

Scoping Report for Public Review

Bierspruit Opencast

**Rustenburg Platinum Mines Limited, Anglo American
Platinum, Amandelbult Complex**

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Abbreviations

Abbreviation	Definition
AIP	Alien and Invasive Plant Species
BAT	Best Available Techniques
BID	Background Information Document
BPEO	Best Practicable Environmental Option
BSR	Blast Sensitive Receptors
CA	Competent Authority
CARA	Conservation of Agricultural Resources Act (Act No. 43 of 1983)
CRR	Comment and Response Report
CSR	Consultation Scoping Report
DALRRD	Department of Agriculture, Land Reform and Rural Development
DEA&DP	Western Cape Department of Environmental Affairs and Development Planning
DFFE	Department of Forestry, Fisheries and the Environment
DME	Department of Minerals and Energy
DMR	Department of Mineral Resources
DWS	Department of Water and Sanitation
EA	Environmental Authorisation
EAP	Environmental Assessment Practitioner
EIA	Environmental Impact Assessment
EIR	Environmental Impact Report
EMF	Environmental Management Framework
EMPr	Environmental Management Programme Report
FSR	Final Scoping Report
GN	Government Notice
HDSA	Historically Disadvantaged South Africans
HIA	Heritage Impact Assessment
I&APs	Interested and Affected Parties
IAIA	International Association of Impact Assessment
IDP	Integrated Development Plan
IFC	International Finance Corporation
IWULA	Integrated Water Use Licence Application
kV	Kilovolts
LEDET	Limpopo Department of Economic Development, Environment and Tourism
LEMA	Limpopo Environmental Management Act (Act No. 7 of 2003)
LHRA	Limpopo Provincial Heritage Resources Authority
LOM	Life of Mine
mamsl	Meters above mean sea level
MRA	Mining Rights Application
NEM:AQA	National Environmental Management: Air Quality Act (Act No. 39 of 2004)
NEM: BA	National Environmental Management: Biodiversity Act (Act No. 10 of 2004)
NEMA	National Environmental Management Act (Act No. 107 of 1998)
NEM:WA	National Environmental Management: Waste Act (Act No. 59 of 2008)
NHRA	National Heritage Resources Act (Act No. 25 of 1999)
NSD	Noise Sensitive Developments
NWA	National Water Act (Act No. 36 of 1998)
PES	Present Ecological State
PGE	Platinum Group Elements
PIA	Palaeontological Impact Assessment
PoS	Plan of Study
PPP	Public Participation Process
PSS	Potential Sensitive Structures
ROM	Run of Mine

Abbreviation	Definition
SAHRA	South African Heritage Resources Agency
SANRAL	South African National Roads Agency
SCC	Species of Conservation Concern
SDF	Spatial Development Framework
SLP	Social Labour Plan
STI	Sexually Transmitted Infections
TLM	Thabazimbi Local Municipality
ToR	Terms of Reference
USBM	United States Bureau of Mines
WDM	Waterberg District Municipality
WHO	World Health Organisation

NEMA REQUIREMENTS WITH REFERENCE TO RELEVANT SECTIONS OF THIS REPORT

Details of how the structure of the Scoping Report addresses applicable requirements for information in terms of the National Environmental Management Act (Act No. 107 of 1998) (NEMA) is outlined in Table 1.

Table 1: Environmental Impact Assessment Regulations (GN No. 982 of 2014) requirements for Scoping Reports

Content as required by NEMA	NEMA Section	Chapter / Section number
Details of - (i) The EAP who prepared the report and; (ii) The expertise of the EAP, including a CV;	2(a)	1.1.1 1.1.2
The location of the activity, including – (i) The 21 digit Surveyor General code of each cadastral land parcel; (ii) Where available, the physical address and farm name; (iii) Where the required information in items (i) and (ii) is not available, the coordinates of the boundary of the property or properties;	2(b)	2
A plan which locates the proposed activity or activities applied for at an appropriate scale, or, if it is- (i) A linear activity, a description and coordinates of the corridor in which the proposed activity or activities is to be undertaken; or (ii) On land where the property has not been defined, the coordinates within which the activity is to be undertaken;	2(c)	3
A description of the scope of the proposed activity, including: (i) All listed and specified activities triggered; (ii) A description of the activities to be undertaken, including associated structures and infrastructure;	2(d)	4
A description of the policy and legislative context within which the development is proposed, including an identification of all legislation, policies, plans, guidelines, spatial tools, municipal development planning frameworks and instruments that are applicable to this activity and are to be considered in the assessment process;	2(e)	5
A motivation for the need and desirability for the proposed development including the need and desirability of the activity in the context of the preferred location;	2(f)	6
Period of environmental authorisation	2(g)	7
A full description of the process followed to reach the proposed preferred activity, site and location within the site, including:	2(h)	8.1
(i) Details of all the alternatives considered;		
(ii) Details of the public participation process undertaken in terms of regulation 41 of the Regulations, including copies of the supporting documents and inputs;		8.2

Content as required by NEMA		NEMA Section	Chapter / Section number	
(iii)	A summary of the issues raised by interested and affected parties, and an indication of the manner in which the issues were incorporated, or the reasons for not including them;		8.3	
(iv)	The environmental attributes associated with the alternatives focusing on the geographical, physical, biological, social, economic, heritage and cultural aspects;		8.4	
(v)	the impacts and risks identified for each alternative, including the nature, significance, consequence, extent, duration and probability of the impacts, including the degree to which these impacts- <i>(aa) can be reversed;</i> <i>(bb) may cause irreplaceable loss of resources; and</i> <i>(cc) can be avoided, managed or mitigated;</i>		8.5	
(vi)	The methodology used in determining and ranking the nature, significance, consequences, extent, duration and probability of potential environmental impacts and risks associated with the alternatives;		8.5.1	
(vii)	Positive and negative impacts that the proposed activity and alternatives will have on the environment and on the community that may be affected focusing on the geographical, physical, biological, social, economic, heritage and cultural aspects;		8.6	
(viii)	The possible mitigation measures that could be applied and level of residual risk;		8.7	
(ix)	The outcome of the site selection matrix;		8.8	
(x)	If no alternatives, including alternative locations for the activity were investigated, the motivation for not considering such and		8.10	
(xi)	A concluding statement indicating the preferred alternatives, including preferred location of the activity;		8.11	
A plan of study for undertaking the environmental impact assessment process to be undertaken, including:			2(i)	9
(i)	A description of the alternatives to be considered and assessed within the preferred site, including the option of not proceeding with the activity;			
(ii)	A description of the aspects to be assessed as part of the environmental impact assessment process;			
(iii)	Aspects to be assessed by specialists;			
(iv)	A description of the proposed method of assessing the environmental aspects, including aspects to be assessed by specialists;			
(v)	A description of the proposed method of assessing duration and significance;			
(vi)	An indication of the stages at which the competent authority will be consulted;			
(vii)	Particulars of the public participation process that will be conducted during the environmental impact assessment process; and			
(viii)	A description of the tasks that will be undertaken as part of the environmental impact assessment process;			
(ix)	Identify suitable measures to avoid, reverse, mitigate or manage identified impacts and to determine the extent of the residual risks that need to be managed and monitored.			

Content as required by NEMA	NEMA Section	Chapter / Section number
An undertaking under oath or affirmation by the EAP in relation to: (i) The correctness of the information provided in the report; (ii) The inclusion of comments and inputs from stakeholders and interested and affected parties; and (iii) Any information provided by the EAP to interested and affected parties and any responses by the EAP to comments or inputs made by interested or affected parties;	2(j)	11
An undertaking under oath or affirmation by the EAP in relation to the level of agreement between the EAP and interested and affected parties on the plan of study for undertaking the environmental impact assessment;	2(k)	11
Where applicable, any specific information required by the competent authority; and	2(l)	10
Any other matter required in terms of section 24(4) (a) and (b) of the Act.	2(m)	10.2



mineral resources

Department:
Mineral Resources
REPUBLIC OF SOUTH AFRICA

SCOPING REPORT

PROPOSED BIERSPRUIT OPENCAST ACTIVITIES AT ANGLO AMERICAN PLATINUM'S AMANDELBULT MINE, LIMPOPO

FOR LISTED ACTIVITIES ASSOCIATED WITH MINING RIGHT AND/OR BULK SAMPLING ACTIVITIES INCLUDING TRENCHING IN CASES OF ALLUVIAL DIAMOND PROSPECTING

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: Rustenburg Platinum Mines Limited, Anglo American Platinum, Amandelbult Complex

TEL NO.: +27 (0)14 784 1001

FAX NO.: +27 (0)14 784 1230

POSTAL ADDRESS: PO Box 02, Chromite, 0362

PHYSICAL ADDRESS: Rustenburg Platinum Mines Limited, Amandelbult Section, Tumela Mine, Thabazimbi. 0380

FILE REFERENCE NUMBER SAMRAD: LPNEMA30512321(048EM)

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 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

OBJECTIVE OF THE SCOPING PROCESS

The objective of the scoping process is to, through a consultative process –

- (a) identify the relevant policies and legislation relevant to the activity;
- (b) motivate the need and desirability of the proposed activity, including the need and desirability of the activity in the context of the preferred location;
- (c) identify and confirm the preferred activity and technology alternative through an impact and risk assessment and ranking process;
- (d) identify and confirm the preferred site, through a detailed site selection process, which includes an impact and risk assessment process inclusive of cumulative impacts and a ranking process of all the identified alternatives focusing on the geographical, physical, biological, social, economic, and cultural aspects of the environment;
- (e) identify the key issues to be addressed in the assessment phase;
- (f) agree on the level of assessment to be undertaken, including the methodology to be applied, the expertise required as well as the extent of further consultation to be undertaken to determine the impacts and risks the activity will impose on the preferred site through the life of the activity, including the nature, significance, consequence, extent, duration and probability of the impacts to inform the location of the development footprint within the preferred site; and
- (g) identify suitable measures to avoid, manage, or mitigate identified impacts and to determine the extent of the residual risks that need to be managed and monitored.

SCOPING REPORT

1 Contact Person and Correspondence Address

1.1 Details of:

1.1.1 The EAP who prepared the report: Zutari (Pty) Ltd

Name of The Practitioner: Ms. Natanya Whitehorn
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 Fax No.: +27 (0)86 574 2929
 E-Mail Address: Natanya.Whitehorn@zutari.com

1.1.2 Expertise of the EAP

1.1.2.1 The qualifications of the EAP

*(With evidence attached as **Appendix 1**).*

Natanya Whitehorn is a registered Environmental Assessment Practitioner (EAP) (Registration Number: 2019/1526) and holds a Bachelor in Geography and Environmental Management which she obtained from the University of Johannesburg in 2001. She further completed her Bachelor of Arts Honours in Environmental Management at the University of Johannesburg in 2002. Copies of these registrations and qualifications are attached in Appendix 1.

1.1.2.2 Summary of the EAP's past experience

*(Attach the EAP's curriculum vitae as **Appendix 2**)*

Natanya specialises in environmental permitting and environmental auditing and her expertise consists of risk assessment, environmental monitoring and social impact assessments (SIAs), including the study of human interaction with one another and the natural environment. She has experience in fieldwork for impact assessments, environmental monitoring as well as the public participation process (PPP), where, she has facilitated and translated at various landowner, stakeholder and public meetings and also gained experience in environmental compliance monitoring by working on a large construction project. Further significant experience includes her role as Project Manager (Environmental Lead) on various integrated environmental management (IEM) processes such as environmental impact assessments (EIAs), basic assessment reports (BARs) and the development of environmental management plans (EMPs).

She has previous working experience in geo-informatics and geographic information systems (GIS). She has more than a decade of experience working with GIS, which she has gained whilst working on projects for the government, local authorities as well as the private sector. She has also gained skills in spatial representation and interpretation through her involvement in the engineering environment. Natanya has specialised in spatial analysis, data processing and mapping while her technical responsibilities include inter alia the evaluation of data, digitising, editing and converting spatial data and non-spatial data from various formats and manipulating data in Esri ArcMap 10 with extension (XTools, ET Geowizards, ET Geotools), ArcView 3.2 and Planet GIS. She has research experience on biodiversity, natural resources management, and human developmental issues and tutoring experience at a tertiary institution in the field of Information Science (IS). Her complete CV is attached as Appendix 2.

SCOPING REPORT

2 Description of the property

Farm Name:	Remaining Extent of Schilpadnest 385 KQ Zwartkop 369 KQ Portion 24
Application area (Ha)	Pit and surrounding study area: approximately 150 ha (Pits measure at approximately 11 ha combined) Overburden stockpile areas: approximately 7 ha Topsoil stockpile areas: approximately 1 ha Haul roads: approximately 4 ha Pollution Control Dams: approximately 1 ha Total: 163 ha
Magisterial district:	Waterberg District Municipality
Distance and direction from nearest town	14km south of Thabazimbi
21 digit Surveyor General Code for each farm portion	T0KQ00000000038500000 T0KQ00000000036900024

3 Locality Map

(show nearest town, scale not smaller than 1:250000 attached as **Appendix 3**).

Please see attached as Appendix 3 as well as Figure 4-1 and Figure 4-2.

4 Description of the scope of the proposed overall activity

4.1 Listed and specified activities

*Provide a plan drawn to a scale acceptable to the competent authority but not less than 1: 10 000 that shows the location, and area (hectares) of all the aforesaid main and listed activities, and infrastructure to be placed on site and attach as **Appendix 4**.*

Please refer to Appendix 4 for the Listed Activity Map as well as the preliminary design drawings.

NAME OF ACTIVITY (All activities including activities not listed) (E.g. Excavations, blasting, stockpiles, discard dumps or dams, Loading, hauling and transport, Water supply dams and boreholes, accommodation, offices, ablution, stores, workshops, processing plant, storm water control, berms, roads, pipelines, power lines, conveyors, etc...etc...etc.)	Aerial extent of the Activity Ha or m²	LISTED ACTIVITY Mark with an X where applicable or affected.	APPLICABLE LISTING NOTICE (GNR 544, GNR 545 or GNR 546)/ NOT LISTED
Storm water during preparation and mining activities will be managed by constructing turf / topsoil berms around	Approximately 1.3 km in length	X	GNR 983 Listing Notice 1: Activity 9

SCOPING REPORT

NAME OF ACTIVITY (All activities including activities not listed) (E.g. Excavations, blasting, stockpiles, discard dumps or dams, Loading, hauling and transport, Water supply dams and boreholes, accommodation, offices, ablution, stores, workshops, processing plant, storm water control, berms, roads, pipelines, power lines, conveyors, etc...etc...etc.)	Aerial extent of the Activity Ha or m ²	LISTED ACTIVITY Mark with an X where applicable or affected.	APPLICABLE LISTING NOTICE (GNR 544, GNR 545 or GNR 546)/NOT LISTED
excavated areas. The area to be excavated is around 1.3 km in length. Canals or pipes may be used which is larger than the threshold.			
All project activities under the 1:100 year floodline may be construed as "within a watercourse".	Approximately 12.44 ha	X	GNR 983 Listing Notice 1: Activity 12 (a)
Overburden will be excavated prior to mining operations and used to refill mined-out pits within the flood line.	Approximately 7 ha	X	GNR 983 Listing Notice 1: Activity 19
New haul roads, along the length of the pit and to the north thereof, will be constructed for transporting material from the pit to the ore or overburden stockpiles.	Approximately 1.3 km & 4 ha	X	GNR 983 Listing Notice 1: Activity 24 GNR 985 Listing Notice 3: Activity 4 (e)(i)(ee)
Indigenous vegetation (of more than 20 hectares) is likely to be cleared for the project. NEMA Listing 2 (Activity 21)	Approximately 24 ha for overburden & topsoil stockpiles, pits, ore stockpiles and haul roads. Additional clearance for associated infrastructure (i.e. contractors laydown areas) required, but will not exceed total area of 163 ha.	X	GNR 983 Listing Notice 1: Activity 27 GNR 984 Listing Notice 2: Activity 15; GNR 985 Listing Notice 3: Activity 12 (e)(ii)
Construction of Pollution Control Dams within the 1:100m floodline of the Bierspruit River.	Approximately 1 ha	X	GNR 984 Listing Notice 2: Activity 6
An existing mining right will be exercised for the extraction minerals on an area exceeding 1.5 ha, and for a period exceeding two years	Approximately 11 ha	X	GNR 984 Listing Notice 2: Activity 17
The Run of Mine (RoM) extracted at the proposed Bierspruit Opencast pit will undergo primary crushing at a mobile crusher at the existing	Approximately 1 ha	X	GNR 984 Listing Notice 2: Activity 19

SCOPING REPORT

NAME OF ACTIVITY (All activities including activities not listed) (E.g. Excavations, blasting, stockpiles, discard dumps or dams, Loading, hauling and transport, Water supply dams and boreholes, accommodation, offices, ablution, stores, workshops, processing plant, storm water control, berms, roads, pipelines, power lines, conveyors, etc...etc...etc.)	Aerial extent of the Activity Ha or m ²	LISTED ACTIVITY Mark with an X where applicable or affected.	APPLICABLE LISTING NOTICE (GNR 544, GNR 545 or GNR 546)/NOT LISTED
10 West Raise-bore, with further processing occurring at the existing Amandelbult Concentrator Plant.			
The overburden stockpiles are defined as residue stockpiles or residue deposits in terms of NEM: WA, including their management in terms of GNR 632 of 24 July 2015. Pollution Control Dams will also be constructed.	Approximately 4.41 ha	X	Category B (10) & B (11) of Waste Management Activities (GNR 921 of 2013 – updated on 2 May 2014)

4.1.1 Description of the activities to be undertaken

(Describe Methodology or technology to be employed, and for a linear activity, a description of the route of the activity)

Rustenburg Platinum Mines (henceforth RPM) proposes extending the existing mining operations through the mining of shallow Merensky and UG2 reefs within the Amandelbult Mining Right Boundary. The proposed project will be referred to as the Bierspruit Opencast project and is located to the east of the Tumela mine 16 West Shaft near Thabazimbi in the Limpopo Province, within the Amandelbult mining complex (refer to Appendix 3 for a locality map as well as Figure 4-1 below). The two main areas are dissected by a gravel road linking the R 510 to areas northwest of the planned opencast area. A culvert structure allows crossing of the Bierspruit between the two planned opencast areas.

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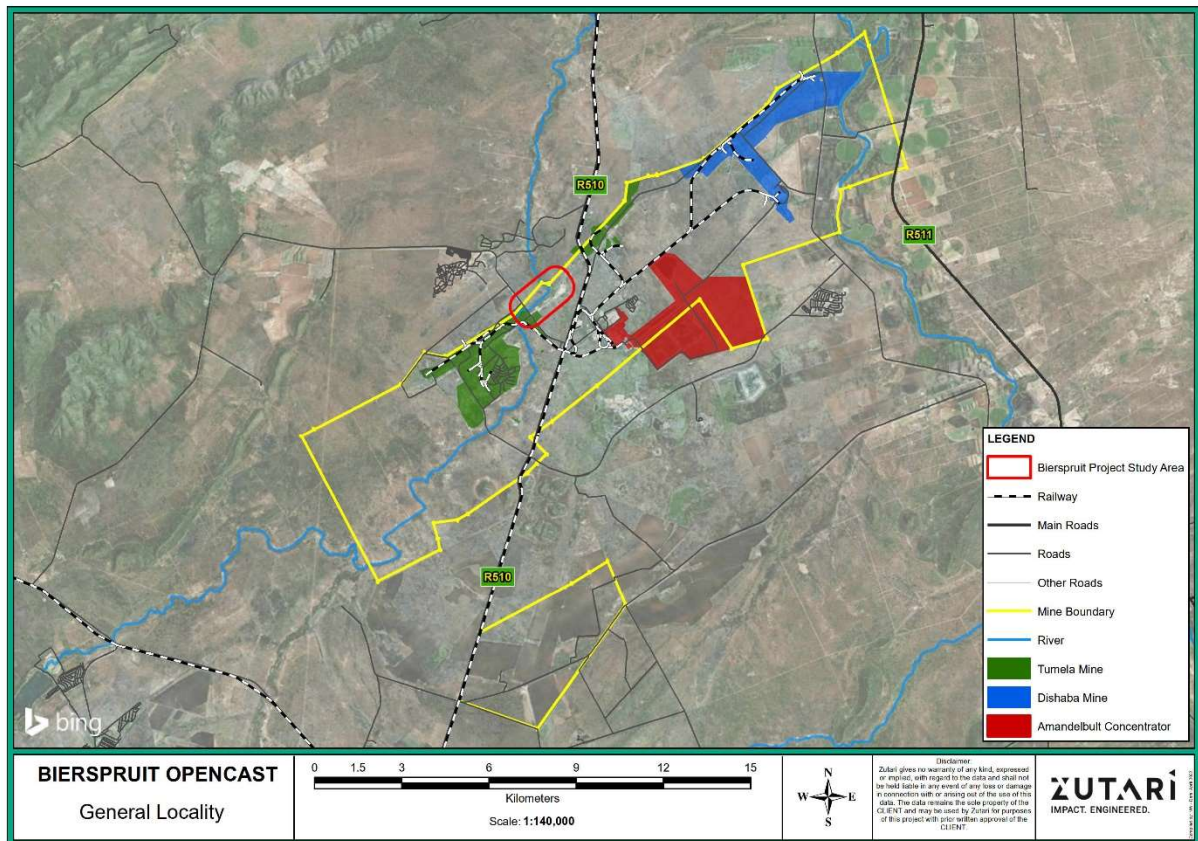


Figure 4-1: General Locality of the Bierspruit Opencast Project.

