in situ material will be used on each side of the river bank underlying the concrete overlay.
- Gabion walls and mattresses will be installed on either side of the culvert to minimize erosion around the bridge structures.
- Stockpile - during construction of the proposed bridge, it is anticipated that some soil material and rocks will need to be moved to a designated area for temporary storage, for use during the rehabilitation of the affected area. All rock materials found onsite will be used back in retaining the riverbanks and in assisting with strengthening the retainer structure such as gabion structure. Planting of accepted vegetation will be done to assist further the enhancement of rehabilitation of each side of the bridge end.

No water will be extracted from the river during construction. Construction water will be obtained from alternative sources, such as Bokoni Platinum Mine. Precast culvert sections will be used, requiring no water at all. The cast in situ concrete slab will be constructed using ready mixed concrete from commercial sources, again requiring no water. The water requirements for the concrete works will thus be minimal – only required for curing of the concrete, and for cleaning. Construction water will be required to re-compact the gravel infill for road construction over the culvert sections.

A General Authorisation has been issued by the Department of Water and Sanitation in terms of Section 39 of the National Water Act (Act No. 36 of 1998) for Section 21 (c) & (i) water uses associated with the bridge construction.

Operational Activities

During the operational and maintenance phase of the proposed project, the applicant will ensure that operation and maintenance activities are carried out by suitable qualified individual as the activities are specialised.

Decommissioning Activities

The proposed bridge will remain operational for the foreseeable future. Therefore no decommissioning phase is currently foreseen.

Table 2: Activities listed in the applicable EIA Regulations

Number and date of the relevant notice	Activity No (s) (in terms of the relevant notice)	Description of listed activity
GNR.983 of 4 December 2014 [as amended]	12 (ii) (a)	The development of (ii) infrastructure or structures with a physical footprint of 100 square metres or more; where such development occurs(a) within a watercourse; or (c) if no development setback exists, within 32 metres of a watercourse, measured from the edge of a watercourse **Construction of a bridge and associated infrastructure (e.g. gabions, reno mattresses, road upgrade) with a physical footprint of 9 600 m2 within a watercourse and within 32 m of a watercourse.**
GNR.983 of 4 December 2014 [as amended]	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, shell grit, pebbles or rock of more than 10 cubic metres from a watercourse; **Construction of a bridge and associated infrastructure (e.g. gabions, reno mattresses) within a watercourse including associated infilling or depositing of material into the watercourse and excavation, removal and moving of soil and sand as part of the construction activities.**

2.1. Sensitive environmental features

A Terrestrial Ecology Assessment and Watercourse Assessment was undertaken for the project by Red Kite Environmental Solutions (2022).

Based on the findings of the Terrestrial Ecology Assessment and Watercourse Assessment the study area has been assigned the following sensitivity ratings:

- The Plains Bushveld vegetation unit, which is situated in the 100 m extended project footprint buffer, is classified as having a moderate sensitivity due to the 2018 National Biodiversity Assessment listing the Sekhukhune Plains Bushveld vegetation type as Endangered (EN). However, due to the impacts to the VU, this VU is considered to be moderately to heavily impacted. Based on the vegetation structure and

characteristics, this VU is considered representative of the Sekhukhune Plains Bushveld vegetation type, albeit modified.

- The watercourse and 20 m sensitivity buffer, in which the project footprint is located, is classified as having a high sensitivity due to the VU consisting of natural vegetation which is considered representative of the vegetation type within which it occurs. The watercourse although impacted still has valuable corridor movement ecological value, including habitat and refuge to species utilising this type of terrain.

