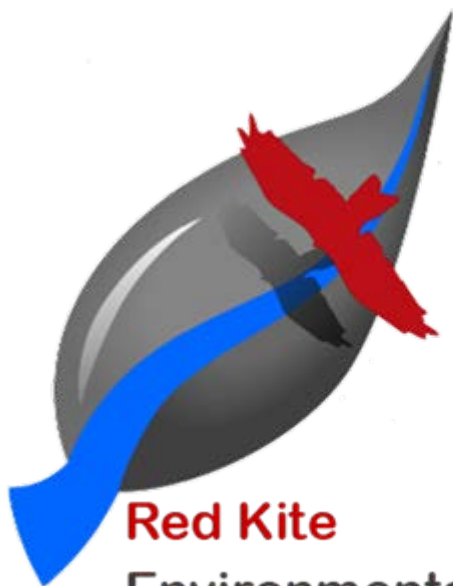


FINAL BASIC ASSESSMENT REPORT

BOKONI PLATINUM MINES: RAPHOLO RIVER REHABILITATION AND WATER TREATMENT PLANT PROJECT



JULY 2021



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mineral resources

Department:
Mineral Resources
REPUBLIC OF SOUTH AFRICA

FINAL

BASIC ASSESSMENT REPORT and ENVIRONMENTAL MANAGEMENT PROGRAMME REPORT

SUBMITTED FOR ENVIRONMENTAL AUTHORIZATIONS IN TERMS OF THE NATIONAL ENVIRONMENTAL MANAGEMENT ACT, 1998 AND THE NATIONAL ENVIRONMENTAL MANAGEMENT WASTE ACT, 2008 IN RESPECT OF LISTED ACTIVITIES THAT HAVE BEEN TRIGGERED BY APPLICATIONS IN TERMS OF THE MINERAL AND PETROLEUM RESOURCES DEVELOPMENT ACT, 2002 (MPRDA) (AS AMENDED).

Name of Applicant	Bokoni Platinum Mines (Pty) Ltd
Project	Bokoni Platinum Mines: Rapholo River Rehabilitation and Water Treatment Plant Project
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File Reference Numbers SAMRAD	LP 6/2/2/609 MR

July 2021

1. IMPORTANT NOTICE

In terms of the Mineral and Petroleum Resources Development Act (Act 28 of 2002 as amended), the Minister must grant a prospecting or mining right if among others the mining “will not result in unacceptable pollution, ecological degradation or damage to the environment”.

Unless an Environmental Authorisation can be granted following the evaluation of an Environmental Impact Assessment and an Environmental Management Programme report in terms of the National Environmental Management Act (Act 107 of 1998) (NEMA), it cannot be concluded that the said activities will not result in unacceptable pollution, ecological degradation or damage to the environment.

In terms of section 16(3)(b) of the EIA Regulations, 2014, any report submitted as part of an application must be prepared in a format that may be determined by the Competent Authority and in terms of section 17 (1) (c) the competent Authority must check whether the application has taken into account any minimum requirements applicable or instructions or guidance provided by the competent authority to the submission of applications.

It is therefore an instruction that the prescribed reports required in respect of applications for an environmental authorisation for listed activities triggered by an application for a right or a permit are submitted in the exact format of, and provide all the information required in terms of, this template. Furthermore, please be advised that failure to submit the information required in the format provided in this template will be regarded as a failure to meet the requirements of the Regulation and will lead to the Environmental Authorisation being refused.

It is furthermore an instruction that the Environmental Assessment Practitioner must process and interpret his/her research and analysis and use the findings thereof to compile the information required herein. (Unprocessed supporting information may be attached as appendices). The EAP must ensure that the information required is placed correctly in the relevant sections of the Report, in the order, and under the provided headings as set out below, and ensure that the report is not cluttered with un-interpreted information and that it unambiguously represents the interpretation of the applicant.

2. OBJECTIVE OF THE BASIC ASSESSMENT PROCESS

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

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

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PART A: SCOPE OF ASSESSMENT AND BASIC ASSESSMENT REPORT

1. CONTACT PERSON AND CORRESPONDENCE ADDRESS

1.1 Details of

1.1.1 Details of the EAP

Name of the Practitioner:	Nicole Upton
Tel No.:	079 555 2433
Fax No.:	N/A
Postal address:	PostNet Suite 0111, Private Bag X37, Lynnwood Ridge, Pretoria, 0040
E-mail address:	nicole@redkiteconsulting.co.za

1.1.2 Expertise of the EAP

1.1.2.1 The qualifications of the EAP

Please refer to Table 1 for a summary of the qualification and experience of the EAP. Refer to Appendix 1 and 2 for more details (CV).

1.1.2.2 Summary of the EAP's past experience

Table 1: Details of EAP

Environmental Consultants:	Red Kite Environmental Solutions (Pty) Ltd
Author:	Nicole Upton
Qualifications:	B.Sc. (Hons) Animal, Plant and Environmental Science
Professional affiliation(s):	<ul style="list-style-type: none"> • South African Council for Natural Scientific Professions (SACNASP) <ul style="list-style-type: none"> ○ (Registration Number: 121030) • Water Institute of Southern Africa (WISA) <ul style="list-style-type: none"> ○ (Membership No: 39243) • International Association for Impact Assessments (IAIAsa) <ul style="list-style-type: none"> ○ (No. 6185)
Expertise of the EAP:	Ms. Upton has a qualification in B.Sc. (Hons) Animal, Plants and Environmental Science (Appendix 1) and has 10 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.
Experience	10 years

2. LOCATION OF THE OVERALL ACTIVITY

Farm Name:	Middelpunt 420 KS Umkoanesstad 419 KS Zeekoegat 421 KS
Application area (Ha)	Middelpunt 420 KS – 1544.8853 ha Umkoanesstad 419 KS – 2635.1021 ha Zeekoegat 421 KS - 2127.6897 ha Area of rehabilitation activities = 7.9 ha Water Treatment Plant activity footprint = 0.3 ha
Magisterial district:	Tubatse Magisterial District Sekhukhune District Municipality Fetakgomo Tubatse Local Municipality
Distance and direction from nearest town	Bokoni Platinum Mines (BPM) is situated in the Sekhukhuneland District of the Limpopo Province. It is located approximately 80 km southeast of Polokwane and approximately 330 km north-east of Johannesburg.
21 digit Surveyor General Code for each farm portion	TOKS0000000042000000 TOKS0000000041900000 TOKS0000000042100000

2.1 Locality map

Refer to Appendix 3 for the Locality Maps for the project area.

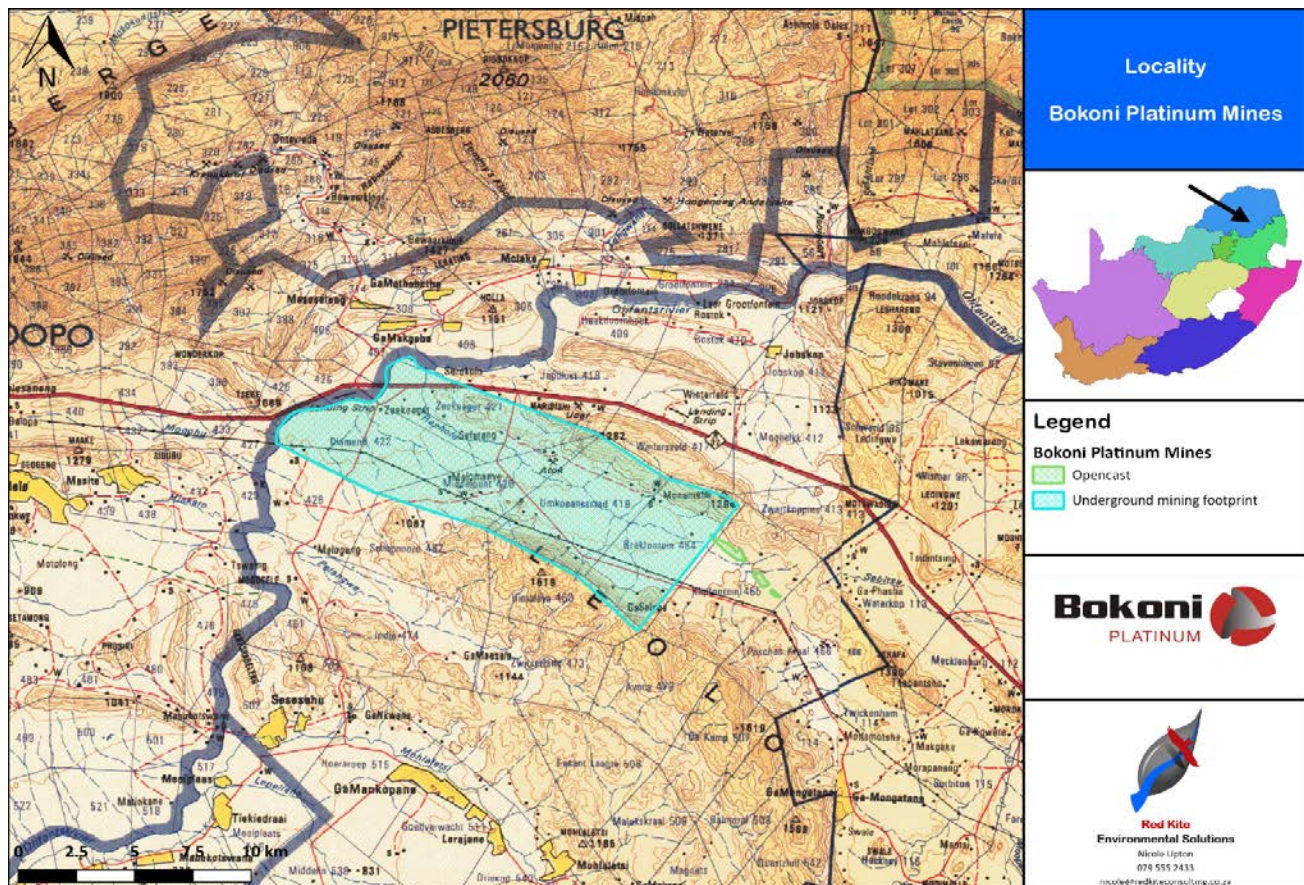


Figure 1: Bokoni Platinum Mines locality map

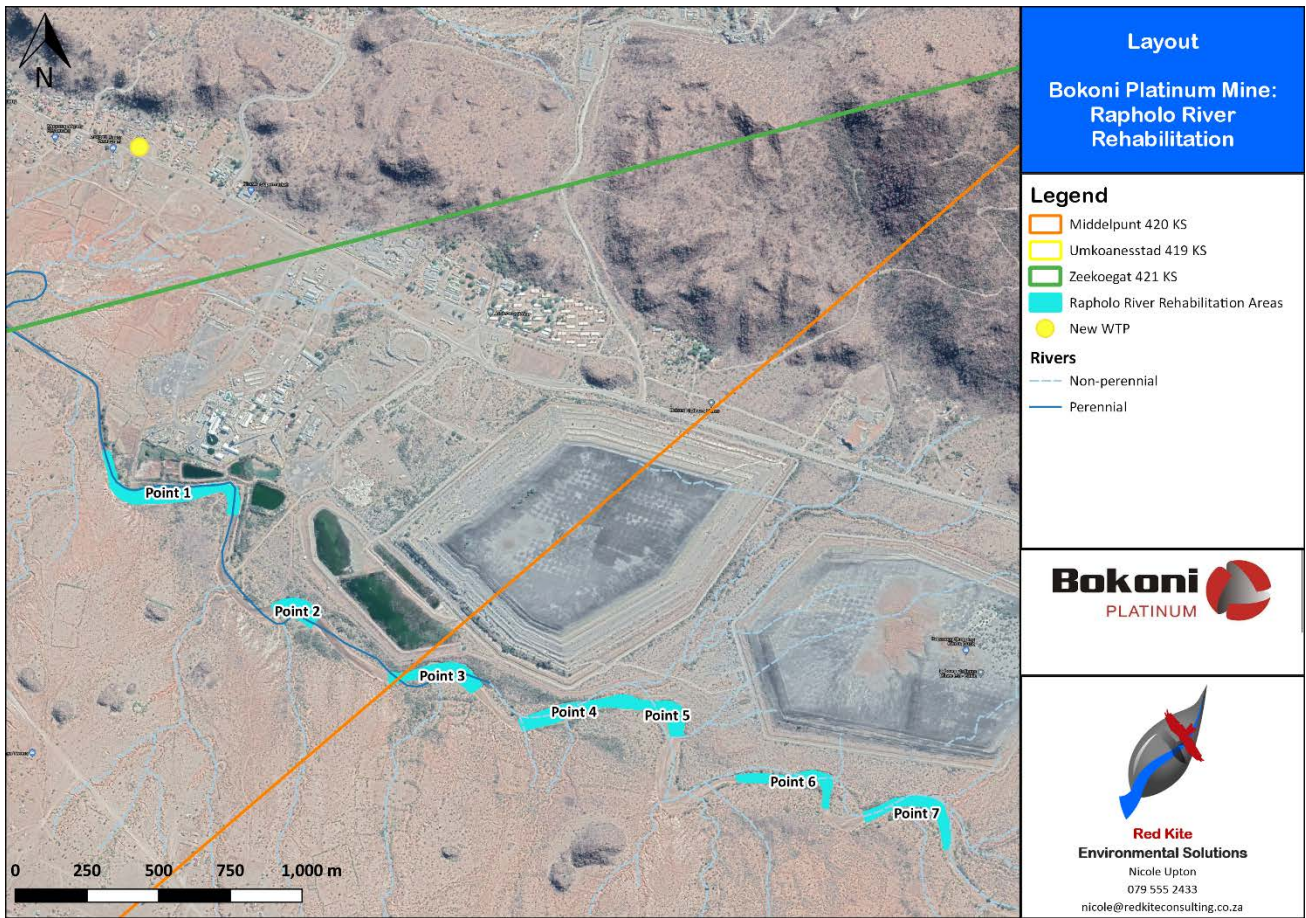


Figure 2: Proposed project locality

3. DESCRIPTION OF THE SCOPE OF THE PROPOSED OVERALL ACTIVITY

This reports details proposed additional activities for the exiting Bokoni Platinum Mine. BPM has an existing and approved Consolidated EMPr. The current and authorised activities of the BPM are briefly summarised below from the approved EMPr for the operations.

Bokoni Platinum Mines (BPM) has mined the Merensky reef since the 1960s and the UG2 reef since 1998 via underground and open pit mining operations.

The mining operation consists of a vertical shaft and various decline shaft systems to access underground mine development on the Merensky and UG2 reef horizons. BPM has installed road, water and power infrastructure, as well as processing concentrators, sufficient to meet its operational requirements. The BPM has an extensive shallow ore body, capable of supporting a life-of-mine plan that is estimated at 39 years. Current mining operations are being conducted at shallow depths, on average 200m below surface.

The BPM is currently in a Care and Maintenance phase. Activities that are currently being undertaken by the mine or have previously been authorised are:

- Drilling and blasting
- Opencast mining (Farm Klipfontein 465 KS and Zeekoegat 421 KS) – opencast mining concluded and areas currently being rehabilitated
- Various underground mining methods (cut and fill, underhand stoping and a combination of cut and fill and scrape and shrink methods)
 - Vertical, UM2 Shaft and Brakfontein
 - Middelpunt Hill shaft
 - Klipfontein decline shaft
 - Zeekoegat decline shaft
- Mineral Processing:
 - Merensky processing plant
 - UG2 processing plant
- Ventilation facilities (various fans and vents)
- Fuel and chemicals storage and use
- Domestic and hazardous waste handling
- Management of waste rock and tailings
 - Merensky Reef: Tailings Storage Facilities (TSFs)
 - Merensky Reef: Waste Rock Dumps
 - UG2 Reef: TSFs
 - UG2 Reef: Waste Rock Dumps
- Water supply, including:
 - Processing water
 - Potable water
 - Surface water drainage
 - Water storage and discharge
 - Merensky water treatment plant
 - Waste water treatment plants (five WWTP on site at the Middelpunt Hill, Atokia Village, UM2, Brakfontein and the concentrator plant)
 - Sewage treatment plants
- Roads
- Electricity supply infrastructure and substations
- Employee housing

- Offices, parking areas, stores, workshops, laydown areas and other administrative and supporting facilities.

3.1 Proposed activities

Bokoni was placed under Care and Maintenance (C&M) during October 2017. In compliance with Duty of Care and relevant legislation, BPM conducted an environmental risk assessment which was submitted to the Department.

BPM identified the systematic migration of the Rapholo riverbank towards its operations as a significant risk. The Rapholo River flows along the southern boundary of the mine. Critical locations have been identified, along the BPM perimeter, in the Rapholo River where excessive erosion has taken place. These locations are encroaching on critical infrastructure and need to be rehabilitated to ensure that no further erosion is caused that will endanger the structural integrity of existing Tailings Storage Facilities (TSFs), Pollution Control Dams (PCDs) and Return Water Dams (RWDs).

Following the identification of the erosion risks, BPM management compiled a Risk Assessment, the results of which indicated that civil works would need to be undertaken to protect and stabilise the areas where erosion has taken place. The rehabilitation works would also ensure that the river flow is not altered and that the river habitat is protected.

Areas with high risk to the facilities, and therefore requiring rehabilitation, were identified and are described in the table below and depicted in the figure below.

Table 2: Classification and description of the risk areas

Nr.	Risk	Description
1	High risk	<i>This area of the riverbank is eroding in the direction of the pollution control dam and should be prioritised.</i>
2	Medium to low risk	<i>This area of the riverbank is eroding parallel to the return water dam and is not perceived as an immediate risk.</i>
3	Very high risk	<i>This area of the riverbank is eroding to the return water dam and shows clear evidence of active erosion taking place. Considering the short distance between the erosion face and the facility, mitigation should be considered as an immediate priority.</i>
4	Very high risk	<i>This area of the riverbank is eroding to the consolidated shows clear evidence of active erosion taking place. Considering the short distance between the erosion face and the facility, mitigation should be considered as an immediate priority.</i>
5	Medium to low risk	<i>This area of the riverbank is eroding north wards to the consolidated TSF with a distance of approximately 300 m from the facility. Considering the distance from the facility, this area is not at immediate risk but should be monitored.</i>
6	High risk	<i>This area of the riverbank is eroding in the direction of dam 6. The area is not an immediate risk due to the distance from the facility but the directionality of the erosion increases the risk to the facility over extended periods.</i>
7	High risk	<i>This area of the riverbank is eroding in the direction of dam 6. The area is not an immediate risk due to the distance from the facility but the directionality of the erosion increases the risk to the facility over extended periods.</i>

BPM pumps excess water from the underground shaft. Various options for the use of the excess water have been identified, of which provision of potable water to BPM employees and nearby communities is the preferred option.

Water pumped from the underground shaft will be treated to drinking water standards through a Water Treatment Plant, prior to provision of drinking water to communities and employees. The proposed infrastructure for the WTP include the following and will have a maximum footprint of 3 000 m² :

- Construction of a Water Treatment Plant with a capacity of 4 000 m³day;

- Construction of new pump station with high lift pumps to pump treated water to the near-by villages;
- Construction of floor slab and steel canopy structure for the new WTP;
- Construction of 80 m of 200 mm dia. GMS pipework to supply raw water to the WTP;
- Construction of 150 m of 160 mm dia. GMS pipeline to supply water to the existing storages and new pump station from the WTP; and
- Construction of 2.4 m high security fence (178 m) around the new WTP facility.

The new WTP will be constructed adjacent to the existing Bokoni Platinum Mines Merensky WTP. The proposed WTP site has been transformed by adjacent community activities and currently consists of bare soil with no indigenous vegetation remaining on the proposed WTP footprint. Refer to Figure 4.

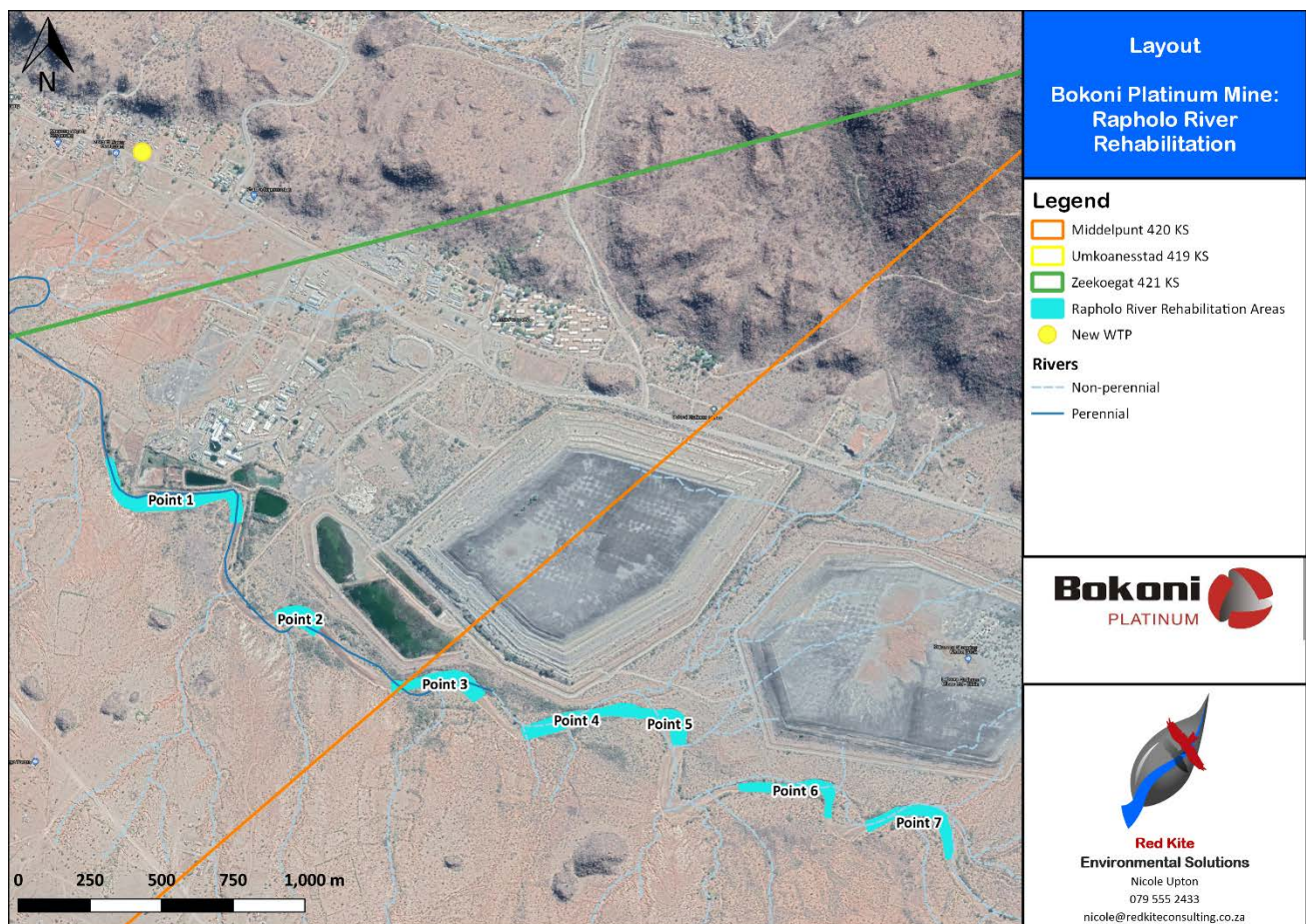


Figure 3: Satellite image of project area

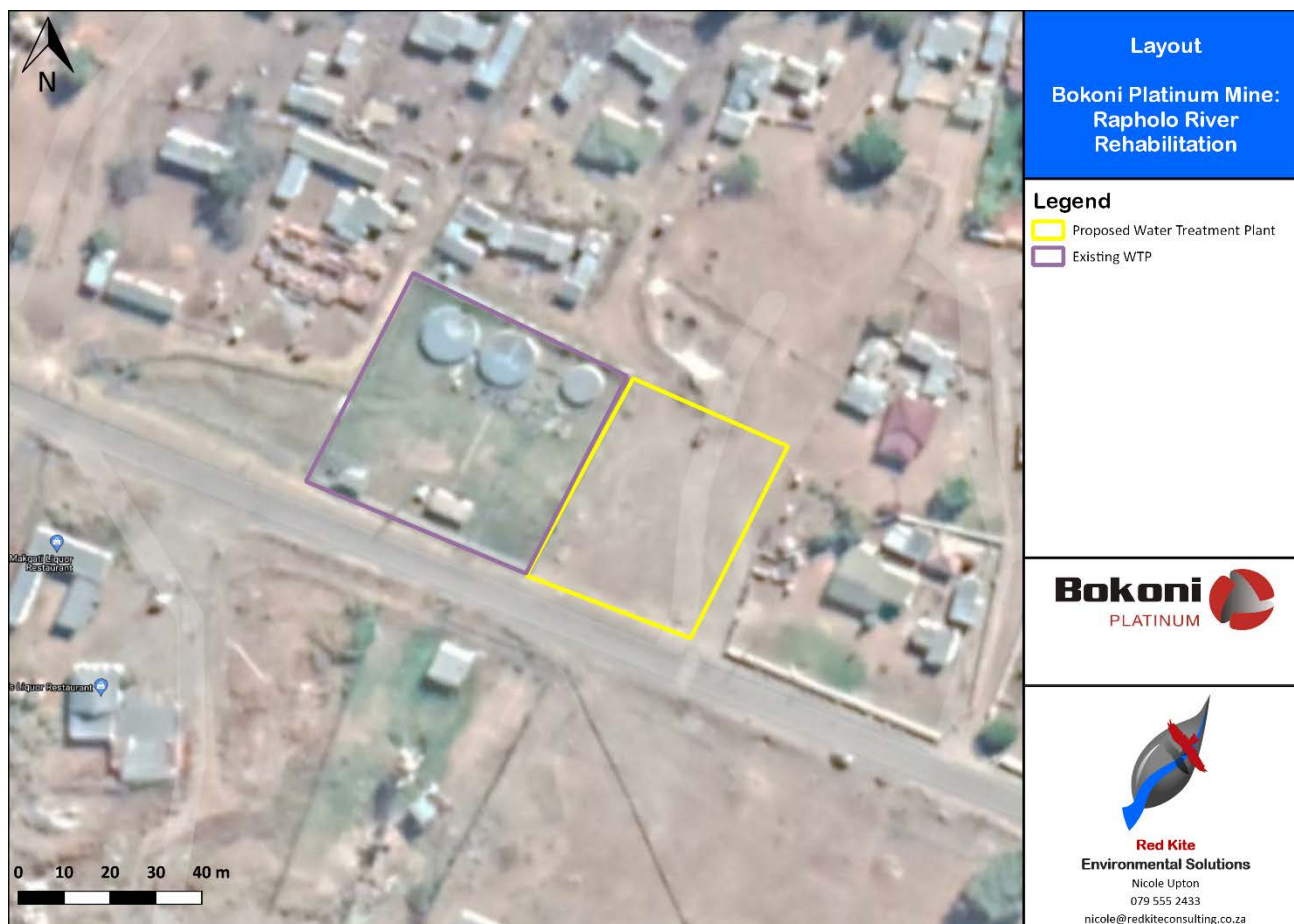


Figure 4: Layout of proposed and existing Water Treatment Plant

Bokoni Platinum Mine proposes to expand the current UG2 processing plant located within the BPM operations to include a Chrome Recovery Plant (CRP), which is designed to treat 60 ktpm of final tailings at Bokoni Mine concentrator. The UG2 ore processed at the Bokoni concentrator has a design feed range of 100 to 110tph. The CRP will be located next to the UG2 Concentrator in order to keep the pumping distances as short as possible. The CRP will receive the UG2 tailings from the flotation section and return a slurry to the existing pipeline and tailings dam after the chrome has been recovered from it.

3.2 Listed and specified activities

Table 3 Listed and Specified Activities

NAME OF ACTIVITY	AERIAL EXTENT OF THE ACTIVITY	LISTED ACTIVITY	APPLICABLE LISTING NOTICE	WASTE MANAGEMENT AUTHORISATION
GN327 (12) 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; (b) in front of a development setback; or (c) if no development setback exists, within 32 metres of a watercourse [...]	7.9 ha	X	GN327 (12)	
Rapholo River Rehabilitation				

NAME OF ACTIVITY	AERIAL EXTENT OF THE ACTIVITY	LISTED ACTIVITY	APPLICABLE LISTING NOTICE	WASTE MANAGEMENT AUTHORISATION
<p>327 (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 [...]</p> <p>Rapholo River Rehabilitation</p>	7.9 ha	X	GN327 (19)	
<p>GN324 (14) The development of - (ii) infrastructure or structures with a physical footprint of 10 square metres or more; where such development occurs - (a) within a watercourse; (b) in front of a development setback; or (c) if no development setback has been adopted, within 32 metres of a watercourse, measured from the edge of a watercourse [...]</p> <p>e. Limpopo</p> <p>i. Outside urban areas:</p> <p>(aa) A protected area identified in terms of NEMPAA, excluding conservancies;</p> <p>(bb) National Protected Area Expansion Strategy Focus areas;</p> <p>(cc) World Heritage Sites;</p> <p>(dd) Sensitive areas as identified in an environmental management framework as contemplated in chapter 5 of the Act and as adopted by the competent authority;</p> <p>(ee) Sites or areas identified in terms of an international convention;</p> <p>(ff) Critical biodiversity areas or ecosystem service areas as identified in systematic biodiversity plans adopted by the competent authority or in bioregional plans;</p> <p>(gg) Core areas in biosphere reserves; or</p> <p>(hh) Areas within 10 kilometres from national parks or world heritage sites or 5 kilometres from any other protected area identified in terms of NEMPAA or from the core area of a biosphere reserve; or</p> <p>Rapholo River Rehabilitation</p>	7.9 ha	X	GN324 (14)	
<p>GN327 (25) The development and related operation of facilities or infrastructure for the treatment of effluent, wastewater or sewage with a daily throughput capacity of more than 2 000 cubic metres but less than 15 000 cubic metres.</p>	0.3 ha	X	GN327 (25)	

NAME OF ACTIVITY	AERIAL EXTENT OF THE ACTIVITY	LISTED ACTIVITY	APPLICABLE LISTING NOTICE	WASTE MANAGEMENT AUTHORISATION
Construction and operation of Water Treatment Plant with daily throughput capacity of 4 000 m³.				
Expansion of existing chrome processing plant to include a Chrome Recovery Plant (CRP)	Included in footprint of exiting chrome processing plant	N/A	N/A	N/A

3.3 Description of the activities to be undertaken

3.3.1 Rapholo River Rehabilitation

Bokoni Platinum Mine (BPM), which is currently under care and maintenance, is located close to the R37 in Limpopo, 70 km to the north-east of Burgersfort. BPM is situated in the Olifants River sub catchment, specifically the B52J quaternary catchment. The Rapholo River flows along the southern boundary of the mine. Critical locations have been identified, along the BPM perimeter, in the Rapholo River where excessive erosion has taken place. These locations are encroaching on critical infrastructure and need to be rehabilitated to ensure that no further erosion is caused that will endanger the structural integrity of existing Tailings Storage Facilities (TSFs), Pollution Control Dams (PCDs) and Return Water Dams (RWDs).

Bokoni is located approximately 70 km from Burgersfort on the Polokwane – Burgersfort road (R37) in the Sekhukhune district of the Limpopo Province. The Rapholo River flows along the southern boundary of the mine. The Rapholo River is non-perennial and only flows during heavy rainfall and storm seasons (December to March).

Bokoni has mined the Merensky reef since the 1960s and the UG2 reef since 1998 via underground and open pit mining operations. Bokoni was placed under Care and Maintenance (C&M) during October 2017. In compliance with Duty of Care and relevant legislation, BPM conducted an environmental risk assessment which was submitted to the Department. BPM identified the systematic migration of the river bank towards its operations as a significant risk.

River bank erosion is a natural process where water flowing through a stream, slowly wears away the soil and rock that forms the stream bank. The river bank erosion of the Rapholo River has been accelerated by land altering activities such as overgrazing and the removal of riverside vegetation. The systematic erosion of the river bank threatens to undermine certain areas of the operations including the tailings dams, return water dams and pollution control dams. This may threaten the structural integrity of these facilities.

Following high rainfall and flows in the Rapholo River during 2018, evidence of severe erosion affecting the BPM Vertical Shaft Pollution Control Dam (PCD) was identified. This erosion poses a severe risk to the structural integrity of the PCD and other mine residue facilities. Due to the location of the erosion risk being within a flood line and the severity of the risk, including tailings dam failure, PCD failure and return water dam failure with associated environmental, health and safety and legal implications, including the possibility of loss of life, the remediation of the erosion risks are of critical importance.

Following the identification of the erosion risks, BPM management compiled a Risk Assessment, the results of which indicated that civil works would need to be undertaken to protect and stabilise the areas where erosion has taken place. The rehabilitation works would also ensure that the river flow is not altered and that the river habitat is protected.

A study was undertaken by Agreenco Environmental to identify the key erosion sections and their historical erosion-based migration. During this study, the areas with high risk to the facilities were identified, based on the perceived direction in which erosion is occurring, historical erosion and bank migration trends and the trends in measured distance between the riverbank and the high-risk facilities. Refer to the table and figure above for a description of the rehabilitation areas.

Method Statement For Gabions and Stone Pitching

- **Equipment (Construction Plant)**

- 1 x Excavator/TLB for excavation and clearing site.
 - 1 x Wacker/rammer for compaction after backfilling and preparation of stone pitching surface.
 - 1 x 6 cubic tipper truck to transport backfill gravel material and stones.
 - 1 x 5000L water tanker for mixing mortar.

- **Gabions (2 m x 1 m x 1 m) AND GABIONS MATTRESS (2 m X 1 m X 0.5 m)**

The gabion boxes will be placed on the edge of the embankment to prevent further erosion.

- Excavate material for gabion trenches
 - Surface to be prepared using hand tools
 - Wacker will be used to compact the surface
 - Place gabion boxes and join them
 - Place gabions by hand to avoid damaging the boxes
 - Fill the boxes with 100-150mm stone
 - Key concrete to lock the ends
 - Close off the gabion boxes
 - Put in the gabion mattresses behind
 - Backfill behind the gabion boxes and mattress to the level of the boxes
- **Stone Pitching**
 - Surface to be prepared using hand tools or a TLB where necessary.
 - Backfill the eroded section of the stone pitching with wet gravel material.
 - Wacker/rammer will be used to compact the prepared surface and the backfilling.
 - Mixed correct mortar for the placing of stones
 - Placing of stones should be in a uniform fashion
 - Stone will also be jointed using mortar

The rehabilitation structures will be covered with soil and vegetated. The structures will be installed to mimic natural slopes (1:2 and 1:3) as far as possible and to mimic the natural characteristics of the river.

Refer to Appendix 6 for the Rehabilitation Designs and Report.

3.3.2 Water Treatment Plant (new)

The Bokoni Platinum Mine (BPM) was placed on care and maintenance since 2017 and is currently experiencing high underground water which has been identified as an on-going environmental risk to the mine. Bokoni Platinum Mine considered various options for solutions to increase the usage of the excess water to comply with the requirements of the Mine Water Use Licence (WUL). Since the mine is under care and maintenance, the excess water cannot be used in the mine operations or maintained within the dams. It is estimated that the four (4) mine shafts combined are currently pumping over 11 Mega litres per day (ML/day) to the surface.