It is anticipated that shallow mining of the mentioned reefs will be done at depths of between 30m to 55m below natural ground level over an area of approximately 11 ha. The proposed Life of Mine (LoM) is 24 months if mining takes place at a rate of 25 000 tonnes per month, with an anticipated 51 Metric Ton (Mt) of waste rock being produced during this time. Rehabilitation will take place thereafter. The Run of Mine (RoM) extracted at the proposed Bierspruit Opencast pit will undergo primary crushing at a mobile crusher at the existing 10 West Raise-bore, with further processing occurring at the existing Amandelbult Concentrator Plant.

Backfilling the pit will take place for a period of 2 years after mining activities at Bierspruit Opencast pit have ceased.

The total volume estimated overburden and ore to be removed during the LoM amounts to 2,870,000 m³. Approximately 574 000m³ will be removed from the western pit, while approximately 2,296,000 m³ will be removed from the eastern pit. Of the total volume removed, 30 – 35% will be stockpiled. Large portions of the two proposed pits encroach within the 100-year flood line of the Bierspruit River so that suitable flood protection works will therefore be required to protect the river and also to prevent flooding of the opencast pits. In addition, suitable stormwater diversion measures will be required to prevent upslope runoff from entering the pits.

As mentioned above, it is necessary to provide two overburden stockpile platforms with their associated pollution control dams for each pit area to contain potentially contaminated runoff and silt from the stockpiles. The proposed mining operations are therefore expected to consist of the following:

- Opencast pits for strip mining;
- Overburden stockpile areas (excess overburden which won't be used for the berms);
- Pollution control dams;
- A topsoil stockpile area;;
- A mobile crusher (at the existing Tumela 10 West Raise-bore) and ore stockpile area;
- Internal access and haul roads for the removal of ore from within the pit;

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- Storm water management measures around excavated and infrastructure areas in the form of berms to be constructed from overburden material;
- A contractor's camp (inclusive of parking); and
- Perimeter fencing around the proposed mining area.

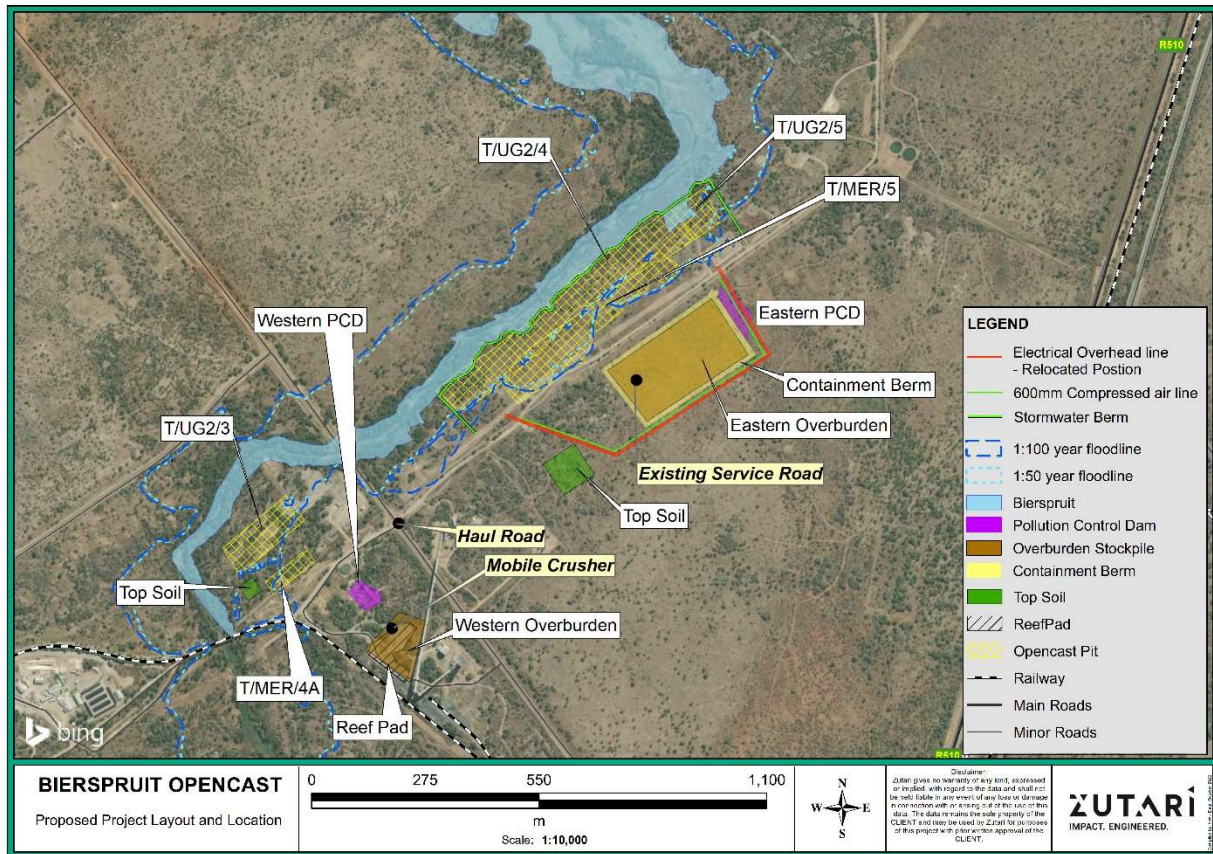


Figure 4-2: Proposed mining areas. The existing 1:100 year flood line is shown in blue

Mining Methodology

The open pit will be mined using a conventional truck and shovel open pit method. The process for the mining method involves stripping, drilling, blasting, loading and hauling of overburden to waste dumps, followed by hauling the Run of Mine (RoM), which is the ore extracted for processing, to the ore stockpile area at the mobile crusher.

The two pits combined are proposed at approximately 1 040 m in length, 60 -80m in width, and 30 to 55m in depth. The pit surface area is approximately 11 ha. The regional topography at Amandelbult is generally flat. The dip of the remaining open cast blocks ranges from 21° to 30°. All pit polygons have been adjusted to accommodate a 10 m crown pillar above underground workings.

The proposed mining sequence for the open pit project is shown in Figure 4-3, and is illustrated in Figure 4-4 (excluding rehabilitation).

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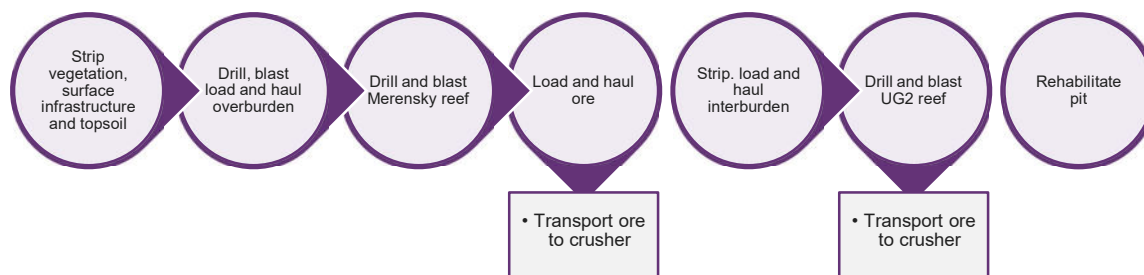


Figure 4-3: Proposed mining sequence.

Truck and shovel operations, in combination with an effective drill and blast plan, are employed at existing opencast operations at Rustenburg Platinum Mines: Amandelbult Section. Therefore, a standard drill, blast, truck shovel operation is assumed at Scoping phase as the mining method. The loading conditions are expected to correspond closely to a small-scale open pit site, with a maximum pit depth of 55 m envisaged. Refer to Figure 4-4 for an illustration of the mining method.

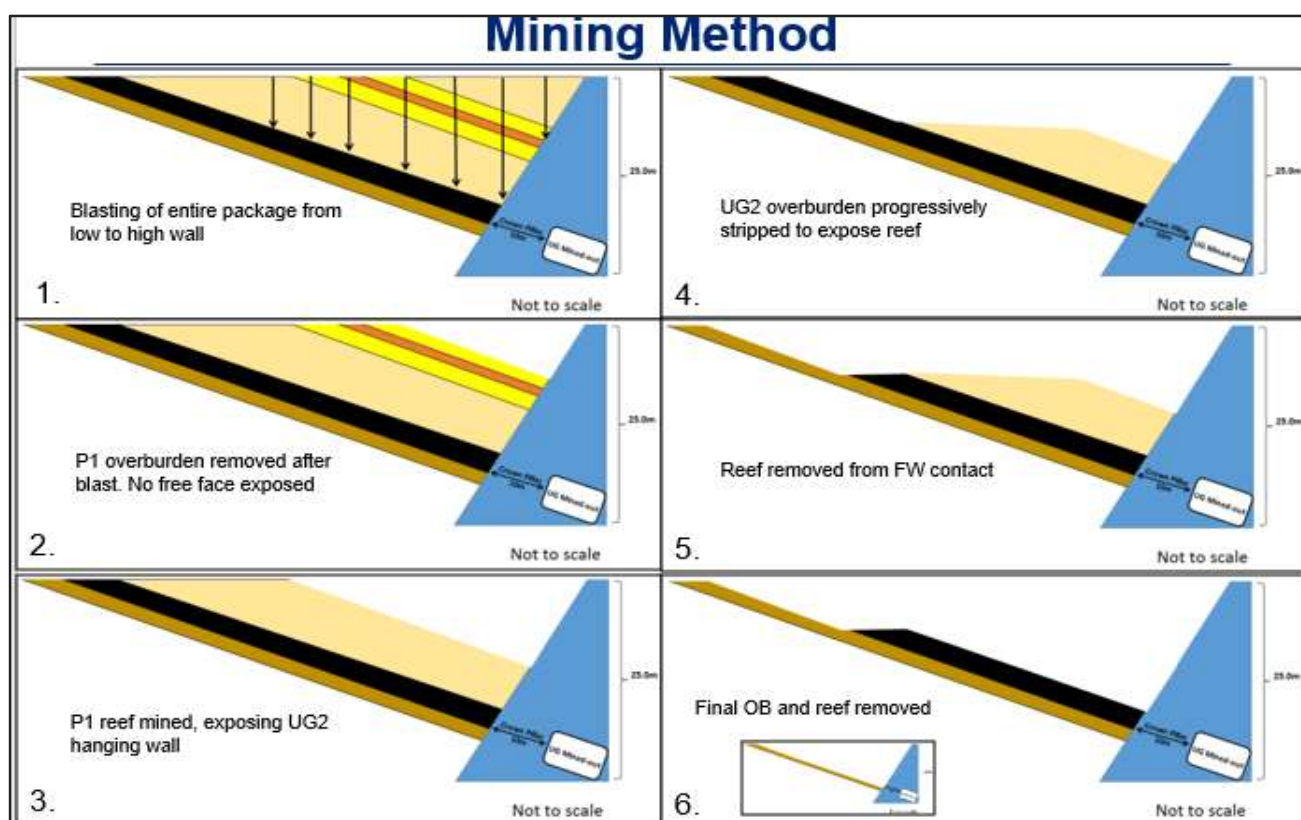


Figure 4-4: Proposed strip-mining process.

Life of Mine (LoM) Schedule

The schedule runs over a period of approximately 2 years (24 months) at a ROM production rate of 25,000 kt/pm for the entire duration of the operations.

The mine will operate a 12 hour day shift – (6am to 6pm) and an 8 hours night shift – (6pm to 2am), 7 days a week.. Articulated dump trucks (ADTs) will be loaded daily (the fleet composition will be finalised in the Environmental Impact Assessment (EIA) phase).

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Ore will then be stockpiled in the designated area next to the aforementioned existing mobile crusher at the existing Tumela 10 West Raise-bore. Front-end loaders will load crushed ore onto the train at the crushing facility one week out of every month, to transport it to the Amandelbult Concentrator.

Rehabilitation of the Bierspruit Opencast pit will run for approximately 2 years after the 24-month LOM.

Platinum Group Element (PGE) Processing

Ore will be crushed to reduce its size at the primary, mobile crusher at the existing Tumela 10 West Raise-bore. It will then be transported to the existing Amandelbult Concentrator Plant via existing rail infrastructure. However, this project's scope in terms of processing is limited to:

- The extraction of ore at the Bierspruit Opencast pit;
- Transportation of ore to the proposed primary crushing facility at the Tumela 10 West Raise-bore area; and
- Loading crushed ore onto the train at the Tumela 10 West Raise-bore area for transportation to the Concentrator.

5 Policy and Legislative Context

APPLICABLE LEGISLATION AND GUIDELINES USED TO COMPILE THE REPORT	REFERENCE WHERE APPLIED
The Republic of South Africa Constitution Act (Act No. 108 of 1996) ("the Constitution")	The environmental right contained in Section 24 of the Constitution provides that everyone is entitled to an environment that is not harmful to his or her well-being. This Scoping Report aims to ensure compliance to this section.
The National Environmental Management Act (Act 107 of 1998) (NEMA) and associated Regulations	NEMA establishes the principles for decision-making on matters affecting the environment. Section 2 of the Act sets out the National Environmental Management principles which apply to the actions of organs of state that may significantly affect the environment. Furthermore, Section 28(1) states that "every person who causes or may cause significant pollution or degradation of the environment must take reasonable measures to prevent such pollution or degradation from occurring, continuing or recurring". If such pollution or degradation cannot be prevented, then appropriate measures must be taken to minimise or rectify such pollution or degradation. The applicant has the responsibility to ensure that the proposed activity and EIA process conform to the principles of NEMA. In developing the EIA process, Zutari has been cognisant of this need, and accordingly the EIA process has been undertaken in terms of NEMA and the EIA Regulations¹. Several listed activities in these regulations are triggered
National Water Act (Act No. 36 of 1998) (NWA) and associated Regulations	The NWA provides for the sustainable and equitable use and protection of water resources. It is founded on the principle that the National Government has overall responsibility for and authority over water resource management, including the equitable allocation and beneficial use of water in the public interest, and that a person can only be entitled to use water if the use is permissible under the NWA. Section 21 of the NWA specifies the water uses which require authorisation from the Department of Water and Sanitation (DWS) in terms of the NWA before they may commence. RPM has also appointed Zutari to apply for Water Use Licences (WUL) required in terms of Section 21 of the NWA.

¹GN No. R 982, 983, 984, and 985 in Government Gazette No.38282 of 4 December 2014.

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APPLICABLE LEGISLATION AND GUIDELINES USED TO COMPILE THE REPORT	REFERENCE WHERE APPLIED
Minerals and Petroleum Resources Development Act (Act 49 of 2008) (MPRDA).	The MPRDA established the state as the custodian of all mineral resources in South Africa, through the minister of mining. The mining industry is regulated by the MPRDA, through the national and regional offices of the Department of Mineral Resources (DMR).
National Environmental Management: Waste Act, 2008 (Act 59 of 2008) (NEMWA) and the Waste Classification and Management Regulations (WCMR).	The WCMR were promulgated on 23 August 2013 (GN R. 634 of 2013), in terms of NEMWA, with the associated Norms and Standards. Waste material needs to be assessed according to the following standards: ■ Norms and Standards for Assessment of Waste for Landfill Disposal (GN R.635, 23 August 2013); and ■ The National Norms and Standards for Disposal of Waste to landfill (GN R.636, 23 August 2013). Mining residues and stockpiles were previously excluded from NEMWA, however, according to the NEM:Waste Amendment Act, Act 26 of 2014, they now fall into Category A of Schedule 3, hazardous waste, unless it can be proven otherwise through the classification process.
National Heritage Resources Act (Act No. 25 of 1999) (NHRA)	In terms of the NHRA, any person who intends to undertake “any development which will change the character of a site exceeding 5,000 m² in extent, or involving three or more existing erven or subdivisions thereof”, “the construction of a road powerline, pipeline exceeding 300 m in length” or “the rezoning of site larger than 10,000 m² in extent...” must at the very earliest stages of initiating the development notify the responsible heritage resources authority, namely SAHRA or the relevant provincial heritage agency. These agencies would, in turn, indicate whether or not a full Heritage Impact Assessment (HIA) would need to be undertaken. Section 38(8) of the NHRA specifically excludes the need for a separate HIA where the evaluation of the impact of a development on heritage resources is required in terms of an EIA process. Accordingly, since the impact on heritage resources would be considered as part of the EIA process outlined here, no separate HIA would be required. SAHRA or the Limpopo Provincial Heritage Resources Authority (LHRA), will review the heritage assessments and provide comments to the DMR, which would consider these comments in their final environmental decision. However, should a permit be required for the damaging or removal of specific heritage resources such as palaeontological or archaeological objects, a separate application for such destruction would need to be submitted to the relevant heritage agency for approval.
Conservation of Agricultural Resources Act (Act No. 43 of 1983) (CARA)	The CARA makes provision for the conservation of agricultural resources through limiting the sub-division of agricultural land, maintaining the production potential of land, combating and preventing erosion, preventing the weakening or destruction of water sources, protecting vegetation, and combating weeds and invader plants. As such, as part of the EIA process, recommendations should be made to ensure that measures are implemented to maintain the agricultural production of land (if possible).
National Environmental Management: Biodiversity Act (Act No. 10 of 2004) (NEM: BA)	The NEM:BA aims to conserve and manage the country's biodiversity via protecting species and ecosystems, specifically those which are threatened or considered to be critically endangered. It also serves to regulate the management of alien vegetation. In terms of NEM:BA a list of endangered, critically endangered, vulnerable, and protected species has been promulgated (Section 6, Table 3 of the Act), which calls for an EIA process, should any of the listed species be identified on the site and need to be removed. An ecological impact assessment, comprising a wetland assessment, floral assessment and faunal assessment, has been undertaken to determine if any listed species are located on the proposed site.

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APPLICABLE LEGISLATION AND GUIDELINES USED TO COMPILE THE REPORT	REFERENCE WHERE APPLIED
Limpopo Environmental Management Act (Act No. 7 of 2003) (LEMA)	LEMA makes provision for the protection and conservation of the environment in the Limpopo Province and regulates a variety of environmental matters including protected areas; hunting of wild and exotic animals; the establishment of Wildlife Councils reports; inland fishing and the protection and aquatic systems; the protection of indigenous plants; restrictions on development and environmental impact reports; declaration and protection. LEMA provisions, especially with respect to provincial protected resources like protected species, will have to be considered.
National Noise Control Regulations (GN R154 of 1992)	A noise impact assessment is undertaken as part of the EIA process, to determine the potential impact of the expected increase in noise levels due to the proposed mining activities.
National Environmental Management: Air Quality Act (No. 39 of 2004) (NEM:AQA) and associated Regulations	An air quality impact assessment has been included as part of the plan of study for this EIA process. The assessment will include the determination of existing air quality conditions and the expected impact of the proposed mining activities on this baseline air quality.

6 Need and Desirability of the Proposed Activities

(Motivate the need and desirability of the proposed development including the need and desirability of the activity in the context of the preferred location).

The Biersruijt Opencast project was initially motivated by a decline in commodity prices during 2018, which shifted the focus from underground to opencast mining at RPM's Amandelbult Complex. An incline was observed during 2021, with downward fluctuations experienced recently. This project will enable RPM to economically extract reef remnants of easily accessible PGE ounces to ensure continued production and meeting of requisite quotas.

Specific need and desirability questions raised by the national and Western Cape Department of Environmental Affairs and Development Planning (DEA&DP) need and desirability guidelines are addressed in Table 2 and Table 3 below. These guidelines are used to ensure all aspects regarding the need and desirability of the project, such as timing and placing of the project is addressed.

Table 2: Responses to questions in the Need and Desirability Guideline: Timing

Question	Response
1. Is the land use (associated with the activity being applied for) considered within the timeframe intended by the existing approved Spatial Development Framework (SDF) agreed to by the relevant environmental authority i.e. is the proposed development in line with the projects and programmes identified as priorities within the Integrated Development Plan (IDP)?	Yes. The larger Thabazimbi area is characterised by many mining enterprises. The mining sector is the primary pillar of the Thabazimbi economy, however from a development and environmental perspective it is important that mining takes place in a responsible manner (Thabazimbi Municipality, 2007).
2. Should development, or if applicable, expansion of the town/ area concerned in terms of this land use (associated with the activity being applied for) occur at this point in time?	Yes. Authorising the project will allow RPM to economically extract reef remnants of easily accessible PGE ounces. This will ensure continuity in production, economic stimulation, and job provision.
3. Does the community/ area need the activity and the associated land use concerned (is it a societal priority)?	Yes. Authorising the project will allow RPM to economically extract reef remnants of easily accessible PGE ounces. This will ensure continuity in production, economic stimulation, and job provision.
4. Are there necessary services with appropriate capacity currently available (at the time of application), or must additional capacity be created to cater for the development?	No additional capacity will be required for the project. Construction and operation will be undertaken by current RPM personnel.

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Question	Response
5. Is this development provided for in the infrastructure planning of the municipality, and if not, what will the implication be on the infrastructure planning of the municipality (priority and placements of services)?	Not applicable. The objective of the project is to mine easily accessible PGE ounces to ensure continuity in production, economic stimulation, and job provision.
6. Is this project part of a national programme to address an issue of national concern or importance?	Yes. The Exploration Strategy for the Mining Industry of South Africa (April 2022) reasons that the exploration strategy is drafted on the strength of South Africa being host to over 50 mineral commodities. It is anchored on three critical pillars of sustainable development, namely, economic growth, social benefits and environmental care through good governance.