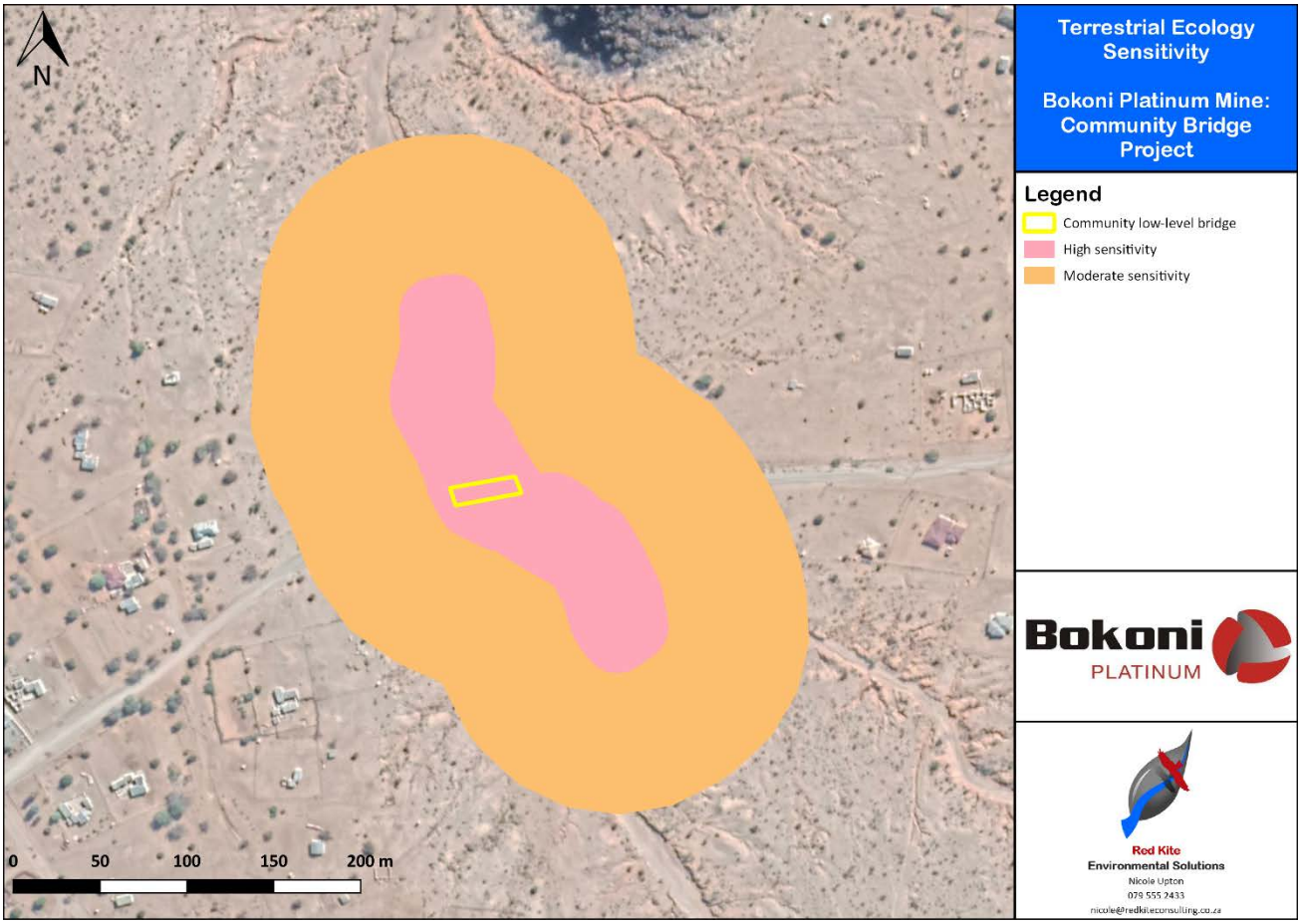

Figure 4: Terrestrial Ecology sensitivity

APelser Archaeological Consulting (APAC) conducted a Phase 1 Heritage Impact Assessment for the proposed Bokoni Platinum Mine Community Bridge Project.

Some sites with an archaeological origin and significance were identified and recorded in the study area and proposed development site boundaries. These are represented by scatters of material situated close to and in the general area of the bridge footprint. These "sites" include MSA/LSA stone tools, as well as some undecorated Iron Age pottery. The sites, even though they are not of very high significance, will be directly impacted by the proposed development. There is also a possibility that in situ (and invisible subterranean) cultural material deposits will be exposed by the bridge development activities. The single piece of decorated Iron Age pottery found in the stream bed some distance away from the development site provides a relative date for the Iron Age of the general area. Based on Huffman's research it is possible

that this decorated rim fragment is part of the Urewe Iron Age Tradition (Moloko Branch) and so-called Icon facies. This would date it to between AD1300 & AD1500.

Figure 5: Image showing the Community Bridge position and footprint in relation to the archaeological material scatters recorded

No other sensitive features in terms of environmental aspects were identified as occurring on the project site.