In an effort to manage this excess underground water, BPM and Sekhukhune District Municipality (SDM), as the Water Services Authority in Sekhukhune, have discussed the option of supplying some of the communities in the surroundings of the mine with treated water, which complies with the Social Labour Plan (SLP) commitments. The Department of Water and Sanitation has also been consulted regarding the water initiative.

Water pumped from the underground shaft will be treated to drinking water standards through a Water Treatment Plant, prior to provision of drinking water to communities and employees. The most suitable treatment application for mine underground water will be the Reverse Osmosis (RO) water treatment plant. The RO plant uses a series of Pressure Sand Filters, Activated Carbon Filters, Reverse Osmosis Filtration System and Polishing Filters to remove heavy metals and chemical from the raw water. Irrespective of the size/capacity, the RO plant requires less surface space and can be installed in a short duration compared to conventional plants.

The proposed infrastructure for the WTP include the following and will have a maximum footprint of 3 000 m² :

- Construction of a Water Treatment Plant with a capacity of 4 000 m³day;
- Construction of new pump station with three high lift pumps to pump treated water to the near-by villages;
- Construction of floor slab and steel canopy structure for the new WTP;
- Construction of 80 m of 200 mm diameter GMS pipework to supply raw water to the WTP;
- Construction of 150 m of 160 mm diameter GMS pipeline to supply water to the existing storages and new pump station from the WTP; and
- Construction of 2.4 m high security fence (178 m) around the new WTP facility.

The new WTP will be constructed adjacent to the existing Bokoni Platinum Mines Merensky WTP, thereby connecting and utilising the existing infrastructure. The proposed WTP site has been transformed by adjacent community activities and currently consists of bare soil with no indigenous vegetation remaining on the proposed WTP footprint. Thus, no additional ecological disturbances will take place. Refer to Figure 4 and photos below.



Figure 6: (left) proposed site for new WTP; (right) existing WTP adjacent to new WTP site

Refer to Appendix 7 for the design report of the proposed WTP.

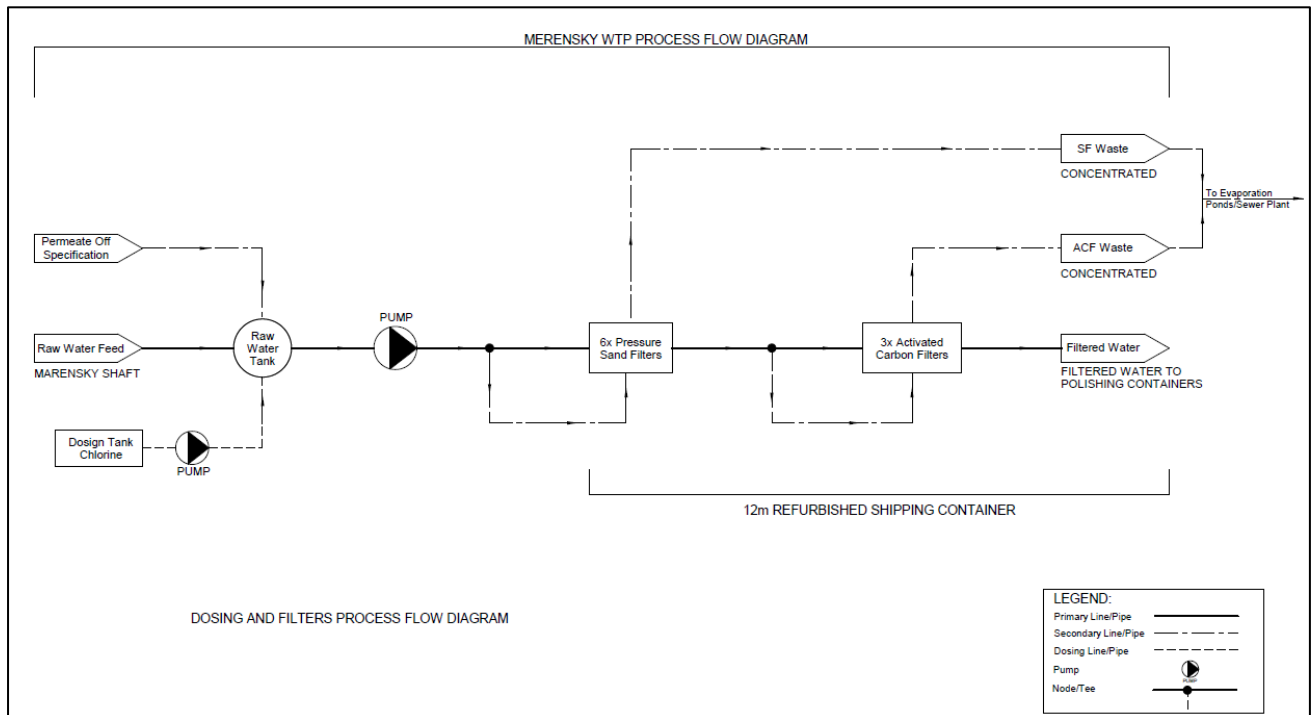


Figure 7: Proposed Water Treatment Plant design diagram (1)

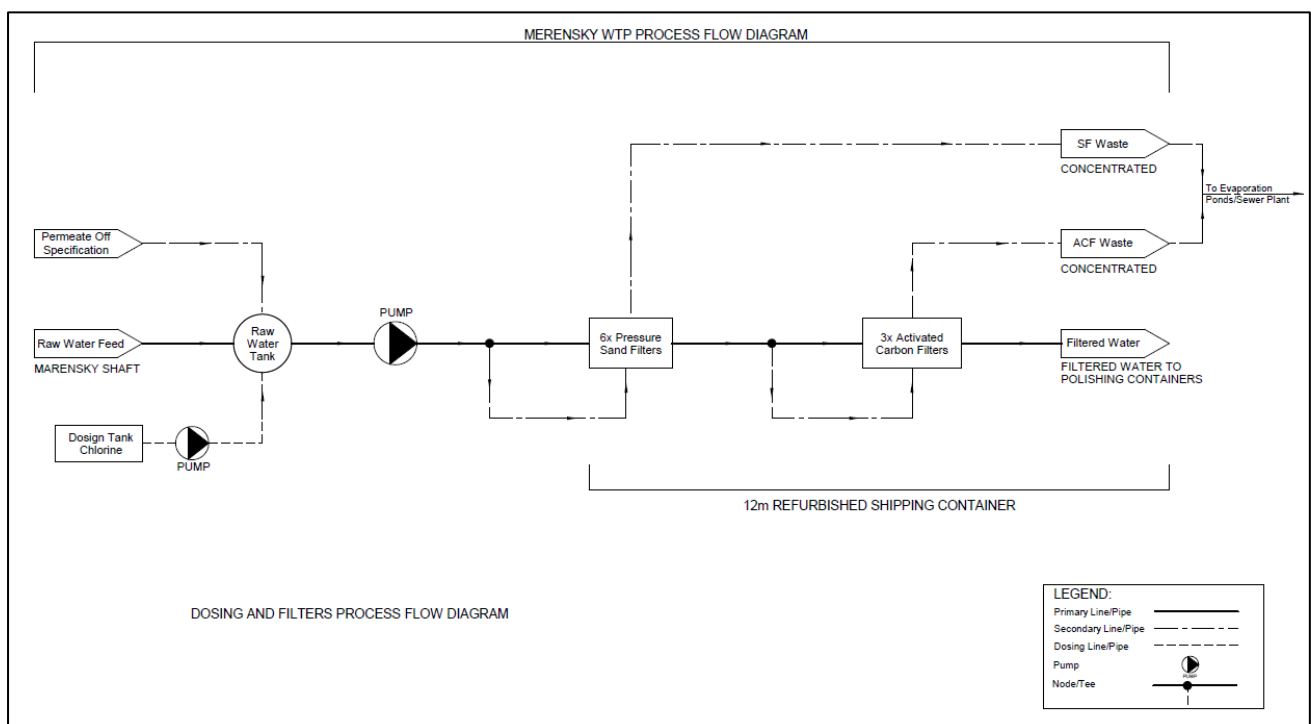


Figure 8: Proposed Water Treatment Plant design diagram (2)

3.3.3 Upgrade of chrome processing plant

Bokoni Platinum Mine proposes to expand the current UG2 processing plant located within the BPM operations to include a Chrome Recovery Plant (CRP), which is designed to treat 60 ktpm of final tailings at Bokoni Mine concentrator. The CRP and associated infrastructure will be installed within the current footprint of the processing plant. Thus, no additional ecological disturbances will take place.

The UG2 ore processed at the Bokoni concentrator has a design feed range of 100 to 110tph. The CRP will be located next to the UG2 Concentrator in order to keep the pumping distances as short as possible. The CRP will receive the UG2 tailings from the flotation section and return a slurry to the existing pipeline and tailings dam after the chrome has been recovered from it.

Based on tested feed characteristics, a multi-stage separators and spiral configuration would be required, consisting of rougher and cleaner spirals stages as well as scavenger spiral stages. The primary recovery of chrome will be done in the rougher stage while the concentrates will be cleaned up to saleable products in the cleaning stages. The purpose of the scavenger spirals would be to capture the ultra-fine material or “missed” chrome in the primary circuit and allow for ore variation.

Elutriators (hydro sizes) will be incorporated in the final design to minimise PGM losses and reduce silica (SiO₂) in the final chrome product, allowing for the production of a chemical grade material which is a different “market” to the metallurgical industry and which requires that the silica to remain below <1.0 %.

As the CRP utilises high volumes of clean water, a separate thickener operation is proposed in the design of the CRP. This would optimise water usage and ensure that the returning tails stream confirm to the criteria stipulated by Bokoni Mine.

The final metallurgical and chemical grade chromite concentrates will be pumped separately to dedicated stockpile areas via dewatering separators. The separator overflows will return by gravity feed back to the spiral process tanks.

A new stockpile area will be created for the chrome production, incorporating storm water management and a truck load-out facility, including a weighbridge.

3.4 Policy and Legislative Context

Table 4: Policy and Legislation

APPLICABLE LEGISLATION AND GUIDELINES USED TO COMPILE THE REPORT	HOW DOES THIS DEVELOPMENT COMPLY WITH AND RESPOND TO THE LEGISLATION AND POLICY CONTEXT
<p>Mineral and Petroleum Resources Development Act (No. 28 of 2002)</p> <p>The primary aim of the MPRDA is to recognise the sovereignty of the State over all the mineral and petroleum resources in South Africa and to promote equitable access to the Country’s resources. The MPRDA has a number of objectives, including to:</p> <ul style="list-style-type: none"> • Promote equitable access to the nation’s mineral and petroleum resources to all the people of South Africa; • Substantially and meaningfully expand opportunities for historically disadvantaged persons, including women, to enter the mineral and petroleum industries and to benefit from the exploitation of the nation’s mineral and petroleum resources; • Promote economic growth and mineral and petroleum resources development in the country; • Provide for security of tenure in respect of prospecting, exploration, mining and production operations; • Give effect to Section 24 of the Constitution of South Africa by ensuring that the nation’s mineral and petroleum resources are developed in an orderly and ecologically sustainable manner while promoting justifiable social and economic development; and • Ensure that holders of mining and production rights contribute towards the socio-economic development of the areas in which they are operating. <p>The MPRDA concerns equitable access to, and sustainable development of, South Africa’s mineral and petroleum resources. The MPRDA makes provision for sustainable mining and requires:</p> <ul style="list-style-type: none"> • That every person who has applied for a mining right must conduct an EIA, determine the environmental baseline, and submit an EMPR to the DMR; • That every holder of a mining reconnaissance permit, prospecting right, mining right, mining permit or retention permit must assess and communicate the impacts of the activity on the environment; • The need to rehabilitate the environment affected by prospecting or mining operations to its natural or predetermined state; and • That the directors of the mining company are liable for unacceptable impacts on the environment. 	<p>Bokoni Platinum Mines has an existing Mining Right (LP 6/2/2/609 MR) and approved Consolidated EMPR for their operations.</p> <p>Red Kite Environmental Solutions compiled the Basic Assessment Report in accordance with the MPRDA (and NEMA, where applicable).</p>

<p style="text-align: center;">APPLICABLE LEGISLATION AND GUIDELINES USED TO COMPILE THE REPORT</p>	<p style="text-align: center;">HOW DOES THIS DEVELOPMENT COMPLY WITH AND RESPOND TO THE LEGISLATION AND POLICY CONTEXT</p>
<p>National Environmental Management Act (No. 107 of 1998)</p> <p>The NEMA is South Africa’s overarching environmental statute concerned with integrated environmental management (IEM) and the underlying principles by which environmental management must be undertaken. Its primary objective is to provide for co-operative governance, thus binding all organs of State by establishing principles for decision making on matters affecting the environment, institutions that will promote co-operative governance, and procedures for co-ordinating environmental functions exercised by organs of State and to provide for matters connected therewith (Government Gazette, 1998).</p> <p>The NEMA provides for the Constitutional right to an environment that is not harmful to the health and well-being of South African citizens, the equitable distribution of natural resources, sustainable development, environmental protection, and the formulation of environmental management frameworks (Government Gazette, 1998). Section 2 of NEMA sets out principles for sustainable integrated environmental governance; the principles are further detailed in subsequent sections of NEMA.</p> <p>Section 24(5), 24M and 44 of the NEMA enables the Minister to publish regulations pertaining to environmental impact assessments. The current Environmental Impact Assessment Regulations, GNR.326 (EIA Regulations), were published on 7 April 2017. Sections 24(2) and 24D of the NEMA make provision for the Minister to publish listed activities that would require environmental authorisation prior to commencement of that activity. The Minister published the following three Regulations in terms of Sections 24(2) and 24D of the NEMA on 4 December 2014:</p> <ul style="list-style-type: none"> • Regulation GNR.327 of 2017 which sets out a list of identified activities which may not commence without environmental authorisation from the competent authority and which must follow the Basic Assessment (BA) procedure as provided for in Chapter 4, Part 2 of the EIA Regulations; • Regulation GNR.325 of 2017 which sets out a list of identified activities which may not commence without environmental authorisation from the competent authority and which must follow the scoping and EIA procedure as provided for in Chapter 4, Part 3 of the EIA Regulations; and • Regulation GNR.324 of 2017, which sets out a list of identified activities per geographical area, which may not commence without environmental authorisation from the competent authority and which must follow the BA procedure as, provided for in Chapter 4, Part 2 of the EIA Regulations. 	<p>In terms of Section 24(2) and 24(D) of the NEMA, authorisation is required for the following listed activities identified in terms of the following, which is detailed in Section 32(d)(i):</p> <ul style="list-style-type: none"> • GN327(12) • GN327(19) • GN324(14) • GN327 (25) <p>This Basic Assessment Report will be submitted to the competent and commenting authority in support of the application for authorisation.</p>

<p style="text-align: center;">APPLICABLE LEGISLATION AND GUIDELINES USED TO COMPILE THE REPORT</p>	<p style="text-align: center;">HOW DOES THIS DEVELOPMENT COMPLY WITH AND RESPOND TO THE LEGISLATION AND POLICY CONTEXT</p>
<p>National Water Act (No. 36 of 1998)</p> <p>The NWA provides for fundamental reformation of legislation relating to water resources and use. The preamble to the Act recognises that the ultimate aim of water resource management is to achieve sustainable use of water for the benefit of all users and that the protection of the quality of water resources is necessary to ensure sustainability of the nation’s water resources in the interests of all water users. The purpose of the Act is stated, in Section 2 as, inter alia:</p> <ul style="list-style-type: none"> • Promoting the efficient, sustainable and beneficial use of water in the public interest; • Facilitating social and economic development; • Protecting aquatic and associated ecosystems and their biological diversity; • Reducing and preventing pollution and degradation of water resources; and • Meeting international obligations. <p>The NWA presents strategies to facilitate sound management of water resources, provides for the protection of water resources, and regulates use of water by means of Catchment Management Agencies, Water User Associations, Advisory Committees and International Water Management.</p> <p>As this Act is founded on the principle that the government has overall responsibility for and authority over water resource management, including the equitable allocation and beneficial use of water in the public interest, an industry (including mines) is only entitled to use water if the use is permissible under the NWA.</p> <p>Section 21 of the NWA provides a list of water uses which require a WULA prior to commencement, unless listed in Schedule 1 (of the NWA) as an existing lawful use. Applying for a WULA triggers NEMA listed activities as contemplated in terms of GNR.327 and GNR.325 of 2017.</p> <p>Water use includes taking and storing water, activities which reduce stream flow, waste discharges and disposals, controlled activities (activities which impact detrimentally on a water resource), altering a watercourse, removing water found underground for certain purposes, and recreation. A water use must be licensed unless it is listed in Schedule 1 (of the NWA), is an existing lawful use, is permissible under a general authorisation, or if a responsible authority waives the need for a license.</p>	<p>Rehabilitation of the Rapholo River and construction and operation of the Water Treatment Plant involves water use activities as set out in Section 21 of the National Water Act (Act No 36 of 1998) (NWA):</p> <ul style="list-style-type: none"> • Section 21 (a): taking water from a water resource; • Section 21(c): Impeding or diverting the flow in a watercourse; and • Section 21(i): Altering the bed, banks, course and characteristics of a water course. • Section 21 (g): disposing of waste in a manner which may detrimentally impact on a water resource; <p>A WULA has been submitted to the DWS in this regard.</p>

<p style="text-align: center;">APPLICABLE LEGISLATION AND GUIDELINES USED TO COMPILE THE REPORT</p>	<p style="text-align: center;">HOW DOES THIS DEVELOPMENT COMPLY WITH AND RESPOND TO THE LEGISLATION AND POLICY CONTEXT</p>
<p>In terms of the NWA, a watercourse is defined as follows:</p> <ul style="list-style-type: none"> • A river or spring; • A natural channel in which water flows regularly or intermittently; • A wetland, lake or dam into which the Minister may, by notice in the Gazette, declare to be a watercourse, and reference to a watercourse, which includes, where relevant, its beds and banks. <p>Furthermore, in terms of the NWA, a wetland is defined as follows: Land which is transitional between terrestrial and aquatic systems where the water table is usually at or near the surface or the land is periodically covered with shallow water, and which land in normal circumstances supports or would support vegetation typically adapted to life in saturated soil.</p>	
<p>National Environmental Management: Biodiversity Act (Act No 10 of 2004)</p> <p>In terms of S57, the Minister of Environmental Affairs has published a list of critically endangered, endangered, vulnerable, and protected species in GNR 151 in Government Gazette 29657 of 23 February 2007 and the regulations associated therewith in GNR 152 in GG29657 of 23 February 2007, which came into effect on 1 June 2007.</p> <p>In terms of GNR 152 of 23 February 2007: Regulations relating to listed threatened and protected species, the relevant specialists must be employed during the EIA Phase of the project to incorporate the legal provisions as well as the regulations associated with listed threatened and protected species (GNR 152) into specialist reports in order to identify permitting requirements at an early stage of the EIA Phase.</p> <p>The Act provides for listing threatened or protected ecosystems, in one of four categories: critically endangered (CR), endangered (EN), vulnerable (VU) or protected. The first national list of threatened terrestrial ecosystems has been gazetted, together with supporting information on the listing process including the purpose and rationale for listing ecosystems, the criteria used to identify listed ecosystems, the implications of listing ecosystems, and summary statistics and national maps of listed ecosystems (National Environmental Management: Biodiversity Act: National list of ecosystems that are threatened and in need of protection, (GG 34809, GN 1002), 9 December 2011).</p>	<p>As the applicant will not carry out any restricted activity, as is defined in S1 of the Act, no permit is required to be obtained in this regard.</p>

<p style="text-align: center;">APPLICABLE LEGISLATION AND GUIDELINES USED TO COMPILE THE REPORT</p>	<p style="text-align: center;">HOW DOES THIS DEVELOPMENT COMPLY WITH AND RESPOND TO THE LEGISLATION AND POLICY CONTEXT</p>
<p>National Environmental Management Air Quality Act (No. 39 of 2004)</p> <p>The National Environmental Management Air Quality Act (No. 39 of 2004) (NEMAQA) allows for national, provincial and local air quality standards to be established as well as the declaration of priority areas. In addition, the NEMAQA requires that Air Quality Management Plans (AQMP) form part of the environmental implementation plan or environmental management plans to be prepared by national departments or the Province as required by Chapter 3 of the NEMA. Furthermore, the NEMAQA requires municipalities to include an AQMP into its integrated development plan (IDP).</p> <p>The NEMAQA requires the Minister of the DEA to publish a list of activities which results in atmospheric emissions which may have a detrimental effect on the environment, including health, social conditions, economic conditions, ecological conditions, ecological conditions or cultural heritage. The NEMAQA requires that an atmospheric emissions licence (AEL) be obtained for such listed activities. Such a list of activities was published in GNR.248 of 2010.</p>	<p>No activities requiring authorisation in terms of GNR.248 of 2010 of NEMAQA will be undertaken.</p>
<p>National Environmental Management Protected Areas Act (No. 57 of 2003)</p> <p>The National Environmental Management Protected Areas Act (No. 57 of 2003) (NEMPAA) concerns the protection and conservation of ecologically viable areas representative of South Africa’s biological diversity and its natural landscapes and seascapes, and includes inter alia:</p> <ul style="list-style-type: none"> • The establishment of a national register of all national, provincial and local protected areas; • The management of those areas in accordance with national standards; and • Inter-governmental co-operation and public consultation in matters concerning protected areas. <p>The NEMPAA defines various kinds of protected areas, namely: special nature reserves, national parks, nature reserves (including wilderness areas) and protected environments, world heritage sites, marine protected areas, specially protected forest areas, forest nature reserves and forest wilderness areas declared in terms of the National Forests Act (No. 84 of 1998), and mountain catchment areas declared in terms of the Mountain Catchment Areas Act (No. 63 of 1970).</p>	<p>The project area is not situated on Protected Areas.</p>

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<p>Part 4 of Chapter 4 of the NEMPAA (Sections 48 to 53) lists restrictions of activities that may not be conducted in a protected area (as described above). Activities that are restricted include:</p> <p>Prospecting and mining activities;</p> <ul style="list-style-type: none"> - Activities that are restricted by: <ul style="list-style-type: none"> • Regulations made by the Minister; • Regulations made by the MEC, in the case of provincial and local protected areas; • By-laws of the relevant municipality, in the case of local protected areas; and <p>Internal rules made by the managing authority of the area;</p> <ul style="list-style-type: none"> - Commercial and community activities where the survival of any species is negatively affected, or the integrity of an ecosystem is significantly disrupted; and - Any development or other activity that is inappropriate for the area given the purpose for which the area was declared. 	
<p>National Heritage Resources Act (No. 25 of 1999)</p> <p>The National Heritage Resources Act (No. 25 of 1999) (NHRA) established the South African Heritage Resources Agency (SAHRA) in 1999. SAHRA is tasked with protecting heritage resources of national significance. With regard to heritage sites, sensitive, vulnerable, highly dynamic or stressed ecosystems, such as coastal shores, dolomitic land and ridges, estuaries, wetlands, and similar systems require specific attention in management and planning procedures, especially where they are subject to significant human resource usage and development pressure. A heritage site means a place declared to be a national heritage site by SAHRA or a place declared to be a provincial heritage site by a provincial heritage resources authority.</p> <p>Section 34 and 38 of the NHRA details specific activities that require a heritage impact assessment that will need to be approved by SAHRA. The following activities require a heritage impact assessment to be undertaken for the Proposed Project. The heritage specialist study has commenced, and the results will be provided in the EIA/ EMPR document.</p> <ul style="list-style-type: none"> • Section 34(1): Structures older than 60 years may not be altered or demolished prior to permission from SAHRA; • Section 38(1a): The construction of a road, power line, pipeline, canal or other similar form of linear 	<p>A Phase 1 Heritage Assessment was undertaken for the project. Refer to Appendix 12.</p>

<p style="text-align: center;">APPLICABLE LEGISLATION AND GUIDELINES USED TO COMPILE THE REPORT</p>	<p style="text-align: center;">HOW DOES THIS DEVELOPMENT COMPLY WITH AND RESPOND TO THE LEGISLATION AND POLICY CONTEXT</p>
<p>development or barrier exceeding 300 m in length;</p> <ul style="list-style-type: none"> • Section 38(1c): Any development or other activity which will change the character of a site (i) exceeding 5,000 m² in extent, or (ii) involving three or more erven or subdivisions. <p>Furthermore, section 48(2) requires a permit from a heritage resources authority to perform such actions at such time and subject to such terms, conditions and restrictions or directions as may be specified in the permit. This would include any development of the site where “development” means any physical intervention, excavation, or actions, other than those caused by natural forces, which results in a change to the nature, appearance or physical nature of a place, or influences its stability and future well-being, including:</p> <ul style="list-style-type: none"> • Construction, alteration, demolition, removal or change of use of a place or a structure at a place; • Carrying out any works on or over or under a place; • Any change to the natural or existing condition or topography of land; and • Any removal or destruction of trees, or removal of vegetation or topsoil. 	
<p>Hazardous Substances Act (No. 15 of 1979)</p> <p>The object of the Act is inter alia to ‘provide for the control of substances which may cause injury or ill health to, or death of, human beings by reason of their toxic, corrosive, irritant, strongly sensitising or flammable nature or the generation of pressure thereby in certain circumstances; for the control of electronic products; for the division of such substances or products into groups in relation to the degree of danger; for the prohibition and control of such substances.’</p> <p>In terms of the Act, substances are divided into schedules, based on their relative degree of toxicity, and the Act provides for the control of importation, manufacture, sale, use, operation, application, modification, disposal and dumping of substances in each schedule.</p>	<p>Dangerous substances contained onsite during the construction, operation and closure phases of the Proposed Project will need to be management in accordance with the Act and safety data sheets (SDS) will need to accompany all dangerous goods (hydrocarbons, cleaning chemicals, paints, etc.).</p>

3.5 Need and desirability of the proposed activities

Bokoni has mined the Merensky reef since the 1960s and the UG2 reef since 1998 via underground and open pit mining operations. Bokoni was placed under Care and Maintenance (C&M) during October 2017. In compliance with Duty of Care and relevant legislation, BPM conducted an environmental risk assessment which was submitted to the Department. BPM identified the systematic migration of the river bank towards its operations as a significant risk.

River bank erosion is a natural process where water flowing through a stream, slowly wears away the soil and rock that forms the stream bank. The river bank erosion of the Rapholo River has been accelerated by land altering activities such as overgrazing and the removal of riverside vegetation. The systematic erosion of the river bank threatens to undermine certain areas of the operations including the tailings dams, return water dams and pollution control dams. This may threaten the structural integrity of these facilities.

Following high rainfall and flows in the Rapholo River during 2018, evidence of severe erosion affecting the BPM Vertical Shaft Pollution Control Dam (PCD) was identified. This erosion poses a severe risk to the structural integrity of the PCD and other mine residue facilities. Due to the location of the erosion risk being within a flood line and the severity of the risk, including tailings dam failure, PCD failure and return water dam failure with associated environmental, health and safety and legal implications, including the possibility of loss of life, the remediation of the erosion risks are of critical importance.

The Bokoni Platinum Mine is currently experiencing high underground water which has been identified as an on-going environmental risk to the mine. Bokoni Platinum Mine considered various options for solutions to increase the usage of the excess water to comply with the requirements of the Mine Water Use Licence (WUL). Since the mine is under care and maintenance, the excess water cannot be used in the mine operations or maintained within the dams. It is estimated that the four (4) mine shafts combined are currently pumping over 11 Mega litres per day (ML/day) to the surface.

In an effort to manage this excess underground water, BPM and Sekhukhune District Municipality (SDM), as the Water Services Authority in Sekhukhune, have discussed the option of supplying some of the communities in the surroundings of the mine with treated water, which complies with the Social Labour Plan (SLP) commitments. The Department of Water and Sanitation has also been consulted regarding the water initiative.

Water pumped from the underground shaft will be treated to drinking water standards through a Water Treatment Plant, prior to provision of drinking water to communities and employees. Existing infrastructure is available for utilisation and the WTP will connect to the Merensky WTP, which is currently used to supply water to the community.

The excess water poses a threat to the environment and the continued operation of the BPM. Thus, the proposed WTP mitigates potential environmental risks, allows the BPM operations to continue operations that provide employment and provides potable water to communities not currently serviced by the municipality.

3.6 Motivation for the overall preferred site, activities and technology alternative

The National Environmental Management Act 107 of 1998, Environmental Impact Assessment Regulations, 2014 requires the applicant to identify alternatives for projects applied for. In terms of the above-mentioned regulations an alternative in relation to a proposed activity, means different means of meeting the general purpose and requirements of the activity, which may include alternatives to the:

- (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.

Bokoni Platinum Mine proposes to rehabilitate eroded areas of the Rapholo River which pose a threat to the structural integrity of the PCD and other mine residue and waste water facilities. Rehabilitation structures will include the construction and installation of gabions and stone pitching. The proposed WTP will be constructed adjacent to the existing Merensky WTP, allowing for shared infrastructure and connection to existing infrastructure. The WTP is also located on a site which is already disturbed by adjacent community activities and the existing WTP.

No alternatives have been considered for assessment. This is due to the nature of the activity (rehabilitation of specific high risk areas in the Rapholo River) and the limited feasible options to undertake the activity. The WTP was sited and designed to make use of existing facilities and infrastructure to optimise the WTP, allow for adequate water treatment to potable water standards and allow for efficient water delivery to the receiving community, whilst taking into consideration environmental impacts. The only practical alternative which has been assessed is the NO-GO alternative.

Alternatives to the methods to be employed in the rehabilitation activities were discussed with the Department of Water and Sanitation (DWS). DWS agreed with the use of stone pitching and gabions to reinforce the eroded areas, with the requirement that all rip-rap be topsoiled and vegetated and bank slopes should be designed for a 1:2 or 1:3 slopes.

Alternative options regarding solutions for the excess water were considered. However, the project, as described in this report, has the greatest advantages for the community, the BPM, as well as greatly reducing the potential environmental impacts. The WTP and supply of potable water to nearby communities was discussed with the Sekhukhune District Municipality as well as the DWS.

No-Go Option

The 'no-go' alternative is the option of not undertaking proposed rehabilitation activities in the Rapholo River. The no-go option assumes that the rehabilitation measures are not implemented and that the erosion in the Rapholo River very likely increases. The no-go alternative would possibly result in severe negative impacts to the structural integrity of the PCD and other mine residue and waste water facilities. Due to the location of the erosion risk being within a flood line and the severity of the risk, including tailings dam failure, PCD failure and return water dam failure with associated environmental, health and safety and legal implications, including the possibility of loss of life, the remediation of the erosion risks are of critical importance. The no-go alternative is therefore not considered desirable at a local, regional and national scale, in terms of job creation and positive economic impacts.

The 'no-go' alternative is the option of not constructing the Water Treatment Plant and thus not providing the nearby communities with potable water. The no-go option assumes that the WTP will not be constructed and that excess water will need to be managed with existing facilities which may lead to system failures, damage to existing infrastructure, overflows, and environmental damage and pollution. The no-go alternative is therefore not considered desirable at a local, regional and national scale, in terms of job creation and positive economic impacts.

3.7 Full description of the process followed to reach the proposed preferred alternatives within the site.

3.7.1 Details of the development footprint alternatives considered

Refer to Section 3(g) above.

4. DETAILS OF THE PUBLIC PARTICIPATION PROCESS FOLLOWED

Objectives of Public Participation

The purpose of this Public Participation Process is:

- To provide Background Information to the proposed activity;
- To provide a locality map indicating the locality of the proposed activity;
- To notify potential Interested and Affected Parties of the Environmental Process to be followed in terms of the Mineral and Petroleum Resources Development Act, 2002 (Act No. 28 of 2002);
- To notify potential Interested and Affected Parties of the Environmental Process to be followed in terms of the National Environmental Management Act, 1998 (Act No. 107 of 1998), as amended; and
- To obtain issues and concerns from potential Interested and Affected Parties regarding the Environmental Process to be followed and the proposed activity, which will be addressed as part of the Public Participation Process.

Public Participation is important for the following reasons:

- It provides an opportunity for Interested & Affected Parties (I&APs), Environmental Assessment Practitioners (EAPs) and the competent authority (CA) to obtain clear, accurate and understandable information about the environmental impacts of the proposed activity or implications of a decision;
- It provides I&APs with an opportunity to voice their support, concerns and questions regarding the project application or decision;
- It provides I&APs with the opportunity of suggesting ways for reducing or mitigating any negative impacts of the project and for enhancing its positive impacts;
- It enables an applicant to incorporate the needs, preferences and values of affected parties into its application;
- It provides opportunities for clearing up misunderstandings about technical issues, resolving disputes and reconciling conflicting interests;
- It is an important aspect of securing transparency and accountability in decision-making; and
- It contributes toward maintaining a healthy, vibrant democracy.

4.1 Identification of I&APs

The following groups were identified as potential Interested and Affected Parties (I&APs):

- Community Representatives and Members;
- Relevant Government Departments;
- Relevant Municipal Representatives, including Ward Councillors;
- Relevant Institutional/Organisational Representatives;
- Landowners/Occupiers;
- Directly adjacent Landowners/Occupiers;
- Land Claimants; and
- Governmental and Non-Governmental Organisations and Agencies.

To ensure that all potential I&APs were made aware of the project and had the opportunity to register and provide comments, the notification process was as thorough as possible. Registration will remain open throughout the Public Participation Process to allow Interested and Affected Parties to register and submit their input throughout. For the list of identified I&APs refer to Appendix 1 of the PP Report.

4.2 Notification of I&APs

4.2.1 Site Notices

To inform surrounding and immediate community members, landowners, occupiers, workers and passers-by of the proposed project and to invite registrations and comments, fourteen (14) A2 notices were erected at a visible and accessible localities throughout the study area on 09 December and 10 December 2020. These notices were erected at public places regularly utilised by the communities in the greater surroundings and are summarised in the table below. Taking the local community into account, seven (7) of the site notices were displayed in English and seven (7) in Sepedi. Photographic evidence of the site notices erected is attached as Appendix 2 of the PP Report.

Date	Number	Language	Coordinates	Placement
09/12/2020	Site Notice 01	English	24°18'28.43"S	Impala Tuckshop
	Site Notice 02	Sepedi	29°54'46.99"E	
09/12/2020	Site Notice 03	English	24°19'6.47"S	Mokgotho Tuckshop
	Site Notice 04	Sepedi	29°56'2.89"E	
09/12/2020	Site Notice 05	English	24°21'38.00"S	Ga-Selepe Tribal
	Site Notice 06	Sepedi	29°56'41.00"E	
09/12/2020	Site Notice 07	English	24°19'59.60"S	Moropeng Tuckshop
	Site Notice 08	Sepedi	29°53'15.57"E	
09/12/2020	Site Notice 09	English	24°17'37.83"S	Magoma Super Market
	Site Notice 10	Sepedi	29°51'10.04"E	
09/12/2020	Site Notice 11	English	24°16'53.70"S	Broadway Super Market
	Site Notice 12	Sepedi	29°51'23.35"E	
10/12/2020	Site Notice 13	English	24°24'18.94"S	Baroka Ba-Nkwana Tribal
	Site Notice 14	Sepedi	29°47'14.68"E	

4.2.2 Newspaper advertisement

To inform a broad spectrum of individuals who might want to register as I&APs, newspaper advertisements were placed in one local newspaper and one regional newspaper. For proof of advertisements placed, refer Appendix 3 of the PP Report. To accommodate the local community, the local advertisement was placed in Sepedi whereas the regional advertisement was placed in English.