Table 3: Responses to questions in the Need and Desirability Guideline: Placing

Question	Response
1. Is the development the best practicable environmental option (BPEO) for this land/ site?	Yes. Mining can only be undertaken in areas where economically mineable resources occur, which determines where the pits are located. This area was established through extensive prospecting and geological modelling. RPM has previously been granted an approval to mine the reefs in terms of Section 39(1) of the Minerals Act, (No. 50 of 1991). The approved Environmental Management Programme Report (EMPr) was compiled in November 2002 and approved in August 2003 by the then Department of Minerals and Energy (DME) (Reference Number 6/2/2/48), Polokwane, Limpopo Province, converting to the new order the Mining Right as per the MPRDA
2. Would the approval of this application compromise the integrity of the existing approved Municipal IDP and SDF as agreed to by the relevant authorities?	No. The project is broadly in line with the existing Municipal IDP and SDF, specifically in relation to the importance of the continuation of mining activities.
3. Would the approval of this application compromise the integrity of the existing environmental management priorities for the area (e.g. as defined in Environmental Management Framework (EMF)), and if so, can it be justified in terms of sustainability considerations?	No. The project will be located in an existing authorised mining right area and stringent mitigation measures will be implemented to protect the natural environment. This project also affords the applicant the opportunity to rehabilitate the previously mined area to the appropriate standards.
4. Do location factors favour this land use (associated with the activity applied for) at this place?	Yes. The proposed site is not earmarked for any particular municipal landuse. The proposed project will be located within an existing authorised mining right area. The area adjacent to the Bierspruit is also classified as previously mined.
5. How will the activity or the land use associated with the activity applied for, impact on sensitive natural and cultural areas (built and rural/ natural environment)?	Cultural environment During the desktop assessment, it was found that a previous study done by Van Skalkwyk (1994) identified a Late Iron Age site in-between the presently proposed Overburden and Topsoil Dumps. However, no evidence of stonewalled enclosures could be identified during the intensive fieldwork of these two dump areas. A single small, stonewalled enclosure was identified a short distance to the west within the development area proposed for TMM Parking (site BSPR1). It seems likely for this small stone enclosure to have been a peripheral element to the main site as identified in the 1994 Van Skalkwyk report. The impact assessment undertaken for this single small stonewalled enclosure at BSPR1 has revealed that the pre-mitigation impact rating for this site is of

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Question	Response
	low negative significance meaning that no specific mitigation measures are required. <u>However, the possible risk for unmarked stillborn graves at the structure identified in 1994 requires that an archaeological watching brief must be implemented for any pre-construction and construction activities on the surface and within 100m from the coordinates recorded for the site during the original heritage survey 25 years ago (S 24.797639 E 27.311083).</u> <u>Natural environment</u> As some portions of the previously disturbed watercourse are anticipated to be lost as a result of the proposed opencast mining activities, the residual impact of these activities is considered significant. Given the current layout, a net loss of functional watercourse area is inevitable, thus a 'High' risk significance. Therefore, it is recommended that the current layout associated with the proposed mining operation be redesigned or an appropriate rehabilitation and /or offset mechanism developed. It must also be noted that in its current condition the area has been severely disturbed, and this project provides an opportunity to rehabilitate the area in an integrated manner thus potentially leading to a net improvement in the condition of the area post closure.
6. How will the development impact on people's health and wellbeing (e.g. in terms of noise, odours, visual character and sense of place, etc.)?	During construction/operation and rehabilitation, there will be particulate emissions (dust) related to debris handling, materials transportation, storage, handling and transfer; open areas (windblown dust). Gas emissions are also expected to occur due to vehicle and construction equipment activity (exhaust fumes). These impacts, however, taking into consideration the location of the proposed project (approximately 2km from the nearest community (Smersha Block)), are expected to be of low significance and can be mitigated and managed to acceptable levels. Movement of construction vehicles and machinery during construction/operation/rehabilitation, may cause a noise nuisance to receptors in close proximity to the project site. The implementation of appropriate mitigation measures would reduce the noise levels to remain within acceptable SANS levels (SANS 10103:2008). Occupational health and safety standards will apply. It is important to note that the closest community is approximately 2km away from the project site thus the deduction can be made that the ambient noise levels would not increase significantly. The project is not expected to have an impact on the visual character and sense of place since it is an area which was previously mined (the existing authorised EMPr is dated November 2002 and approved in August 2003) and is located in very close proximity to the Amandelbult complex. With regards to the visibility of the project, a buffer zone of 10 km around the proposed mining area was



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Question	Response
	used as the human eye can distinguish very little detail beyond this distance. The viewshed indicates that the proposed overburden and topsoil dumps will be visible over 50% of the study area, including the mining town of Amandelbult. The proposed opencast mine's proposed overburden and topsoil dump's visual intrusion will be very low, as there is already existing mine infrastructure of similar unnatural shape and characteristics present within the study area (Amandelbult Concentrator, Dishaba and Tumela mine). The majority of the receptors (resident and transient) will be within a distance of between 500m – 2km, therefore will experience medium visual exposure. It is expected that the number of resident receptors will be high but will attach a low value to aesthetics, when, for instance, compared to employment opportunities. People travelling through the study area (transient receptors) will most likely be local tourists and residents, together they will constitute a high number of people. The environment has already been transformed due to existing mining activities and therefore receptors will attach a low value to aesthetics, as they are either familiar with the mining landscape, or they will be in contact with this specific landscape scenery for a short duration while travelling through the study area.
7. Will the proposed activity or the land use associated with the activity applied for, result in unacceptable opportunity costs?	No. the property on which the proposed project is located is currently not earmarked for other use.
8. Will the proposed land use result in unacceptable cumulative impacts?	No. However, it is expected that the project may result in some cumulative impacts on the functionality of the watercourse, but it needs to be noted that in its current state the area has already been severely disturbed, and this project provides an opportunity to rehabilitate the area in an integrated manner, potentially leading to a net improvement in the condition of the area post closure.

7 Period for which the Environmental Authorisation is Required

The activity must commence within a period of five (5) years from the date of issue of the Environmental Authorisation (EA). Construction and mining must be completed within ten (10) years of the commencement of the activity on site, with rehabilitation being completed in a phased approach as mining activities are completed at each section, where possible. Concurrent rehabilitation is planned which will take place during the construction phase.

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8 Description of the process followed to reach the proposed preferred site

NB!! – This section is not about the impact assessment itself; It is about the determination of the specific site layout having taken into consideration (1) the comparison of the originally proposed site plan, the comparison of that plan with the plan of environmental features and current land uses, the issues raised by interested and affected parties, and the consideration of alternatives to the initially proposed site layout as a result.

8.1 Details of all alternatives considered

With reference to the site plan provided as Appendix 4 and the location of the individual activities on site, provide details of the alternatives considered with respect to:

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

The project plan proposes extending the existing mining operations through the mining of shallow Merensky and UG2 reefs within the Amandelbult Mining Right Boundary. Since this is an existing mining complex, and since the footprint of the proposed project is not expected to extend beyond the existing mining right boundary of the Merensky and UG2 reefs, determining alternative options in terms of property, location, and type of activity was deemed unpractical and unnecessary since such alternatives would increase the environmental impact.

Technology alternatives are also limited since the proposed mining operations will be located within a previously mined open pit mine. This existing open pit will be mined using a conventional truck and shovel open pit method. The process for the mining method involves stripping, drilling, blasting, loading and hauling of overburden to waste dumps, followed by hauling the Run of Mine (RoM) to the ore stockpile area at the mobile crusher. As such, no technology, operational or process alternatives could be considered as viable options.

The option of not implementing the activity (also called the no-go option) involves comparing the proposed activities with that of the current status quo of the existing Amandelbult Mining complex or, more specifically, the Merensky and UG2 reefs. Implementing this option negates the need for appointing unskilled, semi-skilled and skilled mine workers and cancels the positive contribution that this project may have on the local, provincial and national economy. In contrast, this option also prevents the increase in environmental impacts related to construction activities, such as air and noise pollution. This no-go option will be assessed during the detailed impact assessment that will be conducted as part of the EIA phase.

8.2 Details of the Public Participation Process followed

Describe the process undertaken to consult interested and affected parties including public meetings and one on one consultation. NB the affected parties must be specifically consulted regardless of whether or not they attended public meetings. (Information to be provided to affected parties must include sufficient detail of the intended operation to enable them to assess what impact the activities will have on them or on the use of their land.

The following table contains a summary of the public participation process steps that are to be followed with accompanying descriptions of each step. Please also refer to the public participation information attached in Appendix 5.

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Process Steps	Description
Steps to be taken to notify interested and affected parties (Describe the process to be undertaken to consult interested and affected parties including public meetings and one on one consultations. NB the affected parties must be specifically consulted regardless of whether or not they attended public meetings. Photographs of notice boards, and copies of advertisements and notices notifying potentially interested and affected parties of the proposed application must be attached as Appendix)	A notification letter and Background Information Document (BID) will be distributed to all neighbouring landowners, organs of state and other affected parties to notify them of the proposed project. Site notices will be placed in conspicuous locations around the project site. Newspaper advertisements will be placed in the local newspaper, the Platinum Bushveld. The notices could also be circulated internally on the Amandelbult Times and Merafe Corner. This will be done in English, Afrikaans, IsiXhosa and Setswana. All registered interested and affected parties (I&APs) will be notified of the availability of the Scoping Report for public review. The documents will be uploaded onto the Zutari website and, where required and feasible, hard copies may be provided. Public and/or focus group meetings will be held as and when required, depending on the volume and magnitude of comments received during the Public Participation Process (PPP). All comments received will be included in the Comments and Response Report (CRR) and taken into consideration for the Scoping Report for submission to the DMR. This will conclude the Scoping Phase.
Information to be provided to Interested and Affected Parties.	• The site plan. • List of activities to be authorised. • Scale and extent of activities to be authorised. • Typical impacts of activities to be authorised (e.g. Surface disturbance, dust, noise, drainage, fly rock etc.). • The duration of the activity. • Sufficient detail of the intended operation to enable them to assess what impact the activities will have on them or on the use of their land.
Information to be required from Interested and Affected Parties.	• To provide information on how they consider that the proposed activities will impact on them or their socio-economic conditions. • To provide written responses stating their suggestions to mitigate the anticipated impacts of each activity. • To provide information on current land uses and their location within the area under consideration. • To provide information on the location of environmental features on site to make proposals as to how and to what standard the impacts on site can be remedied. requested to make written proposals. • To mitigate the potential impacts on their socio-economic conditions to make proposals as to how the potential impacts on their infrastructure can be managed, avoided or remedied).

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8.3 Summary of issues raised by I&APs

(Complete the table summarising comments and issues raised, and reaction to those responses)

Please note that, since this Scoping Report is currently under public review, all issues raised during the public comment period will be captured and included in this table in the Final Scoping Report for submission to the Department.

Interested and Affected Parties		Date Comments Received	Issues raised	EAPs response to issues as mandated by the applicant	Consultation Status (consensus dispute, not finalised, etc)
List the names of persons consulted in this column, and Mark with an X where those who must be consulted were in fact consulted.					
AFFECTED PARTIES					
Landowner/s	X	TBC	TBC	TBC	TBC
Rustenburg Platinum Mines Limited	X				
Lawful occupier/s of the land					
N/A					
Landowners or lawful occupiers on adjacent properties to the proposed project	X				
Baphalane Ba Mantserre Community Development Trust Saltiel Ramokoka	X				
Sebilong Communal Property Association Moabi Tisane	X				
Trollope Prop CC John Wesley and Peter William	X				
Night Fire Inv 110 Pty Ltd Hendrick Petrus Nel	X				
Silvia Manjolinho Costa	X				
Municipal Councillor	X				
Municipality	X				
Organs of state (Responsible for infrastructure that may be affected Roads Department, Eskom, Telkom, DWA etc.)	X				
Eskom	X				
Telcom	X				



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Interested and Affected Parties		Date Comments Received	Issues raised	EAPs response to issues as mandated by the applicant	Consultation Status (consensus dispute, not finalised,etc)
List the names of persons consulted in this column, and Mark with an X where those who must be consulted were in fact consulted.					
DWS	X				
LHRA	X				
SAHRA	X				
SANRAL	X				
Communities					
Thabazimbi	X				
Dept. Land Affairs					
DALRRD	X				
Traditional Leaders					
Dept. Environmental Affairs					
LEDET	X				
OTHER AFFECTED PARTIES					
INTERESTED PARTIES					

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8.4 The Environmental attributes associated with the sites

Although the proposed project aims to conduct mining activities within an existing authorised mining right area, the potential for environmental impact remains a risk which needs to be assessed during the EIA process especially since the proposed project site is located within the 1:100-year flood line of the Bierspruit River. This proposed extension of mining operations entails mining the shallow Merensky and UG2 reefs within the Amandelbult Mining Right Boundary.

The environmental attributes as described in the baseline environmental description below will undergo a detailed impact assessment process by the respective specialists to determine the significance of the proposed project on these various disciplines. The baseline environmental description for each of these disciplines is detailed in the next section.

8.4.1 Baseline Environment

8.4.1.1 Type of environment affected by the proposed activity

(its current geographical, physical, biological, socio-economic, and cultural character)

Climate

Rainfall information was obtained from historical groundwater and related investigations, which found the average annual rainfall figure to be nearly 600 mm (Figure 8-1). The project area is located in a summer rainfall region where just over 50% of the annual rainfall occurs over the three months of December through to February. The area is characterised by warm to hot summer months and mild to cold winter months with occasional frost (Figure 8-2).

The mean annual evaporation rate is expected to vary between $\pm 1\,700$ and $1\,800$ mm (*Surface Water Resources of South Africa, 1990*), which far exceeds rainfall. The area therefore has a net environmental moisture deficit for the year if the annual figure is considered.

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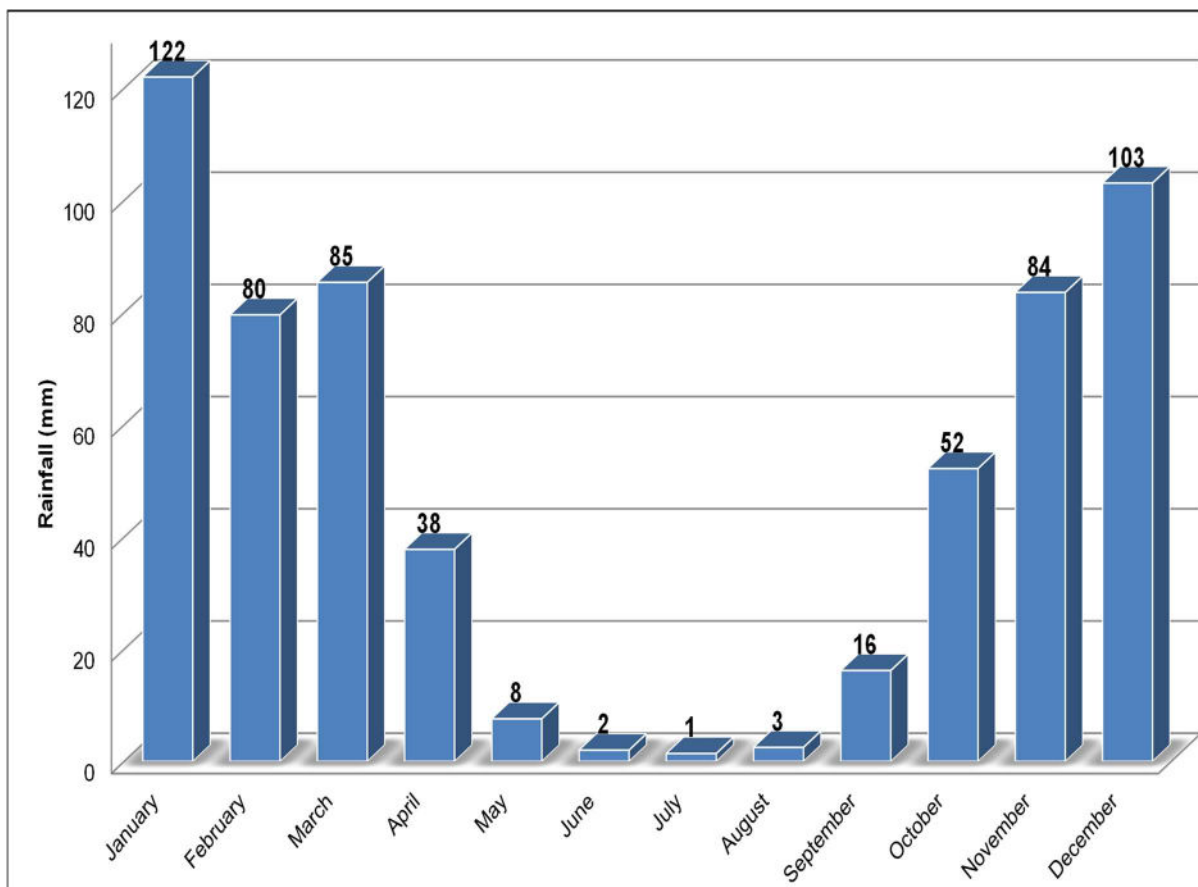


Figure 8-1: Average monthly rainfall for the project area (Groundwater Complete, 2017)

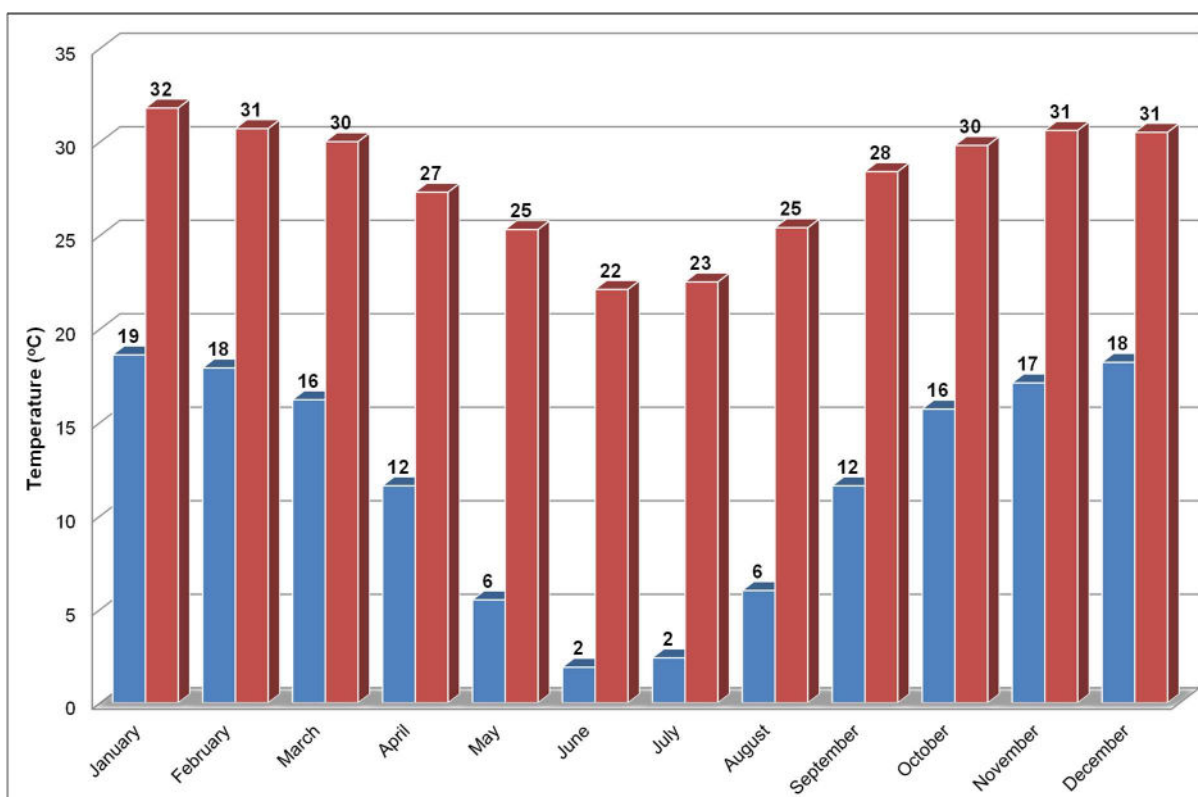


Figure 8-2: Average minimum and maximum temperatures for the project area (Groundwater Complete, 2017)

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Geology

Geological information provided in this report was interpreted from the 1:250 000 scale geological map of the project area provided in Figure 8-3.

The project area is underlain by mafic and ultra-mafic rocks (norite, pyroxenite, anorthosite and gabbro) of the north-western limb of the Bushveld Igneous Complex. The two ore-bearing reefs containing the majority of PGE's are the Merensky and UG2 reefs, which dip towards the south-east. The Merensky Reef varies in thickness from $\pm 0.1\text{m}$ to 3 meters, while the UG2 Reef varies between ± 1.3 and 1.5 meters in thickness.

Young, unconsolidated sediment deposits, also referred to as quaternary deposits, commonly occur along the more prominent watercourses and are depicted in yellow on the abovementioned figure.

Geological structures in the form of north-west by south-east trending faults and dykes occur throughout the mining right area and their positions are indicated on Figure 8-3. These structures are very important from a geohydrological and impact assessment perspective, because:

- The crystalline nature of an igneous dyke makes it impervious to groundwater flow, thus creating a very effective no-flow groundwater boundary.
- Dykes therefore have the ability to divide the aquifer system into smaller sub compartments, often displaying distinct groundwater quality and water level conditions.
- What seems like a contradiction, dykes are targeted when exploring for groundwater. During the initial intrusion of the magma into a fault or discontinuity, rapid cooling caused fractures to form all along the contact. These fractures have the potential to take into or release significant volumes of groundwater from storage.
- Dolerite dykes (although not allowing groundwater to flow across it) therefore also have the potential to create preferred flow paths for both groundwater and contamination (if present).
- Groundwater impacts, both in terms of quality and quantity, therefore tend to extend along the strike of a dyke and/or fault.