3. DESCRIPTION OF APPLICABLE LEGISLATION, POLICIES AND GUIDELINES.

Description of compliance with the relevant legislation, policy or guideline:

Legislation, policy of guideline	Description of compliance
The Constitution of the Republic of South Africa, 1996 (Act 108 of 1996)	The development will not be harmful to the health or wellbeing of surrounding landowners/users. Mitigation measures will be implemented to ensure that the environment is not polluted or degraded.
National Environmental Management Act (NEMA), 1998 (Act No. 107 of 1998) [as amended]	An application for Environmental Authorisation for the development has been submitted for activities listed in GNR.983 of 4 December 2014 (as amended). Environmental management principles and general objectives of Integrated Environmental Management taken into account throughout the application process.
National Water Act, 1998 (Act 36 of 1998)	No water will be extracted from the river during construction. Construction water will be obtained from alternative sources, such as Bokoni Platinum Mine. Precast culvert sections will be used, requiring no water at all. The cast in situ concrete slab will be constructed using ready mixed concrete from commercial sources, again requiring no water. The water requirements for the concrete works will thus be minimal – only required for curing of the concrete, and for cleaning. Construction water will be required to re-compact the gravel infill for road construction over the culvert sections. A General Authorisation has been issued by the Department of Water and Sanitation in terms of Section 39 of the National Water Act (Act No. 36 of 1998) for Section 21 (c) & (i) water uses associated with the bridge construction.
National Environmental Management: Waste Act (NEM:WA) GNR 921, 29 November 2013	Listed activities regarding the generation and storage of waste will not be triggered by the Community Bridge Project, however during the construction and operational phases of the facility, the Norms and Standards of the Waste Act will be adhered to, as well as the implementation of best practice waste management measures as included in the EMPr.
National Environmental Management: Air Quality Act,	No emissions licence is required for the development. The EMPr provides for air quality related impact mitigation measures.

Legislation, policy of guideline	Description of compliance
2004 (Act 39 of 2004) and amendments	
Threatened or Protected Species Regulations (GN 152 of 23 February 2007)	No ToPS species were identified to occur on the project footprint or immediately surrounding area.
List of Protected Tree Species under the National Forests Act, 1998 (Act No. 84 of 1998)	One species protected in terms of the NFA was identified to occur within the greater study area, namely, *Balanites maughamii* (Greenthorn). However, no Protected Trees were found to occur on the project footprint.
National Development Plan	The South African Government through the Presidency has published a National Development Plan (NDP). The Plan aims to eliminate poverty and reduce inequality by 2030. The Plan has the target of developing people's capabilities to improve their lives through education and skills development, health care, better access to public transport, jobs, social protection, rising income, housing and basic services, and safety. It proposes to implement the following strategies to address the above goals: 1. Creating jobs and improving livelihoods; 2. Expanding infrastructure; 3. Transition to a low-carbon economy; 4. Transforming urban and rural spaces; 5. Improving education and training; 6. Providing quality health care; 7. Fighting corruption and enhancing accountability; 8. Transforming society and uniting the nation. The proposed bridge will ensure access for the communities to the basic service facilities during the rainy periods. This bridge will form an integral part of the communities, as it will be a safe, accessible connection point for the communities especially during peak rainfall periods. Community members, including school children and workers will be able to safely and conveniently access schools, health facilities, workplaces, shops, police stations, etc. during rainy periods.
National Heritage Resources Act, 1999 (Act 25 of 1999)	A Heritage Impact Assessment was undertaken for the project, which will be submitted to SAHRA for commenting. Some sites with an archaeological origin & significance were identified and recorded in the study area and proposed development site boundaries.

Legislation, policy of guideline	Description of compliance
	The Heritage specialist recommended the following: The sampling of representative surface material (Stone Age tools and possible further Iron Age pottery & other material) from the area prior to development commencing. This will assist in providing a relative date for the Stone Age & Iron Age use of and settlement in the area. For this an archaeological sampling permit will be required from SAHRA. An application for an archaeological sampling permit will be submitted to SAHRA.
National Environmental Management: Biodiversity Act 10 of 2004	The National Environmental Management Biodiversity Act, 2004 (Act No. 10 of 2004) as amended (NEMBA) including all the pertinent legislation published in terms of this act was considered in compiling the Impact Assessment and EMPr. This included the determination and assessment of the fauna and flora prevailing in and around the project site and handling thereof in terms of NEMBA.
National Environmental Management: Protected Areas Act, 2003 (Act No. 57 of 2003) and amendments	The site is not located within any protected area listed in the NEM: Protected Areas Act.
National Protected Areas Expansion Strategy (NPAES, 2008)	The site is not located within or near a proposed expansion area.
Alien and Invasive Species Regulations, 1 August 2014 [as amended]	Mitigation measures to be implemented during construction and operation to ensure that alien and invasive species are controlled. Mitigation measures included in the EMPr.
Noise Regulations (GN 154 of 1992)	Mitigation measures to reduce noise provided in the EMPr.

5. ENVIRONMENTAL MANAGEMENT STRUCTURE

Bokoni Platinum Mines management will develop an Environmental Management Structure, in line with this EMPr, that is appropriate to the size and scale of the project to develop and implement roles and responsibilities with regards to environmental management.