Advertisements were placed in the following newspapers:

- Wednesday, 09 December 2020: Page 9 of the Weekend Review (Local)
- Wednesday, 09 December 2020: Page 6 of the Capricorn Voice (Regional)

4.2.3 Written notification

Identified I&APs were directly informed of the application processes to be followed by means of email and hand delivery. Proof of written notifications sent is provided in the relevant appendices as described in the sections to follow. Note that the written notifications encouraged potential I&APs to register and provide their comments/questions on the proposed project and related application processes currently underway.

4.2.4 Email notifications

I&APs were notified of the proposed project by means of email on 10 December 2020. The Background Information Document (BID) was attached to the emails and all email notifications sent provided the contact information for

EnviroRoots (Pty) Ltd. Refer to Appendix 4 of the PP Report for the BID in both English and Sepedi. Proof of email notifications sent is attached as Appendix 5 of the PP Report.

4.2.5 Hand delivery

Background Information Documents (BIDs), providing information on the proposed project, were hand delivered to the three relevant tribal offices on 09 December 2020 and 10 December 2020. The acknowledgements of receipt of hand delivered notifications is attached to this report as Appendix 6 of the PP Report.

4.3 Key Stakeholder Meetings

4.3.1 December 2020 Key Stakeholder Meeting

A Key Stakeholder Meeting was held on 03 December 2020 at Bokoni Platinum Mine at 10h00 am. The meeting included representatives of the three relevant tribal offices within the study area. The purpose of the meeting was to present the tribal authorities with information regarding the proposed project and to enlighten the members of the council and community about the participation and involvement associated with such a project. The application processes in terms of the relevant legislative pieces related to the proposed project, were furthermore presented. As part of the Key Stakeholder Meeting, opportunity was granted for council and community members to raise any comments/issues and questions they may have. These have been captured in the minutes of the meetings.

Information pertaining to the Key Stakeholder Meeting is attached as Appendix 7 of the PP Report and includes the following information:

- Public Participation Meeting Minutes;
- Public Participation Meeting Attendance Register; and
- Public Participation Meeting Photographs.

4.3.2 October 2021 Key Stakeholder Meeting

Following a request by traditional leaders, a second Key Stakeholder Meeting was held on 13 October 2021 at the Malips Club at 10h00 am. The meeting included representatives of the three relevant tribal offices within the study area. The purpose of the meeting was to provide additional background information to the project and to explain the applications for Environmental Authorisation and a Water Use License. As part of the Key Stakeholder Meeting, opportunity was granted for council and community members to raise any comments/issues and questions they may have. These have been captured in the minutes of the meetings.

Information pertaining to the Key Stakeholder Meeting is attached as Appendix 8 of the PP Report and includes the following information:

- Public Participation Meeting Minutes;
- Public Participation Meeting Attendance Register; and
- Public Participation Meeting Photographs.

4.4 Notification of I&APs of Reports availability

Hard copies of the Draft BAR and Draft IWWMP, as formal notification, were hand delivered to the three relevant tribal offices on 30 July 2021 and 04 August 2021. Registered I&APs were informed of the availability of the Draft Basic Assessment Report (BAR) and the Draft Integrated Water and Waste Management Plan (IWWMP) for Public Commenting on 05 August 2021 by means of email and text message. I&APs were informed of the relevant commenting period and were encouraged to submit any comments or questions on or before the relevant closing date.

Further to the above, copies of the draft documents were distributed to the Department of Mineral Resources and Energy, the Department of Water and Sanitation, the Limpopo Department of Economic Development, Environment and Tourism and the Limpopo Department of Agriculture and Rural Development on 29 July 2021. Whereas the Fetakgomo Tubatse Local Municipality received a copy on 03 August 2021. Refer to Appendix 14 of the PP Report for the notifications to I&APs of the report's availability.

4.5 Access and Commenting Opportunity

4.5.1 Registration and commenting

A 30-day commenting period has been provided for as part of the registration phase of this Public Participation Process. This has been conducted in line with Section 41(4)(ii) of the National Water Act (NWA), 1998 (Act No. 36 of 1998) which indicates that a commenting period of no less than 60 days (first 30 days) should be provided for and as a courtesy pre-DBAR (Draft Basic Assessment Report) commenting period to allow I&APs to familiarise themselves with the proposed project prior to making the DBAR available for public commenting in accordance with Clause 3(8) of the NEMA EIA Regulations (GN No. 326 of 07 April 2017) - which indicates that any public participation process must be conducted for a period of at least 30 days. However, note that the entire process will remain transparent and allow for I&APs to register and comment throughout.

4.5.2 Draft BAR and Draft WULA

A 30-day commenting period has been provided for as part of the Draft BAR and Draft WULA phase of this Public Participation Process. This has been conducted in line with Section 41(4)(ii) of the National Water Act (NWA), 1998 (Act No. 36 of 1998) which indicates that a commenting period of no less than 60 days (second 30 days) should be provided for and in accordance with Clause 3(8) of the NEMA EIA Regulations (GN No. 326 of 07 April 2017) which indicates that any public participation process must be conducted for a period of at least 30 days. However, note that the entire process remained transparent and allowed for I&APs to register and comment throughout. The local communities were taken into consideration by placing hard copies of the relevant documents for Public Commenting at the relevant tribal offices. Furthermore, as mentioned earlier in this report a Dropbox link to an electronic copy were provided to ensure easy access to the documents available for public commenting.

4.6 Regulatory Consultation

4.6.1 Notification Period

All Departments and State-Owned Entities listed in the I&AP Register (Appendix 1 of the PP Report) have been included in the Public Participation Process. However, direct consultations were conducted with the Regulatory Authorities relevant to this Public Participation Process.

4.6.2 Department of Water and Sanitation (DWS)

BPM corresponded the erosion of the Rapholo River towards BPM infrastructure to the Department of Water and Sanitation (DWS) during 2019 and subsequently also had a joint site investigation with DWS on 29 October 2019 for DWS to observe emergency erosion control works which had to implemented to prevent risks associated with the severe erosion that had taken place. Further correspondence has been forwarded to DWS during 2020 regarding the current application for Environmental Authorisation and the application for a Water Use License required prior to implementing further essential rehabilitation measures. A pre-application consultation meeting was held with the DWS on 16 September 2020. For all proof of communications to/with the DWS refer to Appendix 9 of the PP Report of this report.

4.6.3 Department of Mineral Resources and Energy (DMRE)

Correspondence regarding the Rapholo River erosion risk was forwarded to the Department of Mineral Resources and Energy (DMRE) during 2019. DMR was furthermore invited to the site investigation that took place on 29 October 2019. For communication to the DMRE refer to Appendix 10 of the PP Report.

4.6.4 Department of Agriculture, Land Reform and Rural Development (DALRRD)

Following notification of the proposed project to the Department of Agriculture, Land Reform and Rural Development (DALRRD) on 10 December 2020, the Department provided a formal response in respect of the Land Claim Status for the BPM properties relevant to this project. A follow-up email was forwarded to the DALRRD acting project manager for the land claims on both properties to request whether any additional specific contact persons should be included in the Public Participation Process. Refer to Appendix 11 of the PP Report for communications with the DALRRD.

4.6.5 Ward Councillors and municipalities

The Ward Councillors for Ward 32, Ward 33 and Ward 34 as well as the Fetakgomo Tubatse Local Municipality and the Sekhukhune District Municipality were informed of the proposed project. No responses have been received to date. Refer to Appendix 12 of the PP Report for communications with the relevant Ward Councillors and Municipalities.

4.6.6 South African Heritage Resource Agency (SAHRA)

Comments were received from the South African Heritage Resources Agency (SAHRA) to indicate that since river banks are heritage sensitive areas a Heritage Assessment was required for the project. Refer to Appendix 13 of the PP Report for communications with SAHRA.

4.7 Summary of issues raised by I&APs

For details of all communication between Red Kite and the AIPs refer to the Comments and Response Report of the PPP Report (Appendix 5 of the BAR).

Refer to Appendix 1 of the PP Report for a full list of I&APs included in the PPP.

Refer to Appendix 16 of the PP Report for the Comments and Response Report, which consolidates all comments received from A&APs as well as the EAP responses to the comments.

5. THE ENVIRONMENTAL ATTRIBUTES ASSOCIATED WITH THE ALTERNATIVES

5.1 Type of environment affected by the proposed activity.

Environmental impacts associated with the surface sampling to be undertaken as part of the proposed Prospecting Right activities will be low/insignificant and localised. Based on this information it was therefore determined that no specialist studies will be required as part of the BAR Process.

5.1.1 Geology

At present most of the worldwide supply of platinum and the associated elements is obtained from mines within four major igneous intrusions. The Bushveld Complex of South Africa is one of them (Schouwstra et al, 2000) and is the world's largest layered intrusion.

The Bushveld Complex outcrop is consisted of eastern, western and northern limbs (Figure 3 1) and is approximately 7 to 9 km thick. The complex is subdivided into 3 major zones: the upper zone, main zone and lower zone (which includes the critical subzone).

The project area overlies the Critical Zone and Main Zone intrusive rocks of the eastern limb of the Rustenburg Layered Suite, of the Bushveld Complex. The dip of the layering varies between 15°SSW at Brakfontein 464KS, 20°SSW in the tailings dam area to 30°SSW adjacent to the Olifants River. The economic targets are provided by the PGM bearing Merensky reef and UG2 chromitite horizons.

The local geology is obtained from the diamond-drilled core-hole and show that the rocks are mainly ultramafic, composed of norites, anorthosites and pyroxenites with thin stringers and layers of chromitites.

In addition, swarms of dolerite dyke exist at various depths and orientations. Usually, dykes have low permeability and are barriers to groundwater flow. At Bokoni, however, the top 60-80 m of the dykes are weathered just like the host rocks. When dykes are encountered underground, they are blasted, and mining continues through them. Hence, at they are not expected to be barriers to groundwater flow or the contamination plume.

5.1.2 Climate

A typical climatic description of the study area is hot summers and cold dry winters. The climate of the study area is, however influenced by the prevailing topography being the foothills of Sekhukhune and Leolo mountain ranges that creates microclimatic effects in the form of a hotter and drier climate. The maximum temperature is recorded as 30.4°C and the minimum is 3.9°C.

5.1.2.1 Temperature

The study area is characterised by very hot summer months accompanied by very little rain, and relatively cold winters. See the table below for minimum, and maximum temperatures recorded within a twelve-month period.

Table 5: Temperature

Month	Temperature(°C)	
	Max	Min
January	30.1	17.3
February	29.7	17.4
March	28.2	16.2
April	27.4	12.1

Month	Temperature(°C)	
	Max	Min
May	24.5	8.1
June	21.7	3.9
July	21.6	4.0
August	24.0	6.9
September	27.5	11.3
October	30.4	14.6
November	30.2	16.4
December	30.1	17.4
Annual	27.1	12.2

5.1.2.2 Precipitation and Evaporation

The Mean Annual Precipitation (MAP) for the area is approximately 559 mm per annum, with the monthly rainfall varying between 4 mm and 102 mm. The rainy season is usually from November to March. The project area furthermore falls within the 1600-1700 mm per year evaporation isolines. The minimum evaporation is 102 mm per month and the maximum is 259 mm/month.

Table 6: Table of Precipitation Data Relevant to the Property

Month	Rainfall				Expected maximum in 24 hrs	
	Average	Days	Maximum		1:50 Y	1:100 Y
	mm	1mm	60 min	24 hrs		
January	95	9.8	49	61	86	97
February	84	6.8	39	114	60	66
March	70	6.8	38	62	68	77
April	20	2.6	18	80	57	64
May	8	2.2	13	36	23	28
June	4	1.3	11	27	22	24
July	4	1.3	7	11	12	13
August	8	1.7	6	13	6	6
September	19	1.8	32	38	35	30
October	59	6.3	51	66	61	69
November	102	10.1	33	65	80	90
December	86	8.4	51	79	67	75
Annual	559 total	59.1				53.25 (mean)

Table 7: Evaporation Data relevant to the Property

Month	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec	Annual
Evaporation (mm)	212	174	174	139	121	102	119	167	228	259	228	217	2140

5.1.2.3 Wind

Regionally the daytime winds are normally south-westerly, changing to northerly between the hours of 00:00 and 06:00. Distinct seasonal patterns are observed with northerly winds prevailing in winter, and south-westerly and westerly winds in the summer months. Wind speeds decrease from 3.7 m.s⁻¹ in summer to 3.3 m. s⁻¹ in winter, and are generally light to moderate, annually averaging below 3.5 m.s⁻¹.

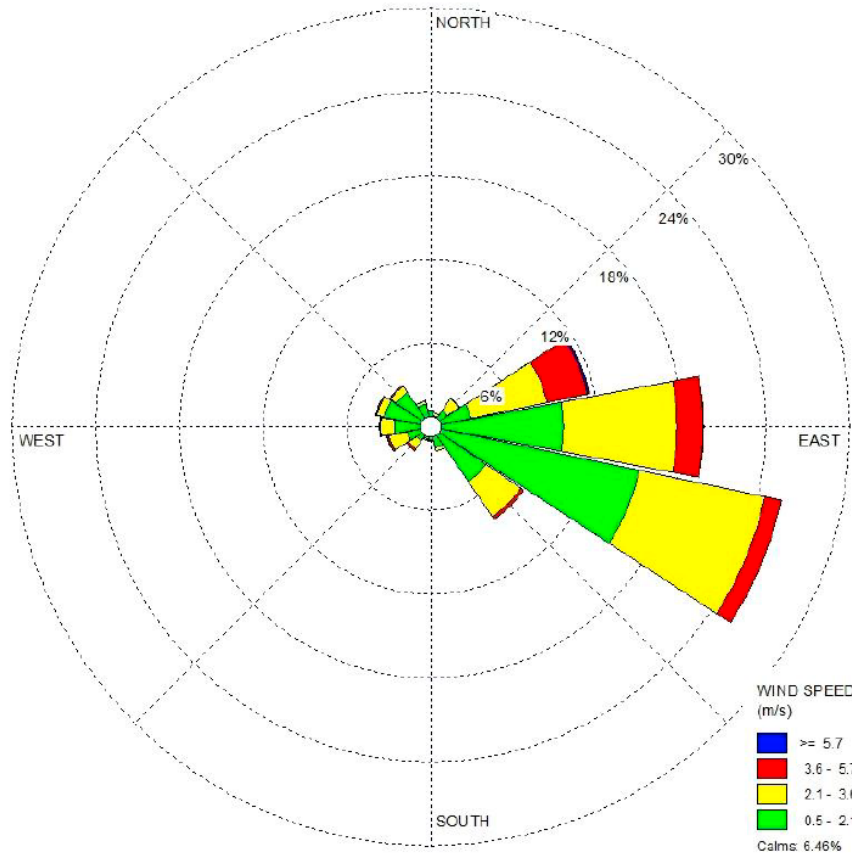


Figure 9: BPM wind rose

5.1.3 Groundwater

The following section is sources from the Hydrogeological Impact Assessment undertaken by Digby Wells Environmental in 2021.

5.1.3.1 Aquifer Layers

Logs of 243 boreholes drilled historically were evaluated to characterise the number and thickness of aquifers layers. In general, water strikes have been intercepted at depths between 10 and 150 mbgl and can be sub-divided into four aquifer layers based on the frequency distribution:

- **Alluvial aquifers:** This is an unconfined alluvial deposit located along the Olifants River, which is made up of unconsolidated sand and gravel. The aquifer thickness varies between 7 m and 21 m along the river. Alluvial deposits are also found along the Rapholo Stream but are often dry, except near the plant area where seepage from the unlined two TSFs and return water dams recharge the aquifer.
- **Shallow weathered aquifer:** The top approximately 60 m of the Bushveld formation is weathered. Within the Rapholo valley this aquifer is typically characterised by weathered and fractured norite, pyroxenite and anorthosite, dipping with the Bushveld strata. In the underground mine workings, this aquifer, in particular the highly weathered pyroxenites, yield most of the groundwater inflow. It is classified as the most important aquifer in the study area, with the highest yields.
- **Fractured Aquifer:** Small amount of water strikes have been recorded between 60 – 80 m. Although the aquifer appears to be dominated by fracturing, partial weathering could be present.
- **A deep unweathered fractured aquifer** which represents discrete fracture zones in otherwise fresh hard rock. Such aquifers have been observed to a depth of 130 – 140 m and are controlled by fracture orientation, depth, connectivity and aperture.

The pyroxenite is, however, of particular interest since it chemically weathers more than the other rocks, such as the norite and anorthosite. The pyroxenite weathers faster and is characterised by deeper weathering horizons. The reason for the weathering of the pyroxenite more than the other ultramafic rocks is suspected to be due to the rock forming mineral being pyroxene that has a high melting point and higher pressure of formation that results in preferential chemical weathering under the atmospheric conditions.

Considerable groundwater inflow from the weathered zone into the underground workings is likely to occur when roof construction of the underground mine extends into the hanging wall of the weathered rocks. The inflow amount is dependent on the degree of weathering, size of hanging wall roofbolts and size of blast induced fractures in the hanging wall. It is highly recommended that mining activities take place below a vertical depth of 80 m (maximum depth of weathering) to avoid groundwater inflow into the underground workings.

Few water strikes (suspected to be related with the NW-SE striking fractures) are encountered at greater depths (130 – 140 m below ground level). The geometry of the fractured aquifer is more difficult to characterise due to the complexity and depth of fractures controlling them.

The deep fractured aquifers are connected with the weathered aquifer and can extend to greater depths into the underground workings.

5.1.3.2 Groundwater Elevation and Flow Direction

The water quality and water levels are currently monitored on a quarterly basis by Letsolo Consulting. Historical data are also available since 1992 to supplement the on-going monitoring programme.

Regionally within the catchment, the groundwater level in the top weathered aquifer does not seem to have been affected by the underground mining that is taking place in the deep basement rocks. The water level in the last 30 years (since monitoring data is available) is stable with no evident decrease in water level. This shows that the mine dewatering has not impacted the water table in the shallow weathered aquifer.

On a catchment scale, the water level is still on its natural state and is following the topography, flowing from the south-east (catchment water shed) towards the north-west (Olifants River). The elevation of the groundwater ranged from 920 m in the south-east to 710 m in the north-west along the Olifants River.

Locally, however, water level impacts are to be expected due to seepage from the unlined water storage facilities and over spillages from the RWDs to Rapholo. The seepage is, however, quickly dissipating in the alluvial deposit within the Rapholo basin, hence Rapholo is not flowing until the Olifants River although excess mine water is being discharged to it.

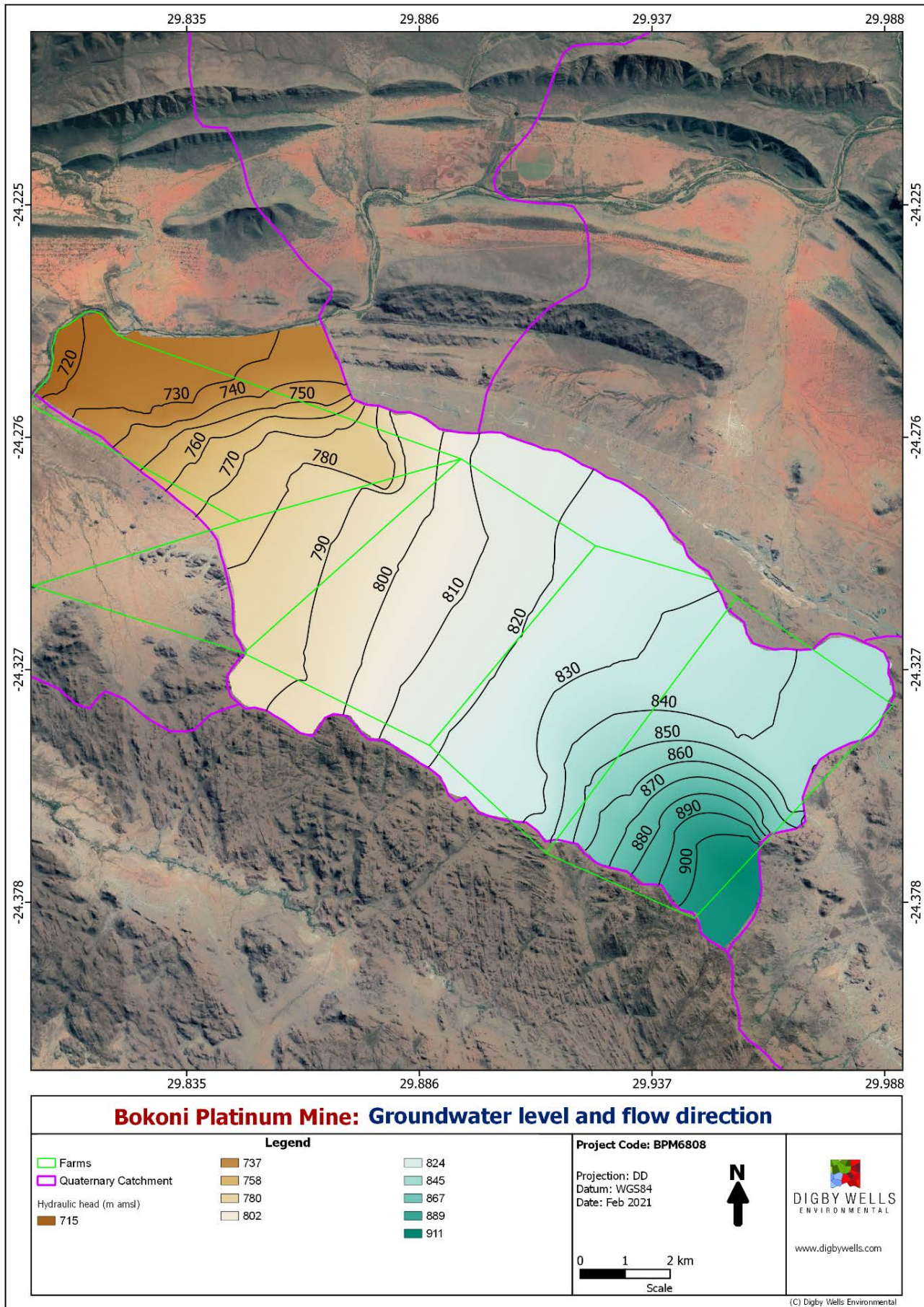


Figure 10: Groundwater level and flow direction

5.1.3.3 Groundwater Quality

No acid-mine drainage is expected at Bokoni as observed from the monitoring data as well as geochemical studies conducted by Digby Wells (2013). The rocks are all mafic and ultramafic with no acid-forming minerals such as pyrite. However, the groundwater quality is evidently impacted by the mining activities. The recirculation of the mine water from the unlined storage facilities to the underground workings over the years has resulted in higher salt concentrations with each circulation, as more and more pollutants and natural soluble salts are added. Process water, with added chemicals at the concentrator plant, is also stored in the unlined stormwater dams.

As observed through monitoring, chloride is the main element of concern at Bokoni and has been used as an indicator of the potential impact that the mine can have on the surrounding environment. Bokoni's WUL limit for chloride in the groundwater resource is 100 mg/L, while the ideal drinking concentration is 200 mg/L (SAWQG, 1996). These benchmarks have been used to determine the mine impact on the groundwater resource.

The background chloride concentration upgradient of the mine is approximately 50 mg/L. Hence any chloride increase when the groundwater flows by the mine is attributed to mining activities.

A maximum chloride concentration of 1200 mg/L is recorded at the return water dams and nearby monitoring boreholes. The impact of the excess mine water discharged on the Rapholo stream is also observed as the plume extends up to 5.5 km away from the Consolidated TSF. This is a concern as the plume is migrating towards the Olifants River in the aquifers. In fact, pockets of concentration plumes above 100 mg/L are already recorded in some monitoring boreholes on the banks of Olifants River.

5.1.3.4 Groundwater Use

Historically more than 90% of the communities in the mining area were dependent on groundwater resources for their water supply, an attempt by the municipality over the past years to install and supply reticulated water has failed. Boreholes are critical and the mine is supplying more and more water to the communities.

The aquifer system present in the Bokoni area comprises a confined to semi-confined weathered and/or fractured rock aquifer associated with layering of the Rustenburg Layered suite. Yields generally vary from 0.05 to 5m³/h but discrete higher yielding zones (5m³/h to 25m³/h) are associated with the deeper weathering along the predominantly northeast to southwest trending faults and dolerite dyke contacts.

The hydrogeological investigations in the area indicate that significant ground water inflows are only likely to occur along the water bearing fracture zones and dolerite dykes contacts that cut across the UG2 seam, (SRK Report 287678/Ground water, 2001). Blow yields reported for boreholes drilled off these lineaments, both in the DWAF study (Botha *et al.*, 2001) and ground water investigation (SRK Report 287678/Ground water, 2001), were found to be minimal.

The average rainfall in the area is given as 570mm per annum for the Tselopele weather station in Burgersfort. A recharge estimate of 2% was given as appropriate for sustainable use in the DWA report. The ground water resources of South Africa Sheet No. 2 (DWA, 1995) however, estimates recharge in the area to be around 10%. This translates to a recharge of about 54mm per annum. Abstraction from the aquifer, either for use and/or by dewatering, should not exceed this quantity.

5.1.4 Surface Water

The following section was sourced from the Surface Water and Aquatic Ecology Assessment undertaken by Enviridi Environmental Consultants in 2021 for the proposed project. Refer to Appendix 8 for the Surface Water and Aquatic Ecology Assessment.

The project site falls within the Olifants Water Management Area (WMA) within Drainage Region B. Major rivers include the Elands, Wilge, Steelpoort, Olifants and Letaba river systems. Many dams are present within this Water Management Area. The project falls across two (2) separate catchments (B52G & B52J). However, the relevant section of the Rapholo/Monametsi river and Bokoni Platinum Mine exclusively falls within the B52J Quaternary Catchment.

The mine is mainly located in the catchment of the Rapholo River (Quaternary Drainage Region B52J) which is a non-perennial tributary of the Olifants River. The main development of the mine is on the northern catchment of the river. The Rapholo is characterised by steep granite hills and highly erodible floodplains. The remainder of Bokoni, namely the MPH decline and adits, lie within the Bok River catchment, another tributary of the Olifants River. The catchment straddles Zeekoegat and Jagdlust farms. Malips dam is an in-stream dam on the Bok River used for recreational purposes by the mine. Both rivers are non-perennial, only having flow after flood events or significant rains.

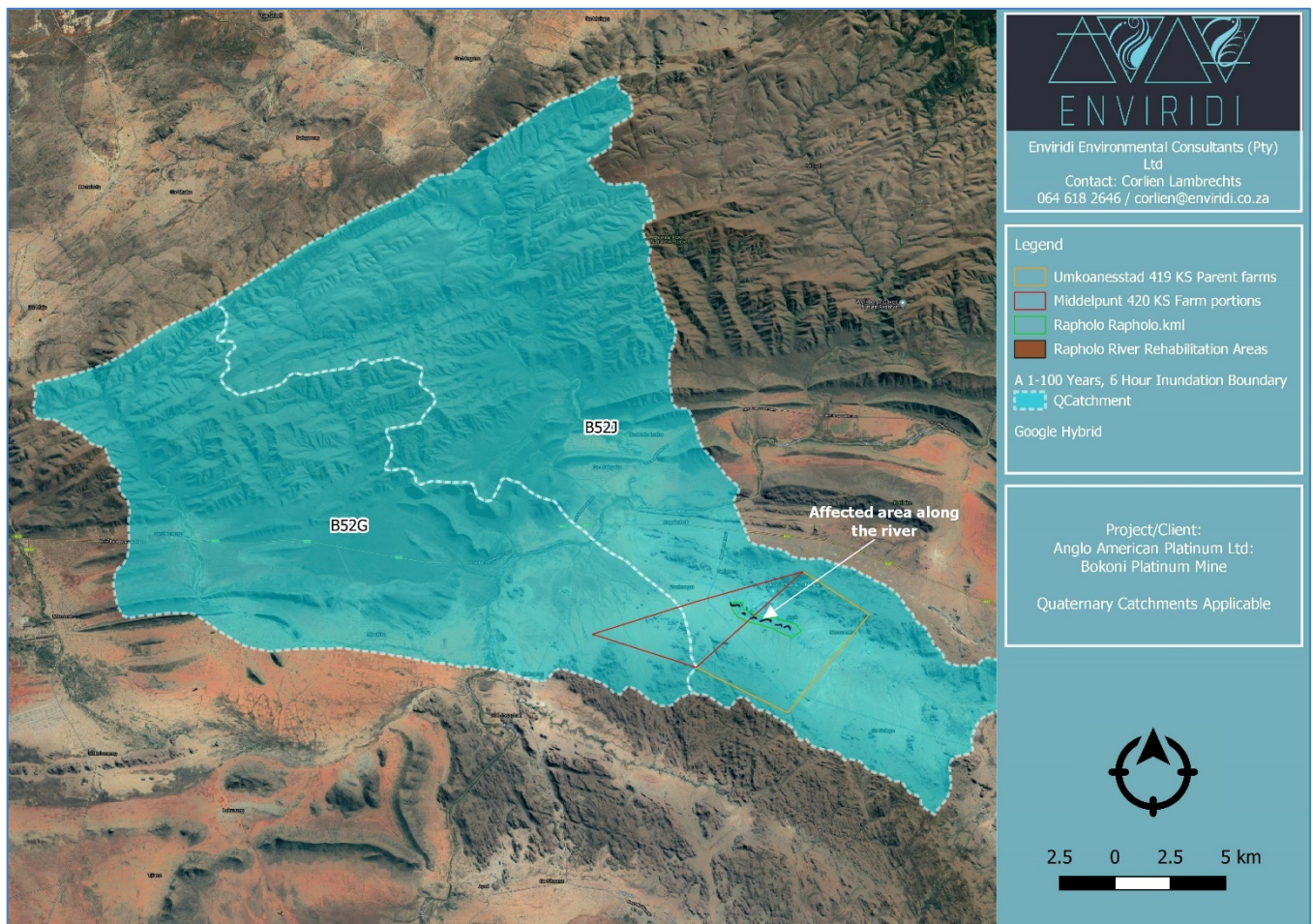


Figure 11: Quaternary Catchments applicable to the Rapholo/Monametsi River system

The Rapholo river visited during the site assessment, showed signs of trampling, erosion, sections of community sand mining taking place in various degrees along the river. Vehicles were also sighted moving along the dry river bed and crossing in many places since the river bed is fairly broad in width, predominantly flat terrain and dry.

Water quality is compared against the formally published Resource Quality Objectives for the specific quaternary catchment. Exceedances can be summarised as the following:'

- Electrical Conductivity (EC), Chloride, Sodium, Calcium and Magnesium exceeds the RQOs, Domestic TWQR and SANS 241; and
- TDS, Nitrate, Faecal Coliforms, E.coli, Aluminium and Hexavalent Chromium exceeds Aquatic, Domestic TWQR and SANS 241.

The findings of the previous monitoring period relevant to the surface environmental water were provided as follows:

- The physical quality of the Surface Water monitoring localities can be summarised as neutral (pH 6.0-8.5; BSW 5, BSW 8, BSW 9, BSW 10, BSW 11 & BSW12) and alkaline/basic (pH > 8.5; BSW 3).
- The salinity was non-saline (TDS <450 mg/l; BSW 11 & BSW 12), saline (TDS 450 – 1000 mg/l; BSW 10) and extremely saline (TDS 2 400 – 3 400 mg/l; BSW 3, BSW 5, BSW 8 & BSW 9).
- The total hardness of the surface water monitoring localities varied between hard (200 – 300 mg/l; BSW 10, BSW 11 & BSW 12) to extremely hard (> 600 mg/l; BSW 3, BSW 5, BSW 8 & BSW 9).
- The average TDS, Cl, SO₄, Ca, Mg and Na concentrations exceeded the WUL (Appendix V Section 5.1 limits) at one or all the sampling localities during the annual period from January to December 2019.
- It was stated, that overall, the TDS, Cl, SO₄, Ca, Mg and Na concentrations of BSW 3 (Bok river outflow from Atokia Village), BSW 5 (Malips club dam), BSW 8 (Rapholo Seepage D/S) and BSW 9 (Rapholo Seepage U/S) varied during the annual period and exceeded the WUL (Appendix V Section 5.1 limits) during the annual period.
- These localities also recorded high annual average nitrate levels (> 20mg/l) with an extremely high hardness profile (total hardness over 1000mg/l). The water quality profile of these localities is not comparable or typical of natural surface water resources for the area. The various possible sources of contamination of these monitoring localities must be investigated in order to further manage and mitigate for the possibility of contamination of the aquatic ecosystem.
- The EC levels and TDS, Cl, SO₄, Ca, Mg and Na concentrations of BSW 10, BSW 11 and BSW 12 (all Olifants River sampling localities) was lower than the concentrations of the other sampling localities during the annual period. The different variable of these 3 sampling localities was mostly below the WUL (Appendix V Section 5.1 limits).

Below is a short discussion of the variables that might have an impact on the environment/health/equipment and/or processes:

- Livestock use: High TDS concentrations may lead to initial reluctance to drink the water and this may lead to a decline in water intake and subsequently in production. However, stock should adapt to the water within a relatively short period of time and return to normal production levels (DAAF, 1996, Vol 3). This will be applicable for BSW 3 (Bok river outflow from Atokia village), BSW 5 (Malips club dam), BSW 8 (Rapholo Seepage D/S) and BSW 9 (Rapholo Seepage U/S).
- Aquatic Ecosystems: Un-ionized ammonia affects the respiratory systems of animals, either by inhibiting cellular metabolism or by decreasing oxygen permeability of the cell membrane. Acute toxicity to fish may cause a loss of equilibrium, hyper-excitability, an increase in breathing rate, an increase in cardiac output and oxygen intake, and in extreme cases convulsions. Chronic effects include in hatching success, reduction in growth rate and morphological development. Pathological change in tissue of gills, liver and kidneys (DAAF, 1996, Vol 7). This will be applicable for BSW5, BSW9 and BSW11. In the aquatic ecosystem or water-storage impoundments, the water may lead to nutrient induced algal blooms and a myriad of other issues relating to the high salinity levels of the water. This is applicable for BSW 3, BSW 5, BSW 8 and BSW 9.
- Potable/Domestic water use: under no circumstances should this water be used for domestic purposes, but should the surface water be consumed accidentally expected health effects will include nitrate-induced methemoglobinemia in infants or mucous-membrane irritation in adults, salinity, sulphate and possibly biological infection induced diarrhoea or gastrointestinal illness, and an increase in health risks associated with high mineral intakes such as kidney/gall bladder stones in sensitive individuals, renal issues and issues in the body's osmotic balance.