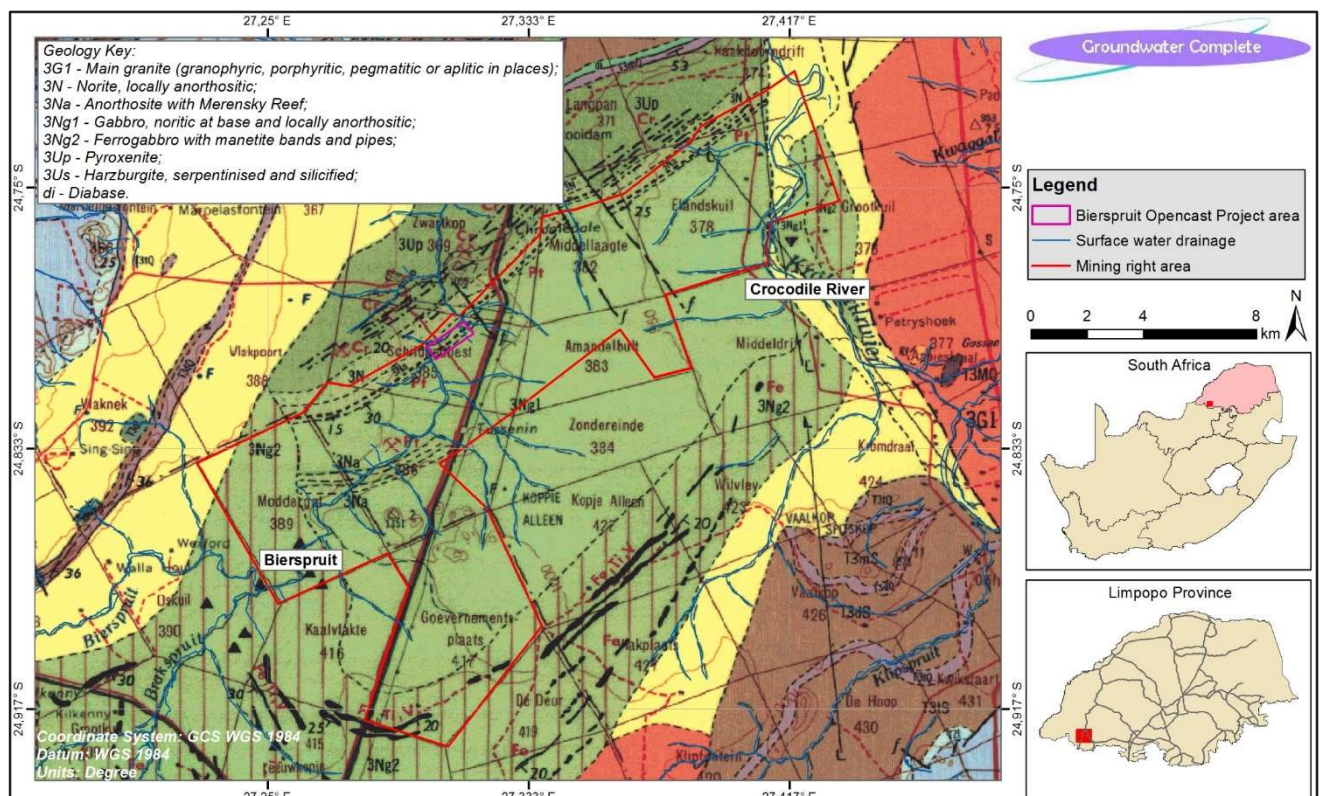


Figure 8-3: Regional geology of the Amandelbult mining right area (1:250 000)

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Air Quality:

The proposed project falls within the Waterberg District Municipality and the Waterberg-Bojanala Priority Area (WBPA). An Air Quality Management Plan has been drafted and baseline characterisation have been completed. The emission summary for the WBPA shows the dominant sectors with regards to the major pollutants considered in the assessment. SO₂ is primarily sourced from industry in the area, with 99.9% of total emissions generated by this sector. Minimal SO₂ contributions are observed from motor vehicles and the residential sectors. Total SO₂ emissions for the priority area are estimated at almost 397 000 tonnes per annum. For NO_x, the industrial contribution to the overall pollutant load is 87%, and the contribution from motor vehicles is 13%. Total WBPA No_x emissions are estimated at approximately 87 000 tonnes per annum. For PM₁₀, mining contributes the greatest proportion of emissions, approximately 60 000 tonnes per annum, and over 70% of total emissions. Industry contributions are lower but still significant at 27%. Total priority area PM₁₀ emissions are estimated at approximately 83 000 tonnes per annum.

The status of ambient air quality indicates elevated fine particulate concentrations near the proposed project area. Zizwe Tumela Opencast Mining in close proximity to the Amandelbult complex maintains a dustfall monitoring network comprising ten source monitoring stations. Dustfall rates for this monitoring network remained below 600mg/m²/day during the period November 2017 to November 2018. There is no ambient fine particulate monitoring data available for the proposed project site.

PM₁₀ monitoring data for Thabazimbi show elevated annual and daily concentrations. Total pollutant emissions rate of 46.04 gram per second of which total suspended particulates account for 79.6% and PM₁₀ for 20.4%.

Geographically, about 94% of the emission load originates from the opencast mining section, 5% from beneficiation / stockpiles and 1% from auxiliary equipment. Mobile equipment is the largest source of ambient pollution (50%), followed by material handling (24%), stockpile fugitive emissions (24%) and mining / processing (2%).

Terrestrial Ecology:

Table 4 below provides a summary of the study area's conservation characteristics. Figure 8-4 and Figure 8-5 indicate the known Important Bird Areas and illustrates how the project falls within an area of high biodiversity importance.

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Table 4: Details of the Study Area in terms of terrestrial ecology (STS, 2019).

Details of the Study Area in terms of Mucina & Rutherford (2012)		Description of the vegetation type(s) relevant to the study area Mucina & Rutherford (2012)		
Biome	The study area is situated within the Savanna Biome .	Vegetation Type	Dwaalboom Thornveld	
Bioregion	The study area is located within the Central Bushveld Bioregion	Climate	Summer rainfall, with very dry winter	
		Altitude (m)	900 - 1200	
		MAP* (mm)	551	
Vegetation Type	The study area is situated within the Dwaalboom Thornveld	MAT* (°C)	19.4	
		MFD* (Days)	19	
		MAPE* (mm)	2505	
Conservation details pertaining to the Study Area (Various databases)		MASMS* (%)	79	
NBA (2011)	The study area falls within an area that is currently poorly protected. These are areas where < 50% of the biodiversity target protection level is met within protected areas as per the Protected Areas Act, 2003 (Act 57 of 2003).	Distribution	Limpopo and North-West Provinces	
National Threatened Ecosystems (2011)	The study area falls within an area that is of least concern.	Geology & Soils	Vertic Black ultramafic clays developed from norite and gabbro. Some areas have less clay. Some with base status and eutrophic red soils. The underlying geology is an Archaean granite-gneiss terrane of the Swazian Eranthem that is covered in parts by the mainly clastic as well as chemical, sediments and volcanic of the Rayton and Silverton Formation, both of the Pretoria Group. Mafic intrusive rocks of the Rustenberg Layered Suite Bushveld Igneous Complex are present in the east of the study area and include the Bierkraal Manette Gabbro.	
SAPAD (2017)	According to the SAPAD (2018) database various Private Natures Reserves (PNR) are situated within 10 km of the study area, namely: Buffelsfontein PNR ± 5 km north, Haakdoorn PNR ± 10 km NE, and Sharmé PNR ± 10 km SE. There are no other protected or conservation areas situated within 10 km.		Conservation	Least Threatened. Target 19%. Approximately 6% statutorily reserved.
	IBA (2015)		The majority of the study area is located within the Northern Turf Thornveld IBA. For more information about the IBA see Appendix D.	Vegetation & landscape features (Dominant Floral Taxa in Appendix B)
Limpopo Conservation Plan Version 2 (2013)				
Critical Biodiversity Area (CBA) 2	The entire study area is situated within an area considered a CBA2. These are best design selected sites to meet biodiversity pattern and/or ecological process targets. Alternative sites may be available to meet these targets. These areas should be maintained in a natural state with limited or no biodiversity loss. Maintain current agricultural activities and ensure that land use is not intensified and that activities are managed to minimize the impact on threatened species.			
Mining and Biodiversity Guidelines (2013)				
Highest Biodiversity Importance	The majority of the study area falls within an area considered to be of Highest Biodiversity Importance. Highest Biodiversity Importance areas include areas where mining is not legally prohibited, but where there is a very high risk that due to their potential biodiversity significance and importance to ecosystem services (e.g. water flow regulation and water provisioning) that mining projects will be significantly constrained or may not receive necessary authorisations.			
High Biodiversity Importance	The small southwestern portion of the study area falls within an area considered to be of High Biodiversity Importance. High Biodiversity Importance areas include protected area buffers (including buffers around National Parks, World Heritage Sites and Nature Reserves), Transfrontier conservation Areas (remaining areas outside of formally proclaimed protected areas), other identified priorities from provincial spatial biodiversity plans and high-water yield areas, amongst others. These areas are important for conserving biodiversity, for supporting or buffering other biodiversity priority areas, for maintaining important ecosystem services for particular communities or the country as a whole. An environmental impact assessment should include an assessment of optimum, sustainable land use for a particular area and will determine the significance of the impact on biodiversity. Mining options may be limited in these areas, and red flags for mining projects are possible. Authorisations may set limits and specify biodiversity offsets that would be written into licence agreements and/or authorisations. Furthermore, a small southern portion is currently not ranked.			



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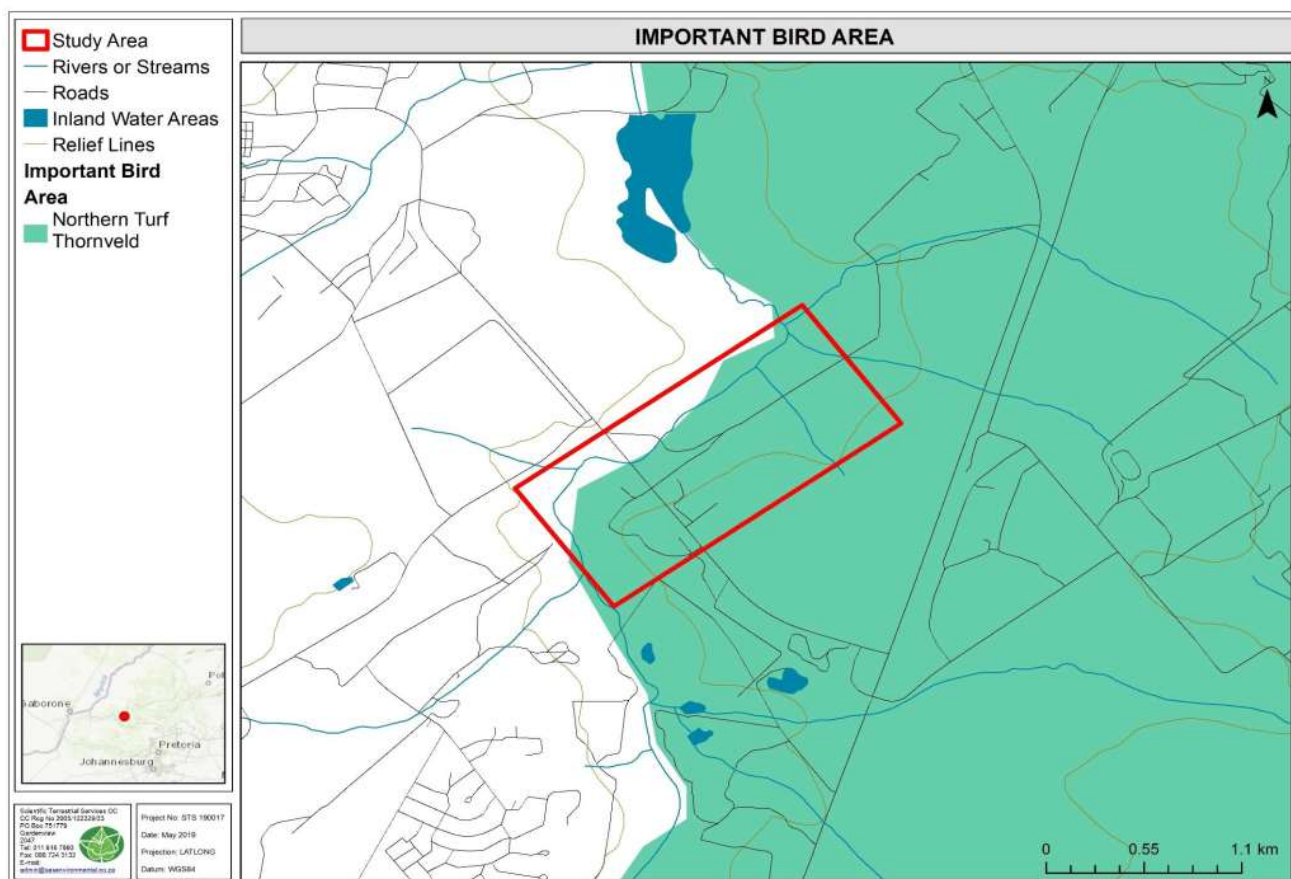


Figure 8-4: The Northern Turf Thornveld Important Bird Area in relation to the study area.

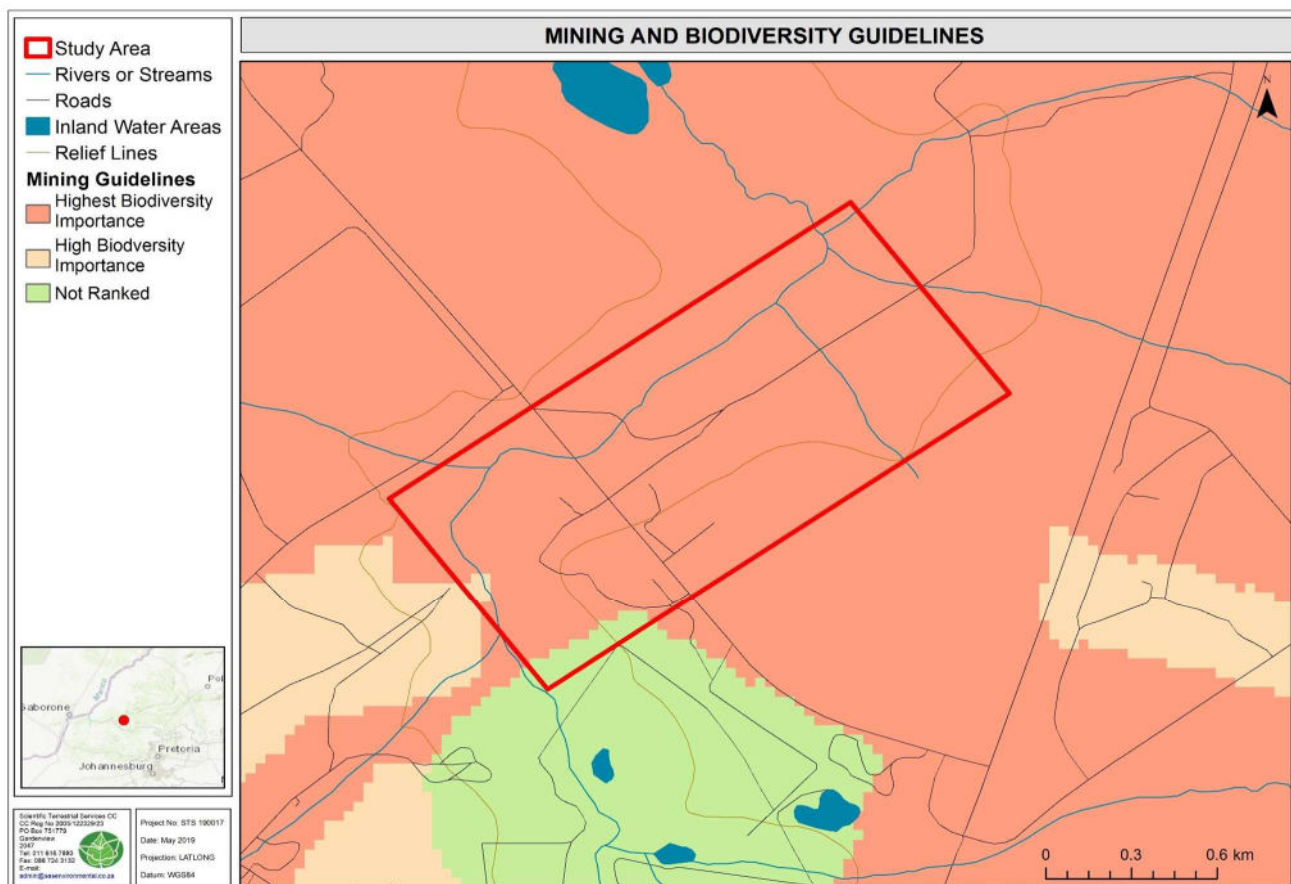


Figure 8-5: The study area falling within a high biodiversity important area (Mining Guidelines, 2013).

Freshwater Biodiversity:

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The following section contains data accessed as part of the desktop assessment and presented as a “dashboard style” report below (Table 5). Please note that site assessments were conducted for all specialist disciplines. The dashboard report aims to present concise summaries of the data on as few pages as possible in order to allow for integration of results by the reader to take place. Where required, further discussion and interpretation is provided.

Table 5: Desktop data relating to the character of the watercourse traversing the study and investigation areas (SAS, 2019).

Aquatic ecoregion and sub-regions in which the study area is located		Detail of the study area in terms of the National Freshwater Ecosystem Priority Area (NFEPA) (2011) database	
Ecoregion	Limpopo Plain	FEPACODE	The study area is located within a sub quaternary catchment currently not considered important in terms of conservation of fish species or watercourses. According to the NFEPA database, there are no wetland features situated within the study area although a natural unchanneled valley-bottom wetland is indicated by the NFEPA database in the south-western portion of the investigation area. This wetland is considered by NFEPA to be in a moderately modified condition (WETCON Class C).
Catchment	Limpopo	NFEPA Wetlands	
Quaternary Catchment	A24F		
WMA	Crocodile (West) and Marico		
subWMA	Lower Crocodile		
Ecological Status of the most proximal sub-quaternary reach (DWS, 2014)		Wetland Vegetation Type	The study area is situated within the Central Bushveld Group 2 (Vulnerable) (Mbona et al. 2014).
Sub-quaternary reach	A24F-00517	NFEPA Rivers	The Bierspruit River traverses the study and investigation areas. The watercourse is considered largely natural according to the Present Ecological State (PES) 1999 classification (Class B) but is considered largely modified according to the River Condition (RIVCON) classification (Class D).
Proximity to study area	Approximately 2km north (downstream) of the study area		
Assessed by expert?	Yes	Detail of the study area in terms of the Limpopo Conservation Plan (C-Plan V2, 2013)	
PES Category Median	D	Critical Biodiversity Area (CBA)	The entire study and investigation area is classified as a Critical Biodiversity Area (CBA) 2. CBA2s are areas selected to meet biodiversity pattern and/or ecological processes targets, although alternative sites may be available to meet targets.
Mean Ecological Importance (EI) Class	Moderate		
Mean Ecological Sensitivity (ES) Class	Moderate		
Stream Order	3		
Default Ecological Class (based on median PES and highest EI or ES mean)	Moderate (Class C)		
Dominant characteristics of the Bushveld Basin Ecoregion Level 2 (8.06) (Kleynhans et al., 2007)			
Dominant primary terrain morphology	Plains, low relief; slightly undulating plains	Rainfall seasonality	Mid-summer
Dominant primary vegetation types	Clay Thorn Bushveld	Mean annual temp. (°C)	18 to 22
Altitude (m a.m.s.l)	900 to 1300	Winter temperature (July)	0 – 22 °C
MAP (mm)	400 to 600	Summer temperature (Feb)	16 – 32 °C
Coefficient of Variation (% of MAP)	25 to 34	Median annual simulated runoff (mm)	20 to 100
Rainfall concentration index	60 to >65		

CBA = Critical Biodiversity Areas; DWS = Department of Water and Sanitation; EI = Ecological Importance; ES = Ecological Sensitivity; ESA = Ecological Support Area; m.a.m.s.l = Meters Above Mean Sea Level; MAP = Mean Annual Precipitation; NFEPA = National Freshwater Ecosystem Priority Areas; PES = Present Ecological State; WMA = Water Management Area

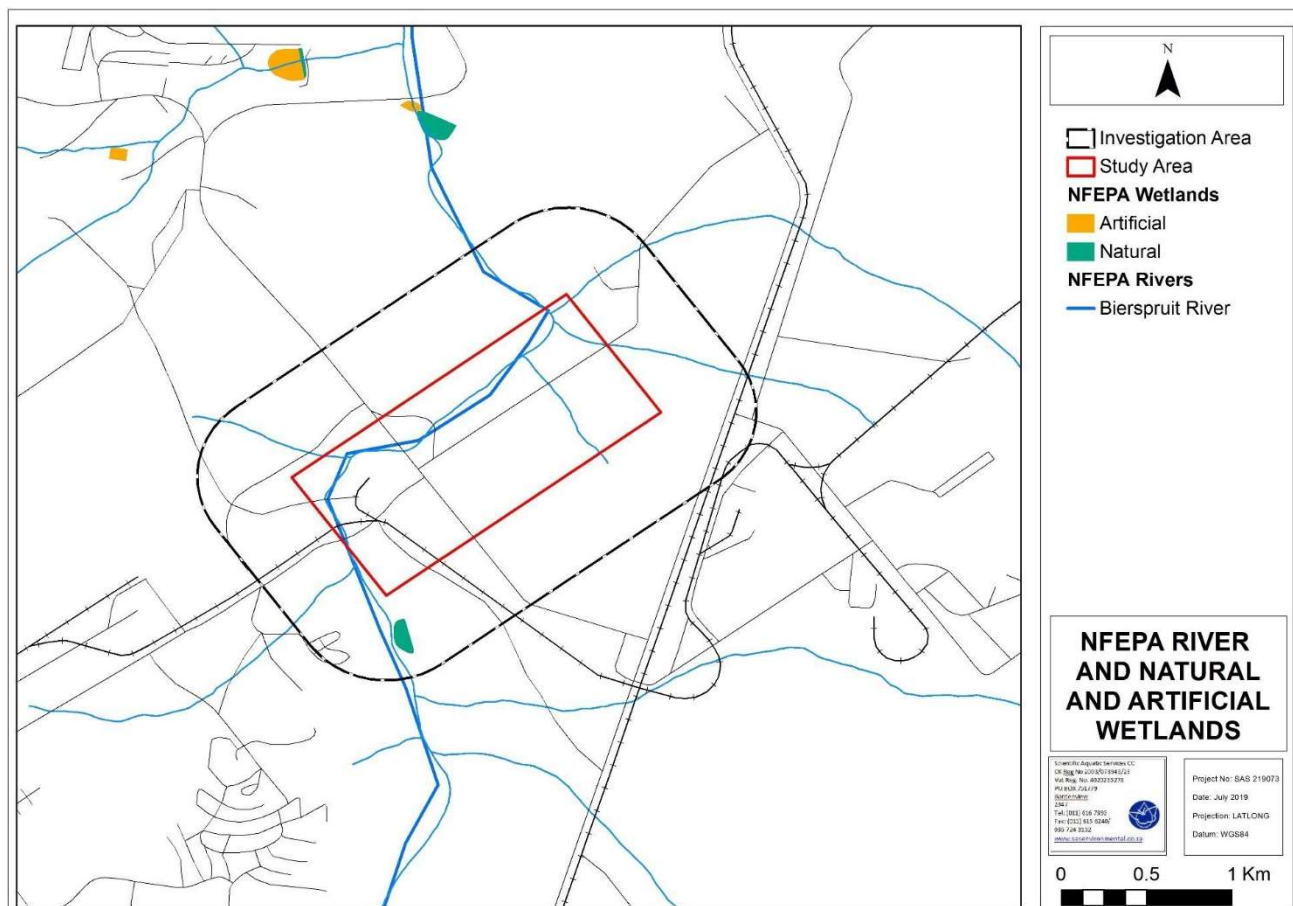


Figure 8-6: The Bierspruit River traversing the study and investigation areas, and a natural wetland within the investigation area, as indicated by the NFEPA (2011) database

Key information on fish species, invertebrates and background conditions associated with the above assessment area, as contained in this database and pertaining to the Present Ecological State (PES), ecological importance and ecological sensitivity for the river, are tabulated in Table 6 to Table 8.