5.1. Roles and Responsibilities

Key roles and responsibilities in order to meet the overall goal for environmental management of the Community Bridge development are as follows:

5.1.1. Bokoni Platinum Mines Management (hereafter referred to as "Management")

Management is responsible for the overall environmental monitoring and implementation of the EMPr, and ensuring compliance thereof with the specifications of the Environmental Authorisation (EA) issued in terms of NEMA. Management should also ensure that any other permits or licences required as part of this project are obtained and complied with. Management may however, at their own costs, render the services of an external environmental consultant to oversee the implementation of the documented mitigation measures of this EMPr. It is also expected that management will appoint an Environmental Control Officer, Environmental Health and Safety Officer, and Construction Manager.

5.1.2. Environmental Health & Safety (EHS) Officer / Environmental Control Officer (ECO)

It is important to note that the EHS Officer will be appointed to fulfil the roles of the Environmental Officer during the construction phase and that of the Environmental Manager during the operational phase. A generic term has therefore been assigned to this sector of roles and responsibilities. The responsibility of the EHS Manager includes overseeing the implementation of the EMPr during the construction and operational phases, monitoring environmental impacts, record-keeping and updating of the EMPr as and when necessary. The EHS Manager is also responsible for monitoring compliance with the conditions of the Environmental Authorisation that may be issued to Bokoni Platinum Mines.

The lead contractor and sub-contractors may have their own Environmental Officers, or designate Environmental Officer functions to certain personnel.

During construction, the EHS Manager will be responsible for the following:

- Meeting on site with the Construction Manager prior to the commencement of construction activities to confirm the construction procedure and designated activity zones.
- Daily or weekly monitoring of site activities during construction to ensure adherence to the specifications contained in the EMPr and Environmental Authorisation, using a monitoring checklist that is to be prepared at the start of the construction phase.

- Preparation of the monitoring report based on the daily or weekly site visit.
- Reporting of any non-conformances within 48 hours of identification of such non-conformance to the relevant agents.
- Conducting an environmental inspection on completion of the construction period and 'signing off' the construction process with the Construction Manager.

During operation, the EHS Manager will be responsible for:

- Overseeing the implementation of the EMPr and monitoring programmes for the operational phase.
- Reviewing the findings of the monitoring and highlight concerns to management, where necessary.
- Ensuring compliance with the Environmental Authorisation conditions.
- Ensuring that the necessary environmental monitoring takes place as specified in the EMPr.
- Updating the EMPr and ensuring that records are kept of all monitoring activities and results.

At the time of preparing this EMPr, the EHS Manager appointment is still to be made by the applicant.

5.1.3. Construction Manager

The construction manager will be responsible for the following:

- Overall construction programme, project delivery and quality control for the construction of the facility.
- Overseeing compliance with the Health, Safety and Environmental Responsibilities specific to the project construction.
- Promoting total job safety and environmental awareness by employees, contractors and sub- contractors and stress to all employees and contractors and sub-contractors the importance that the project proponent attaches to safety and the environment.
- Ensuring that each subcontractor employs an Environmental Officer (or have a designated Environmental Officer function) to monitor and report on the daily activities on-site during the construction period.
- Ensuring that safe, environmentally acceptable working methods and practices are implemented and that sufficient plant and equipment is made available, is properly operated and maintained in order to facilitate proper access and enable any operation to be carried out safely.
- Meeting on site with the EHS Manager prior to the commencement of construction activities to confirm the construction procedure and designated activity zones.
- Ensuring that all appointed contractors and sub-contractors are aware of this EMPr and their responsibilities in relation to the programme.
- Ensuring that all appointed contractors and sub-contractors repair, at their own cost, any environmental damage as a result of a contravention of the specifications contained in the EMPr, to the satisfaction of the EHS Manager.

6. ENVIRONMENTAL MANAGEMENT PROGRAMME

As part of environmental management and enhancement, an identification and description of impact management objectives must be developed, inclusive of the proposed methods and effective management and mitigation measures required during the design, construction and operational phases of the project. The table below lists potential impacts and mitigation measures recommended for the Bokoni Platinum Mines: Community Bridge Project at the different phases.

6.1. Planning and Design Phase

6.1.1. General

Policy compliance: Development must comply with relevant legislation and/or policy, e.g. NEMA, LEMA, Municipal By-laws, SDFs, etc.

A General Authorisation has been issued by the Department of Water and Sanitation in terms of Section 39 of the National Water Act (Act No. 36 of 1998) for Section 21 (c) & (i) water uses associated with the bridge construction.