Temporal and spatial trends between upstream and downstream points within the above-mentioned report can be described as follows:

- Qualities obtained for the Olifants River Upstream (BSW 11) is more or less the same as the qualities obtained from the Downstream (BSW 10) locality, namely neutral, non-saline (BSW 11) to saline (BSW 10) and hard.
- Most of the variable concentrations increased slightly from the upstream to the downstream localities, suggesting a slight impact from the mine on the downstream aquatic environment.
- Qualities obtained for the Rapholo Seepage Upstream (BSW 9) is the same as the qualities obtained from the Downstream (BSW 8) locality, namely neutral, extremely saline and very hard.
- Some of the variable concentrations increased slightly from the upstream to the downstream localities, suggesting a slight impact from the mine on the downstream aquatic environment.

The above description matches the findings as per sample obtained in Rapholo during the December 2020 period and is therefore aligned with historic monitoring results upstream and downstream of the Bokoni Mine (albeit taken in different locations).

The following data of the catchment forms part of the literature available for the specific streams utilised for SASS5 monitoring.

Information provided on River Health Programme for the Sub Quaternary Reach (SQR)



SQ Reach	PES Category Median	Mean EI Class	Mean ES Class	Length Km	Stream Order	Default EC
US & DS Point in Rapholo River						
B52J-00417	E – Serious Modification	Low	Low	26,6	1,0	D
<p>The Sub Quaternary Reach (SQR) associated with the monitoring points fall within the tributary of Olifants (SQR) itself and is labelled B52J-00417. The reach is characterized by the following:</p> <ul style="list-style-type: none"> • The Reach spans an area of 26,60 km; • The Present Ecological State (PES) has been rated Severely Modified (Class E); • The Ecological Importance of the reach has been rated Low; no species of fish are expected in the reach; • The Ecological sensitivity is rated Low; • The reach does not fall into a FEPA; • Moderate instream modifications have been recorded in the reach; • Historic anthropogenic impacts recorded in the reach include: <ul style="list-style-type: none"> ○ Small: Abstraction (run-of river)/increased flows, Crossings low water, Runoff/effluent: Urban areas, Urbanization, ○ Moderate: Bed stabilisation, Small dams (farm), ○ Large: Agricultural lands, Mining, Runoff/effluent: Mining, ○ Serious: Erosion, Sedimentation, Vegetation removal, ○ Critical: Grazing / trampling. 						

The relevant sections of river do not intercept with any FEPA areas, the closest FEPA areas are associated with the Upstream Management Units found upstream of the site and of the Rapholo river.



Integrated Habitat Assessment Survey - IHAS Results

Survey	December 2020 – High Flow		
Sites Assessed	Score	Suitability	Flow
US	N/A – no flow to be sampled	Not suitable (currently Inadequate)	Ephemeral and now flow available during assessment
MS	N/A – no flow to be sampled	Not suitable (currently Inadequate)	Ephemeral and now flow available during assessment
DS	N/A – too little flow to be sampled	Not suitable (currently Inadequate)	Ephemeral and now flow available during assessment – very shallow flow available for Water Quality sample



Upstream Point US located in the Rapholo River

Sampling Area – Upstream			
DHSWS corresponding name		B52J-00417	
Site Name		December 2020	
Upstream Photograph		Downstream Photograph	
			
<i>Upstream photograph at sampling point</i>		<i>Downstream photograph of sampling point</i>	
Site Description		Most upstream point in tributary. Flow was absent, no water visible although recent rains had occurred. Erosion prevalent River well incised.	
Impacts on the water environment observed		Anthropogenic disturbances associated with easy access.	
GPS		24°18'30.11"S 29°53'26.20"E	
Reference PES as per SQR		Class E: Severely Modified	
RQOs to be achieved		Class C: Moderately Modified (2016 /2017 DHSWS Gazetted)	
High Flow 2020	SASS Score	No of Taxa	ASPT
SASS 5 Results	N/A	N/A	N/A

Mid-Stream (MS) located in the Rapholo River

Sampling Area – Midstream			
DHSWS corresponding name		B52J-00417	
Site Name		December 2020	
Upstream Photograph		Downstream Photograph	
			
<i>Upstream photograph at sampling point</i>		<i>Downstream photograph of sampling point</i>	
Site Description		Middle section of the area assessed. Flow was absent, no water visible although recent rains had occurred. Erosion prevalent and clear movement within the river based on the tracks and vehicle tracks present in the riverbed. River well incised.	
Impacts on the water environment observed		Anthropogenic disturbances associated with easy access.	
GPS		24°18'13.42"S 29°52'48.73"E	
Reference PES as per SQR		Class E: Severely Modified	
RQOs to be achieved		Class C: Moderately Modified (2016 /2017 DHSWS Gazetted)	
High Flow 2020	SASS Score	No of Taxa	ASPT
SASS 5 Results	N/A	N/A	N/A

Downstream Points - DS

Sampling Area – Downstream			
DHSWS corresponding name		B52J-00417	
Site Name		December 2020	
Upstream Photograph		Downstream Photograph	
			
<i>Upstream photograph at sampling point</i>		<i>Downstream photograph of sampling point</i>	
Site Description		Site consisted of area which showed recent flow since a small very shallow section of flow (almost similar to sheet flow) was present.	
Impacts on the water environment observed		Motor vehicle waste related substances and spills. Anthropogenic disturbances, litter and waste since vehicles were found to drive inside the riverbed.	
GPS		24°17'45.71"S 29°51'49.91"E	
Reference PES as per SQR		Class E: Severely Modified	
RQOs to be achieved		Class C: Moderately Modified (2016 /2017 DHSWS Gazetted)	
High Flow 2020	SASS Score	No of Taxa	ASPT
SASS 5 Results	N/A	N/A	N/A

Surrounding Surface Water Uses/Users

The Olifants River Catchment falls within the Limpopo River Basin, which is part of an international drainage basin that stretches across South Africa, Mozambique, Zimbabwe and Botswana. In fact, the Olifants River contributes nearly 40% of the water that flows in the Limpopo River, making it an important river in the larger system as a whole.

At the heart of this catchment is the Olifants River, a vital artery that flows for 560 kilometres through South Africa and into Mozambique, where it is known as the Rio dos Elefantes. This once mighty river originates in South Africa's Mpumalanga Highveld, flowing northwards before curving in an easterly direction through the Kruger National Park and into Mozambique, finally in the Indian Ocean north of Maputo.

Unchecked pollution, inappropriate land resource use, weak and poorly enforced policies and regulations and poor protection of habitats and biodiversity are degrading the Olifants at an alarming rate. Factors such as mining from heavy metals, inappropriate land management, rural sprawl and unsustainable use of natural resources all affect the level of goods and services the ecosystem can provide. In the Elands, Steelpoort and Middle parts of the Olifants River, water quality issues are primarily related to salinity (high salt content), eutrophication (too many nutrients), toxicity and sediment. Mining activities and irrigated agriculture near the Steelpoort area are the main cause for salinity and eutrophication problems (salts are from mining processes and nutrients come from fertilizers). Toxicity problems have been associated with the use pesticides and herbicides. Land degradation, poor agricultural practices and overgrazing in

the rural areas within the Middle Olifants are responsible for sediment pollution when soil is washed into the river making it turn brown and muddy. Moreover, this production of sediment causes problems at the downstream Phalaborwa Barrage by blocking pumps and mud sedimenting up the dam.

The Rapholo river visited during the site assessment, showed signs of trampling, erosion, sections of community sand mining taking place in various degrees along the river. Vehicles were also sighted moving along the dry river bed and crossing in many places since the river bed is fairly broad in width, predominantly flat terrain and dry.

5.1.5 Ecology

An Ecology Assessment was undertaken for the Rapholo River Rehabilitation project by Enviridi Environmental Consultants (Appendix 9). Note that the assessment did not include footprints related to the proposed WTP and Chrome Recovery Plant, as both these areas are located on sites already disturbed by current activities and will not result in the clearance of indigenous vegetation.

The project area lies within the Savanna Biome, which is the largest biome in South Africa, covering 34.3% of the country (about 435 000 km²). It is a mixture of grasses and trees or shrubs. Savanna stretches from the Kalahari in the north-west across to the lowveld in the north-east and southwards to the lowlands of KwaZulu Natal and the Eastern Cape. It is found from sea level to about 2 000 metres above sea level. More than 5 700 plant species grow in the Savanna Biome. They include various types of grasses (e.g., Rooigras) and trees like the Baobab, Mopane, Camel Thorn and Knob Thorn.

The site forms part of the Sekhukhuneland Centre of Endemism (SCOE). Most of southern Africa's endemic plants are concentrated in only a few, relatively small areas, known as regions or centres of endemism. Not only do these centres hold clues to the origin and evolution of the botanical diversity within a particular area, but these are also areas that, if conserved, would safeguard the greatest number of plant species (Van Wyk & Smith, 2001).

Sekhukhuneland has been identified through previous studies as one of the most important centres of endemism in the Mpumalanga and Limpopo Provinces. The centre falls within the rainfall shadow of the Drakensberg Escarpment, and it is relatively more arid than the areas to the east. The endemic plants of this area are primarily edaphic specialists that are derived from a unique ecology. The substrate consists of heavy soils derived from the norite, pyroxenite and anorthosite formations that predominate over the region. Endemics are both herbaceous and woody with endemism high in the Anacardiaceae, Euphorbiaceae, Liliaceae and Lamiaceae (Van Wyk & Smith, 2001). The site lies inside the Sekhukhuneland Centre of Endemism and the shallow, rocky areas of the development site can be considered especially sensitive as part of the centre of endemism, and will almost certainly show similar vegetation patterns to the endemic regions, especially since the vegetation is still in a natural state.

The National List of Ecosystems that are Threatened and need of protection (GN1002 of 2011), published under NEMBA, lists national vegetation types that are afforded protection on the basis of rates of transformation. The thresholds for listing in this legislation are higher than in the scientific literature, which means there are fewer ecosystems listed in the National Ecosystem List versus in the scientific literature. The Sekhukhune Plains Bushveld not listed in the "National List of Ecosystems that are Threatened and need of protection". However, the 2018 National Biodiversity Assessment lists this vegetation type as Endangered (EN).

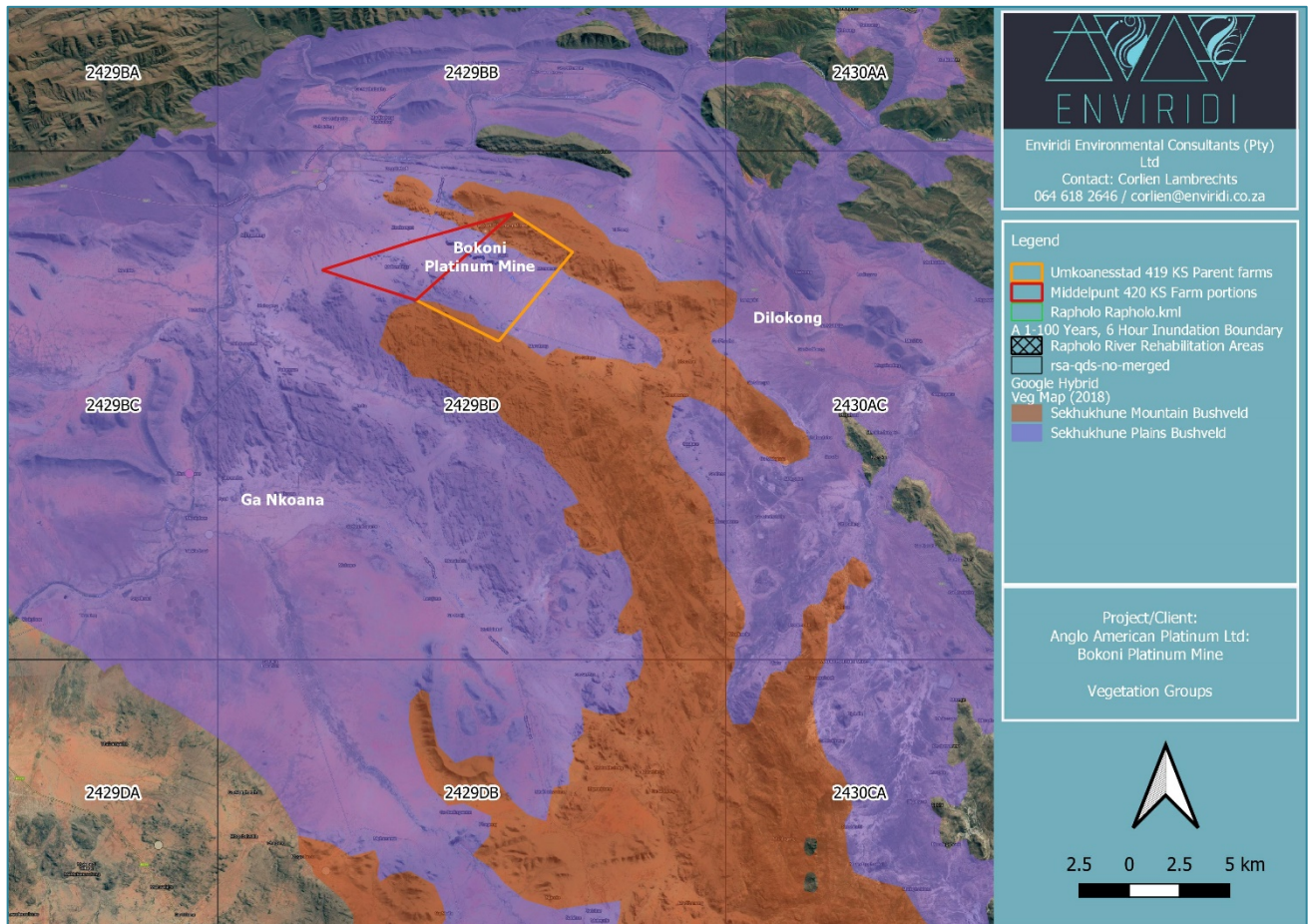


Figure 12: Vegetation Group for the Bokoni Mine Project

The study area contains the following classes from the LCP:

- **ESA1:** The project footprint is located along the Rapholo River, which is considered to be an ESA due to its importance in ecological processes and connectivity for the ecosystem. The project footprint conforms to the description of an ESA1.

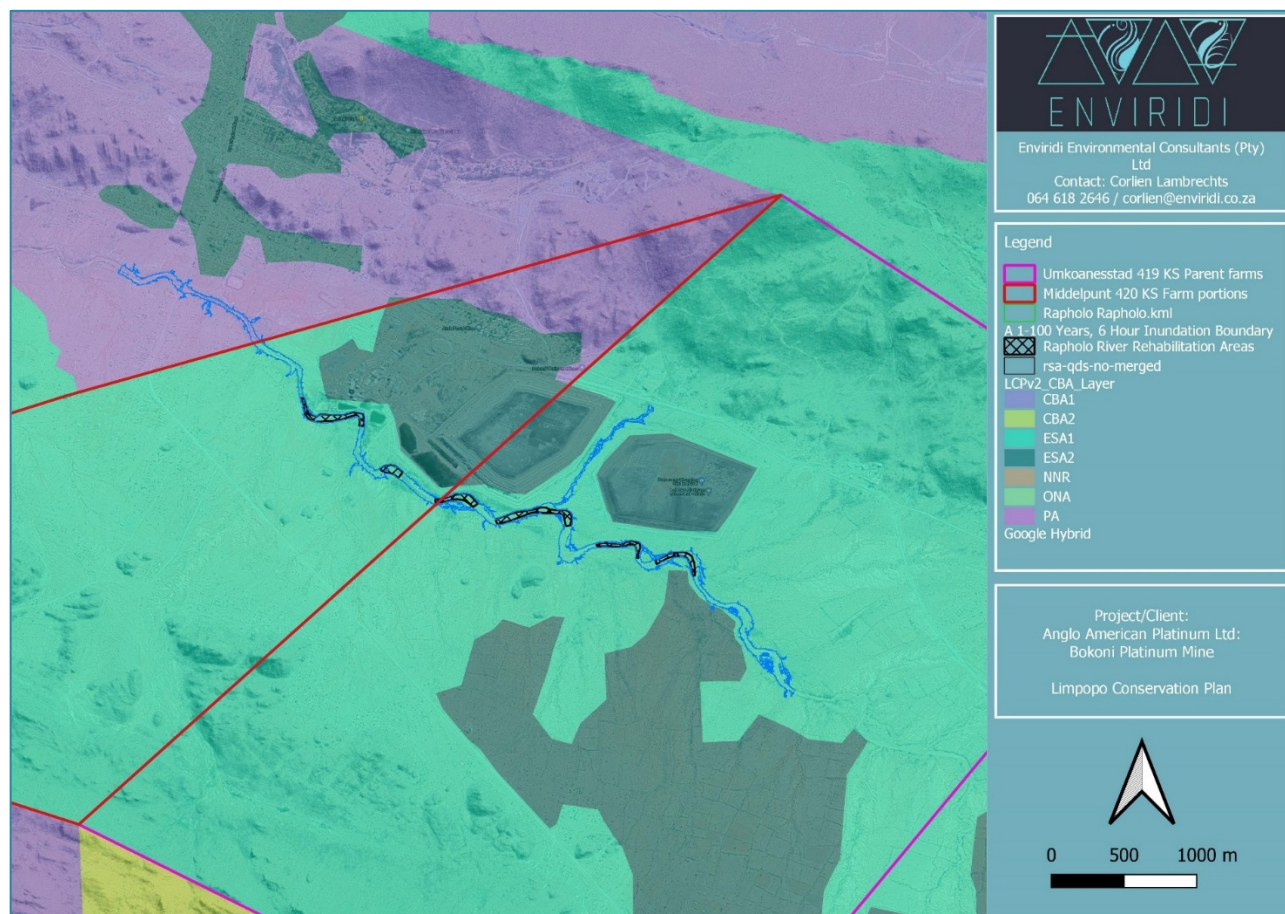


Figure 13: Limpopo Conservation Plan showing ESA1 applicable to Rapholo River rehabilitation

The Potlake Nature Reserve is situated approximately 4.5 km north of the project footprint and the Kruger to Canyons Biosphere Region is located approximately 2.5 km north of the project footprint.

A section of the North East Escarpment NPAES is situated 4 km south of the project footprint.

The site visit was undertaken on the 3rd of December 2020 during Spring conditions and largely focussed along the river where the specific rehabilitation and associated impacts will occur.

The study area (project footprint) is approximately 8 ha in extent. The proposed footprint of the rehabilitation areas is situated within and adjacent to the Rapholo River. The Rapholo River flows in a north-westerly direction, across largely flat plains, toward the Olifants River.

One broadly classified vegetation unit was identified according to plant species composition, previous land use and topography, namely Plains Bushveld Drainage/Riparian Vegetation Unit. The state of the vegetation associated with the proposed rehabilitation project was found to be natural vegetation that is moderately impacted by adjacent land uses and activities.

The Plains Bushveld Drainage/Riparian Vegetation Unit is situated on the entire project footprint (8 ha) and along the Rapholo River. The VU was found to have moderate floral diversity and moderately disturbed. The VU is characterised by short, open thornveld, with a fairly sparse grass layer. The Rapholo River has a sandy bed, bare of vegetation, and was not flowing at the time of the site survey.

Disturbances to vegetation condition included the presence of Alien Invasive Plants (AIP), high levels of erosion, road crossings, wood harvesting, livestock grazing and vehicle and foot traffic. Despite the moderate levels of disturbance to

the VU, when compared to the general species composition of the Sekhukhune Plains Bushveld vegetation type (as described by Mucina & Rutherford, 2006), the VU is considered to be representative of the vegetation type.

One obligate wetland species, namely *Cyperus laevigatus*, was found to occur at the Bokoni Mine discharge point (adjacent to the pollution control dams). No other obligate species were identified in or around the river. Apart from slightly denser plant growth in the immediate vicinity of the Rapholo River no riparian zone could be identified in relation to the surrounding vegetation. The vegetation immediately adjacent to the drainage lines is representative of the vegetation found in the general area and are not considered indicators of riparian conditions.

Dominant tree and shrub species recorded during the site survey included: *Balanites maughamii*, *Dichrostachys cinerea*, *Diospyros lycioides*, *Euphorbia tirucalli*, *Grewia flava*, *G. monticola*, *Indigofera circinnata*, *Lycium horridum*, *Peltophorum africanum*, *Senegalia mellifera*, *Vachellia grandicornuta*, *V. luederitzii*, *V. nilotica* and *Ziziphus mucronata*.

The grass layer is fairly sparse due to heavy livestock grazing. Dominant grass species recorded during the site survey included: *Cenchrus ciliaris*, *Enneapogon cenchroides*, *Eragrostis cilianensis*, *Eragrostis trichophora*, *Schmidtia pappophoroides*, and *Urochloa panicoides*.

Eight (8) exotic species, listed in the NEMBA as invasive, were identified, namely, *Datura ferox*, *Datura stramonium*, *Flaveria bidentis*, *Ipomoea carnea*, *Leucaena leucocephala*, *Ricinus communis*, *Xanthium spinosum*, and *Xanthium strumarium*.

However, none of these species were found to occur in high densities, but rather as scattered individuals.

- The succulents, *Huernia* sp., and *Stapelia gigantea* (Giant carrion flower) were observed to occur on the project footprint. Both of these species are protected in terms of the LEMA.
- *Balanites maughamii* (Greenthorn), *Prunus africana* (African almond) and *Sclerocarya birrea* (Marula) were observed in the VU and are protected in terms of the NFA.
- The vegetation unit is classified as having a high sensitivity due to the VU consisting of natural vegetation which is considered representative of the Sekhukhune Plains Bushveld vegetation type. The project footprint is located along the Rapholo River, which is considered to be an ESA due to its importance in ecological processes and connectivity for the ecosystem. The VU is also considered to be suitable habitat for the SCC, *Asparagus sekhukhuniensis*, which is categorised as Endangered by the SANBI Red List. This species was not identified to occur on the project footprint and is considered to have a moderate likelihood of occurrence.
- A total of 53 plant species were recorded in the studied area during the site survey.
- None of the floral species recorded during the site survey are listed in the ToPS list.

The Rapholo river although impacted still has valuable corridor movement ecological value including habitat and refuge to species utilising this type of terrain.

The faunal investigation provides a description of the ecological diversity in terms of species identification as well as the occurrence of threatened/sensitive species that is dependent on available habitat. During the desktop analysis, it was determined that several Red Data species were listed on the South African National Biodiversity database (SANBI) for the QDS that encompass the specific area, but this assessment was focussed specifically on the river itself.

The most important species of concern that will lead the management is determined to be:

- Species with specialised niches (riverine, ridges or wetland areas) – the Rapholo River;
- Species with large range requirements (grazing mammals) – Bovidae species (including the Cattle (Domestic);
- Species that have limited adaptation capabilities (such as reptile niches) – Mountainous areas not associated with the rehabilitation areas as it is only applicable to the river;

- Migrating species (importance of the ecological and aquatic corridor) – utilising the Rapholo River and associated dry drainage lines found during the field assessment; and
- Species that use the different areas as part of their larger range or preferred habitat (predatory species).

Sensitive invertebrate species are expected to be associated with the ridges and rocky areas as these represent specialised niches. These do not occur on the impact footprint, but as mentioned, towards the north.

The habitat (river systems) was clearly an important corridor as spoor indicated that animals moved along the riverbed on a regular basis. Cattle movement were dominant, however. Since the impacts are only off short term and localised, impacts to animal communities is limited, which is supported by the fact that vegetation clearance will also be limited for this specific rehabilitation project.

The faunal investigation provides a description of the ecological diversity in terms of species identification as well as the occurrence of threatened/sensitive species that is dependent on available habitat. No faunal SCC were sighted or thought to occur associated with the isolated rehabilitation areas due to the nature of the vegetation units and associated habitat.

The Kruger to Canyons Biosphere Reserve also occur towards the north outside of the applicable area which includes the Northern Escarpment NPAES focus area and formally protected Bewaarkloof (Provincial) and Potlake (National) Nature Reserve. A section of the Northern Escarpment (NPAES) also falls towards the south of the applicable development and Rapholo river. However, none intercepts with the Parent farms, the Bokoni Platinum Mine Mining Right or the Rapholo river rehabilitation sites.

The known Vegetation Groups, the Conservation plan and the field assessment were used as a general guideline to determine the conservation targets and current conservation of the area to be impacted by the activities.

The vegetation unit is classified as having a high sensitivity due to the VU consisting of natural vegetation which is considered representative of the Sekhukhune Plains Bushveld vegetation type. The project footprint is located along the Rapholo River, which is considered to be an ESA due to its importance in ecological processes and connectivity for the ecosystem. The VU is also considered to be suitable habitat for the SCC, *Asparagus sekhukhuniensis*, which is categorised as Endangered by the SANBI Red List. This species was not identified to occur on the project footprint and is considered to have a moderate likelihood of occurrence.

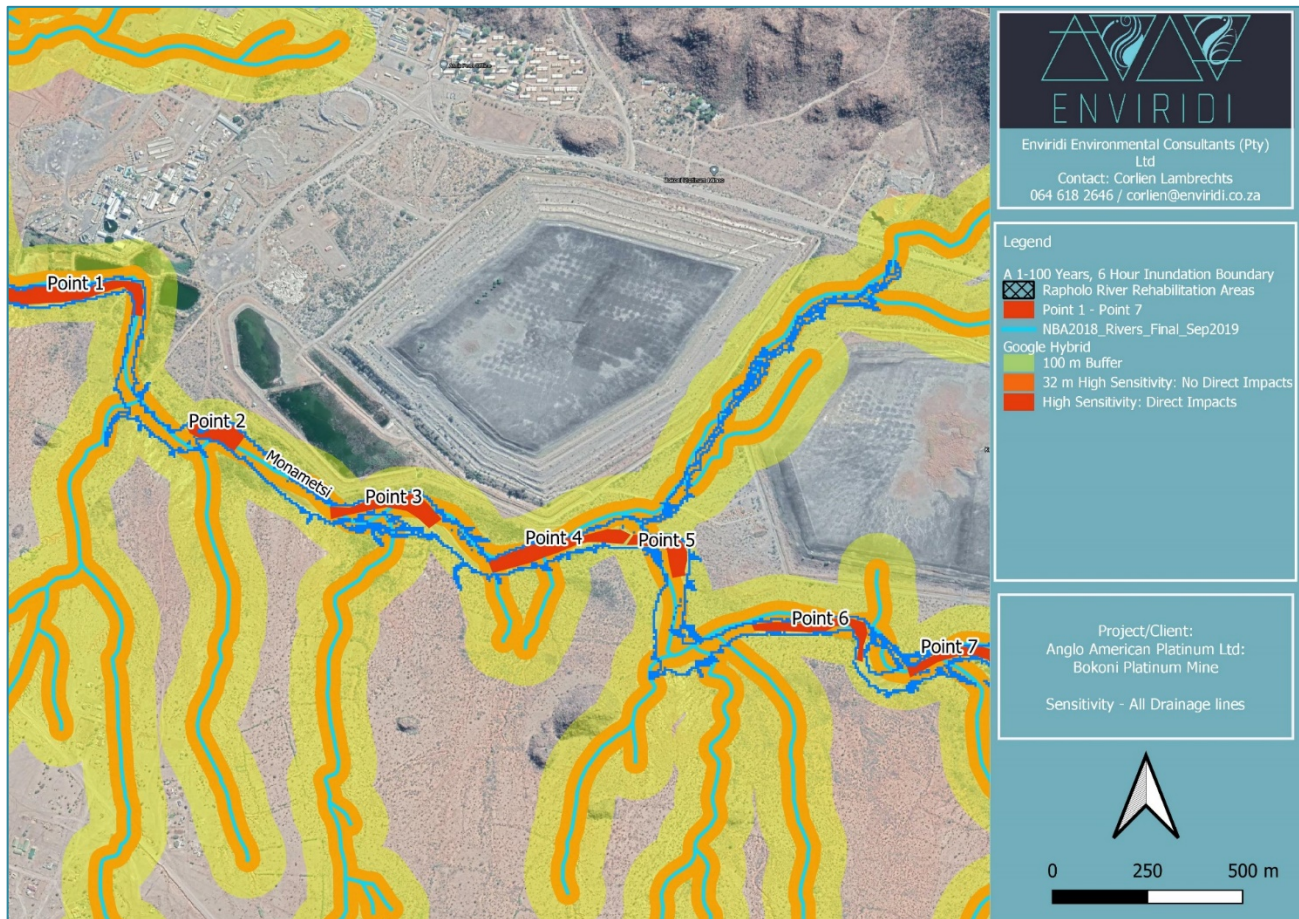


Figure 14: Sensitivity delineated according to general ecological considerations and buffers

5.1.6 Socio-economic

Various socio-economic studies have been undertaken for the mine, namely:

- October 2002: Socio-Economic Report – UG2 TSF and UG2 concentrator;
- June 2003: Socio-Economic Report - Brakfontein shaft and infrastructure;
- November 2006: Social Impact Assessment – Klipgat Community; and
- December 2006: Socio-Economic Assessment – MPH and Vertical shaft UG2 expansions.

Bokoni is located in the Limpopo Province of South Africa within the Fetakgomo Tubatse Local Municipality (Fetakgomo) of the Greater Sekhukhune District Municipality (Sekhukhune).

There are various churches in the area. The mine has developed a number of sports and recreational facilities on the premises. There is a kiosk at the mine, with a number of cafes, butcheries and bottle stores in the surrounding area. Larger shops are located in Polokwane.

The IDP for the Fetakgomo Tubatse Local Municipality provides baseline information on the socio-economic structure for the Fetakgomo Tubatse Municipality. This municipality is formed as an amalgamation between the former Fetakgomo local municipality and the former Greater Tubatse Municipality as both are classified as Category B municipalities in terms of spatial and economic characteristics.

The political governance of the municipality, Fetakgomo Tubatse, is operated on a collective executive system combined with a ward participatory system. The municipality has a total of 39 wards, making it the third (3rd) largest municipality in the Limpopo Province in terms of wards after Polokwane with 45 wards and Thulamela with 41 wards. The municipality

has a total of 77 councillors. Of these, 39 are ward councillors while 38 were proportionally elected.

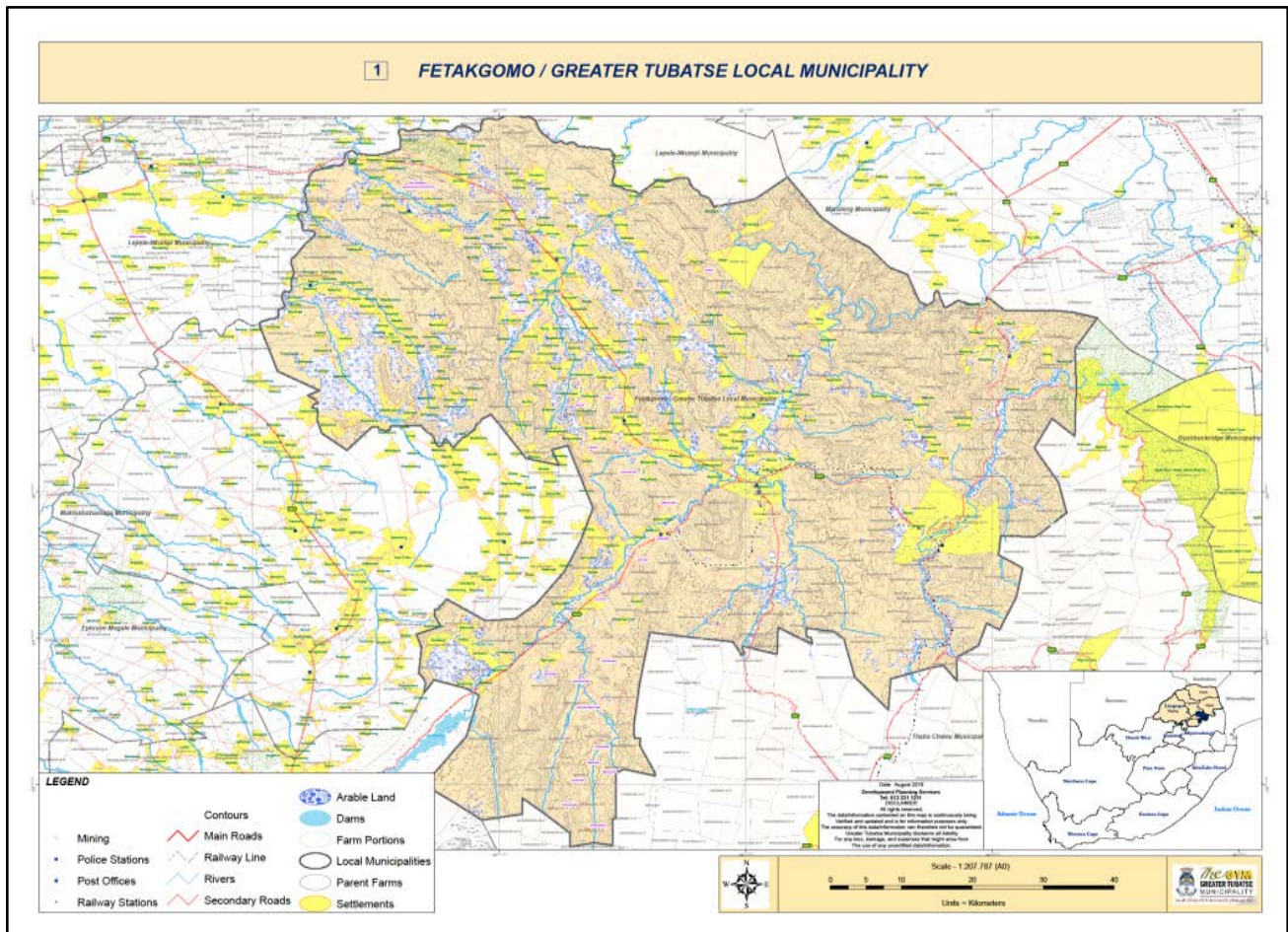


Figure 15: New Fetakgomo Greater Tubatse Local Municipality

The area of jurisdiction of FTLM is approximately 4 550 km². According to the FTLM the northern part has inferior social and engineering infrastructure which impacts on the stability of the economy in this area. This may be attributed to the rural nature of the area. As such, upliftment in the area is of critical importance. There is also virtually no economic base in the northern part of the area and the area is solely dependent on government handouts and migrant labour income for survival.

5.1.6.1 Population Profile

According to the 2011 STASA information; the total population of the former FTLM combined is approximately 429 471 with 106 050 households. In 2016 a community survey was undertaken for FTLM, making it the most highly populated municipality within the Sekhukhune district. It also appears from in the current 2016 Community Survey as compared to the 2011 STASA results that the Fetakgomo Tubatse Local Municipality there has been a population of 490 381 with household increase of 125 454. As per the current community survey 2016 the former Greater Tubatse local Municipality increased with 0.037% and the former Fetakgomo local municipality increase slightly with 0.007. The total percentages of FGTLM as combined increased with 0.043% which put the municipality as the highest in the District.

The population in the district per genders is shown below in Table 33.

Table 8: Sekhukhune District Population group by gender (FGTLM IDP, 2016/17)

2011 STATSA			2016 Community Survey			
Male	Female	Total	Male	Female	Total	Growth Rate
497 648	579 191	1 076 840	548 463	621 299	1 169 762	0.019

The table above indicate the total number of Households for Fetakgomo and Tubatse Municipality in 2011 as combined was 106 050 and 125 454 in 2016; which makes the municipality the biggest municipality in the District. The municipality has shown a growth of 8% growth in 2016; this might be due to the mining activities taking place in the area.