Table 6: Fish species previously collected from or expected in the various SQR monitoring points associated with the various assessment areas.

	A24F-00517 (Bierspruit River)		A24F-00517 (Bierspruit River)
<i>Aplocheilichthys johnstoni</i>	X	<i>Labeo molybdinus</i>	X
<i>Enteromius paludinosus</i>	X	<i>Labeobarbus marequensis</i>	X
<i>Enteromius trimaculatus</i>	X	<i>Mesobola brevianalis</i>	X
<i>Enteromius unitaeniatus</i>	X	<i>Oreochromis mossambicus</i>	X
<i>Chetia flaviventris</i>	X	<i>Pseudocrenilabrus philander</i>	X
<i>Clarias gariepinus</i>	X	<i>Tilapia sparrmanii</i>	X
<i>Labeo cylindricus</i>	X		

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Table 7: Invertebrates previously collected from or expected at the SQR monitoring point associated with the study area.

	A24F-00517 (Bierspruit River)		A24F-00517 (Bierspruit River)
Aeshnidae	X	Hydrophilidae	X
Ancylidae	X	Hydropsychidae 2 Sp	X
Atyidae	X	Leptoceridae	X
Baetidae 2 Sp	X	Lestidae	X
Belostomatidae	X	Libellulidae	X
Caenidae	X	Lymnaeidae	X
Ceratopogonidae	X	Muscidae	X
Chironomidae	X	Naucoridae	X
Chlorocyphidae	X	Nepidae	X
Coenagrionidae	X	Notonectidae	X
Corbiculidae	X	Oligochaeta	X
Corixidae	X	Physidae	X
Culicidae	X	Pleidae	X
Dytiscidae	X	Potamonautidae	X
Gerridae	X	Simuliidae	X
Gomphidae	X	Spaeriidae	X
Gyrinidae	X	Tabanidae	X
Hirudinea	X	Tipulidae	X
Hydracarina	X	Unionidae	X
Hydrometridae	X	Veliidae/Mesoveliidae	X

Table 8: Summary of the ecological status of the sub-quaternary catchment (SQ) reach associated with the study area based on the DWS RQS PES/EIS database.

	A24F-00517 (Bierspruit River)		A24F-00517 (Bierspruit River)
Synopsis		EI Details	
PES Category Median	Largely modified	Fish spp/SQ	13
Mean EI class	Moderate	Fish average confidence	4.69
Mean ES class	Moderate	Fish representivity per secondary class	Moderate
Length	33.65	Fish rarity per secondary class	Very High
Stream order	3	Invertebrate taxa/SQ	40
Default EC4	C (Moderate)	Invertebrate average confidence	5.00
ES Details		Invertebrate representivity per secondary class	High
Fish physical-chemical sensitivity description	High	Invertebrate rarity per secondary class	Very High
Fish no-flow sensitivity	High	EI importance: riparian-wetland-instream vertebrates (excluding fish) rating	High
Invertebrates physical-chemical sensitivity description	High	Habitat diversity class	Low
Invertebrates velocity sensitivity	Very High	Habitat size (length) class	Moderate

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Riparian-wetland-instream vertebrates (excluding fish) intolerance water level/flow changes description	High	Instream migration link class	High
Stream size sensitivity to modified flow/water level changes description	Low	Riparian-wetland zone migration link	High
Riparian-wetland vegetation intolerance to water level changes description	Low	Riparian-wetland zone habitat integrity class	Low
PES Details		Instream habitat integrity class	Moderate
Instream habitat continuity MOD	Moderate	Riparian-wetland natural vegetation rating based on percentage natural vegetation in 500m	Very High
RIP/wetland zone continuity MOD	Moderate	Riparian-wetland natural vegetation rating based on expert rating	Low
Potential instream habitat MOD activities	Large		
Riparian/wetland zone MOD	Serious		
Potential flow MOD activities	Large		
Potential physico-chemical MOD activities	Serious		

Soil, Land Use and Land Capability:

The study area receives a Mean Annual Precipitation (MAP) ranging between 401 and 600mm per annum. The study area resembles a Vertic and Anthropic catena, with Rensburg, Rustenburg/Acardia and Witbank soil forms being dominant, occupying 5.60%, 32.49% and 32.36% of the total surveyed area respectively. The remainder of the study area comprises infrastructure which occupy approximately 29.55%. Below is a tabular presentation of the dominant soils, with relative description of soil horizons as well as associated land capability.

Based on observations during the site assessment, the current land use within the study area is defined as wilderness and surrounded by mining related activities. No commercial agricultural activities are occurring within the near vicinity (i.e. within a 2 km radius) of the study area. The soils associated with the study area have some limiting factors for cultivation under normal circumstances such as high clay content, water logging conditions and shallow effective depth which limits the root penetration of deep-rooted plants. These soils, at best, are suited for pastures and/or wildlife farming but can be cultivated with additional effort. It is also notable that a large portion of the study area is located under the 1:100-year floodline and thus crops would potentially be prone to flood related damage during large rainfall events.

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Table 9: Dominant soil forms and their respective land capability

Soil Form	Code	Diagnostic Horizon Sequence	Land Capability	Areal Extent (ha)	Percentage (%)
Rensburg	Rg	Vertic A/Gley	Grazing (Class V)	0.893	5.60
Rustenburg	Rs	Vertic A/Hard Rock	Grazing (Class VI)	5.180	32.49
Arcadia	Ar	Vertic A/Lithic			
Witbank	Wb	Unspecified	Wildlife (Class VIII)	5.160	32.36
TOTAL				15.944	100.00*

The land capability of the identified soils forms ranged between class V and VIII due to land use limitations related to anthropogenic activities and low soil workability potential. The high clay content and wedge soil structure of related soils can be attributed to inherently poor internal drainage. This limits their land capability largely to marginal potential for arable land use under normal circumstances. These soils are therefore considered to have little contribution to the regional and national agricultural production grid.

The overall potential loss of land capability is anticipated to be relatively low considering the dominant soil forms occurring within the study area due to the marginal agricultural potential of these soils as well as the fact that the area is located under the 1:100-year floodline. Furthermore, the climatic conditions occurring in the vicinity of the study area is associated with a moderately restricted growing season due to high and/or low temperatures, frost and moisture stress. Suitable crops maybe grown at risk of some yield loss as a result of the above-mentioned cultivation constraints under normal circumstances. Due to historic mining activities, a loss of agricultural potential within the Witbank soils have occurred reducing the agricultural potential with these areas only suitable to wilderness land uses.

The Rustenburg/Arcadia soil forms are limited by high clay contents which tightly binds water and soluble nutrients which reduces the potential of plant uptake promoting reduced yields and possible crop failures. Rensburg soil forms are associated with low agricultural potential under normal conditions due to their association with wetland features since they occur in waterlogged conditions, and they are inundated at least seasonally. Although these soils have little contribution to agriculture, these soils are protected by the NWA as they support and maintain the ecological integrity of the freshwater resources.

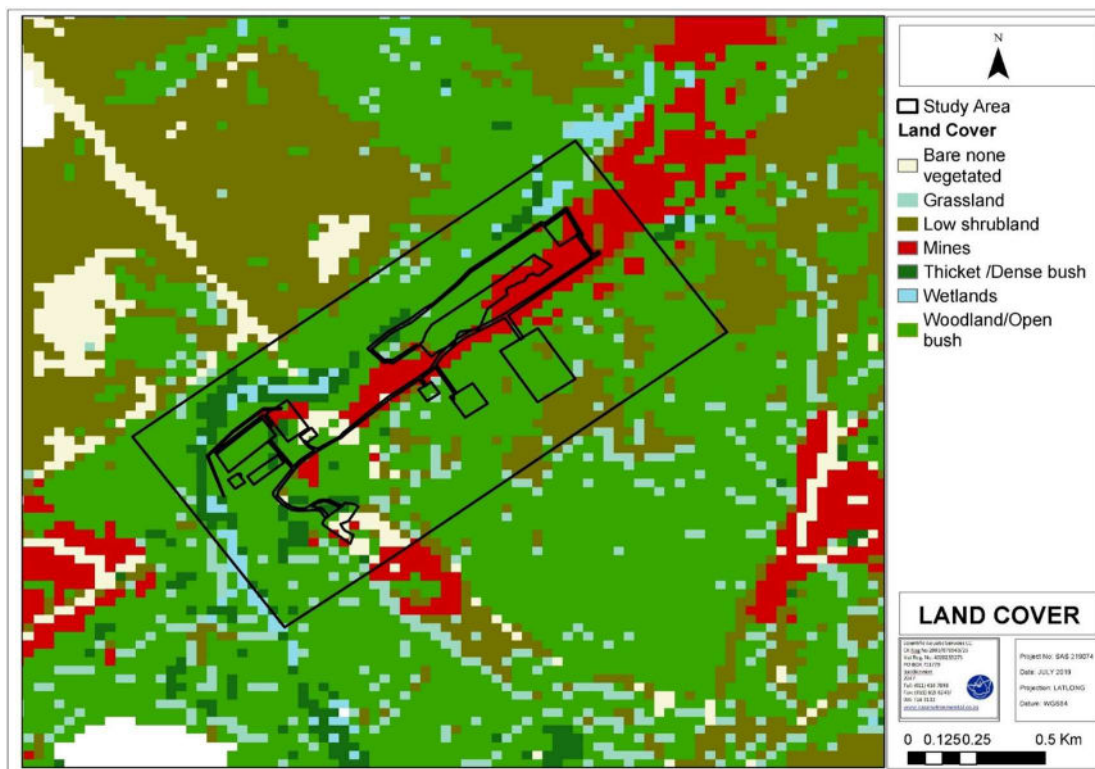


Figure 8-7: Land cover associated with the study area and surrounding area, according to the National Land Cover (2014).

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Groundwater:

The surface topography of the Amandelbult mining right area is relatively flat with surface elevations varying between ± 910 and 1 150 meters above mean sea level (Figure 8-8). The highest surface elevations occur to the south consisting of a group of erosion resistant hillocks, while the lowest elevations are found to the north where the Crocodile River exists the mining right area.

The mining right area is nestled between two prominent water courses, namely the perennial Crocodile River to the east and non-perennial Bierspruit to the west. The Bierspruit is not believed to receive any significant groundwater baseflow, at least not the portion opposite the Bierspruit project area. A topographic high trending north-south divides the mining right area into the A24C and A24F quaternary catchments.

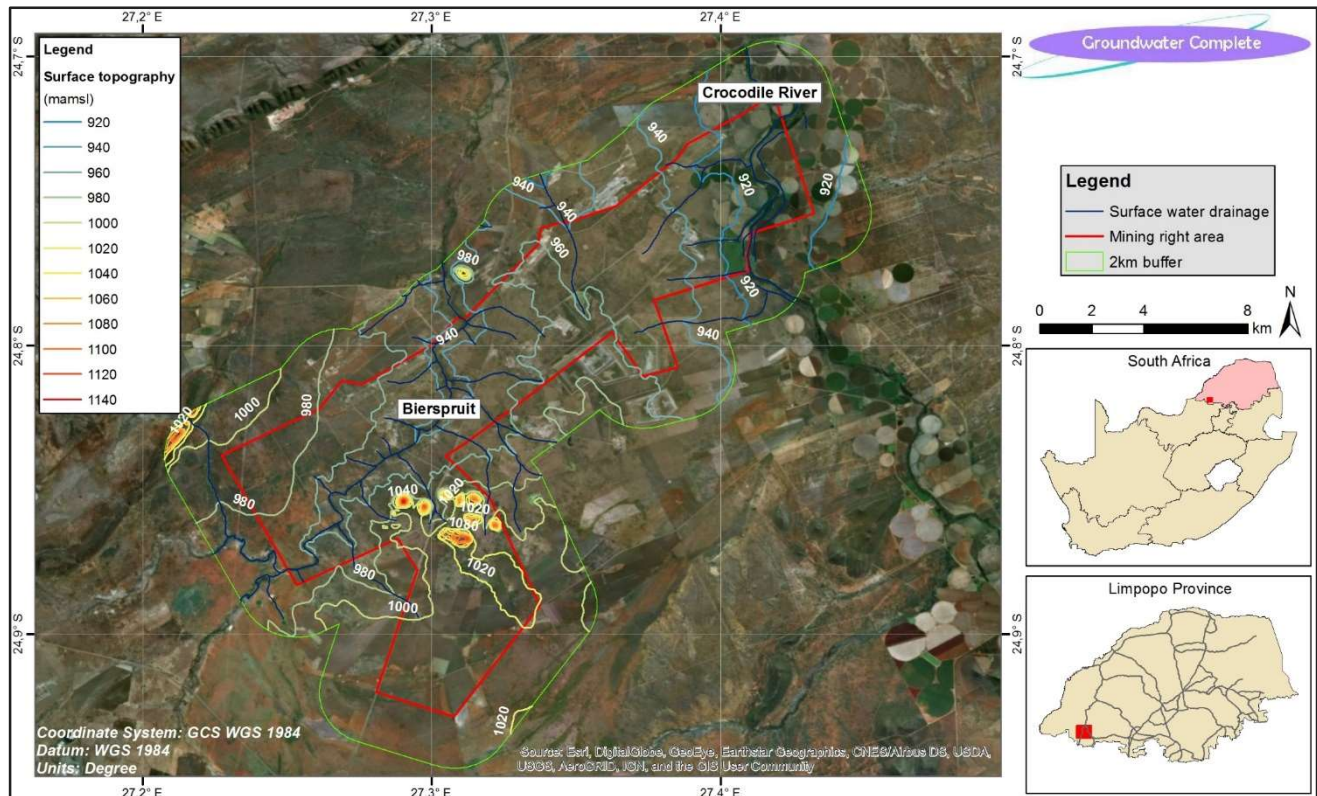


Figure 8-8: Surface elevations and water courses in the Amandelbult mining right area

Heritage:

Mining activities and infrastructure define the immediate surroundings of the study area, including concrete silos with conveyors, pipelines, gravel roads, old waste rock dumps, railway lines, substations and areas where the land surface had been disturbed by past mining-related activities. As a result, significant sections of the study area can be described as disturbed.

The desktop study revealed that the surroundings of the study area is characterised by a long and significant history, whereas previous archaeological and heritage studies from this area have revealed a number of archaeological and heritage sites, which for the most part comprise Late Iron Age stonewalled settlements. These previous reports also revealed very few sites located in the turf thornveld east of the R510 between Thabazimbi and Northam, with more sites (primarily Late Iron Age stonewalled settlements) located west of this main artery. The sites from the surroundings of the study area have primarily been identified at rock outcrops, as well as in close proximity to the Bierspruit.

Interestingly, the study area of one of these previous studies, namely one undertaken in 1994, included the present study area as well. During this previous study a rectangular structure comprising cement brick foundations was identified within the presently proposed Overburden Dump. Furthermore, another site identified during the 1994 survey, namely Site 48, is located in-between the presently proposed Overburden and Topsoil Dumps. This site comprises "...a number of low, circular stone structures occurring on the eastern and western side of a large outcrop of boulders." (Van Schalkwyk, 1994:32).

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A number of photographs in Figure 8-9 to Figure 8-13 below provide general views of the study area and the landscape within which it is located.



Figure 8-9: General view of across a section of the study area. Some sections of the study area are reasonably undisturbed. Note the power lines on the left.



Figure 8-10: Small rock outcrops such as the one shown here are found in the central and western sections of the study area.

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Figure 8-11: These piles of rocks from within the study area point to the disturbed nature of sections of the study area. Such piles and scatters of rocks were found throughout the study area.



Figure 8-12: Sections of the study area are disturbed. This view was taken in the western component of the study area.

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Figure 8-13: This conveyor and concrete silos are located immediately outside the study area but provide an indication of the mining-related activities which had taken place in this area.

Palaeontology:

The proposed development near Thabazimbi is completely underlain by the Pyramid Gabbro-Norite Formation of the Rustenburg Layered Suite (Bushveld Complex). These bedrocks are covered with younger superficial deposits, probably scree and alluvium that are not mapped in the geological map (Figure 8-14). These younger deposits are possibly quaternary to Recent in age. According to the PalaeoMap of South African Heritage Resources Information System the Palaeontological Sensitivity of this layer is insignificant or zero.

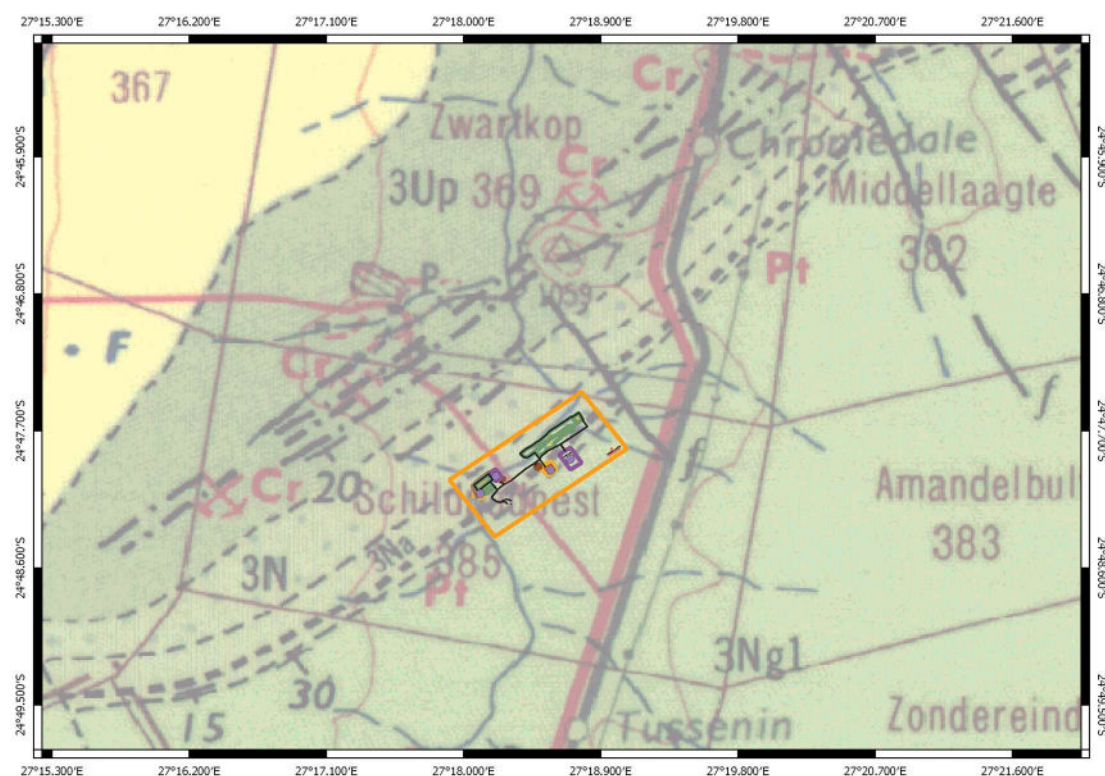


Figure 8-14: Extract of the 1: 250 000 2426 Thabazimbi Geological Map (Council of Geosciences, Pretoria) of the proposed Tailings Facility near Thabazimbi, Limpopo Province.