6.1.2. Social

Some sites with an archaeological origin & significance were identified and recorded in the study area and proposed development site boundaries.

The Heritage specialist recommended the following: The sampling of representative surface material (Stone Age tools and possible further Iron Age pottery & other material) from the area prior to development commencing. This will assist in providing a relative date for the Stone Age & Iron Age use of and settlement in the area. For this an archaeological sampling permit will be required from SAHRA.

An application for an archaeological sampling permit will be submitted to SAHRA. Once the permit has been issued an Archaeological Study will need to be undertaken prior to commencing the construction phase of the project.

6.1.3. Bridge Design

Ensure that the bridge design does not impede the flow of water or cause erosion of the river banks.

6.2. Construction Phase

Table 3: Impact management plan for the bridge project (Construction Phase)

Construction Phase					
Impact Description	**Environmental Objective**	**Management/Mitigation Measures**	**Monitoring Compliance & Reporting**	**Monitoring Frequency**	**Responsibility**
Soil compaction and erosion	To prevent soil erosion	• Diversion of the river should be minimised in terms of spatial and temporal extent. • The design of the diversion should be done in such a way as to minimise the potential erosion effects. • Clearing or disturbance of vegetation should be kept to a minimum. • Any cleared or exposed areas must be rehabilitated with indigenous vegetation at the earliest possible stage. • Temporary measures may need to be implemented to prevent exposed soils from erosion. • Remediation action must be taken at the first sign of any erosion.	• Ensure that regular site inspections are carried out throughout the construction phase. • EHS Officer / ECO to verify that mitigation measure proposed in this EMPr are implemented and compile a report thereof on a monthly basis.	Daily throughout construction phase.	Management / Contractor ECO / EHS Officer
Loss of vegetation.	To protect indigenous vegetation.	• A control of access should be implemented for all areas outside of the development footprint / demarcated construction area to prevent	• To be monitored during regularly scheduled site inspections.	Ongoing throughout construction phase.	Management / Contractor

Construction Phase					
Impact Description	**Environmental Objective**	**Management/Mitigation Measures**	**Monitoring Compliance & Reporting**	**Monitoring Frequency**	**Responsibility**
		unnecessary destruction of habitats or disturbance of species. • It is recommended that existing roads be used and, as far as feasible, no new roads should be created. • The vegetation removal during the construction phase should be controlled, very specific and the clearance area kept as small as possible. • Continuous rehabilitation of the areas impacted which are outside of the development footprint should occur during construction, where re-vegetation practices should be prioritised. • To minimize potential impacts to animal species, animals (wildlife and domestic animals) may under no circumstances be handled, removed, killed or interfered with by the Contractor, his employees, his Sub-Contractors or his Sub-Contractors' employees.			
Alien Invasive Plant Proliferation	To prevent establishment and/or proliferation of AIP	• A management plan for the control of invasive and exotic plant species needs to be implemented. Specialist advice should be used in	• EHS Officer / ECO to verify implementation of the mitigation measures	All phases.	Management ECO / EHS Officer

Construction Phase					
Impact Description	**Environmental Objective**	**Management/Mitigation Measures**	**Monitoring Compliance & Reporting**	**Monitoring Frequency**	**Responsibility**
		this regard. This plan should include pre-treatment, initial treatment and follow-up treatment. Removal of alien and invasive species must continue for a two year maintenance period after development, on a biannual basis.	proposed in this EMPr. • Annual AIP monitoring, followed by control measures, if required.		
Loss Species of Conservation Concern and Sensitive Habitats	To prevent loss of SCC and degradation of sensitive habitats	• All footprint areas should remain as small as possible. • A control of access should be implemented for all areas outside of the development footprint / demarcated construction area to prevent unnecessary destruction of habitats or disturbance of species. • It is recommended that existing roads be used and, as far as feasible, no new roads should be created. • Continuous rehabilitation of the areas impacted which are outside of the development footprint should occur during construction, where re-vegetation practices should be prioritised. • To minimize potential impacts to animal species, animals (wildlife and domestic animals) may	• To be monitored during regularly scheduled site inspections.	Ongoing throughout construction phase.	ECO / EHS Officer