5.1.6.2 Language

The languages that are spoken within the FTLM include Sepedi (94%) and isiZulu (1.2%). Other languages make up the remaining 4.8% (StatsSA, 2011). Table 34 below provides more detail the languages spoken by the people of GTLM.

Table 9: Languages spoken by the people of GTLM

Afrikaans	English	IsiXhosa	IsiZulu	Sepedi	Sesoto	SiSwati	Xitsonga	Tshivenda	Others
0.5%	0.5%	0.3%	1.2%	94%	0.1%	0.4%	0.6%	0.1	0.4

5.1.6.3 Gender & Age Distribution

Table 35 shows that the total population is dominated by young people below 18. The age categories below the age of 18 comprise 51% of the population. The ratio for females is almost equal at ages between 0-17 and then this makes a change. Male-female distribution is then dominated by females for example, from ages 19-65.

Table 10: Gender and age distribution within former GTLM (GTLM, 2016/17)

Age	Male	Female	Grand Total
0-4	22 878	21 999	44 877
5-9	20 271	22 517	42 788
10-14	22 440	23 354	45 794
15-19	19 349	19 811	39 160
20-24	15 907	19 112	35 019
25-29	13 245	14 505	27 750
30-34	10 667	11 582	22 249
35-39	7324	8828	16 152
40-44	6076	9519	15 595
45-49	4952	7109	12 061
50-54	4180	6448	10 628
55-59	3241	3993	7234
60-64	2552	4075	6627
65-69	2256	3015	5271
70-74	1484	3086	4570
75-79	1124	2618	3742
80-84	362	1322	1684
85+	335	1911	2266
Grand Total	158 663	184 804	335 676

5.1.6.4 Education Levels

Education levels in the Limpopo province lag behind those of other provinces of South Africa. While average literacy levels for South Africa were 82.2%, literacy levels for Limpopo were 73.6% in 1991. The Greater Tubatse Local Municipality has 163 primary schools, 92 secondary schools and 8 private schools with a total of 114 723 learners and 3 689 educators. Burgersfort, Ohrigstad and Steelpoort each have a primary school and Burgersfort has additional private primary and secondary schools. Two state of the art schools have been developed by the Department of Limpopo, i.e. Nthame primary school at Riba and Batubatse primary school in Praktitiseer. In rural areas, an abundance of primary schools tends to be common as many pupils leave school early in search of employment in order to support their families. Those that can afford to continue to secondary school do so within the area or in more developed towns outside the municipality (GTLM

IDP, 2016/17). 22.6% of people above the age of 20 have completed matric (grade 12); while 6.6% have higher education (STATSSA, 2011). Figure 50 shows education levels in Greater Tubatse Local Municipality.

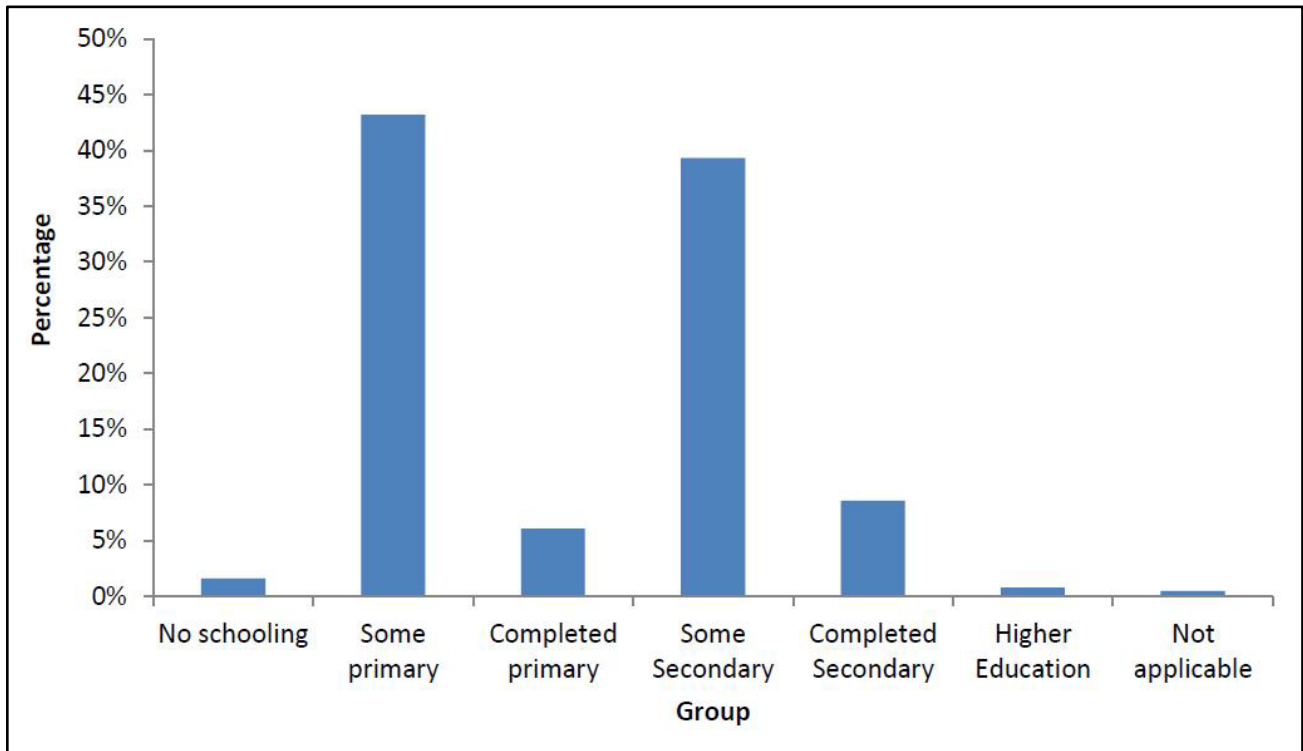


Figure 16: Education levels in Greater Tubatse Local Municipality (StatsSA, 2011)

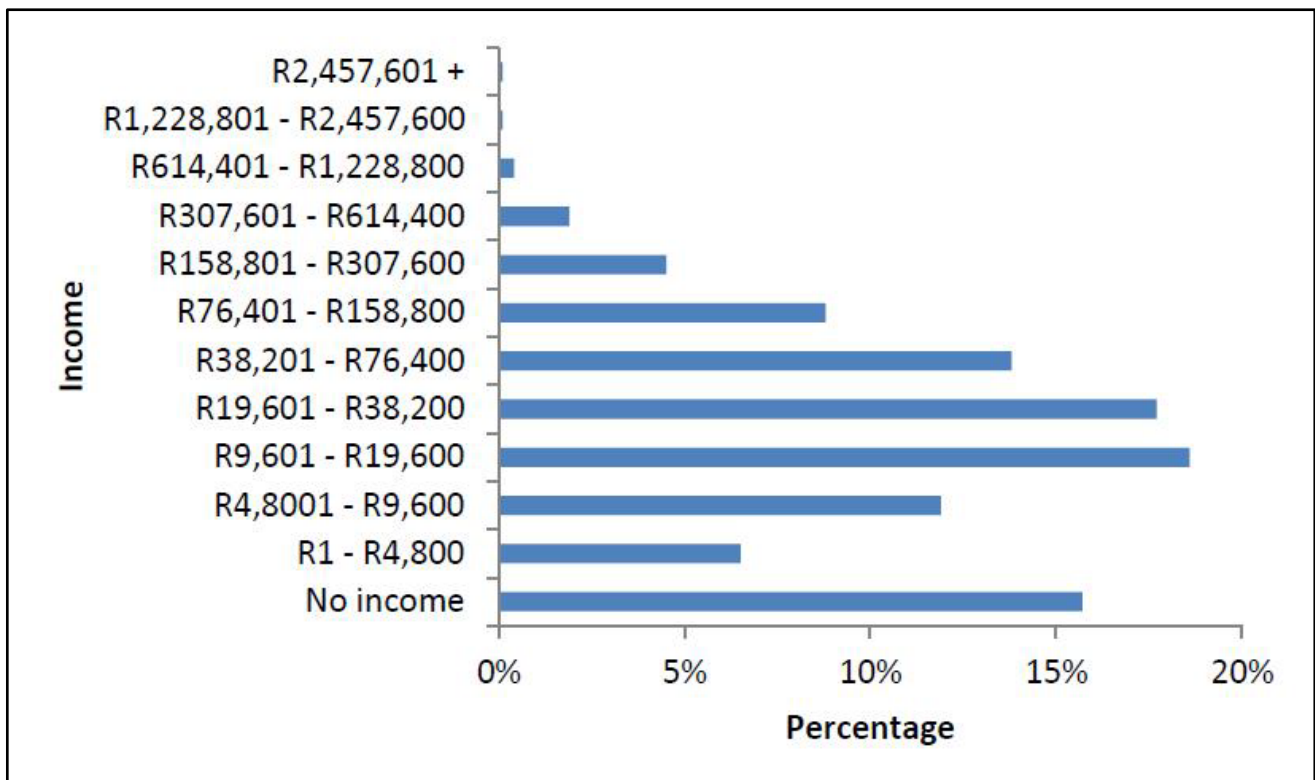


Figure 17: Average household income in GTLM (StatsSA, 2011)

5.1.6.5 Employment Status

The Former Greater Tubatse Local Municipality has a youth unemployment rate of 59.6%. In 2009, The Greater Tubatse Local Municipality had the highest rate of unemployment at 28 022 and in 2015 it still had the highest with 22 264 people unemployed (Local Economic Development Strategy , 2015). Figure 51 and Figure 52 illustrates the employment status of the people of GTLM.

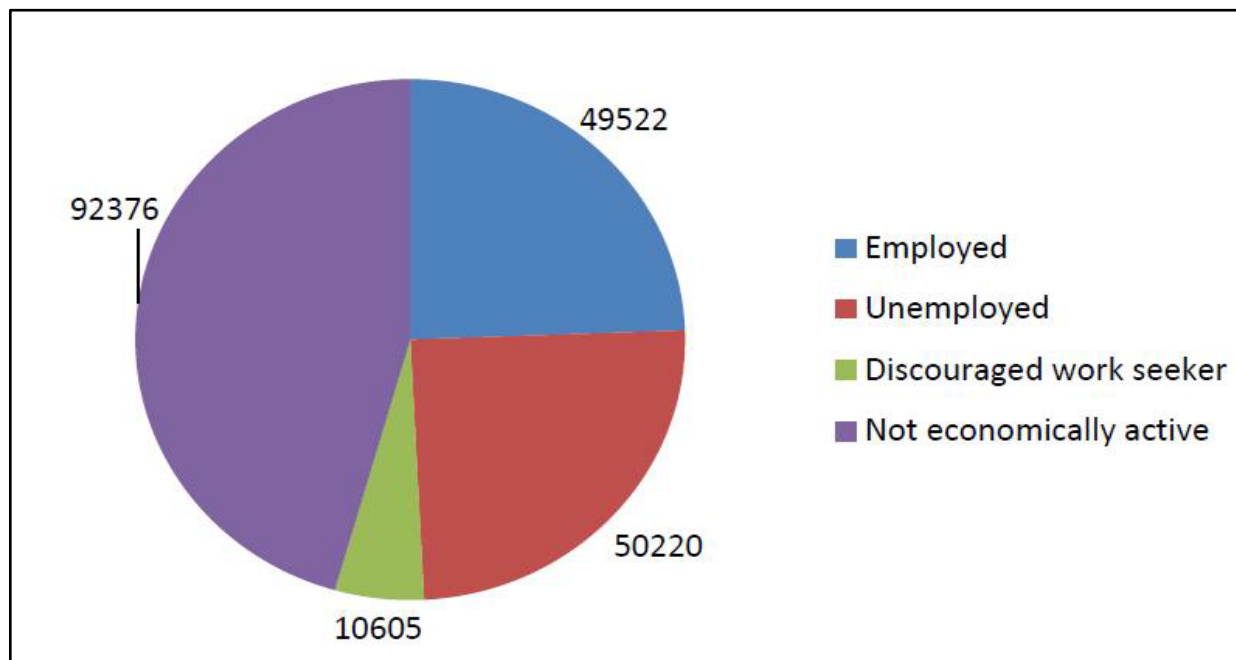


Figure 18: Employment status of people aged 15 - 64 in GTLM (StatsSA, 2011)

5.1.6.6 Infrastructure and Services

Owing to FGTLM’s rural nature, the municipality is plagued by challenges of poor or backlogged service delivery. The provision and maintenance of services become costly because most of the settlements are situated far apart. Some areas are also not large enough to achieve the economic threshold required to make social facilities available in a manner that is economically viable (FGTLM IDP, 2016/17). Majority of infrastructural projects within FGTLM are Expanded Public Works Programme related projects. Such projects aid in the generation of employment opportunities and the assurance of the improvement of the socio- economic conditions within the area. 800 jobs were created in the 2014/2015 financial year through the construction of the small access bridges and other related projects.

5.1.7 Heritage

A Heritage Impact Assessment was undertaken for the project by APelser Archaeological Consulting in 2021 (refer to Appendix 12).

No known Stone Age sites or artifacts are present in the specific study area, while some sites are known from the larger geographical area (Pistorius 2008; Coetzee 2017; Pelser et.al 2010; Pelser 2017 & 2019). Most of these sites are however open-air surface sites located in and around erosion dongas. These tools date to between the Early and Middle Stone Ages mainly

Some Stone Age material was identified in the area during the October 2021 assessment.

There are a number of known Iron Age sites in the larger area geographical area, identified and recorded during previous surveys (Roodt 2002 & 2003; Pistorius 2008; Karodia 2013; Coetzee 2017). These sites were located mostly around the foothills of the mountain range and hills in the area.

Some Iron Age material (undecorated pottery fragments) was found during the October 2021 assessment of the area.

The historical age started with the first recorded oral histories in the area. It includes the moving into the area of people that were able to read and write. The first European group to pass close by the area was that of Schoon in 1836, followed by the Voortrekkers from the 1840's onwards (Bergh 1999: 13-14).

A large number of archaeological/historical sites are located in the Tjate Valley (a few km's south of the study area). The Tjate Valley was declared a Provincial Heritage Site in 2007. A Phase 1 Heritage Impact Assessment was undertaken by Küsel (2008) on the Provincial Heritage site, followed by an assessment of an prospecting area on the farms Djate 249 KT, Fernkloof 539 KS and Quartzhill 542 KS. The area hosts two Royal Capitals of the Ba-Pedi people – the Sekhukhune and the Sekwati capitals. There are also Iron Age sites dating from approximately AD 700, as well as potentially an ancient copper mine. The first Berlin Mission Station and school in Sekhukhune were built in the Tjate Valley. In 1879 the valley was the scene of the Sekhukhune War between the Ba-Pedi and the British. Numerous sites associated with the battle are still visible and the battle is well documented. Rock art exists on the northern border of the declared site. There are a number of sacred sites and 26 cemeteries.

Pistorius (2008) and Coetzee (2017) recorded a number of recent historical sites (including the remains of recent dwellings and cemeteries) in the larger area during previous surveys.

No historical sites or features were identified in the study area during the October 2021 assessment.

5.1.7.1 Results of the October 2021 Fieldwork

Seven (7) points earmarked for rehabilitation work along the Rapholo River were assessed during the October 2021 field work. The work was done mainly on foot and the main aims were to see if any possible cultural heritage (archaeological and/or historical) sites, features or material exists in and around these areas & should there be any if the proposed rehabilitation work will negatively impact on these remains.

Some work related to the rehabilitation had already commenced when the field assessment was conducted, but as most of this work was in the river bed and on the edges of the river bank the impacts were limited away from it. However, it should be noted that with existing erosion being the focus of the rehabilitation there is a possibility of archaeological sites and material being present in and around these erosion dongas and gullies as has been found during previous assessments in the larger area.

Three sites with archaeological remains were identified in the area during the assessment. Site 1 contains a small scatter of Stone Age tools & undecorated Iron Age pottery, while on Site 2 a small scatter of Iron Age pottery and on Site 3 a number of Stone Age tools were found. All three of these sites fall outside of the locations where rehabilitation will take place, but are in close proximity. The density of artifacts on these sites is not large and this makes them also of less cultural heritage (archaeological) significance. It is believed that the documentation and recording of these sites during the Phase 1 assessment is sufficient enough and no other mitigation measures on them is required.

GPS Coordinates of Sites: (1) S24 17 42.60 E29 51 45.30 (2) S24 18 14.10 E29 53 06.20
(3) S24 18 14.30 E29 53 03.70



Figure 19: The location of the sites found and recorded in the area (Google Earth 2021)

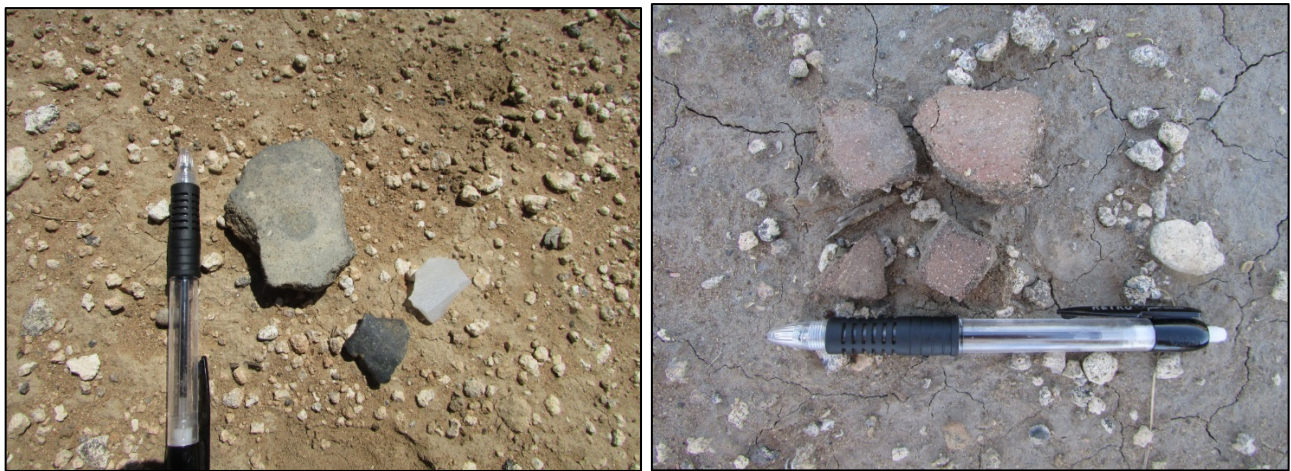


Figure 20: (left) The Iron Age pottery and Stone Age tools from Site 1; (right) Undecorated Iron Age pottery at Site 2.

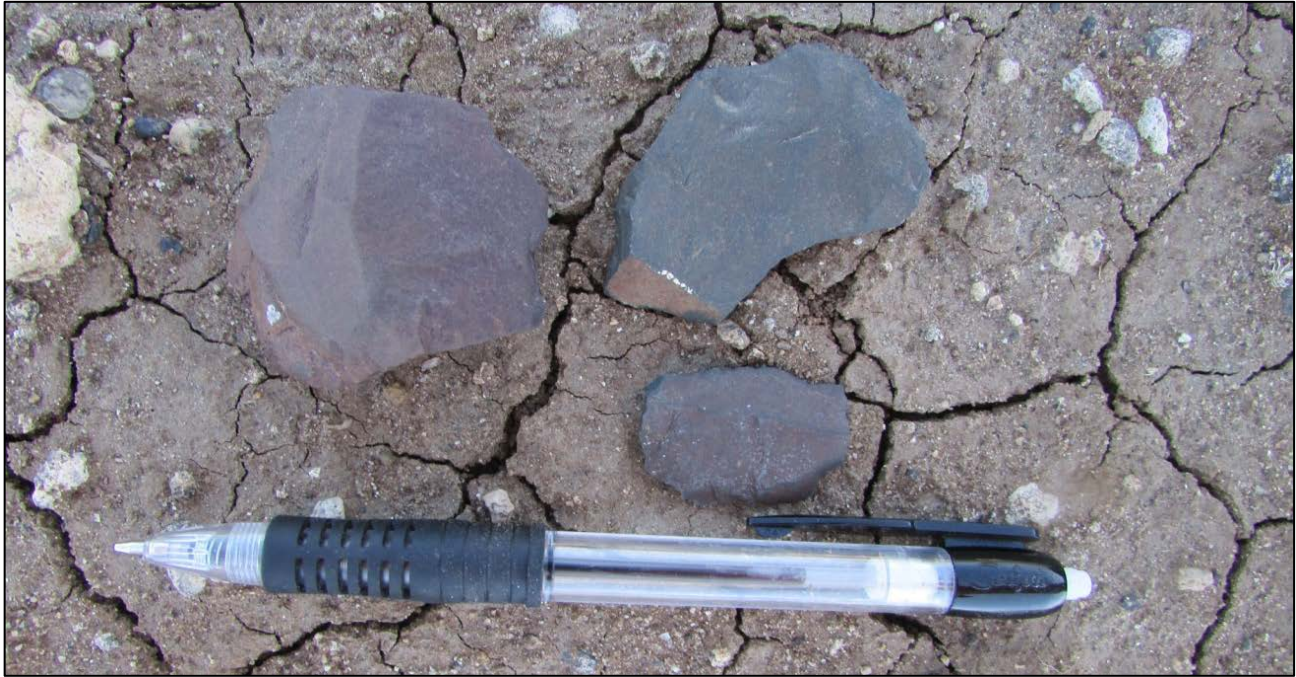


Figure 21: Stone Age tools at Site 3

Although only 3 sites were identified during the assessment, there could be more sites present in the area, especially in and around the erosion dongas that characterizes the area. Most of these – if any are present – will however be located away from the river bed and river bank areas where the rehabilitation is taking place. From a Cultural Heritage point of view the proposed Rapholo River Rehabilitation Project can therefore continue.

5.2 Description of the current land uses

The proposed rehabilitation activities and WTP are not expected to affect any existing infrastructure, beyond requiring the use of existing community and mine access roads. Currently the infrastructure closest to the rehabilitation areas are related to the Bokoni Platinum Mines, such as TSF's, PCDs and waste water facilities. The WTP is situated on a site located between the existing Merensky WTP and village residences.

The current land use on the proposed rehabilitation project footprint is described as natural vegetation, impacted by surrounding anthropogenic activities.

No natural vegetation remains on the footprint of the proposed WTP.

The land surrounding the proposed project areas is dominantly used for livestock grazing, subsistence farming and settlements. Various villages are located in proximity to the proposed project area and most homes have small gardens where vegetables and fruit are grown, often with a kraal for livestock.

Grazing areas are regarded as communal and can be used by all members of the community. Over-grazing during dry periods has denuded much of the area and it is hence extremely susceptible to water and wind erosion.

5.3 Description of specific environmental features and infrastructure on the site

The rehabilitation project footprint is located along the Rapholo River. The Rapholo River and its tributaries (refer to Figure 27) are non-perennial.

One vegetation type, according to Mucina & Rutherford (2006), occurs in the project area, namely Sekhukhune Plains Bushveld (SVcb 27).

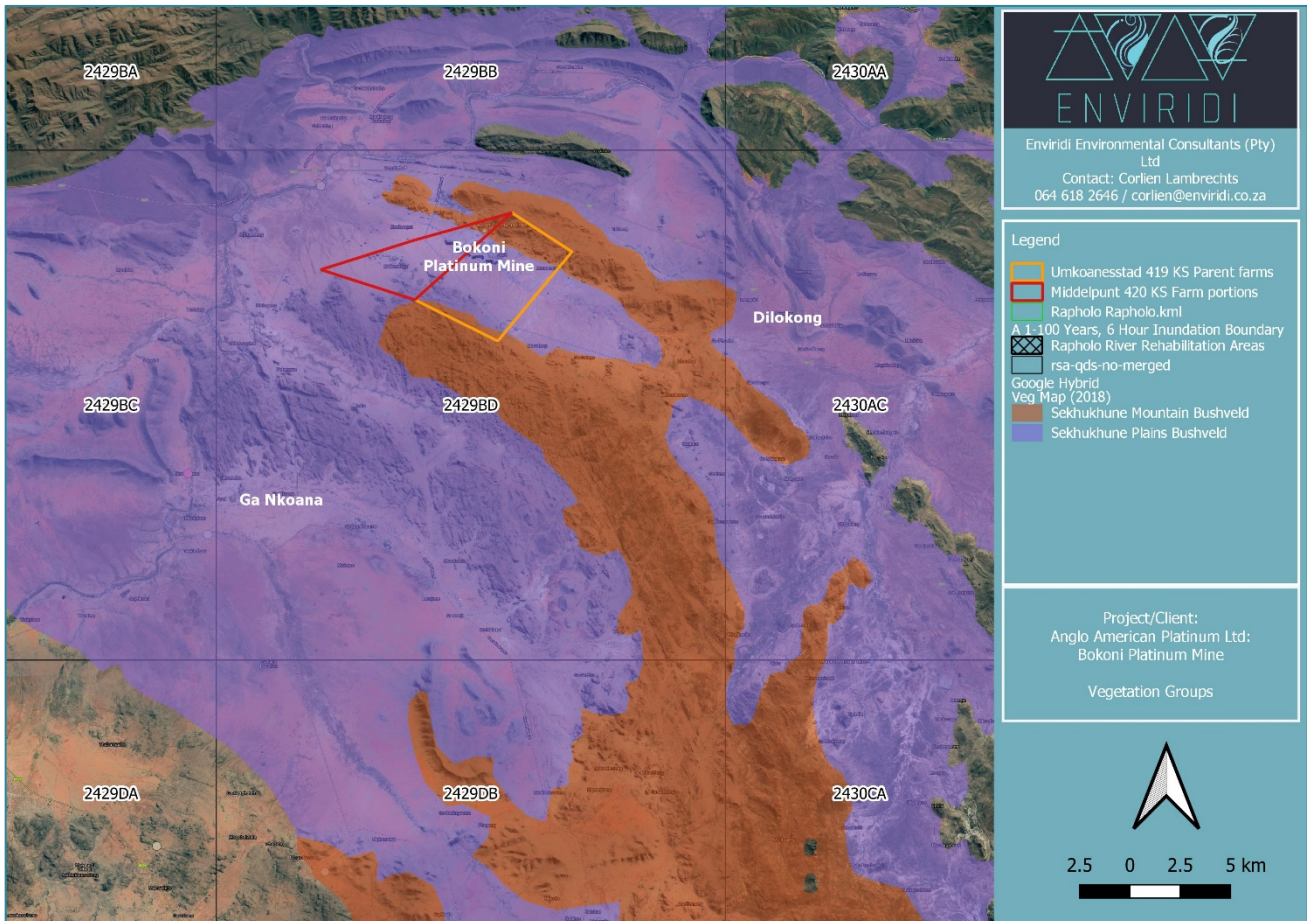


Figure 22: Vegetation Group for the Bokoni Mine Project

The National List of Ecosystems that are Threatened and need of protection (GN1002 of 2011), published under NEMBA, lists national vegetation types that are afforded protection on the basis of rates of transformation. The thresholds for listing in this legislation are higher than in the scientific literature, which means there are fewer ecosystems listed in the National Ecosystem List versus in the scientific literature. The Sekhukhune Plains Bushveld is not listed in the “National List of Ecosystems that are Threatened and need of protection”. However, the 2018 National Biodiversity Assessment lists this vegetation type as Endangered (EN).

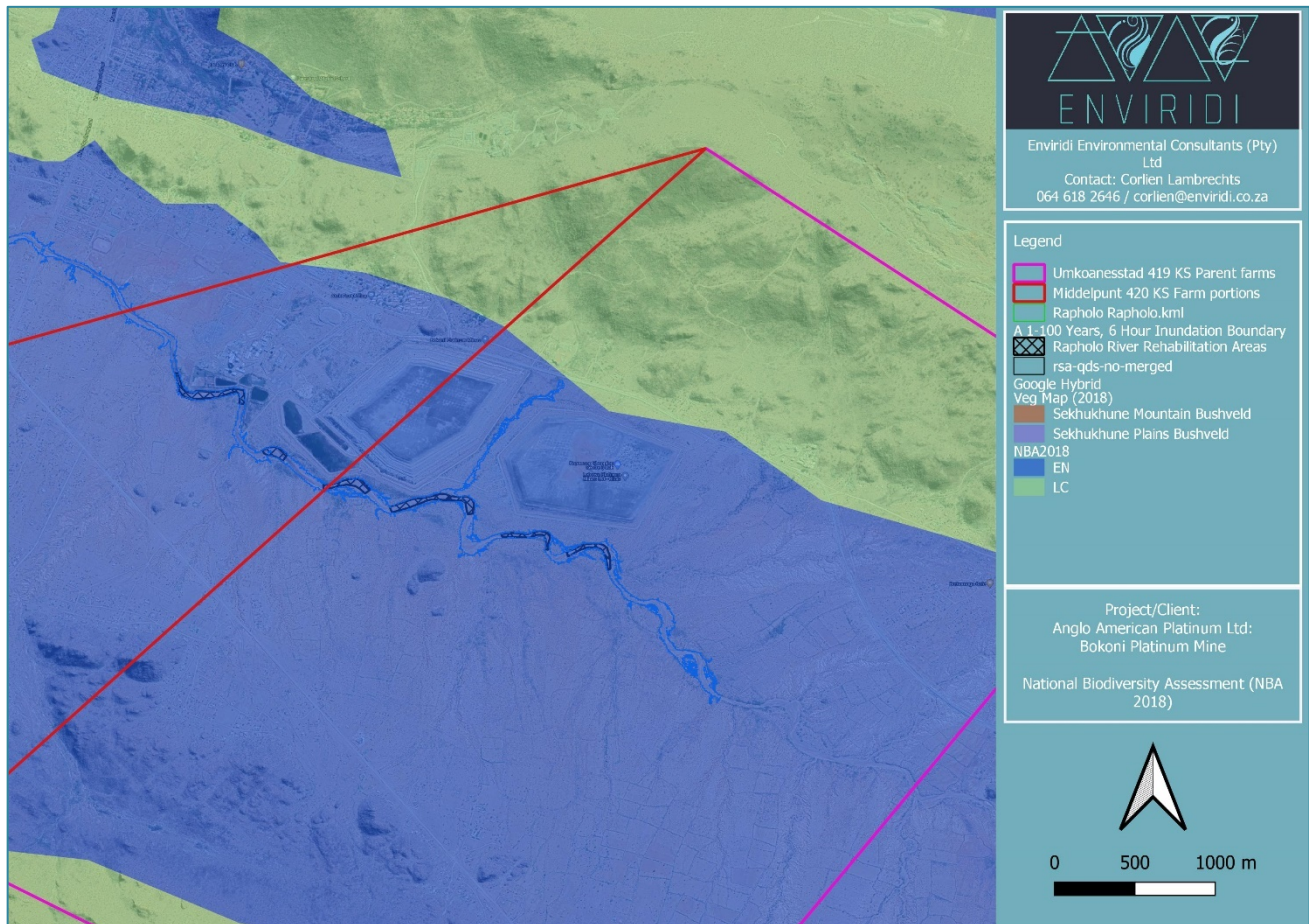


Figure 23: Bokoni Platinum Mine (Pty) Ltd within NBA 2018

There is one main conservation management plan for the province, namely the Limpopo Conservation Plan (LCP). The study area contains the following classes from the LCP:

- **ESA1:** The project footprint is located on an area considered to be an ESA due to its importance in ecological processes and connectivity for the ecosystem. However, the majority of the areas indicated as ESAs, in the vicinity of the proposed project, have been disturbed and transformed by mining and related activities as well as villages. These transformed areas no longer fulfil the functions of ESAs.

The Potlake Nature Reserve is situated approximately 4.5 km north of the project footprint and the Kruger to Canyons Biosphere Region is located approximately 2.5 km north of the project footprint.

A section of the North East Escarpment NPAES is situated 4 km south of the project footprint.