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Legend to Map and short explanation:

3Ng1 - Gabbro, noritic at base and locally anorthositic

3N – Norite, locally anorthositic

3Up - Proxenite

Mining Activities:

Cr - Chromium,

PT – Platinum

According to the SAHRIS palaeosensitivity map (Figure 8-15) there is a very low probability of finding fossils in this area.

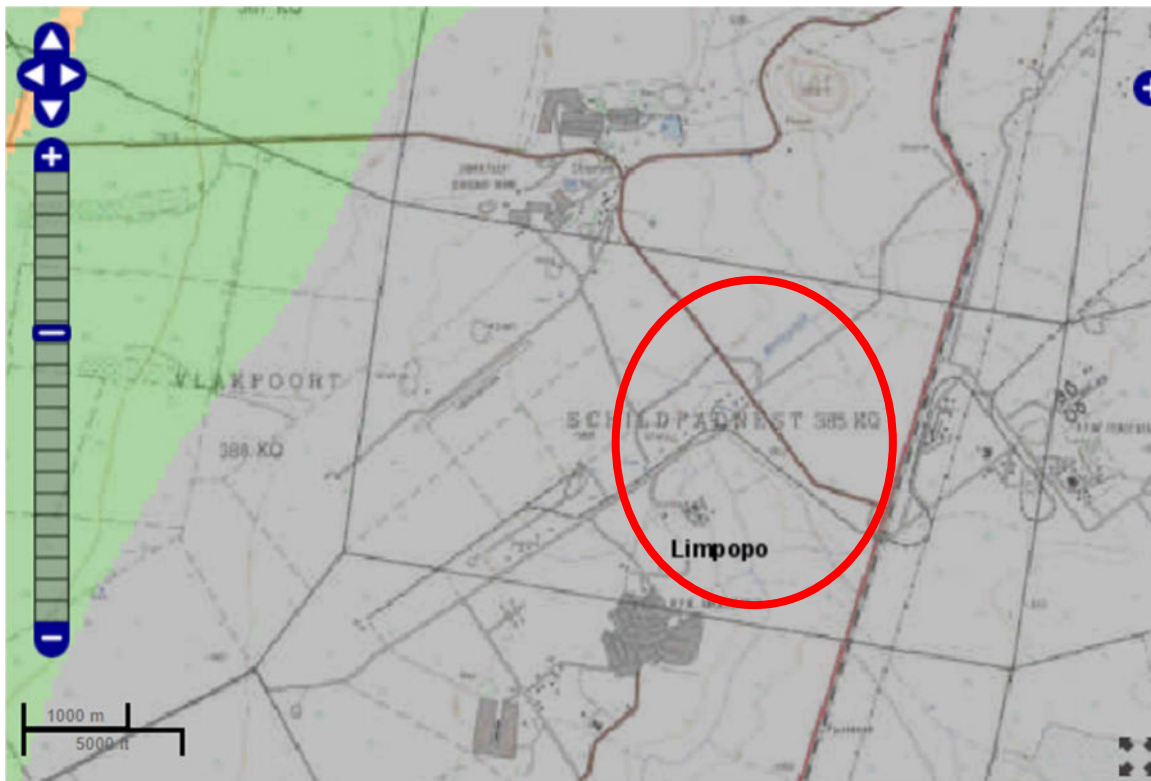


Figure 8-15: Extract of the 1 in 250 000 SAHRIS PalaeoMap map (Council of Geosciences). An approximate location of the proposed development is indicated in red.

Noise:

The study area is described in terms of environmental components that may contribute or change the sound character in the area.

The surrounding land use is mainly mining activities; with tourism and agriculture further from the project focus area. From a desktop perspective (Google Earth®) the surrounding land use can be classed as mining, with suburban residential and subsistence agriculture further from the proposed opencast.

The most important road (in terms of calculable acoustics near a receptor's dwelling) is the access route leading from the R510 to Zwartkop. This is a paved road that transects the focus area. Traffic volumes are low to medium on this road, and, considering the traffic volumes counted during the site visit, average annualized daily traffic (for the first 4 km) would range between 100 – 2,000 vehicles. This therefore may be classified as a minor arterial² road (class 3) or a collector road (class 4 – access road, mixed pedestrian and vehicle traffic, short distance, low order, lower speed, community / farm, road or street carrying less than 1,000 vehicles per day). Increased traffic would influence ambient sound levels up to 200m from this road, but, noise from this source will not be considered.

² SANRAL, 2012: "TRH 26 – South African Road Classification and Access Management Manual". Committee of Transport Officials. Document number DSR_5505816049, Revision 3, Date 2022/12/01

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The proposed project will be developed in an area with an industrial character, with a number of ventilation fans, a railway line, conveyor belts as well as ancillary and support businesses. This study will not investigate the noise levels from these noise sources.

The area falls within the Savanna biome, with the vegetation type classified as other turf thornveld (clay turf thornveld)³. Due to the large amount of anthropogenic activities in the study area (mining and agriculture) ground natural cover has been impacted to make way for mining processes.

Taking into consideration available information, it is the opinion of the specialist that the ground conditions (when considering acoustic propagation on a ground surface) can be classified as medium-hard, which implies that it is not particularly acoustically absorbent. It should be noted that this factor is only relevant for air-borne waves being reflected from the ground surface, with certain frequencies slightly absorbed by the vegetation.

Residential areas and potential noise-sensitive developments/receptors/communities (NSD) were identified using tools such as Google Earth®. Normally noises from mining activities:

- are limited to a distance of approximately 1,000m from the active mining areas. Ambient sound levels are increased due to noises from mining activities, with the potential noise impact measurable;
- audible up to a distance of 2,000m at night, and may be audible up to 4,000m during very quiet periods at night with certain meteorological conditions. Noise levels from mining activities are generally less than 45 dBA further than 1,000m from the mining activities.

There are no NSDs located within 1,000m from the proposed opencast pits, though there are two potential noise-sensitive areas within 2,000m from the opencast pits. They are represented by NSDs 2 and 5, with NSD 3 and 4 representing potential residential dwellings. NSD 1 represents a meeting and conference centre located at the Amandelbult Recreational Club (see Figure 8-16).

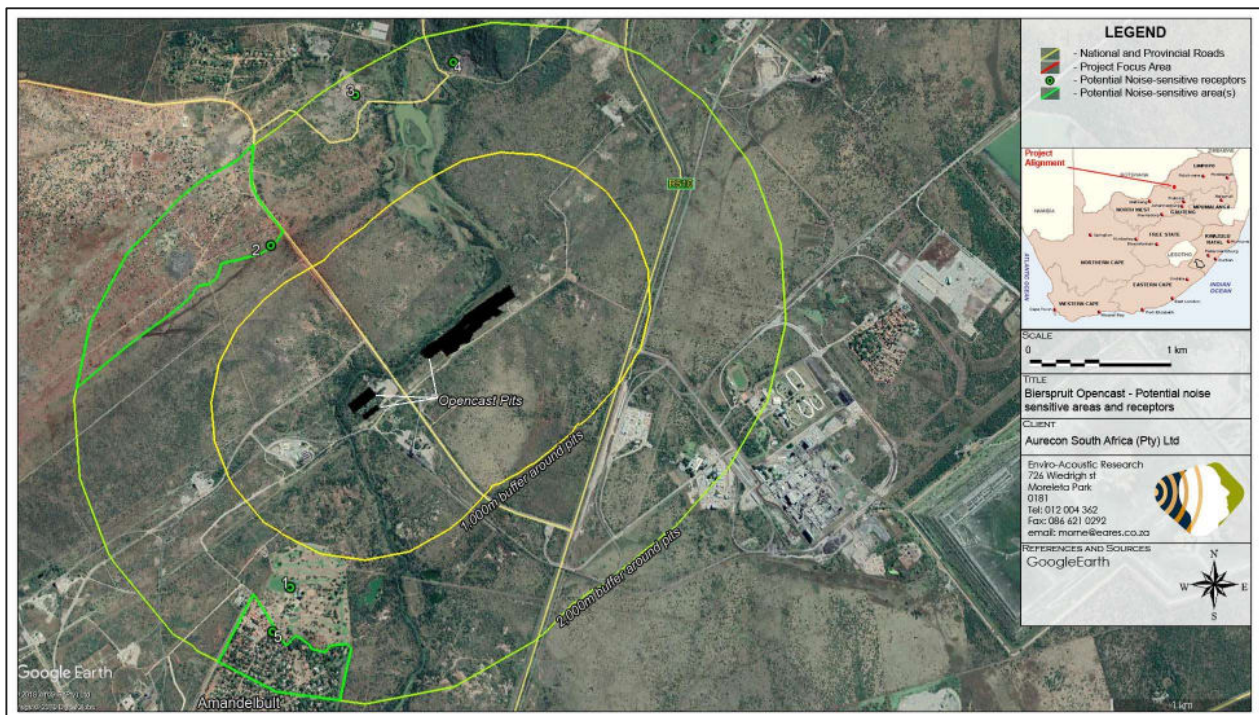


Figure 8-16: Study area and potential noise-sensitive receptors close to proposed development

Visual and Landscape:

The existing open cast mine is located in an area of little natural topographic variation, the main features include the Bierspruit River (lower lying area), running west of the proposed topsoil and overburden dumps and some localised small round hill formations located approximately 6km from the proposed impact which forms a prominent point of elevation. As a result of existing and historic mining activities, the landscape topography has

³ Van Riet, W. Claassen, P. van Rensburg, J. van Viegen & L. du Plessis, "Environmental Potential Atlas for South Africa", Pretoria, 1998.
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been unnaturally altered to a moderate extent. Elevations on site range from approximately 930m - 946 m above sea level

The main landscape types (Figure 8-17) include:

- Mines such as Tumela, Dishaba and Amandelbult Concentrator, various mine related infrastructure is visible such as conveyor belts, slimes dams and smaller buildings.
- Formal and informal residential areas such as Amandelbult town which were established as a direct result of mining operations
- Open strips of natural landscape (dense and open bush), assumed most of it, to be owned by the mine/s for future extension of operations
- Commercial agricultural activities such as irrigated croplands and wildlife ranching
- There are some isolated private lodges located along the Waterberg Mountains, but falls outside the study area

The vegetation is a representation of the Savanna biome and the main vegetation type is Dwaalboom Thornveld, which is characterized by a layer of scattered, low to medium high, deciduous microphyllous trees and shrubs with an almost continuous herbaceous layer dominated by grass species such as *Vachellia tortilis*, *V.nilotica*, *V tenuispina* and *Senegalia erubescens* being the dominant tree species. The vegetation height varies from 3 -7m.

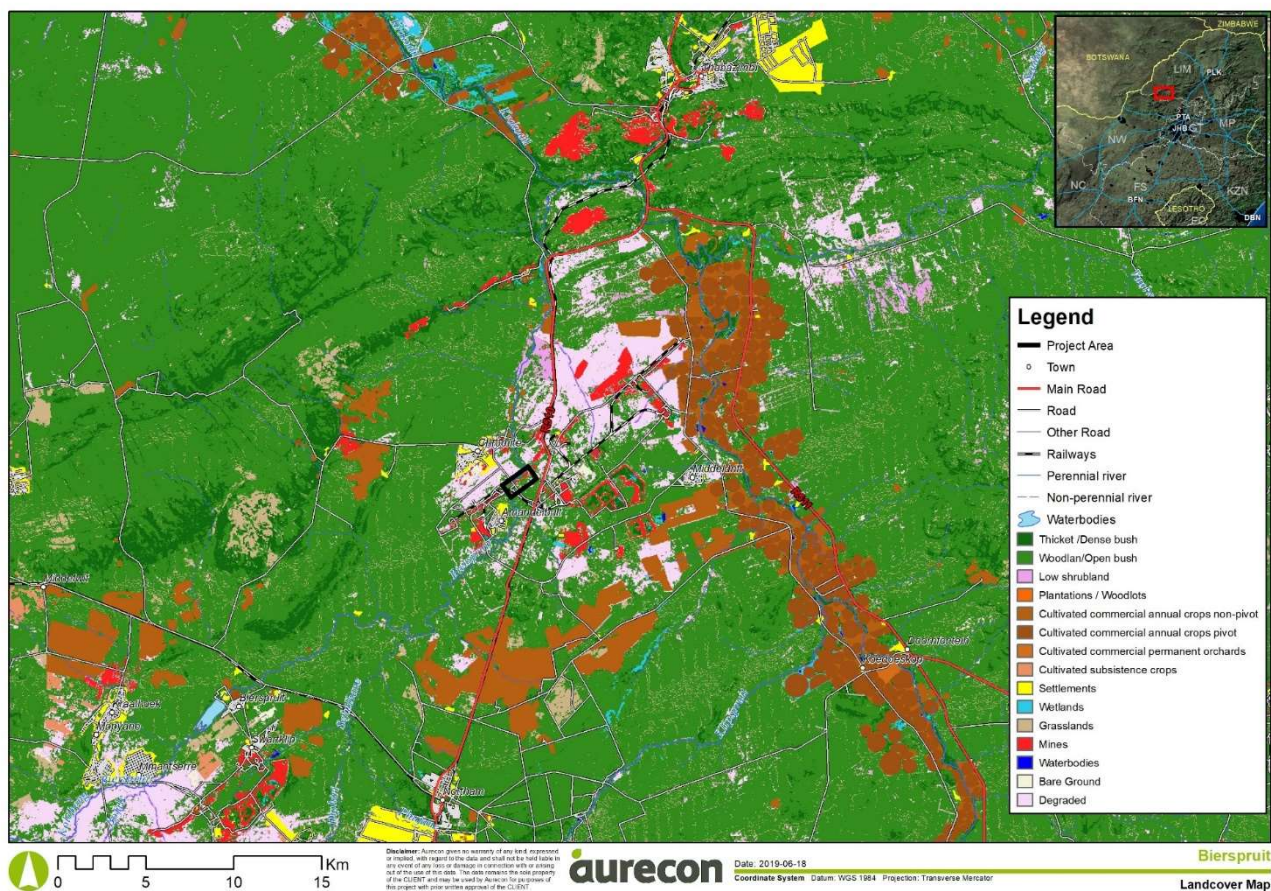


Figure 8-17: Landcover map to inform the visual and landscape baseline description

The following receptor groups were identified:

1. Resident receptors
 - People residing and working in the area
2. Transient receptors
 - Road users travelling on the R510
 - Road users travelling on the unnamed gravel road, connecting the R510 with the informal settlement and tourist lodges, located west of the proposed mining area

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Traffic:

The D1590 links the site to R510, situated about 1,6km south east of the site, one of the two key roads in Thabazimbi which connects the area to the wider region. The surrounding road network is further discussed below:



D1590 is an east-west local collector / distributor road. It connects the nearby mining villages to the R510 to access Thabazimbi and Northam town centres. The road is paved between the R510 and Tumela 16 West Mine access intersection and continues as a gravel road further west.

The current pavement condition in the vicinity of the site is poor as shown in the image on the left.



R510 is north-south rural arterial road, mainly connecting the mining towns of Rustenburg, Northam, Thabazimbi and Lephalale. In the immediate vicinity the R510 provides an indirect link to the Amandelbult Concentrator Plant and Dishaba Mine



The access roads connect the various Amandelbult mine developments to the D1590. The access road has a grade-separated crossing with the R510.

A site visit was conducted on 1st April 2019 to observe the current transport environment in the study area and to confirm locations identified earlier for manual traffic count surveys. The following observations were made during the site visit:

- The D1590 was found to have relatively low traffic volumes. Vehicle types observed along the D1590 included light vehicles, heavy vehicles, buses and minibus taxis.
- There were significant volumes of minibus taxis approaching from the direction of the Smasha Block mining village, about 2.5 km north-west of the proposed site.

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- The deteriorating surface condition of the D1590 was evident, near the site accesses.
- The R510 also carries relatively low traffic volumes but is slightly busier than the D1590 as would be expected of such a hierarchy of road.
- Except for traffic seemingly exceeding the 40 kilometre per hour (kph) posted speed limit on the D1590, no traffic problems were evident during the site visit.

Existing traffic volumes were determined from the traffic count volumes. Existing traffic volumes are shown in Figure 8-18 and Figure 8-19.

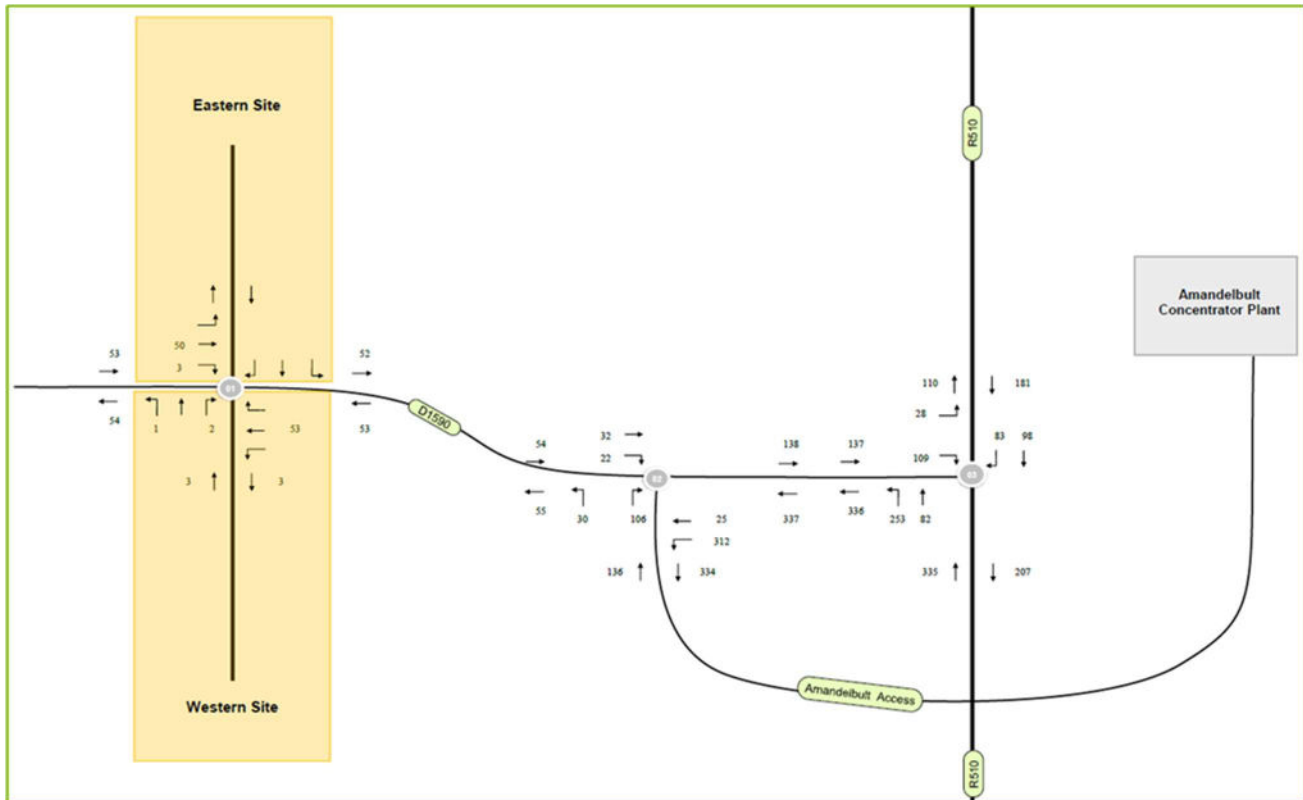


Figure 8-18: Existing traffic volumes AM peak (total traffic)

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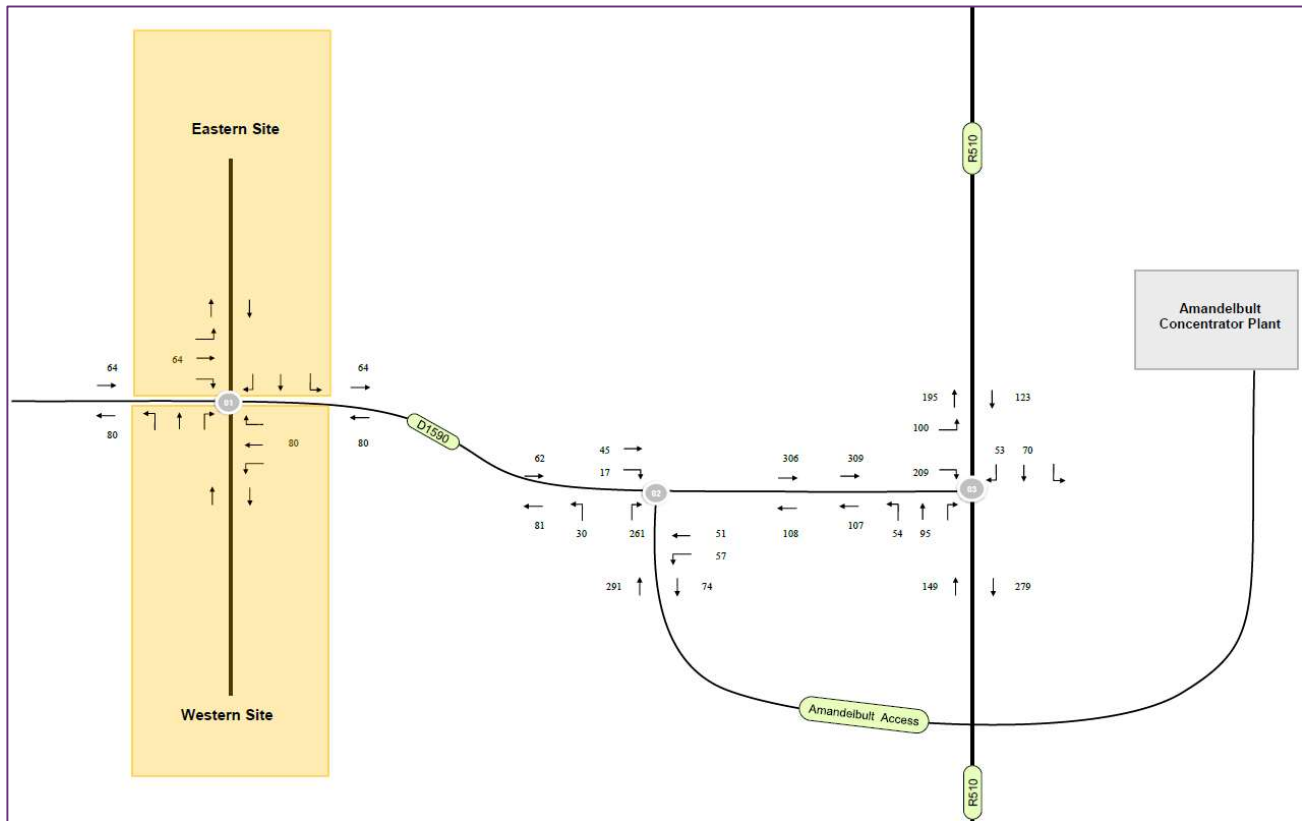


Figure 8-19: Existing traffic volumes PM peak (total traffic)

The D1590 carries up to 150 vehicles peak hour (vph) in both directions west of the Amandelbult access and 450 vph east of the access. R510 carries up to 540 peak hour vehicles south of the D1590 and 320 north of the D1590. It is evident from the count data that the Amandelbult Mine generate most of the traffic that access the D1590, with majority of the traffic approaching from the south (Northam).