Construction Phase					
Impact Description	**Environmental Objective**	**Management/Mitigation Measures**	**Monitoring Compliance & Reporting**	**Monitoring Frequency**	**Responsibility**
		under no circumstances be handled, removed, killed or interfered with by the Contractor, his employees, his Sub-Contractors or his Sub-Contractors' employees. • Hydrological connectivity within the watercourse should always be maintained during construction and operational phases. • Construction activities should only be undertaken during the dry (Winter) season.			
Loss and displacement of fauna on site and hindrance / trapping / killing of fauna	To protect fauna.	• All contractors on site must undergo environmental awareness training which must include the prohibition of any harm or hindrance to any fauna species. • To minimize potential impacts to animal species, animals (wildlife and domestic animals) may under no circumstances be handled, removed, killed or interfered with by the Contractor, his employees, his Sub-Contractors or his Sub-Contractors' employees, unless authorised by the relevant government department.	• EHS Officer / ECO to verify that mitigation measures proposed in this EMPr are implemented and compile a report thereof on a monthly basis. • To be monitored during regularly scheduled site inspections.	Prior to construction. Ongoing throughout construction phase.	EHS Officer / ECO Management / Contractor

Construction Phase					
Impact Description	**Environmental Objective**	**Management/Mitigation Measures**	**Monitoring Compliance & Reporting**	**Monitoring Frequency**	**Responsibility**
		• Contracts with contractors must specify actions that will be taken against contractors who do not conduct activities in line with the EMPr. • Remain clear of other areas where activities are not necessary.			
Pollution of river	To prevent impact on watercourse water quality	• Keep spill kits on-site during the construction phase to remediate any hydrocarbon spills immediately. • Prevent impacts from reaching downstream water resources by ensuring that temporary storm water control measures are implemented during the construction phase.	• EHS Officer / ECO to verify that mitigation measures proposed in this EMPr are implemented and compile a report thereof on a monthly basis. • To be monitored during regularly scheduled site inspections.	Prior to construction. Ongoing throughout construction phase.	Contractor ECO / EHS Officer
Sedimentation and erosion within the river	To prevent impact of sedimentation and erosion on watercourse	• Ensure that the construction footprint is limited to what is needed in order to reduce the amount of vegetation which would need to be cleared. • Erosion prevention measures (gabions, sand bags and reno mattresses, etc.) must be employed immediately downstream of the construction area to limit the movement of silt	• Ensure that regular site inspections are carried out throughout the construction phase. • EHS Officer / ECO to verify that mitigation measure proposed in this EMPr are	Daily throughout construction phase.	Contractor ECO / EHS Officer

Construction Phase					
Impact Description	**Environmental Objective**	**Management/Mitigation Measures**	**Monitoring Compliance & Reporting**	**Monitoring Frequency**	**Responsibility**
		and soil mobilized during construction. • The design of the bridge structure must take into account the direction and strength of the flow of the river, and ensure that measures to reduce scouring of the river bed and erosion of the banks in the vicinity of the bridge are incorporated.	implemented and compile a report thereof on a monthly basis.		
Degradation of ambient air quality as a result of dust generated.	To minimise the impact on the ambient air quality as a result of construction activities and increased traffic to and from the site.	• Provide dust masks for the workers. • Wet the area and stabilise the dust emissions. • Use covers where possible during transportation and storage of construction material. • Limit the number, as well as the speed, of the vehicles travelling to and from the site. • Where possible, removal of any discarded or unused material must be done immediately. • If possible, construction work must be paused during periods of strong winds.	• Ensure regular maintenance of construction vehicles to allow for 'cleaner' emissions from these vehicles, including equipment maintenance. • EHS Officer / ECO to ensure compliance and reporting thereof.	Daily during the construction phase.	Contractor Management EHS Officer / ECO
Noise disturbances as a result of construction activities.	To minimise noise generation on site.	• All construction vehicles and equipment to be properly serviced in order to meet the necessary noise level requirements. • Restriction of work to daylight hours (7am to 5pm).	• EHS Officer / ECO to ensure compliance and reporting thereof.	Ongoing throughout construction phase.	Contractor Management EHS Officer / ECO

Construction Phase					
Impact Description	**Environmental Objective**	**Management/Mitigation Measures**	**Monitoring Compliance & Reporting**	**Monitoring Frequency**	**Responsibility**
		• Restriction of any unnecessary noise e.g. portable radios, vehicle radios, whistles, etc. • Construction employees to be housed away from site.			
Traffic Impacts due to construction of the bridge	To minimise impacts of temporary road closure	• Attempt to restrict any detours to the shortest period possible. • Provide strategic signage to forewarn motorists of any detour(s). • Barricade the low-level crossing with clear signage if it is not useable at any given period. • Minimize the number of construction vehicles required for the project and prevent any unnecessary travelling of these vehicles especially during peak hours and after hours.	• EHS Officer / ECO to ensure compliance and reporting thereof.	Ongoing throughout construction phase.	Contractor ECO / EHS Officer
Solid Waste Generation	Promotive effective waste management.	• Concrete and rubble should be reused and/or recycled where possible. • Waste that cannot be reused or recycled should be disposed of in the correct manner at the nearest registered waste disposal site. • Litter should be discarded into bins and removed from site on a weekly basis.	• EHS Officer / ECO to develop a waste management plan and ensure implementation and adherence thereof.	Ongoing throughout construction phase.	Management Contractor EHS Officer / ECO