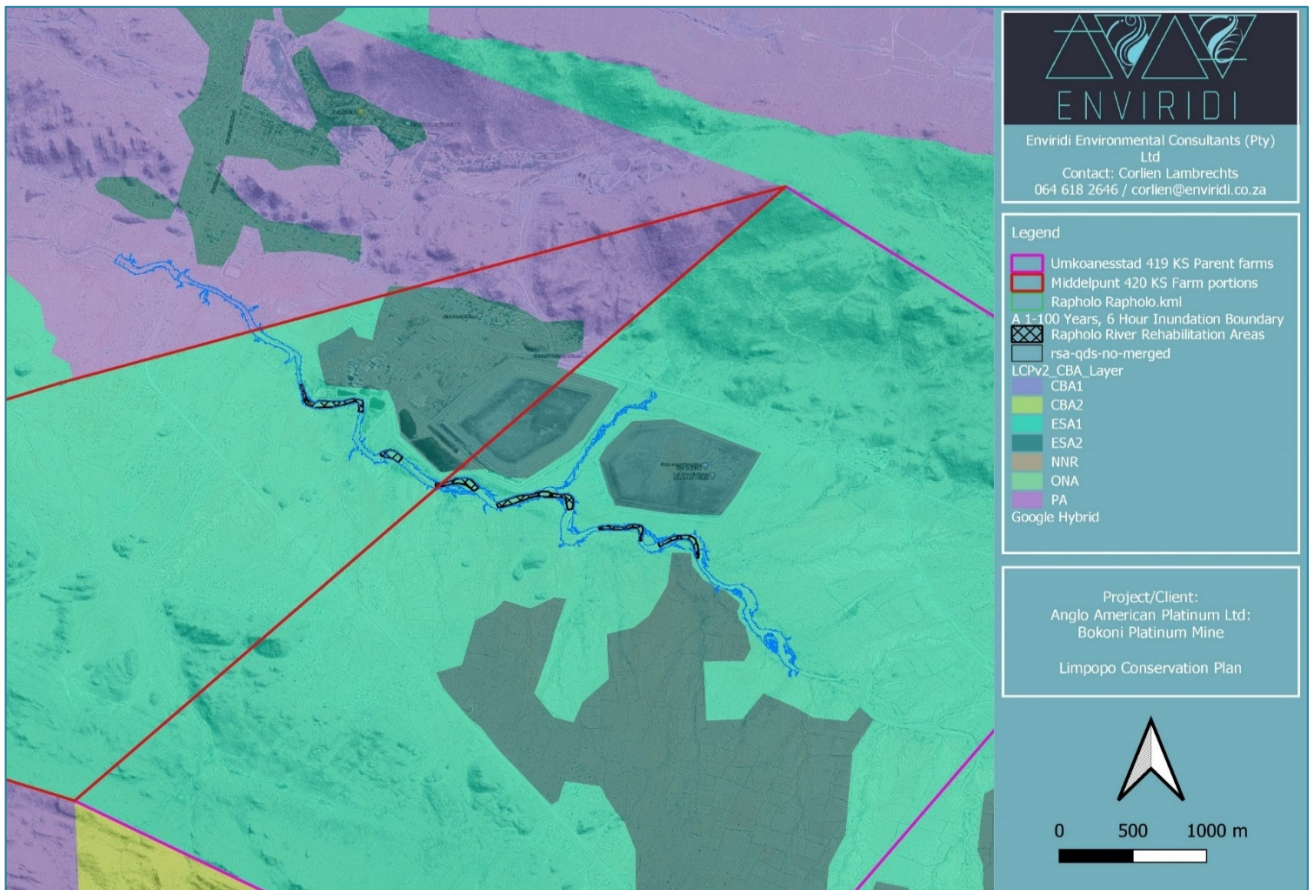


Figure 24: Limpopo Conservation Plan showing ESA1 applicable to Rapholo River rehabilitation

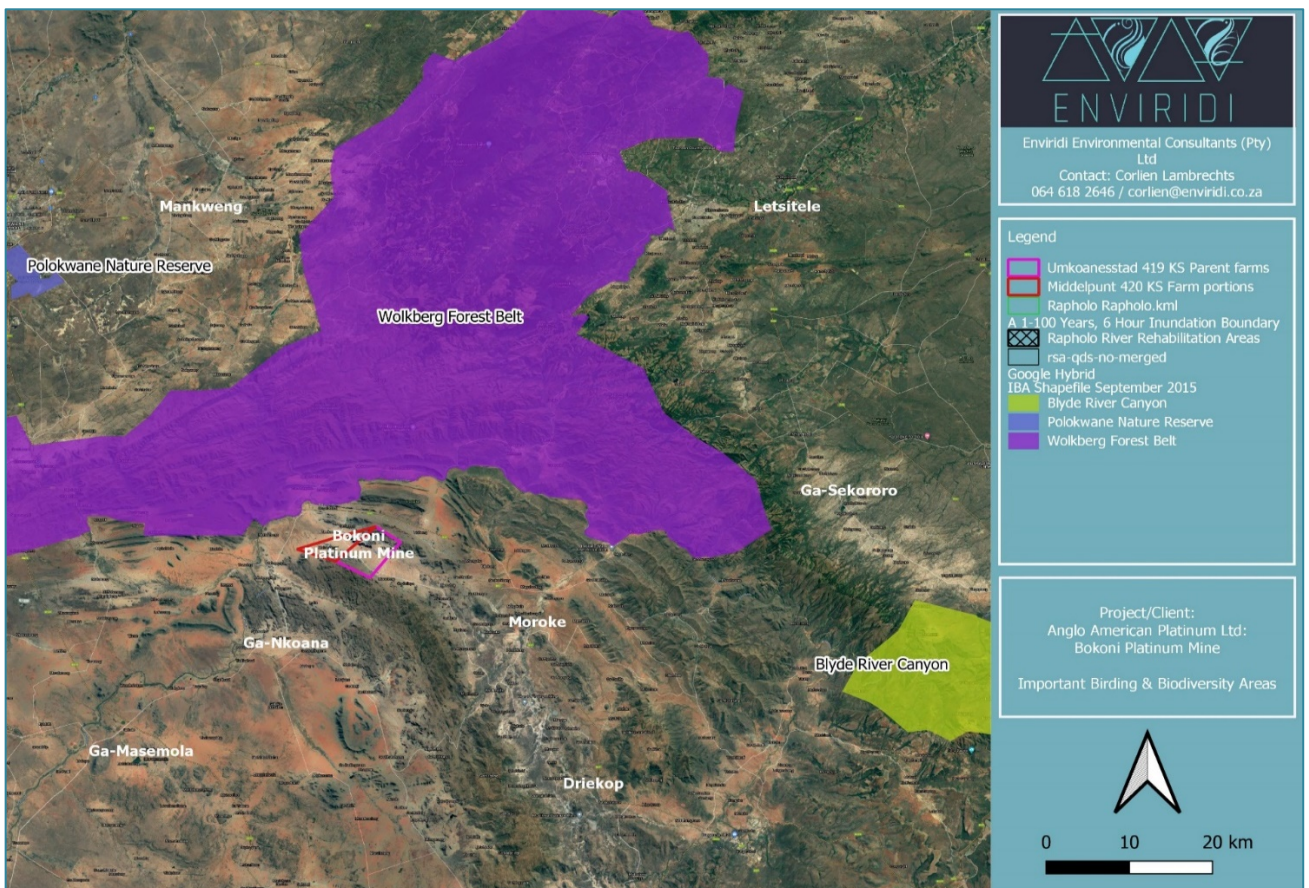


Figure 25: Important Biodiversity and Birding Areas and Protected Areas (NPAES and IBAs)

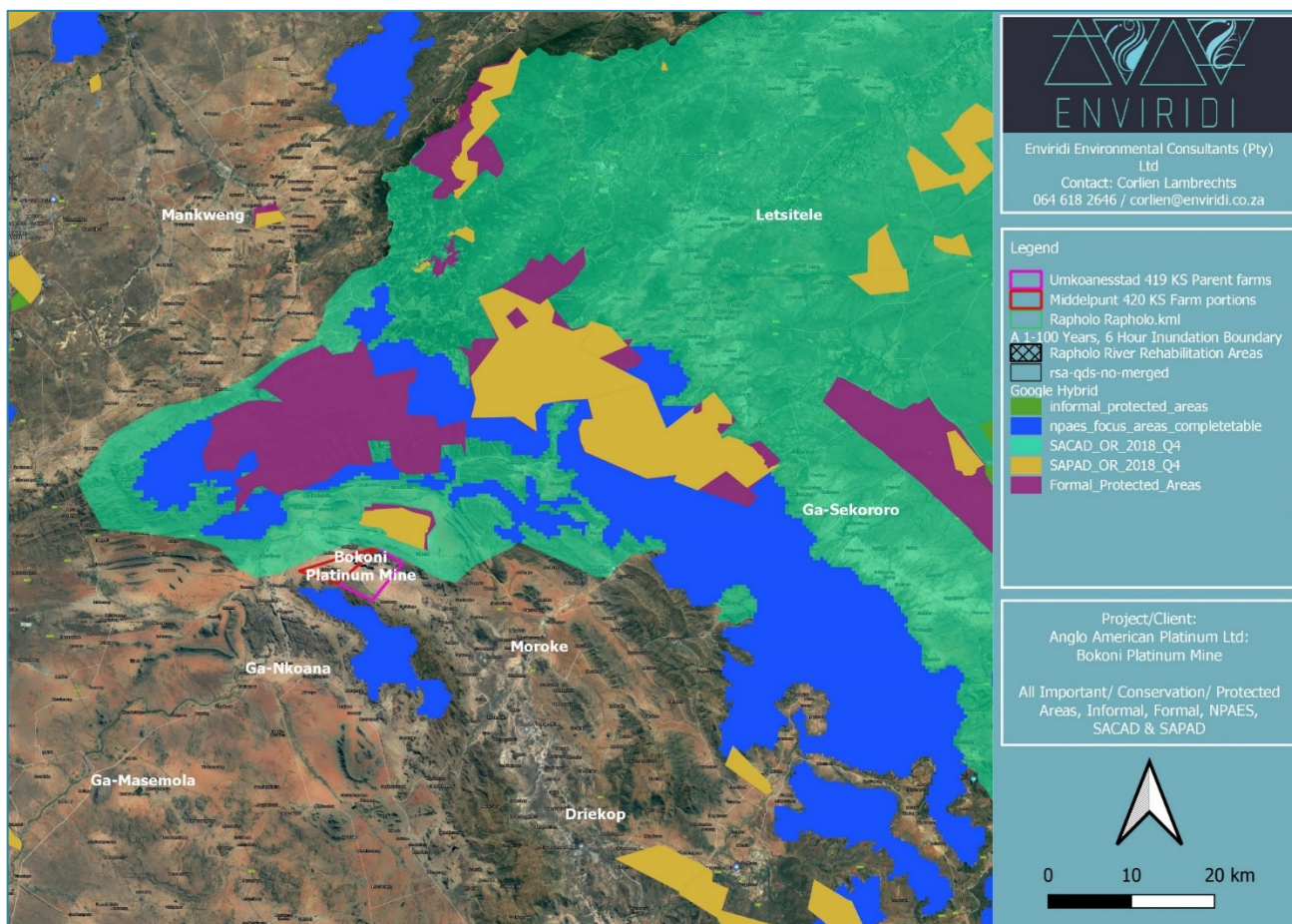


Figure 26: Protected Areas (Formal, Informal, NPAES, SACAD & SAPAD)

The site forms part of the Sekhukhuneland Centre of Endemism (SCOE). Most of southern Africa’s endemic plants are concentrated in only a few, relatively small areas, known as regions or centres of endemism. Not only do these centres hold clues to the origin and evolution of the botanical diversity within a particular area, but these are also areas that, if conserved, would safeguard the greatest number of plant species (Van Wyk & Smith, 2001).

Sekhukhuneland has been identified through previous studies as one of the most important centres of endemism in the Mpumalanga and Limpopo Provinces. The centre falls within the rainfall shadow of the Drakensberg Escarpment, and it is relatively more arid than the areas to the east. The endemic plants of this area are primarily edaphic specialists that are derived from a unique ecology. The substrate consists of heavy soils derived from the norite, pyroxenite and anorthosite formations that predominate over the region. Endemics are both herbaceous and woody with endemism high in the Anacardiaceae, Euphorbiaceae, Liliaceae and Lamiaceae (Van Wyk & Smith, 2001). The site lies inside the Sekhukhuneland Centre of Endemism and the shallow, rocky areas of the development site can be considered especially sensitive as part of the centre of endemism, and will almost certainly show similar vegetation patterns to the endemic regions, especially since the vegetation is still in a natural state. Other important attributes of this region’s flora are summarized in Table 11 below:

Table 11: Attributes of the Sekhukhuneland Centre of Plant Endemism

Centre of Endemism Size:	5 449.4 km ²
Total Number of Species / Taxa	± 2 200
Endemic / Near endemic taxa:	>100
Rate of endemism:	4.5%
Area in Limpopo Province:	2 794 km ²
Proportion in Limpopo Province:	51.7%
Total % transformed:	28.57%

The vegetation unit is classified as having a high sensitivity due to the VU consisting of natural vegetation which is considered representative of the Sekhukhune Plains Bushveld vegetation type. The rehabilitation project footprint is located along the Rapholo River, which is considered to be an ESA due to its importance in ecological processes and connectivity for the ecosystem. The VU is also considered to be suitable habitat for the SCC, *Asparagus sekhukhuniensis*, which is categorised as Endangered by the SANBI Red List. This species was not identified to occur on the project footprint and is considered to have a moderate likelihood of occurrence.

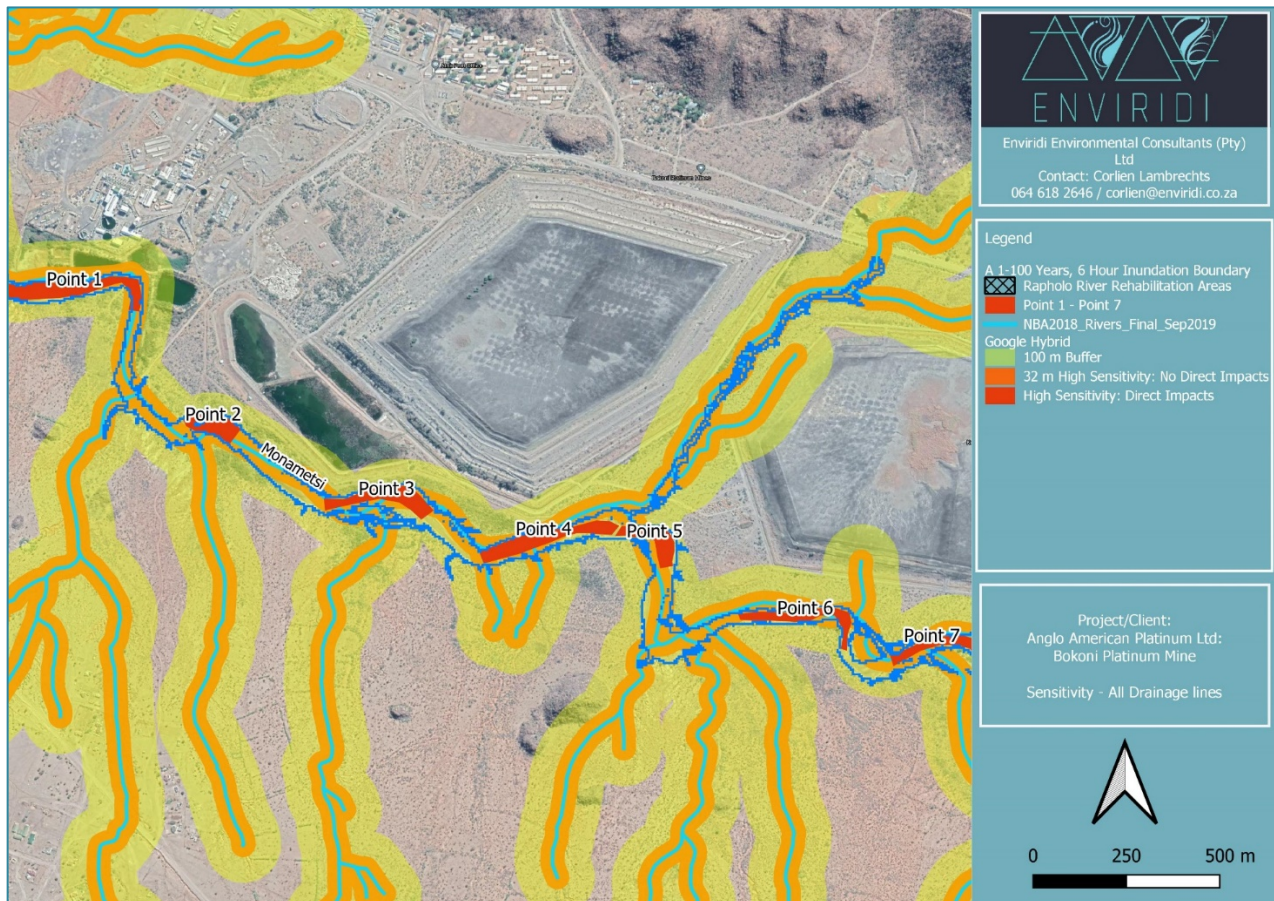


Figure 27: Sensitivity delineated according to general ecological considerations and buffers

Note that the assessment did not include footprints related to the proposed WTP and Chrome Recovery Plant, as both these areas are located on sites already disturbed by current activities and will not result in the clearance of indigenous vegetation.

6. IMPACTS AND RISKS IDENTIFIED INCLUDING THE NATURE, SIGNIFICANCE, CONSEQUENCE, EXTENT, DURATION AND PROBABILITY OF THE IMPACTS, INCLUDING THE DEGREE TO WHICH THESE IMPACTS

The impact section has been divided into 2 tables. Table 12 identifies and lists the various anticipated impacts along with relevant mitigation measures, while Table 13 provides details on the rating of these impacts in terms the nature, significance, consequence, extent, duration and probability of the impacts, including the degree to which these impacts can be mitigated or reversed.

Table 12: List of identified impacts and proposed mitigations measures

Aspect	Potential Impact	Mitigation Measures
Ecology	Site establishment: failure to plan for suitable areas for the construction site establishment may result in unnecessary degradation of the surrounding terrestrial and aquatic environment.	<ul style="list-style-type: none"> • The design of the construction site must ensure minimal impacts to the aquatic and terrestrial environment. • The construction site must be demarcated and communicated with the contractor prior to commencement of construction. • Avoid encroaching on natural areas directly adjacent to proposed activities in close proximity or within buffer areas. • Construction must only take place within the demarcated construction footprint. • Any construction outside of the demarcated site must be approved by the ECO before construction in this area takes place.
Ecology	Construction activities could result in the damage or destruction of flora species.	<ul style="list-style-type: none"> • Movement for construction personnel and vehicles in natural areas should be limited as far as possible to prevent unnecessary destruction of habitats or disturbance of species. It is also vital that no additional fragmentation occurs and that existing roads are used as far as possible in order to limit the area of disturbance. • Should any vegetation removal be necessary for construction of rehabilitation structures, it should be controlled and very specific. • Continuous rehabilitation of the areas impacted which are outside of the project footprint should occur during construction, where revegetation practices should be prioritised. • All footprint areas should remain as small as possible. • 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.
Ecology	Construction, human, and vehicle movement and introduction of foreign material e.g., soils may lead to the introduction of alien invader species, impacting on the floral characteristics of the project site and	<ul style="list-style-type: none"> • Demarcate specific areas to be developed and remain clear of other areas where activities are not necessary. • 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 and should be planned and budgeted for in advance. • Avoidance of unnecessary disturbance or destruction of natural habitat is an important mitigation tool for flora and thereby associated fauna. • Avoid encroaching on natural areas directly adjacent to proposed activities in close proximity or within buffer areas. • Implement rehabilitation features as proposed by the formal rehabilitation programme as proposed (Agreenco, 2018).

Aspect	Potential Impact	Mitigation Measures
	adjacent natural areas. These species may also compete with indigenous species and riparian community structure could be changed. Distribution of AIP species will also be facilitated to downstream areas via the Rapholo River.	<ul style="list-style-type: none"> • Rehabilitation must include planting of indigenous local species, preferably suitable riparian species if banks and beds are affected and as per approved rehabilitation plan for Section 21 (c) & (i) activities - focussing on species native to the river. • Proliferation of alien and invasive species is expected within any disturbed areas. These species should be eradicated and controlled to prevent their spread within or beyond the footprint. • A management plan and proper follow-up strategy for the prevention of the establishment and/or further spread of new populations of such species should be developed and enforced. • Rehabilitate affected areas as soon as possible and after approval had been obtained for the project. • To prevent the erosion of soil, management measures may include structures to protect areas and soil from areas susceptible to erosion. Water control structures should be constructed and well maintained to minimize erosion and to create a favourable habitat for the establishment of vegetation.
Surface Water	Rehabilitation could be ineffective if measures are not appropriately complied to and not implemented correctly. Without the necessary mitigation measures, rehabilitation will be unsuccessful, and the environment will not be self-sustaining.	<ul style="list-style-type: none"> • A management plan for control of invasive/exotic plant species needs to be implemented for all footprint and surrounding areas. This will be ongoing until the end of the mining closure phase. • Rehabilitation plans should be planned long before the closure phase is due. Continuous rehabilitation should also take place during the operational phase. • Rehabilitation plan should be implemented. This includes the process of replanting the vegetation. Rehabilitation plans should be compiled with the use of a specialist and the correct seeding techniques and mixtures should be applied. • Close monitoring of plant communities to ensure that ecology is restored and self-sustaining. The monitoring of the flora should be conducted annually by the environmental practitioner, until a suitably qualified specialist deems the monitoring to no longer be necessary. A report should be written and stored and should be available at all times.
Surface water	Alteration of drainage patterns and sediment movement within the Rapholo River due to rehabilitation of the Rapholo River. Loss of Biodiversity and Ecological function. Interference with Ecological Corridor functioning	<ul style="list-style-type: none"> • Regular monitoring of rehabilitation areas, specifically the occurrence of erosion. • Implement the formal rehabilitation programme to combat and prevent additional erosion in the areas identified as priority areas as per rehabilitation report (Agreenco, 2018).
Surface Water	Inappropriate location and management of	<ul style="list-style-type: none"> • Material stockpiles must be located 50 m away from the watercourse. • Construction should preferably be undertaken in the dry season. • Material stockpiles locations must be approved by the ECO.

Aspect	Potential Impact	Mitigation Measures
	material stockpiles may result in erosion and mobilization of materials into the watercourses.	
Surface Water	Failure to implement effective stormwater management measures may result in increased surface soil erosion and contamination of the watercourse.	<ul style="list-style-type: none"> • Berms and swathes must be placed in areas that may be prone to erosion. • Temporary cut-off drains and berms may be required to capture storm water and promote infiltration. • Construction should preferably be undertaken in the dry season.
Surface Water	The generation of construction waste such as building rubble, excess concrete and general waste created by workers. The inappropriate disposal and management of construction waste may result in the pollution of the watercourse and surrounding environment.	<ul style="list-style-type: none"> • All general waste must be disposed of in bins/waste skips labelled "general waste". • Sufficient waste bins must be provided throughout the construction site for collecting waste. • All general waste collected on site must be disposed of at a licensed general waste disposal site. • Adequate sanitary facilities must be provided for construction workers and they must be properly secured to the ground. • Maintenance of the chemical toilets should be done on a regular basis to prevent any leakages.
Soil	Spillages of hazardous substances from inappropriate handling, transport and use of the substances may result in pollution of soils.	<ul style="list-style-type: none"> • Cement and concrete must not be mixed directly on the ground, or during rainfall events. • Drip trays must be placed under stationary construction machinery overnight to avoid soil contamination from oil and fuel leaks. • Absorbent materials in the form of a spill kit must be provided on site. • Contaminated soil must either be excavated or treated on-site, depending on the nature and extent of the spill. • Contaminated remediation materials must be carefully removed from the area of the spill so as to prevent further release of petrochemicals to the environment, and stored in suitable containers until appropriate disposal. • All hazardous waste generated on site must be placed in a temporary impermeable bunded containment area which must be disposed of at a hazardous landfill site or be collected by the appropriate service provider.
Surface Water	Spillages of hazardous substances from	<ul style="list-style-type: none"> • Cement and concrete must not be mixed directly on the ground, or during rainfall events when the potential for transport of pollutants to watercourses is the greatest.

Aspect	Potential Impact	Mitigation Measures
	inappropriate handling, transport and use of the substances may result in pollution of the surrounding environment and watercourse as well as soil contamination.	<ul style="list-style-type: none"> • Used cement bags should be collected and stored in containers to prevent wind-blown cement dust and water contamination. • Mixed cement/concrete must not be allowed to flow into any watercourses. • Drip trays must be placed under stationary construction machinery overnight to avoid soil contamination from oil and fuel leaks. • Absorbent materials in the form of a spill kit must be provided on site. • Contaminated soil must either be excavated or treated on-site, depending on the nature and extent of the spill. • Contaminated remediation materials must be carefully removed from the area of the spill so as to prevent further release of petrochemicals to the environment, and stored in suitable containers until appropriate disposal. • All hazardous waste generated on site must be placed in a temporary impermeable bunded containment area which must be disposed of at a hazardous landfill site or be collected by the appropriate service provider.
Ecology	Construction activities within the watercourses could result in impacts on the watercourse habitat and subsequently the loss of aquatic fauna.	<ul style="list-style-type: none"> • Any aquatic fauna found on site prior during construction must be removed and reintroduced into undisturbed areas of the watercourse as approved by the ECO.
Soil	The erosion from construction activities may result in the loss of soil from the development area and surrounds.	<ul style="list-style-type: none"> • Stormwater control must be undertaken to prevent soil loss from the site. • The contractor must develop and implement an Erosion Management Plan. • All erosion control mechanisms must be regularly maintained. • Natural vegetation must be retained where possible to avoid soil erosion. • Construction must be phased in order to minimise the area of exposed soil at any one time. • Disturbed areas of natural vegetation must be rehabilitated immediately to prevent further soil erosion. • Fill and stabilise eroded river banks immediately after construction activity in the specific area commences.
Ecology	During the construction phase, activities may permanently damage or remove unidentified plant and animal SCC present on site. It should however be noted that no SCC were identified during the site assessment.	<ul style="list-style-type: none"> • Should SCC be identified during construction, construction activities in the area containing the SCC must stop immediately and a search and rescue operation must be conducted by a qualified botanist. • All SCC impacted by construction activities must be conserved and rescued. • All rescued SCC must be transplanted to a suitable habitat or nursery for the duration of the construction phase; • All rescued SCC must be replanted within the site where it was originally found or in close proximity during rehabilitation
Socio-economic	During the construction phase, there is the	<ul style="list-style-type: none"> • Where possible construction resources must be purchased from local companies.

Aspect	Potential Impact	Mitigation Measures
	potential for temporary job opportunities to be created.	
Air Quality	During the construction phase, construction vehicles and construction activities could result in the generation of significant dust during windy conditions.	<ul style="list-style-type: none"> • During windy periods un-surfaced and un-vegetated areas must be dampened down. • Vegetation must be retained where possible as this will reduce dust travel. • Any complaints or claims emanating from dust issues must be attended to immediately and noted in the complaints register.
Visual	During the construction phase construction activity and the presence and use of large machinery on site and along access roads will result in a visual disturbance of the surrounding landscape.	<ul style="list-style-type: none"> • All construction activity should take place during daylight working hours (i.e. 7 – 5pm). • All construction activity and equipment must be limited to the demarcated areas. • Good housekeeping must be maintained throughout the construction work areas to limit the visual intrusion of the construction activities.
Noise	During the construction phase, construction activities could result in an increase in ambient noise levels on site and affect surrounding landowners, road users and the general public.	<ul style="list-style-type: none"> • Activities which include the movement of construction vehicles and the operation of machinery should be restricted to normal working hours (07:00am – 17:00pm). • There must be a complaints register on site for nearby residents to make complaints. These must be addressed and recorded.
Ecology	Inadequate implementation of rehabilitation measures in disturbed areas may lead to the degradation of the surrounding environment and establishment of	<ul style="list-style-type: none"> • The rehabilitation plan must be implemented during and after the construction has been completed. • All temporarily disturbed areas must be rehabilitated with indigenous vegetation as soon as construction in the particular area or phase of work is complete, i.e. rehabilitation is on-going throughout construction as phases have been completed. • All impacted areas must be restored as per the EMP requirements.

Aspect	Potential Impact	Mitigation Measures
	alien invasive plant species.	
Surface Water	During the operation phase, failure to maintain rehabilitation structures and waste water systems and related infrastructure may result in leakages or failure of systems which may pollute the surrounding environment.	<ul style="list-style-type: none"> • Regular maintenance and inspections of all infrastructure and services must be undertaken the operational phase of the rehabilitation works and WTP and related infrastructure.
Surface Water	Erosion and sedimentation may also occur as a result of poor slope stabilisation.	<ul style="list-style-type: none"> • Banks must be rehabilitated, including re-establishment of vegetation cover; • Continued maintenance of the rehabilitation structures, especially following a flooding event, must take place.
Surface Water	Rehabilitation of the watercourse will stabilise and restore riverbanks and reduce further erosion at the rehabilitated areas.	N/A
Socio-economic	Provision of treated water to household without a reliably water supply will improve quality of life for those serviced.	N/A
Socio-economic	Due to system failures the quality of water provided to communities may be poor.	<ul style="list-style-type: none"> •Water supplied to communities for potable use must be monitored for selected water quality parameters regularly. •Monitoring results should be available upon request to authorities and I&APs or community. •During the operational phase all water treatment infrastructure must be properly managed, maintained and operated throughout the life of the project. •During the operational phase periodic inspections of the WTP infrastructure should be implemented to identify any system failure.
Groundwater	During the operational phase failure of WTP infrastructure, (pump station etc.)	<ul style="list-style-type: none"> •During the operational phase all water treatment infrastructure must be properly managed, maintained and operated throughout the life of the project. •During the operational phase periodic inspections of the WTP infrastructure should be implemented to identify any system failure which could lead to contamination of the groundwater and surrounding water bodies.

Aspect	Potential Impact	Mitigation Measures
	and the lack of infrastructural maintenance coupled with poor operation may lead to waste water overflows resulting in contamination of the ground, groundwater and surrounding water systems.	<ul style="list-style-type: none"> • Any leaks and failures of the WTP infrastructure must be fixed immediately and areas rehabilitated as needed.
Soil	During the operational phase failure of WTP infrastructure, (pump station etc.) and the lack of infrastructural maintenance coupled with poor operation may lead to waste water overflows resulting in contamination of the ground, groundwater and surrounding water systems.	<ul style="list-style-type: none"> • During the operational phase all water treatment infrastructure must be properly managed, maintained and operated throughout the life of the project. • During the operational phase periodic inspections of the WTP infrastructure should be implemented to identify any system failure which could lead to contamination of the groundwater and surrounding water bodies. • Any leaks and failures of the WTP infrastructure must be fixed immediately and areas rehabilitated as needed.
Cultural	Heritage and cultural artefacts may be damaged or destroyed due to construction activities. Note that no heritage or cultural artefacts are expected to occur on the project footprint.	<ul style="list-style-type: none"> • Local museums as well as the South African Heritage Resource Agency (SAHRA) will be informed if any artifacts are uncovered in the affected area and mitigation measures recommended by SAHRA will be followed. • The contractor will ensure that his workforce is aware of the necessity of reporting any possible historical or archaeological finds to the ECO so that appropriate action can be taken. • Any discovered artifacts will not be removed under any circumstances. Any destruction of a site can only be allowed once a permit is obtained and the site has been mapped and noted.

Table 13: Significance statements and rating of the identified environmental impacts, before and after mitigation

Aspect	Potential Impact	Phase	Extent		Duration		Intensity		Probability		Weighting Factor		Significance without mitigation		Mitigation Efficiently		Significance with mitigation	
Ecology	Site establishment: failure to plan for suitable areas for the construction site establishment may result in unnecessary degradation of the surrounding terrestrial and aquatic environment.	C	3	Regional	2	Short to medium term	1	Low	3	Likely	2	Low to medium	18	Low to medium	0.2	High	3.6	Low
Ecology	Construction activities could result in the damage or destruction of flora species.	C, O	2	Site	3	Medium	3	Medium	4	Highly likely	3	Medium	36	Low to medium	0.4	Medium to high	14	Low
Ecology	Construction, human, and vehicle movement and introduction of foreign material e.g., soils may lead to the introduction of alien invader species, impacting on the floral characteristics of the project site and adjacent natural areas. These species may also compete with indigenous species and riparian community structure could be changed. Distribution of AIP species will also be facilitated to downstream areas via the Rapholo River.	C, O	3	Regional	4	Long term	3	Medium	3	Likely	4	Medium to high	52	Medium	0.2	High	10	Low
Surface Water	Rehabilitation could be ineffective if measures are not appropriately complied to and not implemented correctly. Without the necessary mitigation measures, rehabilitation will be unsuccessful, and the environment will not be self-sustaining.	C,O	3	Regional	3	Medium term	3	Medium	2	Possible	3	Medium	33	Low to medium	0.4	Medium to High	13	Low
Surface water	Alteration of drainage patterns and sediment movement within the Rapholo River due to rehabilitation of the Rapholo River. Loss of Biodiversity and Ecological function. Interference with Ecological Corridor functioning	C, O	3	Regional	4	Long term	3	Medium	3	Likely	3	Medium	39	Low to medium	0.2	High	7.8	Low

Aspect	Potential Impact	Phase	Extent		Duration		Intensity		Probability		Weighting Factor		Significance without mitigation		Mitigation Efficiently		Significance with mitigation	
Surface Water	Inappropriate location and management of material stockpiles may result in erosion and mobilization of materials into the watercourses.	C	3	Regional	2	Short to medium term	3	Medium	3	Likely	3	Medium	33	Low to medium	0.2	High	6.6	Low
Surface Water	Failure to implement effective stormwater management measures may result in increased surface soil erosion and contamination of the watercourse.	C	3	Regional	2	Short to medium term	2	Low	3	Likely	2	Low to medium	20	Low to medium	0.4	Medium to high	8	Low
Surface Water	The generation of construction waste such as building rubble, excess concrete and general waste created by workers. The inappropriate disposal and management of construction waste may result in the pollution of the watercourse and surrounding environment.	C	2	Site	2	Short to medium term	2	Low	3	Likely	2	Low to medium	18	Low	0.2	High	3.6	Low
Soil	Spillages of hazardous substances from inappropriate handling, transport and use of the substances may result in pollution of soils.	C	2	Site	2	Short to medium term	3	Medium	3	Likely	3	Medium	30	Low to medium	0.4	Medium to high	12	Low
Surface Water	Spillages of hazardous substances from inappropriate handling, transport and use of the substances may result in pollution of the surrounding environment and watercourse as well as soil contamination.	C	2	Site	2	Short to medium term	3	Medium	3	Likely	3	Medium	30	Low to medium	0.4	Medium to high	12	Low
Ecology	Construction activities within the watercourses could result in impacts on the watercourse habitat and subsequently the loss of aquatic fauna.	C	3	Regional	3	Medium term	3	Medium	4	Highly likely	4	Medium to high	52	Medium	0.6	Medium to high	31	Low to medium
Soil	The erosion from construction activities may result in the loss of soil from the development area and surrounds.	C	2	Site	2	Short to medium term	2	Low	2	Possible	3	Medium	24	Low to medium	0.2	High	4.8	Low

Aspect	Potential Impact	Phase	Extent		Duration		Intensity		Probability		Weighting Factor		Significance without mitigation		Mitigation Efficiently		Significance with mitigation	
Ecology	During the construction phase, activities may permanently damage or remove unidentified plant and animal SCC present on site. It should however be noted that no SCC were identified during the site assessment.	C	2	Site	4	Long term	3	Medium	1	Improbable	2	Low to medium	20	Low to medium	0.6	Medium	12	Low
Socio-economic	During the construction phase, there is the potential for temporary job opportunities to be created.	C	3	Regional	2	Short to medium term	3	Medium	4	Highly likely	3	Medium	36	POSITIVE: Low to Medium	POSITIVE			
Air Quality	During the construction phase, construction vehicles and construction activities could result in the generation of significant dust during windy conditions.	C	3	Regional	2	Short to medium term	1	Low	4	Highly likely	2	Low to medium	20	Low to medium	0.4	Medium to high	8	Low
Visual	During the construction phase construction activity and the presence and use of large machinery on site and along access roads will result in a visual disturbance of the surrounding landscape.	C	2	Site	2	Short to medium term	1	Low	5	Definite	2	Low to medium	20	Low to medium	1	Low	20	Low to medium
Noise	During the construction phase, construction activities could result in an increase in ambient noise levels on site and affect surrounding landowners, road users and the general public.	C	3	Regional	2	Short to medium term	3	Medium	4	Highly likely	2	Low to medium	24	Low to medium	0.6	Medium	14	Low
Ecology	Inadequate implementation of rehabilitation measures in disturbed areas may lead to the degradation of the surrounding environment and establishment of alien invasive plant species.	C	3	Regional	3	Medium term	3	Medium	3	Likely	3	Medium	36	Low to medium	0.2	High	7.2	Low
Surface Water	During the operation phase, failure to maintain rehabilitation structures and waste water systems and related infrastructure may result in leakages or failure of systems which	O	3	Regional	4	Long term	3	Medium	4	Highly likely	3	Medium	42	Medium	0.6	Medium	25	Low to medium

Aspect	Potential Impact	Phase	Extent		Duration		Intensity		Probability		Weighting Factor		Significance without mitigation		Mitigation Efficiently		Significance with mitigation	
	may pollute the surrounding environment.																	
Surface Water	Erosion and sedimentation may also occur as a result of poor slope stabilisation.	C, O	3	Regional	3	Medium term	3	Medium	3	Likely	3	Medium	36	Low to medium	0.4	Medium to high	14	Low
Surface Water	Rehabilitation of the watercourse will stabilise and restore riverbanks and reduce further erosion at the rehabilitated areas.	C, O	3	Regional	5	Permanent	3	Medium	5	Definite	3	Medium	48	POSITIVE: Medium	POSITIVE			
Socio-economic	Provision of treated water to household without a reliably water supply will improve quality of life for those serviced.	O	3	Regional	4	Long term	3	Medium	5	Definite	4	Medium to high	60	POSITIVE: Medium to high	POSITIVE			
Socio-economic	Due to system failures the quality of water provided to communities may be poor.	O	3	Regional	4	Long term	3	Medium	3	Likely	4	Medium to high	52	Medium	0.4	Medium to high	21	Low to medium
Groundwater	During the operational phase failure of WTP infrastructure, (pump station etc.) and the lack of infrastructural maintenance coupled with poor operation may lead to waste water overflows resulting in contamination of the ground, groundwater and surrounding water systems.	O	3	Regional	4	Long term	3	Medium	3	Likely	2	Low to medium	26	Low to medium	0.4	Medium to high	10	Low
Soil	During the operational phase failure of WTP infrastructure, (pump station etc.) and the lack of infrastructural maintenance coupled with poor operation may lead to waste water overflows resulting in contamination of the ground, groundwater and surrounding water systems.	O	3	Regional	4	Long term	3	Medium	3	Likely	2	Low to medium	26	Low to medium	0.4	Medium to high	10	Low
Cultural	Heritage and cultural artefacts may be damaged or destroyed due to construction activities. Note that no heritage or cultural artefacts are expected to occur on the project footprint.	C	2	Site	2	Short to medium term	3	Medium	1	Improbable	2	Low to medium	16	Low	0.6	Medium	9.6	Low

Based on the nature and scale of the proposed activities, no cumulative impacts are anticipated.