The R510 is paved and appears to be in a fair condition. However, the surface quality of the paved section of the D1590 is poor, based on site observations. Local traffic includes light vehicles, heavy vehicles, buses and minibus taxis.

The horizontal alignment of R510 is relatively straight near the site as such visibility, sight distances and sight lines are within acceptable standards. The R510 has good surfacing condition and has a posted speed limit of 120 kph within the study area.

The D1590 has a posted speed limit of 40 kph. However, vehicles were observed possibly exceeding this speed limit near the site. The D1590 has poor surfacing condition, especially near the proposed mine access.

Heavy vehicles in the traffic stream generally add to driver anxiety for other road users, impact on pedestrian movements and therefore increase road safety risks. The section of the D1590, east of the Amandelbult Mine access currently carries 30 heavy vehicles per hour and 10 heavy vehicles per hour west of the access.

The D1590, near the proposed site access is well served by public transport, with minibus taxis making up to 28% of the total vehicles along the road and buses 6.4%. Buses and minibus taxis that service the area comprise of both private mine employee transport vehicles and public transport services. With buses and taxis carrying more people per vehicle, it can be expected that the large majority people in the study area are transport by public transport or employee shuttles.

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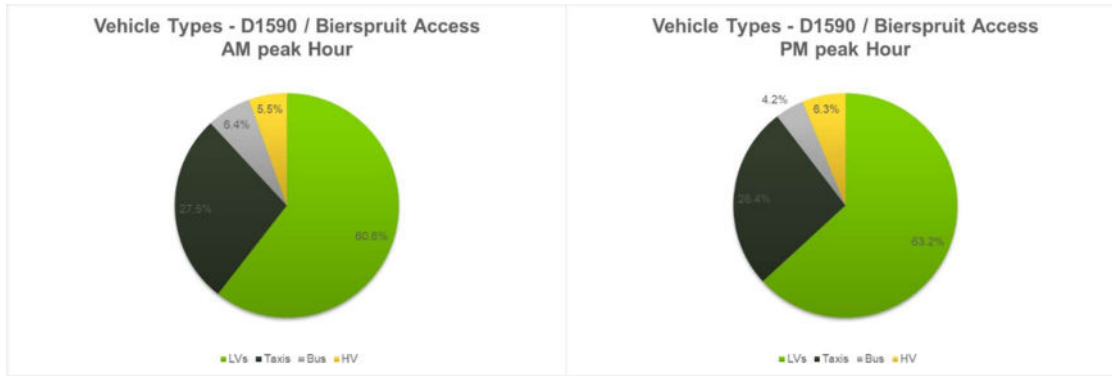


Figure 8-20: Vehicle type composition - D1590 / Bierspruit Mine Access intersection

There are currently no dedicated walking and cycling facilities along the D1590 and R510. No significant walking and cycling activities were evident during the site visit, except for people walking to and from public transport drop-off locations to the local mines.

Waste Assessment:

The RoM extracted at the proposed Bierspruit Opencast Pit will undergo primary crushing at a mobile crusher to the west of the proposed pit area (at the existing 62 East shaft), with further processing occurring at the existing Amandelbult Concentrator Plant. The mining operations will result in storage of overburden stockpile areas that will require a WUL in terms of the NWA.

Representative samples of overburden were collected that had been taken by the Mine during borehole drilling at Bierspruit in order to assess the waste in terms of the requirements of the NEMWA. The waste that will be generated through the opencast operations will require stockpiling for further use during rehabilitation or require disposal:

Composite samples of the predictive waste which could be generated at the opencast pits were made from the following reefs:

- Merensky; and
- UG 2.

The national norms and standards for disposal of waste to landfill GN R.636 of 23 August 2013, describe standard containment barrier design, waste acceptance and waste disposal requirements.

Waste assessed in terms of the Norms and Standards for Assessment of Waste for Landfill Disposal set in terms of section 7(1) of the Act must be disposed to a licensed landfill as shown in Table 10.

Table 10: Landfill disposal requirements

Waste Type	Landfill Disposal Requirements
Type 0 waste	The disposal of Type 0 waste to landfill is not allowed. The waste must be treated and re-assessed in terms of the Norms and Standards for Assessment of Waste for Landfill Disposal.
Type 1 waste	Type 1 waste may only be disposed of at a Class A landfill designed in accordance with section 3(1) and (2) of these Norms and Standards, or, subject to section 3(4) of these Norms and Standards, may be disposed of at a landfill site designed in accordance with the requirements for a Hh / HH landfill as specified in the Minimum Requirements for Waste Disposal by Landfill (2nd Ed., Department of Water Affairs and Forestry, 1998).
Type 2 waste	Type 2 waste may only be disposed of at a Class B landfill designed in accordance with section 3(1) and (2) of these Norms and Standards, or, subject to section 3(4) of these Norms and Standards, may be disposed of at a landfill site designed in accordance with the requirements for a GLB+ landfill as specified in the Minimum Requirements for Waste Disposal by Landfill (2nd Ed., DWAF, 1998).
Type 3 waste	Type 3 waste may only be disposed of at a Class C landfill designed in accordance with section 3(1) and (2) of these Norms and Standards, or, subject to section 3(4) of these Norms and Standards, may be disposed of at a landfill site designed in accordance with the requirements for a GLB+ landfill as specified in the Minimum Requirements for Waste Disposal by Landfill (2nd Ed., DWAF, 1998).
Type 4 waste	Type 4 waste may only be disposed of at a Class D landfill designed in accordance with section 3(1) and (2) of these Norms and Standards, or, subject to section 3(4) of these Norms and Standards, may be disposed of at a landfill site designed in accordance with the requirements for a GLB landfill as specified in the Minimum Requirements for Waste Disposal by Landfill (2nd Ed., DWAF, 1998).

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Based on the requirements of GN R.635, the total concentrations of the constituents are as follows:

Merensky overburden

- Sample 1 (Merensky reef ore) – Copper, nickel, and lead exceed TCT0 but < TCT1.
- Sample 1 – all organic analytes fall below TCT1

Thus, based on the total concentrations the Merensky Reef Ore overburden falls into Type 3 category.

Based on the requirements of GN R.635, the leachable concentrations of the constituents as follows:

- Sample 1 (Merensky reef ore) – all elements fall below LCT0;
- Sample 1 – all organic analytes fall below LCT1.
- Thus, based on the leachable concentrations the Merensky Reef overburden falls into the Type 4 category.

UG2 Overburden

- Sample 2 (UG2) – Arsenic, cadmium, cobalt, copper, nickel, lead, antimony, and selenium exceed TCT0 but < TCT1.
- Sample 2 – all organic analytes fall below TCT1

Thus, based on the total concentrations UG2 falls into the Type 3 category.

- Sample 2 (UG2) – all analytes fall below LCT0.
- Sample 2 – all organic analytes fall below LCT1.

Thus, based on the leachable concentrations the UG2 sample falls into the Type 4 category.

The overall analytical results indicate that both materials are Type 3, based on the total and leachable analysis results, and can be disposed on a class C or G:L:B+ disposal facility. The type of landfill liner is shown in Figure 8-21.

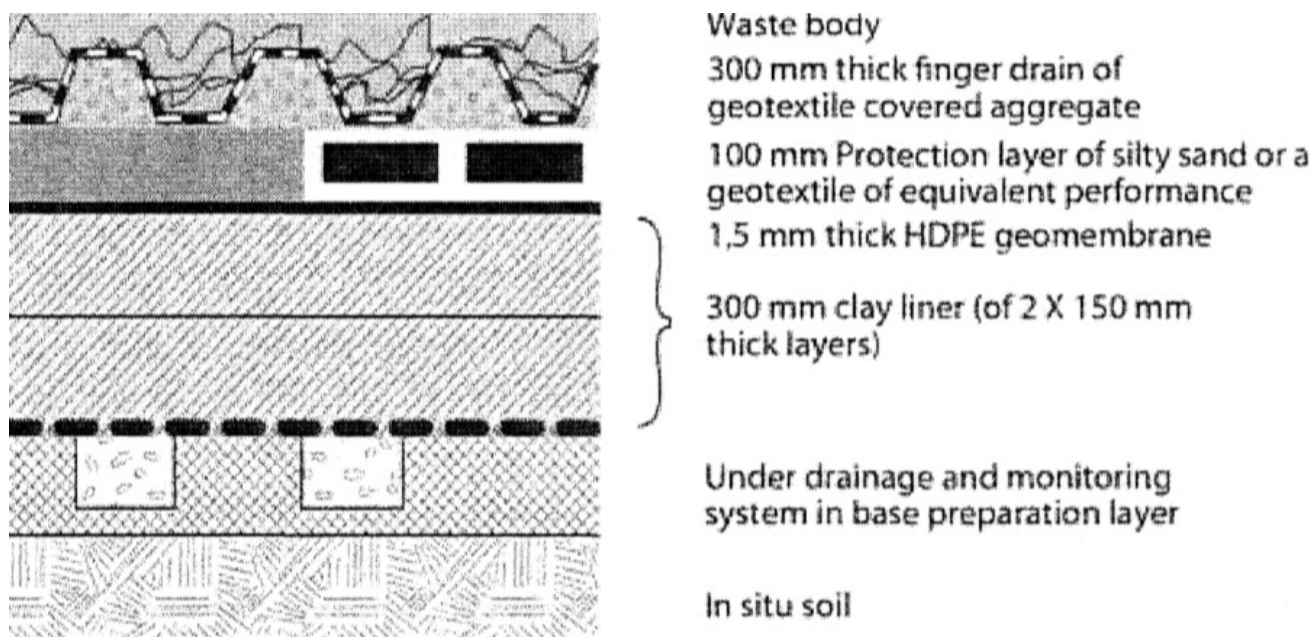


Figure 8-21: Class C Landfill (GN R636, 23 August 2013)

If one considers the leachable concentrations only, then the assessment indicates the materials are Type 4. A Type 4 waste can be disposed on a class D or G:L:B – disposal facility. The liner requirements for a Type D facility is shown in Figure 8-22.

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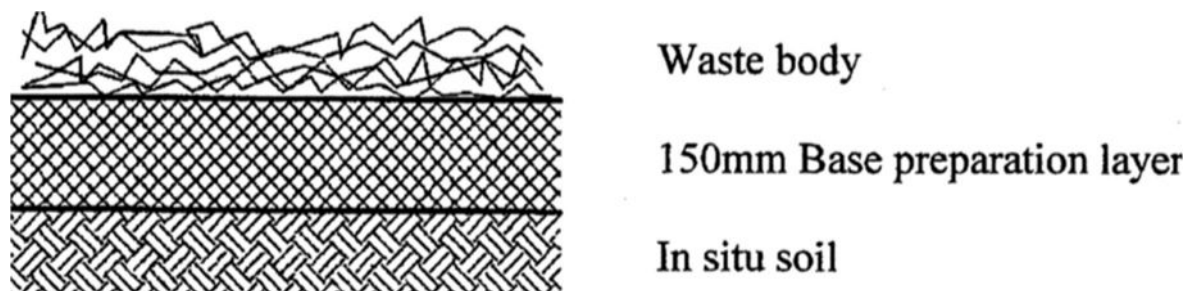


Figure 8-22: Class D Landfill (GN R636, 23 August 2013)

The analytical results indicate that all the materials are Type 3, based on the total analysis results, and can be disposed on a class C or G:L:B+ disposal facility. All the elements that exceeded the TCT0 are summarised below in Table 11.

Table 11: Summary of results exceeding the TCT0 (mg/l)

Analyte	TCT0	Merensky overburden total	UG2 total
Arsenic	5.8	-	<8
Cadmium	7.5	-	<8
Cobalt	50	-	58.13
Copper	16	114.2	28.81
Nickel	91	145.6	379.8
Lead	20	21.31	24.64
Selenium	10	-	30.22
Antimony	10	-	<16

The analytes of most significance are copper, nickel and lead. As the pH of both materials is quite high, these metals would not be expected to leach out of the materials, and this is confirmed by the leach tests as none of these analytes are found at levels above the LCT0 limits.

8.4.1.2 Description of the current land uses

Based on observations during the site assessment, the current land use within the study area is defined as wilderness and surrounded by mining related activities. No commercial agricultural activities are occurring within the near vicinity (i.e. within a 2 km radius) of the study area. The area is subject to informal grazing.

8.4.1.3 Description of specific environmental features and infrastructure on the site

Since the project is proposed to mine the existing backfilled open pit of the Amandelbult mine along the Bierspruit River, there are no specific environmental features on the site itself other than the Bierspruit. A significant portion of the watercourse will be impacted by opencast pits and some surface infrastructure that traverses the watercourse. The proposed opencast pit mining operation and related infrastructure will not only result in complete removal of some portions of the watercourse (area within the 1:100-year floodline) but will also impact on habitat defined as wetland. There is also existing infrastructure from previous mining operations present on site.

Four habitat units are associated with the larger study area and mining areas. Additionally, there are areas which have already been cleared/developed which form part of the current mining activities/infrastructure (named Transformed Areas) which provide no habitat for floral species. These units and site conditions are briefly discussed below:



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Dwaalboom Thornveld Habitat:

This habitat unit is considered to be the dominant habitat within the study area and associated with the topsoil stockpiles, overburden dumps, TMM parking, and the western opencast pits. This habitat unit consists of woody species such as *Senegalia mellifera* (Black Thorn), *Vachellia nilotica* (Scented Thorn), *Vachellia karroo* (Sweet thorn) and *Ziziphus mucronata* (Buffalo Thorn). The herbaceous layer consisted of species such as *Panicum maximum*, *Digitaria eriantha*, *Eragrostis curvula* and *Setaria incrassata*. This habitat unit was noted to be less disturbed than the other habitats units, however mining edge effects, limited veld management in terms of vegetation, fire and ungulate interactions have, to a degree, resulted in the degradation of the habitat, although not to a point of significance.

Freshwater Habitat:

The Freshwater habitat comprises the Bierspruit River which flows through the study area. The riparian vegetation associated with the Bierspruit River is very dense, restricting access to the river. The floral species diversity of the Freshwater habitat is largely representative of floral species known to occur in the region, notably along freshwater systems where large tree species such as *Vachellia nilotica* and *Ziziphus mucronata* can be observed. In addition to the Bierspruit River, an artificial depression was observed within the footprint of the north-eastern opencast pit. This depression is deemed to be artificial as it is unlikely to persist under natural conditions.

Degraded Habitat:

This habitat unit was observed in the areas which have been historically disturbed as a result of past mining activities. These disturbances also include the construction activities associated with the vent shaft, power lines and water pipelines as well as the expansion and development of the mine and the associated edge effects. Within this habitat unit, Alien and Invasive Plant species (AIP) were evident as well as the presence of floral species often found in association with disturbed areas such as *Cynodon dactylon*, *Aristida congesta*, *Bidens pilosa* and *Tagetes minuta*. Additionally, the disposal of construction/excavated rock material from historical earth moving activities was evident.

Transformed Areas:

The Transformed areas include all tracts of land that have been cleared as part of the current mining practices for the greater Amandelbult mining complex. Such areas include the current roads, storage or parking areas and general mine operational sites. As these areas were either devoid of vegetation or presented very limited areas of plant growth, they were not further discussed as they do not add value to the terrestrial ecology of the study area. Please refer to Figure 8-23 below illustrating an example of the current state of the Transformed areas.



Figure 8-23: Transformed areas associated with the study area

Existing and proposed Infrastructure:

Figure 8-24 illustrates the existing infrastructure in relation to the proposed mining activities.

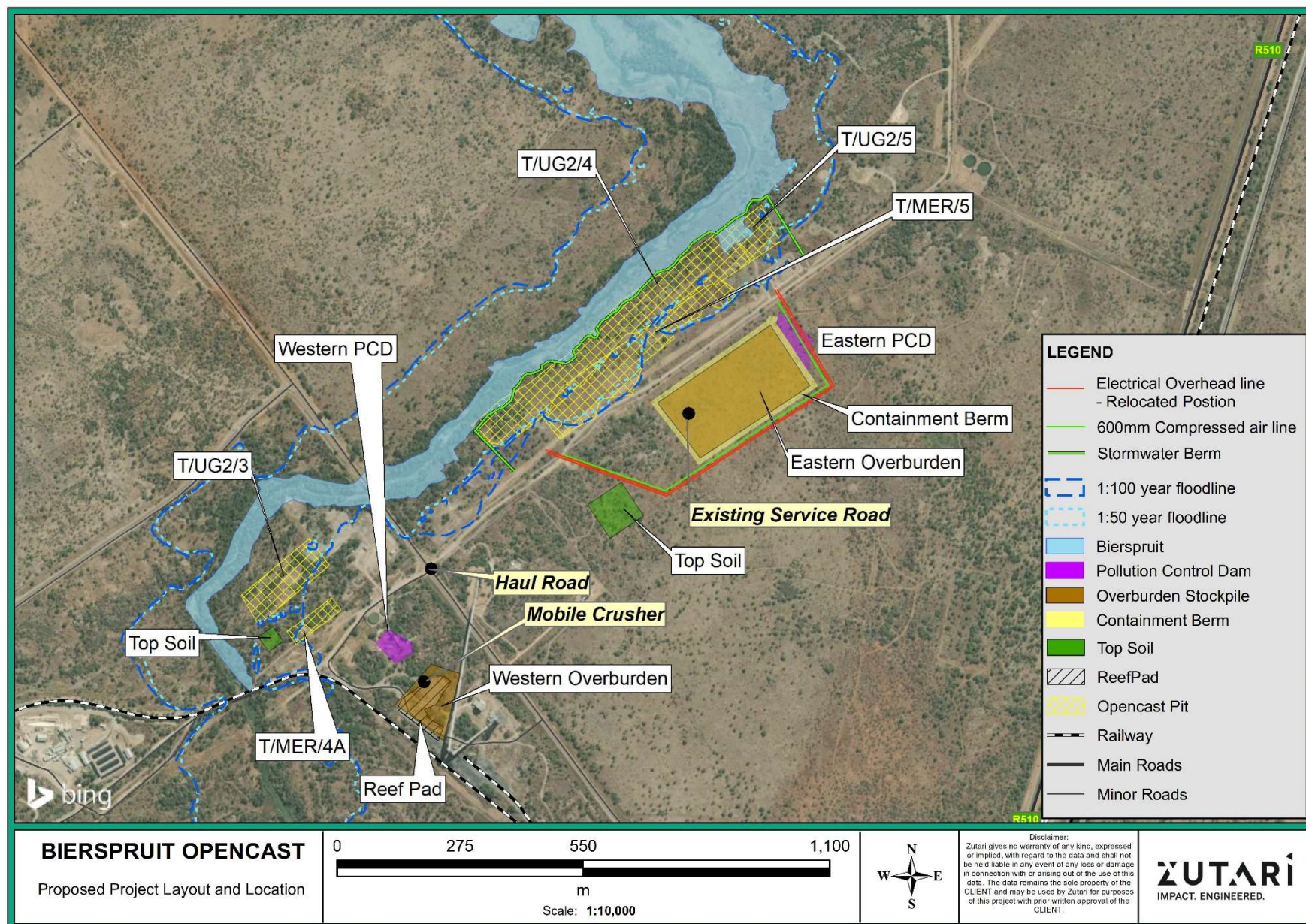


Figure 8-24: Map of the existing and proposed Bierspruit open cast mining areas.

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8.4.1.4 Environmental and current land use map

(Show all environmental and current land use features)

As illustrated in Figure 8-25 below, the following landuses can be attributed to the proposed Bierspruit Opencast Study Area:

- Mining;
- Woodland / open bush;
- Degraded vegetation;
- Bare ground;
- Wetlands; and
- Small patches of Thicket / Dense bush.