Construction Phase					
Impact Description	**Environmental Objective**	**Management/Mitigation Measures**	**Monitoring Compliance & Reporting**	**Monitoring Frequency**	**Responsibility**
		• Any hazardous materials must be disposed of immediately and in the correct manner. • General good house-keeping should be practiced on site.			
Construction activities may disturb or destroy sites or features of heritage importance.	To protect heritage resources.	• An application for an archaeological sampling permit will be submitted to SAHRA. Once the permit has been issued an Archaeological Study will need to be undertaken prior to commencing the construction phase of the project.	• Management and EHS Officer to ensure compliance and reporting thereof.	During construction phase	Management EHS Officer / ECO
Local employment and skills development.	Increase employment opportunities.	• Contractors employed for the proposed bridge construction should be sourced locally. • Ensure the use of local companies for the purchasing of infrastructure components and construction.	• Management to ensure employment plan verifies the proposed mitigation measures of this EMPr.	Once-off during planning.	Management Contractor

6.3. Operational Phase

Table 4: Impact management plan for the bridge project (Operational Phase)

Operational Phase					
Impact Description	**Environmental Objective**	**Management/Mitigation Measures**	**Monitoring Compliance & Reporting**	**Monitoring Frequency**	**Responsibility**
The introduction and spread of alien invasive species as a result of increased activity on site and vehicles being vectors.	To prevent the spreading and increase of alien invasive species.	• A management plan for the control of invasive and exotic plant species needs to be implemented. Specialist advice should be used in this regard. This plan should include pre-treatment, initial treatment and follow-up treatment. Removal of alien and invasive species must continue for a two year maintenance period after development, on a biannual basis.	• EHS Officer . ECO to verify implementation of the mitigation measures proposed in this EMPr. • Annual AIP monitoring, followed by control measures, if required.	Annually	EHS Officer / ECO Management
Reduction of erosion and sedimentation	Ensure bridge structure remains non-erosive	• Banks must be rehabilitated, including re-establishment of vegetation cover. • Continued maintenance of the bridge, i.e. removing debris from the culverts and repair of the approach embankments after period of heavy rainfall.	• EHS Officer . ECO to verify implementation of the mitigation measures proposed in this EMPr	Bi-annually (before and after rain season)	EHS Officer / ECO Management
Potential impact of traffic.	Enhancement of benefits of bridge crossing	• Place barriers along the sides of the crossing. • Place clear signage at either ends of the crossing. • Road maintenance checks and any necessary maintenance work must be conducted on an annual basis especially in the period following heavy rains or flooding.	• EHS Officer . ECO to verify implementation of the mitigation measures proposed in this EMPr	Annually	Management ECO

6.4. Decommissioning Phase

Decommissioning and/or closure phase is not expected to occur for the bridge infrastructure. Should there be plans to decommission the bridge; a closure plan will be submitted to the competent authority for approval.

7. REPORTING

7.1. Administration

Before the contractor begins each construction activity, the Contractor shall give to the ECO and engineer a written method statement setting out the following:

- The type of construction activity.
- Locality where the activity will take place.
- Identification of impacts that might result from the activity.
- Identification of activities or aspects that may cause an impact.
- Methodology and/or specifications for impact prevention for each activity or aspect.
- Methodology and/or specifications for impact containment for each activity or aspect.
- Emergency/disaster incident and reaction procedures.
- Treatment and continued maintenance of impacted environment.

The contractor may provide such information in advance of any or all construction activities provided that new submissions shall be given to the ECO and/or engineer whenever there is a change or variation to the original.

The ECO and/or engineer may provide comment on the methodology and procedures proposed by the Contractor but he shall not be responsible for the contractor's chosen measures of impact mitigation and emergency/disaster management systems. However, the contractor shall demonstrate at inception and at least once during the contract that the approved measures and procedures function properly.

7.2. Good housekeeping

The contractor shall undertake "good housekeeping" practices during construction. This will help avoid disputes on responsibility and allow for the smooth running of the contract as a whole. Good housekeeping extends beyond the wise practice of construction methods that leaves production in a safe state from the ravages of weather to include the care for and preservation of the environment within which the site is situated.