6.1 Methodology used in determining and ranking the nature, significance, consequences, extent, duration and probability of potential environmental impacts and risks;

The criteria for the description and assessment of environmental impacts were drawn from the EIA Guidelines, National Environmental Management Act (Act No. 107 of 1998): EIA Regulations (2014) and as amended from time to time.

The level of detail as depicted in the EIA Guidelines was fine-tuned by assigning specific values to each impact. In order to establish a coherent framework within which all impacts could be objectively assessed, it was necessary to establish a rating system, which was applied consistently to all the criteria. For such purposes each aspect was assigned a value, ranging from one (1) to five (5), depending on its definition. This assessment is a relative evaluation within the context of all the activities and the other impacts within the framework of the project.

An explanation of the impact assessment criteria is defined below.

Table 14: Impact Assessment Criteria

EXTENT	
Classification of the physical and spatial scale of the impact	
Footprint	The impacted area extends only as far as the activity, such as footprint occurring within the total site area.
Site	The impact could affect the whole, or a significant portion of the site.
Regional	The impact could affect the area including the neighbouring farms, the transport routes and the adjoining towns.
National	The impact could have an effect that expands throughout the country (South Africa).
International	Where the impact has international ramifications that extend beyond the boundaries of South Africa.
DURATION	
The lifetime of the impact that is measured in relation to the lifetime of the proposed development.	
Short term	The impact will either disappear with mitigation or will be mitigated through a natural process in a period shorter than that of the construction phase.
Short to Medium term	The impact will be relevant through to the end of a construction phase (1.5 years).
Medium term	The impact will last up to the end of the development phases, where after it will be entirely negated.
Long term	The impact will continue or last for the entire operational lifetime i.e. exceed 30 years of the development, but will be mitigated by direct human action or by natural processes thereafter.
Permanent	This is the only class of impact, which will be non-transitory. Mitigation either by man or natural process will not occur in such a way or in such a time span that the impact can be considered transient.
INTENSITY	
The intensity of the impact is considered by examining whether the impact is destructive or benign, whether it destroys the impacted environment, alters its functioning, or slightly alters the environment itself. The intensity is rated as	
Low	The impact alters the affected environment in such a way that the natural processes or functions are not affected.
Medium	The affected environment is altered, but functions and processes continue, albeit in a modified way.
High	Function or process of the affected environment is disturbed to the extent where it temporarily or permanently ceases.

PROBABILITY	
This describes the likelihood of the impacts actually occurring. The impact may occur for any length of time during the life cycle of the activity, and not at any given time. The classes are rated as follows:	
Improbable	The possibility of the impact occurring is none, due either to the circumstances, design or experience. The chance of this impact occurring is zero (0 %).
Possible	The possibility of the impact occurring is very low, due either to the circumstances, design or experience. The chances of this impact occurring is defined as 25 %.
Likely	There is a possibility that the impact will occur to the extent that provisions must therefore be made. The chances of this impact occurring is defined as 50 %.
Highly Likely	It is most likely that the impacts will occur at some stage of the development. Plans must be drawn up before carrying out the activity. The chances of this impact occurring is defined as 75 %.
Definite	The impact will take place regardless of any prevention plans, and only mitigation actions or contingency plans to contain the effect can be relied on. The chance of this impact occurring is defined as 100 %.

The status of the impacts and degree of confidence with respect to the assessment of the significance must be stated as follows:

- **Status of the impact:** A description as to whether the impact would be positive (a benefit), negative (a cost), or neutral.
- **Degree of confidence in predictions:** The degree of confidence in the predictions, based on the availability of information and specialist knowledge.

Other aspects to take into consideration in the specialist studies are:

- Impacts should be described both before and after the proposed mitigation and management measures have been implemented.
- All impacts should be evaluated for the full-lifecycle of the proposed development, including construction, operation and decommissioning.
- The impact evaluation should take into consideration the cumulative effects associated with this and other facilities which are either developed or in the process of being developed in the region.
- The specialist studies must attempt to quantify the magnitude of potential impacts (direct and cumulative effects) and outline the rationale used. Where appropriate, national standards are to be used as a measure of the level of impact.

Mitigation

The impacts that are generated by the development can be minimised if measures are implemented in order to reduce the impacts. The mitigation measures ensure that the development considers the environment and the predicted impacts in order to minimise impacts and achieve sustainable development.

(i) Determination of Significance-Without Mitigation

Significance is determined through a synthesis of impact characteristics as described in the above paragraphs. It provides an indication of the importance of the impact in terms of both tangible and intangible characteristics. The significance of the impact “without mitigation” is the prime determinant of the nature and degree of mitigation required. Where the impact is positive, significance is noted as “positive”. Significance is rated on the following scale:

Table 15: Significance-Without Mitigation

NO SIGNIFICANCE	The impact is not substantial and does not require any mitigation action.
LOW	The impact is of little importance, but may require limited mitigation.
MEDIUM	The impact is of importance and is therefore considered to have a negative impact. Mitigation is required to reduce the negative impacts to acceptable levels.
HIGH	The impact is of major importance. Failure to mitigate, with the objective of reducing the impact to acceptable levels, could render the entire development option or entire project proposal unacceptable. Mitigation is therefore essential.

(ii) *Determination of Significance- With Mitigation*

Determination of significance refers to the foreseeable significance of the impact after the successful implementation of the necessary mitigation measures. Significance with mitigation is rated on the following scale:

Table 16: Significance- With Mitigation

NO SIGNIFICANCE	The impact will be mitigated to the point where it is regarded as insubstantial.
LOW	The impact will be mitigated to the point where it is of limited importance.
LOW TO MEDIUM	The impact is of importance, however, through the implementation of the correct mitigation measures such potential impacts can be reduced to acceptable levels.
MEDIUM	Notwithstanding the successful implementation of the mitigation measures, to reduce the negative impacts to acceptable levels, the negative impact will remain of significance. However, taken within the overall context of the project, the persistent impact does not constitute a fatal flaw.
MEDIUM TO HIGH	The impact is of major importance but through the implementation of the correct mitigation measures, the negative impacts will be reduced to acceptable levels.
HIGH	The impact is of major importance. Mitigation of the impact is not possible on a cost-effective basis. The impact is regarded as high importance and taken within the overall context of the project, is regarded as a fatal flaw. An impact regarded as high significance, after mitigation could render the entire development option or entire project proposal unacceptable.

Assessment Weighting

Each aspect within an impact description was assigned a series of quantitative criteria. Such criteria are likely to differ during the different stages of the project’s life cycle. In order to establish a defined base upon which it becomes feasible to make an informed decision, it was necessary to weigh and rank all the criteria.

(iii) *Ranking, Weighting and Scaling*

For each impact under scrutiny, a scaled weighting factor is attached to each respective impact (refer Table 17). The purpose of assigning weights serves to highlight those aspects considered the most critical to the various stakeholders and ensure that each specialist’s element of bias is taken into account. The weighting factor also provides a means whereby the impact assessor can successfully deal with the complexities that exist between the different impacts and associated aspect criteria.

Simply, such a weighting factor is indicative of the importance of the impact in terms of the potential effect that it could have on the surrounding environment. Therefore, the aspects considered to have a relatively high value will score a relatively higher weighting than that which is of lower importance.

Table 17: Description of assessment parameters with its respective weighting

EXTENT		DURATION		INTENSITY		PROBABILITY		WEIGHTING FACTOR (WF)		SIGNIFICANCE RATING (SR)	
Footprint	1	Short term	1	Low	1	Probable	1	Low	1	Low	0-19
Site	2	Short to Medium	2			Possible	2	Low to Medium	2	Low to Medium	20-39
Regional	3	Medium term	3	Medium	3	Likely	3	Medium	3	Medium	40-59
National	4	Long term	4			Highly Likely	4	Medium to High	4	Medium to High	60-79
International	5	Permanent	5	High	5	Definite	5	High	5	High	80-100
MITIGATION EFFICIENCY (ME)						SIGNIFICANCE FOLLOWING MITIGATION (SFM)					
High			0.2			Low			0 - 19		
Medium to High			0.4			Low to Medium			20 - 39		
Medium			0.6			Medium			40 - 59		
Low to Medium			0.8			Medium to High			60 - 79		
Low			1.0			High			80 - 100		

(iv) Identifying the Potential Impacts Without Mitigation Measures (WOM)

Following the assignment of the necessary weights to the respective aspects, criteria are summed and multiplied by their assigned weightings, resulting in a value for each impact (prior to the implementation of mitigation measures).

Equation 1:

Significance Rating (WOM) = (Extent + Intensity + Duration + Probability) x Weighting Factor

(v) Identifying the Potential Impacts with Mitigation Measures (WM)

In order to gain a comprehensive understanding of the overall significance of the impact, after implementation of the mitigation measures, it was necessary to re-evaluate the impact.

(vi) Mitigation Efficiency (ME)

The most effective means of deriving a quantitative value of mitigated impacts is to assign each significance rating value (WOM) a mitigation efficiency (ME) rating (refer to Table 17). The allocation of such a rating is a measure of the efficiency and effectiveness, as identified through professional experience and empirical evidence of how effectively the proposed mitigation measures will manage the impact.

Thus, the lower the assigned value the greater the effectiveness of the proposed mitigation measures and subsequently, the lower the impacts with mitigation.

Equation 2:

Significance Rating (WM) = Significance Rating (WOM) x Mitigation Efficiency
 or WM = WOM x ME

(vii) Significance Following Mitigation (SFM)

The significance of the impact after the mitigation measures are taken into consideration. The efficiency of the mitigation measure determines the significance of the impact. The level of impact is therefore seen in its entirety with all considerations taken into account.

6.2 The positive and negative impacts that the proposed activity (in terms of the initial site layout) and alternatives will have on the environment and the community that may be affected.

Bokoni Platinum Mine proposes to rehabilitate eroded areas of the Rapholo River which pose a threat to the structural integrity of the PCD and other mine residue and waste water facilities. Rehabilitation structures will include the construction and installation of gabions and stone pitching. The proposed WTP will be constructed adjacent to the existing Merensky WTP, allowing for shared infrastructure and connection to existing infrastructure. The WTP is also located on a site which is already disturbed by adjacent community activities and the existing WTP.

No alternatives have been considered for assessment. This is due to the nature of the activity (rehabilitation of specific high risk areas in the Rapholo River) and the limited feasible options to undertake the activity. The WTP was sited and designed to make use of existing facilities and infrastructure to optimise the WTP and allow for efficient water delivery to the receiving community, whilst taking into consideration environmental impacts. The only practical alternative which has been assessed is the NO-GO alternative.

Alternatives to the methods to be employed in the rehabilitation activities were discussed with the Department of Water and Sanitation (DWS). DWS agreed with the use of stone pitching and gabions to reinforce the eroded areas, with the requirement that all rip-rap be topsoiled and vegetated and bank slopes should be designed for a 1:2 or 1:3 slopes.

Alternative options regarding solutions for the excess water were considered. However, the project as described in this report has the greatest advantages for the community the BPM as well as greatly reducing the potential environmental impacts. The WTP and supply of potable water to nearby communities was discussed with the Sekhukhune District Municipality as well as the DWS.

The identified potential impacts range from air pollution such as dust, noise pollution, soil pollution, waste pollution, water pollution and fauna and flora impacts. All these will be properly managed. None of these impacts will be significant since the proposed activities will be of small scale and mitigation measures will be adhered to. Due to the nature, location and scale of the proposed activities all impacts were rated as Low significance, after the implementation of mitigation measures. Refer to the tables above which review the significance of impacts by taking the proposed mitigation measures into consideration.

All anticipated impacts with the relevant mitigation measures have been included in the section above – Table 12 and Table 13.

Refer to Part A section 4 for comments and concerns raised by IAPs as well as the EAPs responses.

The issues and comments which were raised were addressed in the Public Consultation document (Appendix 5). Please see Appendix 5 for a comprehensive Issues and Response trail indicating details on the above.

6.3 The possible mitigation measures that could be applied and the level of risk

Refer to Table 12 for the proposed mitigation measures.

6.4 Motivation where no alternative sites were considered

Bokoni Platinum Mine is an existing operation and proposes to rehabilitate eroded areas of the Rapholo River which pose a threat to the structural integrity of the PCD and other mine residue and waste water facilities. Rehabilitation structures will include the construction and installation of gabions and stone pitching. The proposed WTP will be constructed adjacent to the existing Merensky WTP, allowing for shared infrastructure and connection to existing infrastructure. The WTP is also located on a site which is already disturbed by adjacent community activities and the existing WTP.

No alternatives have been considered for assessment. This is due to the nature of the activity (rehabilitation of specific high risk areas in the Rapholo River) and the limited feasible options to undertake the activity. The WTP was sited and designed to make use of existing facilities and infrastructure to optimise the WTP and allow for efficient water delivery to the receiving community, whilst taking into consideration environmental impacts. The only practical alternative is the NO-GO alternative.

6.5 Statement motivating the alternative development location within the overall site

Bokoni Platinum Mine is an existing operation and proposes to rehabilitate eroded areas of the Rapholo River which pose a threat to the structural integrity of the PCD and other mine residue and waste water facilities. Rehabilitation structures will include the construction and installation of gabions and stone pitching. The proposed WTP will be constructed adjacent to the existing Merensky WTP, allowing for shared infrastructure and connection to existing infrastructure. The WTP is also located on a site which is already disturbed by adjacent community activities and the existing WTP.

No alternatives have been considered for assessment. This is due to the nature of the activity (rehabilitation of specific high risk areas in the Rapholo River) and the limited feasible options to undertake the activity. The WTP was sited and designed to make use of existing facilities and infrastructure to optimise the WTP and allow for efficient water delivery to the receiving community, whilst taking into consideration environmental impacts. The only practical alternative is the NO-GO alternative.

6.6 Full description of the process undertaken to identify, assess and rank the impacts and risks the activity will impose on the preferred site (In respect of the final site layout plan) through the life of the activity.

Refer to section 6.1 for the Methodology used in determining and ranking the nature, significance, consequences, extent, duration and probability of potential environmental impacts and risks.

Refer to Table 13 for the significance statements of each identified impact.

All impacts were identified by desktop analysis, specialist studies and assessments, consultation process with landowners and I&APs and a site visit.

6.6.1 Summary of specialist reports.

LIST OF STUDIES UNDERTAKEN	RECOMMENDATIONS OF SPECIALIST REPORTS	SPECIALIST RECOMMENDATIONS THAT HAVE BEEN INCLUDED IN THE EIA REPORT	REFERENCE TO APPLICABLE SECTION OF REPORT WHERE SPECIALIST RECOMMENDATIONS HAVE BEEN INCLUDED.
Surface Water and Aquatic Ecology Report	<p>Refer to Section 5.1.4 for the baseline described in the Surface Water and Aquatic Ecology Report. Table 12 and Table 13 include the potential impacts identified and related mitigation measures recommended.</p> <p>Based on the risks predicted and assessed, the applicant needs to develop an Environmental Management Programme / Plan which describe in detail how identified impacts will be managed on site to ensure that impacts are minimized and specifically how and when the rehabilitation will be implemented as per existing conceptual plan. The management measures as indicated in the report must be implemented where applicable.</p> <p>Based on findings and recommendations above. it is the reasoned opinion of the specialists that the development may continue if all mitigation measures are implemented.</p>	X	Refer to Section 5.1.4 for the baseline described in the Surface Water and Aquatic Ecology Report. Table 12 and Table 13 include the potential impacts identified and related mitigation measures recommended.
Ecology Assessment	<p>Refer to Section 5.1.5 for the baseline described in the Ecology Assessment Report. Table 12 and Table 13 include the potential impacts identified and related mitigation measures recommended.</p> <p><u>General Mitigation Measures prescribed:</u></p> <ul style="list-style-type: none"> • The succulents, <i>Huernia</i> sp., and <i>Stapelia gigantea</i> (Giant carrion flower) were observed to occur on the project footprint. Both of these species are protected in terms of the LEMA. • <i>Balanites maughamii</i> (Greenthorn), <i>Prunus africana</i> (African almond) and <i>Sclerocarya birrea</i> (Marula) were observed in the VU and are protected in terms of the NFA. • The vegetation unit is classified as having a high sensitivity due to the VU consisting of natural vegetation which is considered representative of the Sekhukhune Plains Bushveld vegetation type. The project footprint is located along the Rapholo River, which is considered to be an ESA due to its importance in ecological processes and connectivity for the ecosystem. The VU is also 	X	Refer to Section 5.1.5 for the baseline described in the Ecology Assessment Report. Table 12 and Table 13 include the potential impacts identified and related mitigation measures recommended.

LIST OF STUDIES UNDERTAKEN	RECOMMENDATIONS OF SPECIALIST REPORTS	SPECIALIST RECOMMENDATIONS THAT HAVE BEEN INCLUDED IN THE EIA REPORT	REFERENCE TO APPLICABLE SECTION OF REPORT WHERE SPECIALIST RECOMMENDATIONS HAVE BEEN INCLUDED.
	<p>considered to be suitable habitat for the SCC, <i>Asparagus sekhukhuniensis</i> is categorised as Endangered by the SANBI Red List. This species was not identified to occur on the project footprint and is considered to have a moderate likelihood of occurrence.</p> <ul style="list-style-type: none"> • Obtain relevant permits/consent, if applicable, for each protected or endangered floral species identified within the proposed development area that will be destroyed. • Implement rehabilitation features as proposed by the formal rehabilitation programme as proposed (Agreenco, 2018). • Rehabilitation must include planting of indigenous local species, preferably suitable riparian species if banks and beds are affected and as per approved rehabilitation plan for Section 21 (c) & (i) activities - focussing on species native to the river. • A suitable responsible person should be appointed during the construction phase to ensure that no unnecessary ecological impacts occur or animal is harmed and no breeding ground or unexpected discovery of red listed/sensitive animals that may require relocation is handled incorrectly by uninformed personnel. • Prevent the needless loss of or damage to flora particularly with regard to protected, endemic, near-endemic and rare species to keep the specific habitat type as unaltered as possible. This will include the active management of Alien and Invasive species around the perimeter and within the development footprint. • Prevent death, injury or hindrance to any fauna encountered during the project phases, and particularly with regard to any possible protected or endemic species. • Prevent impacts from reaching the downstream river environments at any stage of the development as these will impact the aquatic life within the systems as well as impact all the animals using the water resources on-site as well as downstream impacts. • Adhere to all management and mitigation measures as prescribed within the water resources/surface water specialist report Invalid source specified.. 		

LIST OF STUDIES UNDERTAKEN	RECOMMENDATIONS OF SPECIALIST REPORTS	SPECIALIST RECOMMENDATIONS THAT HAVE BEEN INCLUDED IN THE EIA REPORT	REFERENCE TO APPLICABLE SECTION OF REPORT WHERE SPECIALIST RECOMMENDATIONS HAVE BEEN INCLUDED.
	<ul style="list-style-type: none"> • Corridor movement associated with water resources should not be hampered by the development. No sections of the river should be cordoned off (only if it will help prevent access and impacts). • Continuous monitoring of impacts is important to ensure the baseline environmental condition is not impacted. • 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. • Activities on site must comply with the regulations of the Animal Protection Act, 1962 (Act No. 71 of 1962). Workers should also be advised on the penalties associated with the needless destruction of wildlife, as set out in this act. • No fishing, hunting or trapping should be allowed by the employees or other parties. • Demarcate specific areas to be developed and remain clear of other areas where activities are not necessary. • 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 and should be planned and budgeted for in advance. • Avoidance of unnecessary disturbance or destruction of natural habitat is an important mitigation tool for flora and thereby associated fauna. • If any SCC are encountered within the subject property in the future, the following should be ensured: <ul style="list-style-type: none"> ○ If any threatened species will be disturbed, ensure effective relocation of individuals to suitable offset areas or within designated open space on the subject property; ○ All rescue and relocation plans should be overseen by a suitably qualified specialist; and ○ Obtain relevant permits/consent, if applicable, for each protected or endangered floral species identified within the proposed development area that will be destroyed, 		

LIST OF STUDIES UNDERTAKEN	RECOMMENDATIONS OF SPECIALIST REPORTS	SPECIALIST RECOMMENDATIONS THAT HAVE BEEN INCLUDED IN THE EIA REPORT	REFERENCE TO APPLICABLE SECTION OF REPORT WHERE SPECIALIST RECOMMENDATIONS HAVE BEEN INCLUDED.
	<ul style="list-style-type: none"> • Keep spill kits and hazmat prevention kits on-site to remediate any spill immediately before reaching the natural environment. As mentioned, this will be prudent in this development, since petroleum and other hydrocarbons could be spilled in the environment if not managed well. • Prevent impacts from reaching downstream water resources by ensuring no spillage and proper handling of infrastructure during removal. • Continuous rehabilitation of the area should occur in accordance with the WUL, as well as monitoring as prescribed. • Ensure awareness amongst all staff, contractors and visitors to site to not needlessly harm or hinder animals or damage flora that is endemic and serve as habitat for the animals inhabiting the area. • Allow animals to escape areas of activity freely and do not hinder their movement. • All activities should be preferably restricted to one area as delineated within the formal layout. Strict measurements should be implemented. <p><u>Monitoring</u> Monitoring framework should be instigated and managed by their responsible body and the following system may enforce good practice:</p> <ul style="list-style-type: none"> • Implement an “Observe and report” approach which will enable employees to report any disturbance of flora/fauna or degradation that they encounter. • Alien invasive awareness, eradication and control programme on an annual basis. • Rehabilitation plans should be closely monitored including plant communities to ensure that ecology is restored and self-sustaining. The monitoring of the flora should be conducted annually by the environmental practitioner, until a suitably qualified specialist deems the monitoring to no longer be necessary. <p>Based on findings and recommendations above. it is the reasoned opinion of the specialists that the development may continue if all mitigation measures are implemented.</p>		

LIST OF STUDIES UNDERTAKEN	RECOMMENDATIONS OF SPECIALIST REPORTS	SPECIALIST RECOMMENDATIONS THAT HAVE BEEN INCLUDED IN THE EIA REPORT	REFERENCE TO APPLICABLE SECTION OF REPORT WHERE SPECIALIST RECOMMENDATIONS HAVE BEEN INCLUDED.
Hydrogeological Assessment	Refer to Section 5.1.3 for the baseline described in the Ecology Assessment Report. Table 12 and Table 13 include the potential impacts identified and related mitigation measures recommended.	X	Refer to Section 5.1.3 for the baseline described in the Ecology Assessment Report. Table 12 and Table 13 include the potential impacts identified and related mitigation measures recommended.
Heritage Assessment	<p>A number of known cultural heritage sites (archaeological and/or historical) exist in the larger geographical area within which the study area falls. Previous work in the larger geographical area within which the study area falls recorded a number of cultural heritage (archaeological and historical) sites here.</p> <p>Seven (7) points earmarked for rehabilitation work along the Rapholo River were assessed during the October 2021 field work. Some work related to the rehabilitation had already commenced when the field assessment was conducted, but as most of this work was in the river bed and on the edges of the river bank the impacts were limited away from it. Three sites with archaeological remains were identified in the area during the assessment. Site 1 contains a small scatter of Stone Age tools & undecorated Iron Age pottery, while on Site 2 a small scatter of Iron Age pottery and on Site 3 a number of Stone Age tools were found. All three these sites fall outside of the locations where rehabilitation will take place, but is in close proximity. The density of artifacts on these sites is not large and this makes them also of less cultural heritage (archaeological) significance.</p>	X	Refer to Section 5.1.7 for a summary of the findings of the Heritage Assessment. Table 12 and Table 13 include the potential impacts identified and related mitigation measures recommended.

LIST OF STUDIES UNDERTAKEN	RECOMMENDATIONS OF SPECIALIST REPORTS	SPECIALIST RECOMMENDATIONS THAT HAVE BEEN INCLUDED IN THE EIA REPORT	REFERENCE TO APPLICABLE SECTION OF REPORT WHERE SPECIALIST RECOMMENDATIONS HAVE BEEN INCLUDED.
	<p>Although only 3 sites were identified during the assessment, there could be more sites present in the area, especially in and around the erosion dongas that characterizes the area. Most of these – if any are present – will however be located away from the river bed and river bank areas where the rehabilitation is taking place. From a Cultural Heritage point of view the proposed Rapholo River Rehabilitation Project can therefore continue.</p> <p>Finally, it should be noted that although all efforts are made to locate, identify and record all possible cultural heritage sites and features (including archaeological remains) there is always a possibility that some might have been missed as a result of grass cover and other factors. The subterranean nature of these resources (including low stone-packed or unmarked graves) should also be taken into consideration. Should any previously unknown or invisible sites, features or material be uncovered during any development actions then an expert should be contacted to investigate and provide recommendations on the way forward.</p> <p>From Cultural Heritage point of view the development should therefore be allowed to continue, taking cognizance of the above recommendations.</p>		

6.7 Environmental impact statement

Bokoni Platinum Mine proposes to rehabilitate eroded areas of the Rapholo River which pose a threat to the structural integrity of the PCD and other mine residue and waste water facilities. Rehabilitation structures will include the construction and installation of gabions and stone pitching. The proposed WTP will be constructed adjacent to the existing Merensky WTP, allowing for shared infrastructure and connection to existing infrastructure. The WTP is also located on a site which is already disturbed by adjacent community activities and the existing WTP.

No alternatives have been considered for assessment. This is due to the nature of the activity (rehabilitation of specific high risk areas in the Rapholo River) and the limited feasible options to undertake the activity. The WTP was sited and designed to make use of existing facilities and infrastructure to optimise the WTP and allow for efficient water delivery to the receiving community, whilst taking into consideration environmental impacts.

Alternative options regarding solutions for the excess water were considered. However, the project as described in this report has the greatest advantages for the community the BPM as well as greatly reducing the potential environmental impacts. The WTP and supply of potable water to nearby communities was discussed with the Sekhukhune District Municipality as well as the DWS.

It is the opinion of the EAPs that should the project proceed, impacts on the receiving natural areas can be minimised through the careful adherence to suggested mitigation measures.

Potential impacts Identified have been rated as low significance. The WTP will be constructed on a site that is already disturbed and devoid of natural vegetation and which is adjacent to the existing Merensky WTP. The rehabilitation measures proposed to be undertaken within the Rapholo River are aimed at stabilizing the current river banks and protecting the river from further damage due to erosion.

Table 18: Summary of findings of impact assessment

Aspect	Potential Impact	Phase	Significance without mitigation	Significance with mitigation
Ecology	Site establishment: failure to plan for suitable areas for the construction site establishment may result in unnecessary degradation of the surrounding terrestrial and aquatic environment.	C	Low to medium	Low
Ecology	Construction activities could result in the damage or destruction of flora species.	C, O	Low to medium	Low
Ecology	Construction, human, and vehicle movement and introduction of foreign material e.g., soils may lead to the introduction of alien invader species, impacting on the floral characteristics of the project site and adjacent natural areas. These species may also compete with indigenous species and riparian community structure could be changed. Distribution of AIP species will also be facilitated to downstream areas via the Rapholo River.	C, O	Medium	Low

Aspect	Potential Impact	Phase	Significance without mitigation	Significance with mitigation
Surface Water	Rehabilitation could be ineffective if measures are not appropriately complied to and not implemented correctly. Without the necessary mitigation measures, rehabilitation will be unsuccessful, and the environment will not be self-sustaining.	C,O	Low to medium	Low
Surface water	Alteration of drainage patterns and sediment movement within the Rapholo River due to rehabilitation of the Rapholo River. Loss of Biodiversity and Ecological function. Interference with Ecological Corridor functioning	C, O	Low to medium	Low
Surface Water	Inappropriate location and management of material stockpiles may result in erosion and mobilization of materials into the watercourses.	C	Low to medium	Low
Surface Water	Failure to implement effective stormwater management measures may result in increased surface soil erosion and contamination of the watercourse.	C	Low to medium	Low
Surface Water	The generation of construction waste such as building rubble, excess concrete and general waste created by workers. The inappropriate disposal and management of construction waste may result in the pollution of the watercourse and surrounding environment.	C	Low	Low
Soil	Spillages of hazardous substances from inappropriate handling, transport and use of the substances may result in pollution of soils.	C	Low to medium	Low
Surface Water	Spillages of hazardous substances from inappropriate handling, transport and use of the substances may result in pollution of the surrounding environment and watercourse as well as soil contamination.	C	Low to medium	Low
Ecology	Construction activities within the watercourses could result in impacts on the watercourse habitat and subsequently the loss of aquatic fauna.	C	Medium	Low to medium
Soil	The erosion from construction activities may result in the loss of soil from the development area and surrounds.	C	Low to medium	Low
Ecology	During the construction phase, activities may permanently damage or remove	C	Low to medium	Low

Aspect	Potential Impact	Phase	Significance without mitigation	Significance with mitigation
	unidentified plant and animal SCC present on site. It should however be noted that no SCC were identified during the site assessment.			
Socio-economic	During the construction phase, there is the potential for temporary job opportunities to be created.	C	POSITIVE: Low to Medium	
Air Quality	During the construction phase, construction vehicles and construction activities could result in the generation of significant dust during windy conditions.	C	Low to medium	Low
Visual	During the construction phase construction activity and the presence and use of large machinery on site and along access roads will result in a visual disturbance of the surrounding landscape.	C	Low to medium	Low to medium
Noise	During the construction phase, construction activities could result in an increase in ambient noise levels on site and affect surrounding landowners, road users and the general public.	C	Low to medium	Low
Ecology	Inadequate implementation of rehabilitation measures in disturbed areas may lead to the degradation of the surrounding environment and establishment of alien invasive plant species.	C	Low to medium	Low
Surface Water	During the operation phase, failure to maintain rehabilitation structures and waste water systems and related infrastructure may result in leakages or failure of systems which may pollute the surrounding environment.	O	Medium	Low to medium
Surface Water	Erosion and sedimentation may also occur as a result of poor slope stabilisation.	C, O	Low to medium	Low
Surface Water	Rehabilitation of the watercourse will stabilise and restore riverbanks and reduce further erosion at the rehabilitated areas.	C, O	POSITIVE: Medium	
Socio-economic	Provision of treated water to household without a reliably water supply will improve quality of life for those serviced.	O	POSITIVE: Medium to high	

Aspect	Potential Impact	Phase	Significance without mitigation	Significance with mitigation
Socio-economic	Due to system failures the quality of water provided to communities may be poor.	O	Medium	Low to medium
Groundwater	During the operational phase failure of WTP infrastructure, (pump station etc.) and the lack of infrastructural maintenance coupled with poor operation may lead to waste water overflows resulting in contamination of the ground, groundwater and surrounding water systems.	O	Low to medium	Low
Soil	During the operational phase failure of WTP infrastructure, (pump station etc.) and the lack of infrastructural maintenance coupled with poor operation may lead to waste water overflows resulting in contamination of the ground, groundwater and surrounding water systems.	O	Low to medium	Low
Cultural	Heritage and cultural artefacts may be damaged or destroyed due to construction activities. Note that no heritage or cultural artefacts are expected to occur on the project footprint.	C	Low	Low

7. ASPECTS FOR INCLUSION AS CONDITIONS OF AUTHORISATION

It is recommended that the following conditions be included in the Environmental Authorisation:

- All mitigation measures included in this report should be adhered to.

7.1 Reasoned opinion as to whether the proposed activity should or should not be authorised

It is the EAPs opinion that the information contained in this report and the documentation attached hereto is sufficient to make a decision in respect of the activity applied for.

Having assessed all the potential environmental impacts associated with the proposed development, it is the opinion of the EAP that the project is issued with a positive Environmental Authorisation for the following reasons:

- The proposed development is expected to have low impacts on the natural environment and the aim of the rehabilitation activities is to stabilise the river and prevent / minimise ongoing impacts due to erosion of the river banks.
- No impacts to cultural resources are expected.
- As far as feasible, activities have been positioned to occur on already disturbed area, where impacts to ecological aspects are minimised.
- The proposed project will not have any negative impacts on the environment that cannot be mitigated and managed.
- The development will supply potable water to communities in need, that are not currently serviced by the municipality.
- The proposed project activities support exiting BPM operations, which will continue to provide employment in the region.
- A project-specific Environmental Management Programme (EMPr) has been compiled according to (but not limited to) the impacts and mitigation measures included in this assessment.
- The need and desirability of the project is driven by social and environmental factors.
- The EMPr is a legally binding document and the mitigation measures stipulated within the document and Basic Assessment Report will be implemented by the appointed contractor.
- An Environmental Control Officer (ECO) will need to be appointed to manage the implementation of the EMPr during the construction phase.

7.1 Description of any assumptions, uncertainties and gaps in knowledge

- Due to the nature of the activities (small scale) the site was not subjected to a Visual, Noise, Land Capability, Traffic Impact or Air Quality (etc.) Assessment. Information was sourced from specialist reports compiled for the existing and authorised activities associated with the BPM.
- Ecology Assessment: Summer conditions were encountered during the time of this study (3rd of December 2020) with onset and appointment for the project in August 2020 awaiting formal go-ahead, although rainfall have not been prevalent within the Province before the field assessment date, the area was found to be visibly dry.

7.2 Period for which the Environmental Authorisation is required

The authorisation is required for the duration of the mining activities which is 50 years.

7.3 Undertaking

The undertaking has been included in Part B (EMPr) of this report.

8. FINANCIAL PROVISION

The financial provision for the proposed activities, as applied for and described in this report, has been calculated as R 1,665,783.33 (including (VAT)).