7.3. Record keeping

The engineer and the ECO will continuously monitor the contractor's adherence to the approved impact prevention procedures and the engineer shall issue to the contractor a notice of non-compliance whenever transgressions are observed. The ECO should document the nature and magnitude of the non-compliance in a designated register, the action taken to discontinue the non-compliance, the action taken to mitigate its effects and the results of the actions. The non-compliance shall be documented and reported to the engineer in the monthly report. These reports shall be made available to LEDET when requested.

The Contractor shall ensure that an electronic filing system identifying all documentation related to the EMPr is established.

A list of reports likely to be generated during all phases of the Project is provided below, and all applicable documentation must be included in the environmental filing system catalogue or document retrieval index.

- Final Environmental Impact Assessment Report.
- Environmental Management Programme.
- Final design documents and diagrams issued to and by the Contractor.
- All communications detailing changes of design/scope that may have environmental implications.
- Weekly and monthly site monitoring reports.
- Complaints register.
- Medical reports.
- Training manual.
- Training attendance registers.
- Incident and accident reports.
- Emergency preparedness and response plans.
- Environmental Authorisation, Permits and legal documents.
- Monthly site meeting minutes during construction.
- All method statements from the Contractor for all phases of the project.

7.4. Document control

The Contractor and resident engineer shall be responsible for establishing a procedure for electronic document control. The document control procedure should comply with the following requirements:

- Documents must be identifiable by organisation, division, function, activity and contact person.
- Every document should identify the personnel and their positions, who drafted and compiled the document, who reviewed and recommended approval, and who finally approved the document for distribution.
- All documents should be dated, provided with a revision number and reference number, filed systematically, and retained for a five year period.

The Contractor shall ensure that documents are periodically reviewed and revised, where necessary, and that current versions are available at all locations where operations essential to the functioning of the EMPr are performed. All documents shall be made available to the independent external auditor.

8. ENVIRONMENTAL AWARENESS AND TRAINING PLAN

Bokoni Platinum Mines Management has to appoint an EHS Officer / ECO whose duty is to also implement an effective environmental awareness plan aimed to educate workers and contractors in terms of the biodiversity on site, environmental risks associated with the development and land management of the site. Training and / or awareness should be raised and effectively communicated prior to the commencement of the construction phase. Training sessions should incorporate the management plans addressed in this EMPr as well as any new information and documentation provided by the EHS Officer / ECO.

The EHS Officer / ECO would be the most suitable person to conduct these training sessions, identifying sensitive environments as well as all the risks and impacts associated with the project, and the methods in which to deal with the impacts in order to avoid environmental degradation. Training sessions can be monitored by providing an attendance register indicating the workers that received training as well as evidence of the training and/or awareness received. These sessions would also need to be carried out throughout the operational phase of the facility, at least once a year, or as new information becomes available.

Through training/awareness, the applicant will also make his employees aware of:

- the importance of conformance with the environmental policy and the requirements of the EMPr;
- the significant environmental impacts, actual or potential, of their work activities and the environmental benefits of improved personal performance;
- their roles and responsibilities in achieving conformance with the environmental policy and the requirements of the EMPr, including emergency preparedness and response requirements; and
- the potential consequences of departure from the specific operating procedures and/or mitigation measures specified in the EMPr.

Environmental training and development needs of employees will be identified on a regular basis through:

- Identification of significant environmental impacts;
- Analysis of non-conformance and incident reports; and
- Audit reports.

9. AUDITING AND CORRECTIVE ACTION

In order to assess good "environmental practice" and to ensure compliance with the EMPr, there should be ongoing monitoring to determine the appropriateness and adequacy, as well as the implementation of measures recommended in this EMPr.

This EMPr must form part of the contractual agreement and be adhered to by both the contractors / workers and the applicant.

The applicant must appoint an EHS Officer / ECO, who will be responsible for monitoring and reporting on the implementation of the EMPr, together with monitoring and reporting on compliance with the conditions of the Environmental Authorisation.

The implementation of mitigation measures included in this EMPr will assist to avoid and / or mitigate any potential negative impacts associated with the construction and operational activities associated with the development.

An external environmental audit must be conducted and submitted to the competent authority at intervals as indicated in the environmental authorisation.

The environmental audit report must determine the level of compliance with the provisions of the environmental authorisation and EMPr and must comply with the requirements of Section 34 and Appendix 7 of the National Environmental Management Act (Act 107 of 1998) (NEMA): Environmental Impact Assessment Regulations, 2014 (as amended).