Table 19: Financial Provisioning Calculation

No.	Closure Component	Applicability	Unit	Quantity	Unit rate	Amount (2021)
1	Infrastructure Areas					
1.1	Dismantling of CRP, WTP and related structures	Yes	m ²	250	R783.00	R195,750.00
1.2	Demolition of reinforced concrete buildings and structures	Yes	m ²	1500	R537.00	R805,500.00
1.3	Removal of containers and mobile structures	No	m ²	0	N/A	N/A
	Subtotal					R1,001,250.00
3	General Surface Rehabilitation and Topsoil Placement					
3.1	Topsoil placement over rehabilitated area	Yes	m ³	2500	R24.95	R62,375.00
3.2	Rip and scarify	Yes	Ha	0.5	R6,800.00	R3,400.00
3.3	Hydroseed	Yes	Ha	0.5	R34,200.00	R17,100.00
	Subtotal					R82,875.00
4	P&G's, Contingencies and Allowances					
4.1	Preliminaries and general	Yes	N/A	10%	N/A	R108,412.50
4.2	Contingencies	Yes	N/A	10%	N/A	R108,412.50
4.3	Specialist Studies and additional allowances	No	N/A	10%	N/A	N/A
	Subtotal					R108,412.50
5	Pre-site Relinquishment Monitoring and aftercare					
5.1	Surface Water quality monitoring	Yes	Years	5	R0.00	R0.00
5.2	Groundwater quality monitoring	Yes	Years	5	R0.00	R0.00
5.3	Rehabilitation monitoring (vegetation, soil)	Yes	Years	3	R73,044.09	R219,132.27
5.4	Care and maintenance of rehabilitated areas	Yes	Ha	0.6	R22,612.50	R13,567.50
5.5	Contingencies for post-closure aspects	Yes	N/A	10%	N/A	R23,269.98
	Subtotal					R255,969.75
	GRAND TOTAL (excluding VAT)					R 1,448,507.25
	GRAND TOTAL (including VAT)					R 1,665,783.33

8.1 Explain how the aforesaid amount was derived

As part of the Basic Assessment Report and Environmental Management Plan to be submitted to the Competent Authority the financial provision related the proposed project activities will be calculated according to the provision of Appendix 5 of the NEMA EIA Regulations of 2014 (GNR 982 and GNR 327) and as stipulated under Appendix 4 of the Financial Provision Regulations of 2015 (GNR 1147).

This section provides details on the closure cost. The outlined assumptions and limitations also underpin the basis of this closure cost determination. It is important to note that the estimation is based on existing information. The closure cost calculation has been performed in accordance with NEMA GNR 1147 financial provision.

Due to the current uncertainty surrounding the change in the financial provision regulations, this report has utilised the current existing regulations but has only calculated the final rehabilitation cost and no concurrent rehabilitation cost is included based on the mine schedule. Concurrent annual environmental costs will be included into the operating budget of the mine. The closure costs of the aspects linked with the project have been determined using current contractor costs.

The costing methodology applied is summarized as follows:

- Undertook a site visit to key areas related to the proposed project to confirm observations and assumptions;
- Developed an itemised plan indicating an inventory of closure aspects based on the proposed activities and discussions with mine personnel;
- Defined specific rehabilitation actions for each through reviewing specialist studies, impact assessment outcomes, industry guidelines, and rehabilitation experience;
- Calculated monitoring and maintenance costs and
- Compiled a dedicated closure spreadsheet to determine the closure costs of the quantified actions through applicable rates.

The following qualifications and assumption were made for the assessment:

- Input in this calculation are based on information obtained from the mine, reference documents, site visits and interviews.
- The financial provision calculation is based on prescribed legal methodologies and applications, and is based on certain interpretations and assumptions documented and contextualized to the best ability of the EAP.
- No scheduled cost is included in the quantum calculations for financial provision.
- This calculation addresses rehabilitation costs required at closure and the post closure monitoring and maintenance;
- Contractor rates were utilised to determine the applicable rates.
- Calculations for infrastructure such as plant infrastructure, concreted areas and steel structures were based on estimates received from the client.
- A contingency of 10% has been included to allow for unforeseen costs associated with contractors or rate increases in the closure phase and post closure phase.
- The calculated costs only relate to those activities being applied for in this application and no provision was made for existing activities related to the BPM.

8.2 Confirm that this amount can be provided from operating expenditure

Bokoni Platinum Mines will provide the financial provision as specified by the Competent Authority.

9. SPECIFIC INFORMATION REQUIRED BY THE COMPETENT AUTHORITY

9.1 Compliance with the provisions of sections 24(4)(a) and (b) read with section 24 (3) (a) and (7) of the National Environmental Management Act (Act 107 of 1998). the EIA report must include the:-

9.2 Impact on the socio-economic conditions of any directly affected person

A consultation process was conducted (Appendix 5). During this process landowners, surrounding landowner, national, provincial and local government departments were identified and notified of the application. All comments and concerns were recorded and considered during compilation of this report. Appendix 5 provides comprehensive details on the PPP to date with sufficient proof.

9.3 Impact on any national estate referred to in section 3(2) of the National Heritage Resources Act

As the footprint of the rehabilitation areas are situated within the course of the Rapholo River and the WTP is located in a village and on areas already cleared by community activities, no Heritage Resources are expected to be encountered or impacted by the proposed rehabilitation project.

Note that various heritage assessment have been undertaken on the BPM Mining Right Area. No archaeological findings of significance were noted on the areas related to this proposed project's footprint.

9.4 Other matters required in terms of sections 24(4)(a) and (b) of the Ac.

Refer to section 3.6, 3.7 and 6.4.

PART B: ENVIRONMENTAL MANAGEMENT PROGRAMME REPORT

10. ENVIRONMENTAL MANAGEMENT PROGRAMME

10.1 Details of the EAP

Name of the Practitioner:	Nicole Upton
Tel No.:	079 555 2433
Fax No.:	N/A
Postal address:	PostNet Suite 0111, Private Bag X37, Lynnwood Ridge, 0040
E-mail address:	nicole@redkiteconsulting.co.za

The requirement for the provision of the details and expertise of the EAP are included in PART A of the Basic Assessment Report. Refer to Appendix 1 and 2 for qualifications and a comprehensive CV.

10.2 Description of the Aspects of the Activity

The requirement to describe the aspects of the activity is already included in PART A of the Basic Assessment Report.

10.3 Composite Map

Refer to Appendix 3 for the locality map and Appendix 4 for sensitivity maps.

10.4 Description of Impact management objectives including management statements

10.4.1 Determination of closure objectives

The closure objectives provided below are to ensure that the closure of the site is compliant with the legislature and that the environment will be left in a state which is sustainable and not harmful. Closure objectives include but are not limited to:

- To ensure closure complies with the Mineral and Petroleum Resources Development Act 28 of 2002.
- To ensure that the footprints are rehabilitated to an acceptable standard and that all environmental and social risks have been reduced and do not pose any threat to the environment.
- To implement management strategies that will ensure that the negative impacts (risks) associated with proposed project activities are eliminated or minimized to acceptable standards.
- To leave the area in a manner that is environmentally safe and does not pose any health risks to the neighbouring communities.

10.4.2 Volumes and rate of water use required for the operation.

The proposed Water Treatment Plant will treat 4 000 m³ of waste water per day.

Water use requirements for the expansion of the processing plant (Chrome Recovery Plant) still need to be determined. However, it is expected that waste water will be reused in the process.

10.4.3 Has a water use licence has been applied for?

A water use licence has been applied for in terms of the National Water Act (Act No. 36 of 1998).

10.5 Impact Management Measures

Aspect	Potential Impact	Phase	Mitigation Measures	Timeframe for implementation
Ecology	Site establishment: failure to plan for suitable areas for the construction site establishment may result in unnecessary degradation of the surrounding terrestrial and aquatic environment.	C	<ul style="list-style-type: none"> The design of the construction site must ensure minimal impacts to the aquatic and terrestrial environment. The construction site must be demarcated and communicated with the contractor prior to commencement of construction. Avoid encroaching on natural areas directly adjacent to proposed activities in close proximity or within buffer areas. Construction must only take place within the demarcated construction footprint. Any construction outside of the demarcated site must be approved by the ECO before construction in this area takes place. 	<p>Prior to construction commencing</p> <p>On-going</p>
Ecology	Construction activities could result in the damage or destruction of flora species.	C, O	<ul style="list-style-type: none"> Movement for construction personnel and vehicles in natural areas should be limited as far as possible to prevent unnecessary destruction of habitats or disturbance of species. It is also vital that no additional fragmentation occurs and that existing roads are used as far as possible in order to limit the area of disturbance. Should any vegetation removal be necessary for construction of rehabilitation structures, it should be controlled and very specific. Continuous rehabilitation of the areas impacted which are outside of the project footprint should occur during construction, where revegetation practices should be prioritised. All footprint areas should remain as small as possible. 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. 	On-going throughout construction and operational phase
Ecology	Construction, human, and vehicle movement and introduction of foreign material e.g., soils may lead to the introduction of alien invader species, impacting on the floral characteristics of the project site and adjacent natural areas. These species may also compete with	C, O	<ul style="list-style-type: none"> Demarcate specific areas to be developed and remain clear of other areas where activities are not necessary. 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 and should be planned and budgeted for in advance. Avoidance of unnecessary disturbance or destruction of natural habitat is an important mitigation tool for flora and thereby associated fauna. 	<p>On-going throughout construction and operational phase</p> <p>AIP monitoring and removal annually throughout</p>

Aspect	Potential Impact	Phase	Mitigation Measures	Timeframe for implementation
	<p>indigenous species and riparian community structure could be changed. Distribution of AIP species will also be facilitated to downstream areas via the Rapholo River.</p>		<ul style="list-style-type: none"> • Avoid encroaching on natural areas directly adjacent to proposed activities in close proximity or within buffer areas. • Implement rehabilitation features as proposed by the formal rehabilitation programme as proposed (Agreenco, 2018). • Rehabilitation must include planting of indigenous local species, preferably suitable riparian species if banks and beds are affected and as per approved rehabilitation plan for Section 21 (c) & (i) activities - focussing on species native to the river. • Proliferation of alien and invasive species is expected within any disturbed areas. These species should be eradicated and controlled to prevent their spread within or beyond the footprint. • A management plan and proper follow-up strategy for the prevention of the establishment and/or further spread of new populations of such species should be developed and enforced. • Rehabilitate affected areas as soon as possible and after approval had been obtained for the project. • To prevent the erosion of soil, management measures may include structures to protect areas and soil from areas susceptible to erosion. Water control structures should be constructed and well maintained to minimize erosion and to create a favourable habitat for the establishment of vegetation. 	<p>construction and operational phases</p>
<p>Surface Water</p>	<p>Rehabilitation could be ineffective if measures are not appropriately complied to and not implemented correctly. Without the necessary mitigation measures, rehabilitation will be unsuccessful, and the environment will not be self-sustaining.</p>	<p>C,O</p>	<ul style="list-style-type: none"> • A management plan for control of invasive/exotic plant species needs to be implemented for all footprint and surrounding areas. This will be ongoing until the end of the mining closure phase. • Rehabilitation plans should be planned long before the closure phase is due. Continuous rehabilitation, as needed, should also take place during the operational phase. • Rehabilitation plan should be implemented. This includes the process of replanting the vegetation. Rehabilitation plans should be compiled with the use of a specialist and the correct seeding techniques and mixtures should be applied. • Close monitoring of plant communities to ensure that ecology is restored and self-sustaining. The monitoring of the flora should be conducted annually, until a suitably qualified specialist deems the monitoring to no longer be necessary. A report should be written and stored and should be available at all times. 	<p>On-going throughout construction and operational phase</p> <p>AIP monitoring and removal annually throughout construction and operational phases</p>

Aspect	Potential Impact	Phase	Mitigation Measures	Timeframe for implementation
Surface water	Alteration of drainage patterns and sediment movement within the Rapholo River due to rehabilitation of the Rapholo River. Loss of Biodiversity and Ecological function. Interference with Ecological Corridor functioning	C, O	<ul style="list-style-type: none"> Regular monitoring of rehabilitation areas, specifically the occurrence of erosion. Implement the formal rehabilitation programme to combat and prevent additional erosion in the areas identified as priority areas as per rehabilitation report (Agreenco, 2018). 	Annual visual monitoring of rehabilitated areas of the Rapholo River.
Surface Water	Inappropriate location and management of material stockpiles may result in erosion and mobilization of materials into the watercourses.	C	<ul style="list-style-type: none"> Material stockpiles must be located 50 m away from the watercourse. Construction should preferably be undertaken in the dry season. Material stockpiles locations must be approved by the ECO. 	On-going throughout construction phase
Surface Water	Failure to implement effective stormwater management measures may result in increased surface soil erosion and contamination of the watercourse.	C	<ul style="list-style-type: none"> Berms and swathes must be placed in areas that may be prone to erosion. Temporary cut-off drains and berms may be required to capture storm water and promote infiltration. Construction should preferably be undertaken in the dry season. 	On-going throughout construction phase
Surface Water	The generation of construction waste such as building rubble, excess concrete and general waste created by workers. The inappropriate disposal and management of construction waste may result in the pollution of the watercourse and surrounding environment.	C	<ul style="list-style-type: none"> All general waste must be disposed of in bins/waste skips labelled "general waste". Sufficient waste bins must be provided throughout the construction site for collecting waste. All general waste collected on site must be disposed of at a licensed general waste disposal site. Adequate sanitary facilities must be provided for construction workers and they must be properly secured to the ground. Maintenance of the chemical toilets should be done on a regular basis to prevent any leakages. 	On-going throughout construction phase
Soil	Spillages of hazardous substances from inappropriate handling, transport and use of the substances may result in pollution of soils.	C	<ul style="list-style-type: none"> Cement and concrete must not be mixed directly on the ground, or during rainfall events. Drip trays must be placed under stationary construction machinery overnight to avoid soil contamination from oil and fuel leaks. Absorbent materials in the form of a spill kit must be provided on site. Contaminated soil must either be excavated or treated on-site, depending on the nature and 	On-going throughout construction phase

Aspect	Potential Impact	Phase	Mitigation Measures	Timeframe for implementation
			extent of the spill. • Contaminated remediation materials must be carefully removed from the area of the spill so as to prevent further release of petrochemicals to the environment, and stored in suitable containers until appropriate disposal. • All hazardous waste generated on site must be placed in a temporary impermeable banded containment area which must be disposed of at a hazardous landfill site or be collected by the appropriate service provider.	
Surface Water	Spillages of hazardous substances from inappropriate handling, transport and use of the substances may result in pollution of the surrounding environment and watercourse as well as soil contamination.	C	• Cement and concrete must not be mixed directly on the ground, or during rainfall events when the potential for transport of pollutants to watercourses is the greatest. • Used cement bags should be collected and stored in containers to prevent wind-blown cement dust and water contamination. • Mixed cement/concrete must not be allowed to flow into any watercourses. • Drip trays must be placed under stationary construction machinery overnight to avoid soil contamination from oil and fuel leaks. • Absorbent materials in the form of a spill kit must be provided on site. • Contaminated soil must either be excavated or treated on-site, depending on the nature and extent of the spill. • Contaminated remediation materials must be carefully removed from the area of the spill so as to prevent further release of petrochemicals to the environment, and stored in suitable containers until appropriate disposal. • All hazardous waste generated on site must be placed in a temporary impermeable banded containment area which must be disposed of at a hazardous landfill site or be collected by the appropriate service provider.	On-going throughout construction phase
Ecology	Construction activities within the watercourses could result in impacts on the watercourse habitat and subsequently the loss of aquatic fauna.	C	• Any aquatic fauna found on site prior during construction must be removed and reintroduced into undisturbed areas of the watercourse as approved by the ECO.	Prior to commencement of construction and throughout the construction phase, as needed.
Soil	The erosion from construction activities may result in the loss of	C	• Stormwater control must be undertaken to prevent soil loss from the site. • The contractor must develop and implement an Erosion Management Plan.	On-going throughout construction phase

Aspect	Potential Impact	Phase	Mitigation Measures	Timeframe for implementation
	soil from the development area and surrounds.		<ul style="list-style-type: none"> • All erosion control mechanisms must be regularly maintained. • Natural vegetation must be retained where possible to avoid soil erosion. • Construction must be phased in order to minimise the area of exposed soil at any one time. • Disturbed areas of natural vegetation must be rehabilitated immediately to prevent further soil erosion. • Fill and stabilise eroded river banks immediately after construction activity in the specific area commences. 	
Ecology	During the construction phase, activities may permanently damage or remove unidentified plant and animal SCC present on site. It should however be noted that no SCC were identified during the site assessment.	C	<ul style="list-style-type: none"> • Should SCC be identified during construction, construction activities in the area containing the SCC must stop immediately and a search and rescue operation must be conducted by a qualified botanist. • All SCC impacted by construction activities must be conserved and rescued. • All rescued SCC must be transplanted to a suitable habitat or nursery for the duration of the construction phase; • All rescued SCC must be replanted within the site where it was originally found or in close proximity during rehabilitation 	On-going throughout construction phase, as needed.
Socio-economic	During the construction phase, there is the potential for temporary job opportunities to be created.	C	<ul style="list-style-type: none"> • Where possible construction resources must be purchased from local companies. 	On-going throughout construction phase.
Air Quality	During the construction phase, construction vehicles and construction activities could result in the generation of significant dust during windy conditions.	C	<ul style="list-style-type: none"> • During windy periods un-surfaced and un-vegetated areas must be dampened down. • Vegetation must be retained where possible as this will reduce dust travel. • Any complaints or claims emanating from dust issues must be attended to immediately and noted in the complaints register. 	On-going throughout construction phase, as needed.
Visual	During the construction phase construction activity and the presence and use of large machinery on site and along access roads will result in a visual disturbance of the surrounding landscape.	C	<ul style="list-style-type: none"> • All construction activity should take place during daylight working hours (i.e. 7 – 5pm). • All construction activity and equipment must be limited to the demarcated areas. • Good housekeeping must be maintained throughout the construction work areas to limit the visual intrusion of the construction activities. 	On-going throughout construction phase.

Aspect	Potential Impact	Phase	Mitigation Measures	Timeframe for implementation
Noise	During the construction phase, construction activities could result in an increase in ambient noise levels on site and affect surrounding landowners, road users and the general public.	C	<ul style="list-style-type: none"> • Activities which include the movement of construction vehicles and the operation of machinery should be restricted to normal working hours (07:00am – 17:00pm). • There must be a complaints register on site for nearby residents to make complaints. These must be addressed and recorded. 	On-going throughout construction phase.
Ecology	Inadequate implementation of rehabilitation measures in disturbed areas may lead to the degradation of the surrounding environment and establishment of alien invasive plant species.	C	<ul style="list-style-type: none"> • The rehabilitation plan must be implemented during and after the construction has been completed. • All temporarily disturbed areas must be rehabilitated with indigenous vegetation as soon as construction in the particular area or phase of work is complete, i.e. rehabilitation is on-going throughout construction as phases have been completed. • All impacted areas must be restored as per the EMP requirements. 	On-going throughout construction phase.
Surface Water	During the operation phase, failure to maintain rehabilitation structures and waste water systems and related infrastructure may result in leakages or failure of systems which may pollute the surrounding environment.	O	<ul style="list-style-type: none"> • Regular maintenance and inspections of all infrastructure and services must be undertaken the operational phase of the rehabilitation works and WTP and related infrastructure. 	Throughout operational phase at interval specified by facility engineer.
Surface Water	Erosion and sedimentation may also occur as a result of poor slope stabilisation.	C, O	<ul style="list-style-type: none"> • Banks must be rehabilitated, including re-establishment of vegetation cover; • Continued maintenance of the rehabilitation structures, especially following a flooding event, must take place. 	<p>Annual visual monitoring of rehabilitated areas of the Rapholo River.</p> <p>Maintenance and rehabilitation on-going throughout construction and operational phase, as needed.</p>

Aspect	Potential Impact	Phase	Mitigation Measures	Timeframe for implementation
Surface Water	Rehabilitation of the watercourse will stabilise and restore riverbanks and reduce further erosion at the rehabilitated areas.	C, O	N/A	N/A
Socio-economic	Provision of treated water to household without a reliably water supply will improve quality of life for those serviced.	O	N/A	N/A
Socio-economic	Due to system failures the quality of water provided to communities may be poor.	O	<ul style="list-style-type: none"> •Water supplied to communities for potable use must be monitored for selected water quality parameters regularly. •Monitoring results should be available upon request to authorities and I&APs or community. •During the operational phase all water treatment infrastructure must be properly managed, maintained and operated throughout the life of the project. •During the operational phase periodic inspections of the WTP infrastructure should be implemented to identify any system failure. 	Monthly monitoring of potable water quality. Throughout operational phase at interval specified by facility engineer.
Groundwater	During the operational phase failure of WTP infrastructure, (pump station etc.) and the lack of infrastructural maintenance coupled with poor operation may lead to waste water overflows resulting in contamination of the ground, groundwater and surrounding water systems.	O	<ul style="list-style-type: none"> •During the operational phase all water treatment infrastructure must be properly managed, maintained and operated throughout the life of the project. •During the operational phase periodic inspections of the WTP infrastructure should be implemented to identify any system failure which could lead to contamination of the groundwater and surrounding water bodies. •Any leaks and failures of the WTP infrastructure must be fixed immediately and areas rehabilitated as needed. 	Throughout operational phase at interval specified by facility engineer.
Soil	During the operational phase failure of WTP infrastructure, (pump station etc.) and the lack of infrastructural maintenance coupled with poor operation may lead to waste water overflows resulting in	O	<ul style="list-style-type: none"> •During the operational phase all water treatment infrastructure must be properly managed, maintained and operated throughout the life of the project. •During the operational phase periodic inspections of the WTP infrastructure should be implemented to identify any system failure which could lead to contamination of the groundwater and surrounding water bodies. 	Throughout operational phase at interval specified by facility engineer.

Aspect	Potential Impact	Phase	Mitigation Measures	Timeframe for implementation
	contamination of the ground, groundwater and surrounding water systems.		<ul style="list-style-type: none"> Any leaks and failures of the WTP infrastructure must be fixed immediately and areas rehabilitated as needed. 	On-going throughout operational phase, as needed.
Cultural	Heritage and cultural artefacts may be damaged or destroyed due to construction activities. Note that no heritage or cultural artefacts are expected to occur on the project footprint.	C	<ul style="list-style-type: none"> Local museums as well as the South African Heritage Resource Agency (SAHRA) will be informed if any artifacts are uncovered in the affected area and mitigation measures recommended by SAHRA will be followed. The contractor will ensure that his workforce is aware of the necessity of reporting any possible historical or archaeological finds to the ECO so that appropriate action can be taken. Any discovered artifacts will not be removed under any circumstances. Any destruction of a site can only be allowed once a permit is obtained and the site has been mapped and noted. 	On-going throughout construction phase.

10.5.1 Financial Provision

10.5.1.1 Determination of the amount of Financial Provision.

10.5.1.1.1 Describe the closure objectives and the extent to which they have been aligned to the baseline environment described under the Regulation.

The closure objectives provided below are to ensure that the closure of the site is compliant with the legislature and that the environment will be left in a state which is sustainable and not harmful. Closure objectives include but are not limited to:

- To ensure closure complies with the Mineral and Petroleum Resources Development Act 28 of 2002.
- To ensure that the prospecting footprints are rehabilitated to an acceptable standard and that all environmental and social risks have been reduced and do not pose any threat to the environment.
- To implement management strategies that will ensure that the negative impacts (risks) associated with proposed prospecting are eliminated or minimized to acceptable standards.
- To leave the area in a manner that is environmentally safe and does not pose any health risks to the neighbouring communities.

10.5.1.1.2 Confirm specifically that the environmental objectives in relation to closure have been consulted with landowner and interested and affected parties.

The draft report was made available to all identified I&APs for review and comment. Comments and concerns have been recorded and incorporated in the Final BAR and EMPr which will be submitted to the DMRE (Competent Authority). PPP has been included in Appendix 5.

10.5.1.1.3 Provide a rehabilitation plan that describes and shows the scale and aerial extent of the main mining activities, including the anticipated mining area at the time of closure.

Refer to Appendix 4 for the layout of the proposed activities. Refer to Appendix 11 for Bokoni Platinum Mines' Rehabilitation Strategy and Implementation Plan.

10.5.1.1.4 Explain why it can be confirmed that the rehabilitation plan is compatible with the closure objectives.

The rehabilitation plan has been compiled in accordance with the objectives and goals and is deemed to be satisfactory according to the Mine and Petroleum Resources Development Act, 2002 (Act No. 28 of 2002) as amended and GNR 1147 of the National Environmental Management Act, 1988 (Act No. 107 of 1998).

10.5.1.1.5 Calculate and state the quantum of the financial provision required to manage and rehabilitate the environment in accordance with the applicable guideline.

The financial provision for the proposed activities, as applied for and described in this report, has been calculated as R 1,665,783.33 (including VAT).

Table 20: Financial Provisioning Calculation

No.	Closure Component	Applicability	Unit	Quantity	Unit rate	Amount (2021)
1	Infrastructure Areas					
1.1	Dismantling of CRP, WTP and related structures	Yes	m ²	250	R783.00	R195,750.00
1.2	Demolition of reinforced concrete buildings and structures	Yes	m ²	1500	R537.00	R805,500.00
1.3	Removal of containers and mobile structures	No	m ²	0	N/A	N/A
	Subtotal					R1,001,250.00
3	General Surface Rehabilitation and Topsoil Placement					
3.1	Topsoil placement over rehabilitated area	Yes	m ³	2500	R24.95	R62,375.00
3.2	Rip and scarify	Yes	Ha	0.5	R6,800.00	R3,400.00
3.3	Hydroseed	Yes	Ha	0.5	R34,200.00	R17,100.00
	Subtotal					R82,875.00
4	P&G's, Contingencies and Allowances					
4.1	Preliminaries and general	Yes	N/A	10%	N/A	R108,412.50
4.2	Contingencies	Yes	N/A	10%	N/A	R108,412.50
4.3	Specialist Studies and additional allowances	No	N/A	10%	N/A	N/A
	Subtotal					R108,412.50
5	Pre-site Relinquishment Monitoring and aftercare					
5.1	Surface Water quality monitoring	Yes	Years	5	R0.00	R0.00
5.2	Groundwater quality monitoring	Yes	Years	5	R0.00	R0.00
5.3	Rehabilitation monitoring (vegetation, soil)	Yes	Years	3	R73,044.09	R219,132.27
5.4	Care and maintenance of rehabilitated areas	Yes	Ha	0.6	R22,612.50	R13,567.50
5.5	Contingencies for post-closure aspects	Yes	N/A	10%	N/A	R23,269.98
	Subtotal					R255,969.75
	GRAND TOTAL (excluding VAT)					R 1,448,507.25
	GRAND TOTAL (including VAT)					R 1,665,783.33

10.5.1.1.6 Confirm that the financial provision will be provided as determined.

Bokoni Platinum Mines will provide the financial provision as specified by the Competent Authority.

10.6 Mechanisms for monitoring compliance with and performance assessment against the environmental management programme and reporting thereon

The monitoring and performance of the prospecting activities will be conducted as prescribed in terms of regulation 55 of the Mineral and Petroleum Resources Development Act, 2002 (Act 28 of 2002). Section 38 of the Act is also relevant as far as monitoring of impacts is concerned. This section stipulates that the holder of the prospecting right or permit is required to rehabilitate the land disturbed to its natural state or predetermined condition. An annual EMP performance assessment will be submitted to DMRE.

The Impact Assessment table in Section 10.5 shows the anticipated impacts associated with proposed activities together with mitigation measures to reduce or lower environmental impacts associated with the proposed activities.

Due to the low significance of the potential impacts related to the proposed project activities, the existing monitoring programme is considered to be sufficient. Monitoring requirements as set out in the approved EMP and WUL for the operations should continue to be implemented as required.

The existing and approved monitoring programme required to be implemented by Bokoni Platinum Mines includes the following aspects:

- Dust monitoring done in-house on a monthly basis.
- Groundwater quality and borehole level monitoring is completed quarterly.
- Process water is monitored monthly.
- Surface water monitoring for potable water takes place on a monthly basis on site.
- Bi-annual bio-monitoring and toxicity testing.
- Annual vegetation, sediment and terrestrial biodiversity assessments.

Additional to the above monitoring requirements, Alien Invasive Plant monitoring and eradication should be undertaken annually.

10.7 Indicate the frequency of the submission of the performance assessment/ environmental audit report

All information as required by the various Government Departments should be captured and be readily available for submission when required and also for review by the external consultant conducting the performance assessment and audits.

As per NEMA EIA Regulations, a performance assessment/audit will be conducted by an external consultant throughout the life of mine at intervals stipulated in the EA. It is recommended to complete these audits annually. This is conducted to assess the adequacy and compliance to the EMP and the relevant legislation. As per NEMA, any amendments to the EMP that may be required due to the performance assessment findings will be completed if necessary.

The Financial Provision must be reviewed on an annual basis, and submitted to the DMR.

In addition to the NEMA requirements, the IWUL will be audited as per conditions. The IWWMP will be updated annually.

10.8 Environmental Awareness Plan

10.8.1 Manner in which the applicant intends to inform his or her employees of any environmental risk which may result from their work.

All employees will undergo an induction course when they are employed at the prospecting area which will inform them of the environmental issues / risks and requirements prior to work commencing. An annual refresher will be done thereafter. The following aspects of environmental training should be included within the induction course:

- Sustainability
- Environmental goals and manner of achieving these
- Rehabilitation
- Waste management / minimisation (including recycling)
- Saving water
- Dealing with soil contamination and spillages
- Solutions to environmental risks

The Site manager shall ensure that adequate environmental training takes place. All employees shall be given an induction presentation on environmental awareness. Where possible, the presentation needs to be conducted in a language understandable by all employees. The environmental training should, as a minimum, include the following:

- The importance of conformance with all environmental policies;
- The environmental impacts, actual or potential, of their work activities
- The environmental benefits of improved personal performance;
- The potential consequences of departure from specified operating procedures;
- The mitigation measures required to be implemented when carrying out their work activities;
- The importance of not littering; and
- Details of, and encouragement to, minimise the production of waste and re-use, recover and recycle waste where possible.

10.8.2 Manner in which risks will be dealt with in order to avoid pollution or the degradation of the environment.

Refer to Section 10.5 for the recommended mitigation measures to limit environmental impacts.

Objectives

The following requirements are relevant:

- The organisation shall establish, implement and maintain a procedure(s) to identify potential emergency situations and potential accidents that can have an impact(s) on the environment and how it will respond to them.
- The organisation shall respond to actual emergency situations and accidents and prevent or mitigate associated adverse environmental impacts.
- The organisation shall periodically review and, where necessary, revise its emergency preparedness and response procedures, in particular, after the occurrence of accidents or emergency situations.
- The organisation shall also periodically test such procedures where practicable.

Identification of Environmental Risks

Environmental risks must be identified and procedures must be set in place by the Mine to deal with potential environmental risks, which could include:

- Environmental emergency situations;

- Potential accidents that can have an impact on the environment; and
- General environmental ignorance that could lead to unnecessary pollution or disturbance to the environment.

Potential environmental risks identified on the Bokoni Platinum Mine operations:

- Petrochemical/chemical spillages;
- Hazardous material spillages;
- Uncontrolled emissions to the atmosphere;
- Fires;
- Tailings residue stockpiles (wet or dry) failures;
- Untreated effluent spillages;
- Explosions and natural disasters;
- Disturbance of sensitive ecological environments;
- Disturbance to heritage and cultural resources;
- Uncontrolled erosion; and
- Dissatisfaction of local communities / outrage of communities.

Incident response steps

- 1) Incidents are to be reported to a supervisor and ECO immediately.
- 2) The responsible person or, where the incident occurred in the course of that person's employment, his or her employer, must, as soon as reasonably practicable after knowledge of the incident –
 - a) take all reasonable measures to contain and minimise the effects of the incident, including its effects on the environment and any risks posed by the incident to the health, safety and property of persons. Risk classification is determined for the incident.
 - b) undertake clean-up procedures;
 - c) remedy the effects of the incident;
 - d) assess the immediate and long-term effects of the incident on the environment and public health.
- 3) Incident Register is completed, including actions taken to remediate impacts.
- 4) Incidents with a risk of medium and above must be reported to the responsible authority within 24 hours and action plan compiled with 14 days.

10.8.2.1 Incident Reporting

The responsible person or, where the incident occurred in the course of that person's employment, his or her employer must forthwith after knowledge of the incident, report through the most effective means reasonably available –

- a. the nature of the incident;
- b. the substances involved and an estimation of the quantity released and their possible acute effect on persons and the environment and data needed to assess these effects;
- c. any risks posed by the incident to public health, safety and property;
- d. the toxicity of substances or by-products released by the incident; and
- e. any steps that should be taken in order to avoid or minimise the effects of the incident on public health and the environment
- f. causes of the incident, whether direct or indirect, including equipment, technology, system, or management failure; and
- g. measures taken and to be taken to avoid a recurrence of such incident.

Should the incident pose a threat to public health, safety and property or have a risk rating of medium or higher the incident report must be submitted to -

- a. the Director-General;
- b. the South African Police Services and the relevant fire prevention service;
- c. the relevant provincial head of department or municipality; and

- d. all persons whose health may be affected by the incident.

10.8.2.2 Risk Classification

1. Risk Calculation

Exposure X Probability X Result (Consequence) = Risk Rating

2. Risk Reduction

Exposure X Probability X Result (Consequence after mitigation steps are implemented) = Risk Rating after Mitigation

3. Risk Level

400 <	=	Very High risk, discontinuation considered immediate correction required
200 to 400	=	High risk, immediate correction required
70 to 200	=	Medium / Substantial risk, mitigation required
20 to 70	=	Low / Possible risk, mitigate when required
>20	=	Tolerable risk, report to Supervisor when complete

Probability Of Event Occurring	Risk	Exposure To Event	Risk
Almost Certain	10	Yearly	0.5
Has happened	6	Quarterly	1
Possible	3	Monthly	2
Heard of	1	Weekly	3
Unlikely	0.5	Daily	6
		Continuous	10
Result (Consequence)			Risk Rating
Catastrophic Environmental Impact Irreversible / regional degradation of the biophysical environment, biodiversity compromised on regional scale, formal complaints with clear expectations of corrective actions, impact on immediate and remote neighbours			100
Major Environmental Impact. Irreversible and localised degradation of the biophysical environment, biodiversity compromised on local scale, formal complaints with clear expectations of corrective actions, impact on immediate neighbours (level 3)			40
Very Serious Environmental Impact Irreversible and localised degradation of the biophysical environment, biodiversity compromised on local scale, formal complaints with clear expectations of corrective actions, impact on immediate neighbours (level 2)			15
Serious Environmental Impact Reversible and localised degradation of the biophysical environment, biodiversity not compromised, low-level complaints, no perceived expectations of corrective action(level 1)			7
Self-reversible impact within life of business. No reasonable cause for external complaints			3
Minor environmental incident. Very low impact on biophysical environment, No reasonable cause for external complaints			1

4. Follow-up

Within 24 hours of an incident occurring, regardless of size or impact, the supervisor will conduct a follow-up investigation. The investigation will attempt to determine the cause of the incident and any procedural modifications needed to prevent the spill from recurring. Information gathered during the follow-up investigation will be used in preparing the written report described above.

10.9 Specific information required by the Competent Authority

The Immediate Closure Provision is and will continue to be updated yearly as part of the annual liability assessment required by the MPRDA and GNR 1147 in terms of the NEMA.

11. UNDERTAKING

The EAP herewith confirms

- a) the correctness of the information provided in the reports
- b) the inclusion of comments and inputs from stakeholders and I&APs;
- c) the inclusion of inputs and recommendations from the specialist reports where relevant; and
- d) that the information provided by the EAP to interested and affected parties and any responses by the EAP to comments or inputs made by interested and affected parties are correctly reflected herein.



Signature of the environmental assessment practitioner:

Red Kite Environmental Solutions (Pty) Ltd

Name of company:

22 October 2021

Date:

-END-