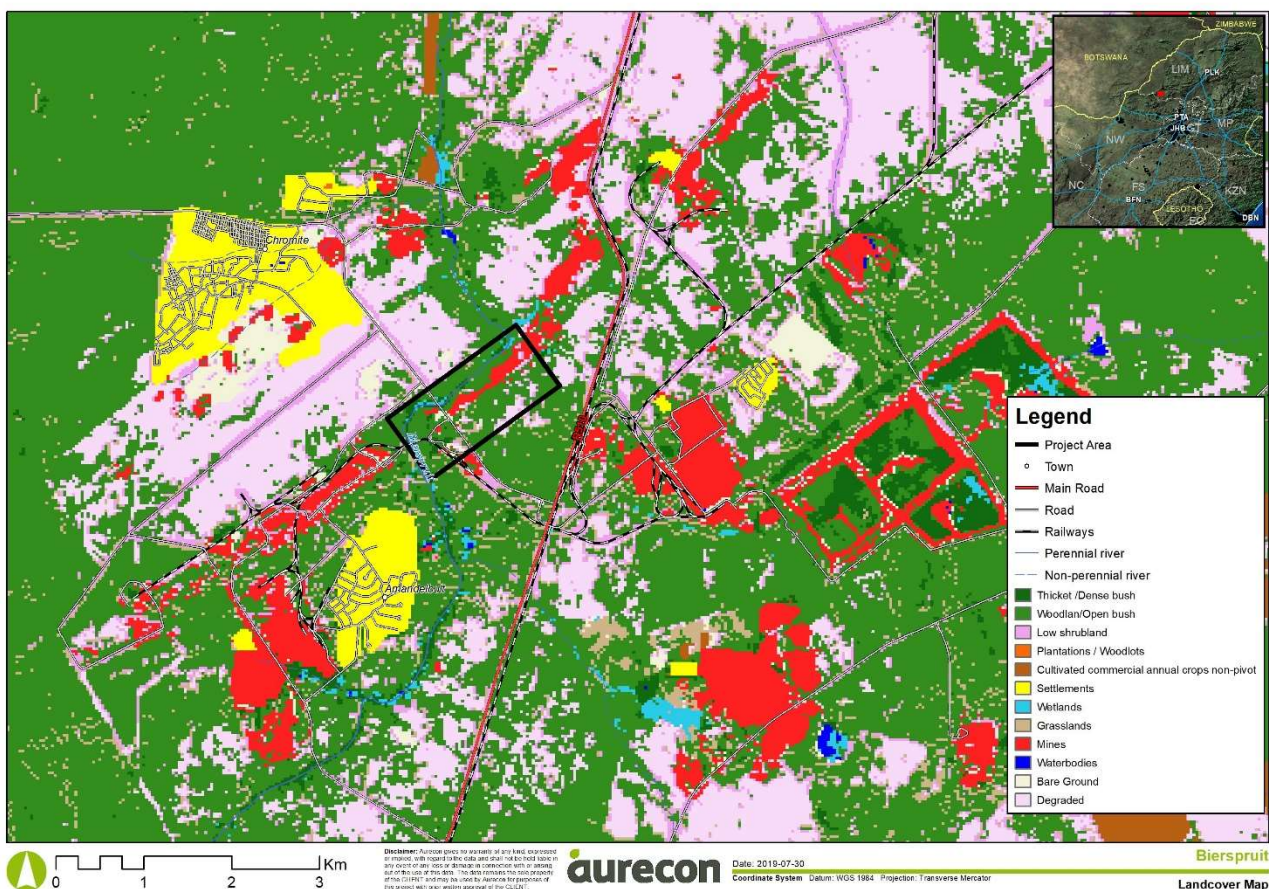


Figure 8-25: Landcover map.

8.5 Impacts identified

(Provide a list of the potential impacts identified of the activities described in the initial site layout that will be undertaken, as informed by both the typical known impacts of such activities, and as informed by the consultations with affected parties together with the significance, probability and duration of the impacts)

The anticipated impacts related to the proposed project include:

- Loss of terrestrial and freshwater habitat biodiversity.
- Loss of vegetation.

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- Loss of floral and faunal species of conservation concern.
- Soil erosion.
- Soil compaction.
- Soil contamination.
- Impact on groundwater levels and quality.
- Impact on heritage and palaeontological resources.
- Impact on the local traffic and road condition of the area.
- Increased air pollution / decline in air quality.
- Increased noise levels.
- Visual impact (although temporary)
- Impact on the social and socio-economic environment (positive and negative).

8.5.1 Methodology used in determining the significance of environmental impacts

(Describe how the significance, probability, and duration of the aforesaid identified impacts that were identified through the consultation process was determined in order to decide the extent to which the initial site layout needs revision).

This section briefly outlines the proposed method for assessing the significance of the potential environmental and socio-economic impacts during the construction, operational and decommissioning phase.

For each predicted impact, criteria are applied to establish the significance of the impact based on likelihood (probability) and consequence, firstly in the case of no mitigation and then with the most effective mitigation measure(s) in place.

The criteria that contribute to the consequence of the impact are **INTENSITY** (the degree to which pre-development conditions are changed); the **DURATION** (length of time that the impact will continue); and the **EXTENT** (spatial scale) of the impact. The sensitivity of the receiving environment and/or sensitive receptors is incorporated into the consideration of consequence by appropriately adjusting the thresholds or scales of the intensity, duration and extent criteria, based on expert knowledge. For each impact, the specialist applies professional judgement to ascribe a numerical rating for each criterion according to the ratings provided. The consequence is then established using the formula:

Consequence = intensity x (duration + extent)

Depending on the numerical result of this calculation, the impact's consequence would be classified as one of the following:

- Extremely; highly; moderately; slightly detrimental;
- Negligible; or
- Slightly, moderately, highly or extremely beneficial.

To determine the significance of an impact, the probability (or likelihood) of that impact occurring is also taken into account. In assigning probability, the specialist must take into account the likelihood of occurrence and the degree of uncertainty and detectability of the impact. Significance is calculated according to the following formula:

Significance = consequence x probability

Depending on the numerical result of this calculation, the impact would fall into a significance category of one of the following:

- Very Low;
- Low (negative or positive);
- Moderate (negative or positive);
- High (negative or positive);
- Very High (negative or positive).

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8.6 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

(Provide a discussion in terms of advantages and disadvantages of the initial site layout compared to alternative layout options to accommodate concerns raised by affected parties)

As discussed previously, the project plan proposes extending the existing mining operations through the mining of previously mined shallow Merensky and UG2 reefs within the Amandelbult Mining Right Boundary. Since this is in an existing mining complex, and since the footprint of the proposed project is not expected to extend beyond the existing mining right boundary of the Merensky and UG2 reefs, determining alternative options in terms of property, location, and type of activity was deemed unpractical and unnecessary since such alternatives would increase the environmental impact.

Technology alternatives are also limited since the proposed mining operations will be located within a previously mined existing open pit mine (which has been backfilled). This existing open pit will be mined using a conventional truck and shovel open pit method. The process for the mining method involves stripping, drilling, blasting, loading and hauling of overburden to waste dumps, followed by hauling the RoM to the ore stockpile area at the mobile crusher. As such, no technology, operational or process alternatives could be considered as viable options.

As such, comparing positive and negative impacts of the proposed project versus an alternative option in terms of layout, footprint and technology cannot be completed. Furthermore, no comments from interested and affected parties have yet been received since this report is intended to be subjected to a public participation period of 30 days. Any comments received during this period will be taken into consideration. Any recommendations for alternative options raised by stakeholders will also be considered and responded to in terms of feasibility and comparative impact assessments as required.

The following preliminary positive and negative impacts related to the proposed project are briefly discussed below. Lastly, a brief summary of the advantages and disadvantages of the project is provided. Detailed assessments of potential social and biophysical impacts (positive and negative) associated with the proposed project and associated infrastructure during the lifecycle of the project will be conducted as part of the EIA phase of the project.

Loss of habitat and species diversity for faunal and floral species:

During the open cast mining process, there will be removal of vegetation and loss of floral habitat within the study area. During the open cast mining process, there will be removal of vegetation and loss of floral habitat within the study area. The floral SCC *Stenostelma umbelliferum*, Near threatened (NT) is considered to have an increased probability of occurring within the Dwaalboom Thornveld Habitat. In addition, the SCC *Vachellia erioloba* (Camel Thorn) is also known to occur within this region. The removal, relocation or destruction of this species will require permits as stipulated within the National Forest Act (Act No. 84 of 1998) (as amended in September 2011), and as such development activities cannot commence until such permits are in place. The faunal SCC *Pterocles gutturalis* (Yellow-throated Sandgrouse, Threatened) and *Python natalensis* (Southern African Python, Vulnerable) are also considered to have an increased probability of occurring within the Dwaalboom Thornveld and the Freshwater Habitat.

The impact significance is expected to be moderate to high negative. However, with the implementation of mitigation measures it is expected to decrease to a possible low negative significance.

Loss of freshwater habitat, ecological structure and diversity:

A significant portion of the watercourse will be impacted by the opencast pit and some surface infrastructure that traverses the watercourse. The proposed opencast pit mining operation and related infrastructure will not only result in complete removal of some portions of the watercourse (area within the 1:100-year floodline) but will also impact on habitat defined as wetland. The mining operation will also likely result in the exposure of soil, increased surface runoff, and the risk of erosion and increased movement of sediment into remaining wetland

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areas. The deposition of sediments within the wetland will likely impact on the geomorphological processes and thus lead to a change in wetland vegetation structure and composition. Increased turbidity and suspended solid loads are likely to result in deterioration of water quality, which may have a negative impact on aquatic biota. Other impacts on water quality, including increased salt loads and chemical constituents of concern are possible and the risk of an altered pH regime must also be considered. Thus, it is anticipated that the proposed mining activities will result in an overall reduction in the extent, ecological integrity and service provision of the Bierspruit system occurring within the investigation area.

The surrounding land uses such as roads and historic mining related operations which have encroached on the wetland boundaries have resulted in the alteration and removal of wetland vegetation structures and floral composition. Hence, habitat provision is considered to be altered (especially due to the invasion of alien vegetation species), resulting in a lowered species diversity. Despite this, some areas of the wetland have extensive vegetation cover and therefore provide foraging and breeding habitat for less sensitive avifaunal and mammalian species.

The impact significance is expected to be high negative. However, with the implementation of mitigation measures it is expected to decrease to a moderate negative significance.

Soil, Land Use and Land Capability:

The soils are anticipated to be exposed to erosion, compaction, dust emission, and potential soil contamination impacts during the proposed opencast mining operation. These impacts may persist for the duration of the operational phase if not mitigated adequately. The soils associated with the study area have some limiting factors for cultivation under normal circumstances such as high clay content, water logging conditions and shallow effective depth which limits the root penetration of deep-rooted plants. These soils, at best, are suited for pastures and/or wildlife farming but can be cultivated with additional effort. It is also notable that a large portion of the study area is located under the 1:100-year floodline and thus crops would potentially be prone to flood related damage during large rainfall events. These soils are therefore considered to have little contribution to the regional and national agricultural production grid. No commercial agricultural activities are occurring within the near vicinity (i.e. within a 2 km radius) of the study area.

The overall potential loss of land capability is anticipated to be relatively low considering the dominant soil forms occurring within the study area due to the marginal agricultural potential of these soils as well as the fact that the area is located under the 1:100-year floodline. Furthermore, the climatic conditions occurring in the vicinity of the study area is associated with a moderately restricted growing season due to high and/or low temperatures, frost and moisture stress.

The impact significance is expected to be moderate negative and decreased to low negative with the implementation of mitigation measures.

Heritage and palaeontological resources:

A single small stonewalled enclosure was identified a short distance to the west within the development area proposed for Tumela Mine Parking (refer to site Bierspruit 1 (BSPR 1) in Figure 8-26 below). It seems likely for this small stone enclosure to have been a peripheral element to the main site identified by Van Schalkwyk (1994) in-between two of the current development footprint areas.

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Figure 8-26: The small stonewalled enclosure at the site BSPR 1.

Due to the low heritage significance of site referenced as BSPR 1, the significance is expected to be low negative. No cultural heritage resources, graves or palaeontological resources are anticipated to be affected by the proposed opencast mine. However, the possible risk for unmarked stillborn graves at the structure identified in 1994 requires that an archaeological watching brief must be implemented for any pre-construction and construction activities on the surface and within 100m from the coordinates recorded for the site during the original heritage survey 25 years ago (S 24.797639 E 27.311083).

Air Quality:

There are five zones of control that apply in terms of the National Framework and the site area falls within Zone 3 which is identified by ambient air quality that remains within the standards, but sustained air quality management interventions are required to, at least, maintain or improve this situation. The Ambient Air Quality Standards will be the levels of ambient air quality where immediate governance interventions are triggered with the aim of, at least, bringing the area into compliance with the standard. This standard is the boundary between air that is potentially harmful and air that is not harmful to health and well-being.

The project falls within the Waterberg District Municipality and the Waterberg-Bojanala Priority Area (WBPA). Air Quality Management Plans (AQMPs) have been drafted and baseline characterisation has been completed for these areas. The status of ambient air quality indicated elevated fine particulate concentrations in the vicinity of the project. The overall objective of the WBPA AQMP is to bring ambient air quality in the area into full compliance with national ambient air quality standards by 2020 and to maintain the state as the region develops.

Dilution of air contaminants in the atmosphere is an important process in preventing undesirable levels of pollutants in the ambient air. Atmospheric dispersion of air contaminants is the result of ventilation, atmospheric turbulence and molecular diffusion. However, gaseous and particulate air contaminants are primarily dispersed into the ambient air through wind action and atmospheric turbulence, much of it on the micro scale level. Depending on the relevant environmental and adiabatic lapse rates, various plume formation can be predicted. These include, looping, neutral, coning, fanning, lofting, fumigating and trapping.

The air quality impact study concluded the following:

- The process falls within the Waterberg District Municipality and the Waterberg-Bojanala Priority Area. Air Quality Management Plans have been drafted and baseline characterisation have been completed. The status of ambient air quality indicates elevated fine particulate concentrations near the project.

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- ▶ Zizwe Tumela Opencast Mining maintains a dustfall monitoring network comprising ten source monitoring stations. Dustfall rates remained below 600mg/m²/day during the period November 2017 to November 2018.
- ▶ There is no ambient fine particulate monitoring data available for the site. PM₁₀ monitoring data for Thabazimbi show elevated annual and daily concentrations.
- ▶ Total pollutant emission rate of 46.04 gram per second of which total suspended particulates account for 79.6% and PM₁₀ for 20.4.
- ▶ Geographically, about 94% of the emission load originates from the opencast mining section, 5% from beneficiation/stockpiles and 1% from auxiliary equipment.
- ▶ Mobile equipment is the largest source of ambient pollution (50%), followed by material handling (24%), stockpile fugitive emissions (24%) and mining/processing (2%).
- ▶ Dispersion of particulate emissions from the process was modelled using the ISC-AERMOD View model based on the standard Gaussian solution.
- ▶ The results present the spectrum from maximum ground level concentration to maximum impact area, and accounts for daily and annual reference periods.
- ▶ Ground level concentrations were predicted for atmospheric conditions based on local meteorological data for the period 1 July 2014 to 31 August 2019.
- ▶ Dry deposition will most likely be a nuisance on-site and beyond the mining boundary, up to a distance of 500m from operations.
- ▶ Dust deposition rates at the nearest sensitive receivers, will probably remain at current background levels. Deposition patterns will closely correlate material handling and transport activities.
- ▶ PM₁₀ concentrations above both the 24-hour and annual national standards are likely beyond the mining boundary.
- ▶ During peak pollution episodes, typically associated with hot, dry and windy conditions, excessive daily PM₁₀ concentrations could be experienced up to a distance of 5 kilometres downwind of mining operations. These contraventions could top the prescribed number of four per annum up to 3 kilometres.
- ▶ Cumulative annual PM₁₀ concentrations will probably exceed the national standard of 40µg/m³ up to a distance of 1 kilometre from mining operations. Annual average PM₁₀ concentrations are expected to be the highest near the ROM crushing and screening operations.
- ▶ The impact assessment considered the cumulative effects on air quality caused by the aggregate of past and present actions in the area.
- ▶ The negative impact of nuisance dust during all phases of the project is negligible. Mitigation through administrative measures and best available techniques (BAT) for the industry will maintain the residual impact at the nearest sensitive receivers at current background levels.
- ▶ The negative impact of fine particulate matter (PM₁₀) during all phases of the project is negligible to minor. Engineering measures in combination with best available techniques (BAT) for the industry will reduce the impact to acceptable levels at the nearest sensitive receivers.
- ▶ Modelling predictions are based on emission reduction factors ranging up to 70% for selected activities. Implementation of a combination of control measures in a focused approach will see a further reduction in the predicted impact area.
- ▶ Ambient monitoring should be used in combination with modelling to assess the effectiveness of control measures at the receiving environment, on a quarterly basis.
- ▶ Strict monitoring of ambient air quality will assist effective air quality management and open communication to all stakeholders.

Blasting:

The potential impacts of ground vibration, air blast levels and fly rock risks that will be caused by the opencast mine will be determined using methods provided by the United States Bureau of Mines (USBM).

Ground vibration levels may be disturbing when blasting takes place within 1000m from residential houses (the unmitigated scenario for 5x 25m deep blast holes). The impact may be of high significance. Mitigation is available that will reduce the vibration levels to less than 2.54 mm/s within 1,000 m from the blast. Ground vibration levels may pose a risk of damage to building and structures in the direct vicinity of the mining area.

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Potential Sensitive Structures (PSS) or Blast Sensitive Receptors (BSR) located within 2000m from the blasting area were identified. The potential magnitude of blasting related impacts (ground vibration, air overpressure and fly rock dangers) will be calculated in a scientific manner, using that information to rate the potential significance of these dangers and provide mitigation and management measures if a potential medium or high significance risk is identified. The mitigation measures should be sufficient to reduce the potential risk to a low significance.

Groundwater:

Opencast mining, when occurring below the water table, results in groundwater discharging or flowing into the pit. Pit dewatering is consequently required to ensure dry and safe mining conditions, which ultimately leads to the dewatering of the local aquifer and lowering of groundwater levels.

The planned overburden dumps and opencast pits themselves are the only potential sources of groundwater contamination associated with the Bierspruit Opencast Project. Note that during the operational phase, and for as long as it takes water levels to recover from the impacts of pit/aquifer dewatering, the pits are expected to act as sinks rather than sources of contamination. Surface water run-off originating from the planned overburden dumps, toe-seeps and seepage through the base may potentially contaminate the groundwater with high levels of nitrate. Water level impacts were simulated to extend further towards the south-east along geological structures/faults that act as preferred pathways for groundwater.

Impact significance is expected to be moderate negative and low negative with the implementation of mitigation measures.

Traffic:

The D1590 was found to have relatively low traffic volumes. Vehicle types observed along the D1590 included light vehicles, heavy vehicles (trucks and buses) and minibus taxis. The D1590 carries up to 150 vehicles during the peak hour (vph) in both directions west of the Amandelbult access and 450 vph east of the access. There were significant volumes of minibus taxis approaching from the direction of the Smashblock mining village, about 2.5 km north-west of the proposed site.

The R510 also carries relatively low traffic volumes but is slightly busier than the D1590 as would be expected of such a higher class of road. The R510 carries up to 540 peak hour vehicles south of the D1590 and 320 north of the D1590 intersection.

The development is not expected to have major impact on road geometry standards and classification, as there is no significant heavy vehicle trip generation that will necessitate re-construction of the local road network.

With a combination of low external road network heavy traffic generation and short lifespan of the facilities, the impact of the proposed development on road safety is considered low negative. With mitigation measures it should decrease to very low negative.

Visual and landscape:

The following visual impacts may occur during the operational, decommissioning and closure phase:

- ▶ Reduction in visual resource value due to the overburden and topsoil dumps; and
- ▶ Permanent alteration of site topographical and visual character due to the presence of the overburden dump.

Impact significance is expected to be low negative with a decrease in significance to very low negative when mitigation measures are implemented.

Noise:

Ideally, the activities of the proposed mining activity should not change the ambient sound levels with more than 7 dBA. This would set the acceptable rating for ambient noise levels at less than 52 dBA for daytime noise levels and 49 dBA for night-time noise levels. The 49-dBA night-time rating level is higher than the International Finance Corporation (IFC) and World Health Organisation (WHO) recommended night-time noise limit for residential use and the 45 night-time limit will be set as the recommended rating level. In terms of international

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noise limits (IFC and WHO), the mining activities should not increase total noise levels to more than 55 and 45 dBA (day- and night-times respectively).

While the proposed opencast will pose a risk to the surrounding soundscape, the potential change in ambient sound levels was calculated to be low and the noise impact will be of a low significance. The proposed mining activities will be further than 1,000m from all potential Noise Spectral Density (NSD) and the risk of a noise impact would be low both for the night- and daytime periods.

Disadvantages of the proposed project:

Possible disadvantages of the proposed Bierspruit opencast mine include an increased impact significance to the floral and faunal ecology, however with the implementation of mitigation measures, the disadvantages or risks can be managed.

The freshwater habitat is also anticipated to be lost as the result of the mining and was rated as a “High” risk significance with the current conditions described as being severely disturbed. With appropriate restoration and rehabilitation, the project provides opportunity to improve the current site condition post-closure.

Advantages of the proposed project:

Advantages of this overall project are that the proposed mitigation measures and rehabilitation measures will provide an opportunity to rehabilitate the area in an integrated manner thus potentially leading to a net improvement in the condition of the area post closure.

Other advantages include Amandelbult’s commitment, through its Social and Labour Plan (SLP) to start up and sustain infrastructure and poverty eradication projects through measures addressing housing and living conditions and nutrition of mine employees. A plan is also in place to provide Historically Disadvantaged South Africans’ (HDSA) companies with opportunities to supply to the mining operations, the focus areas include: job creation, basic infrastructure, community education and skills development, community safety, health and welfare.

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

(With regard to the issues and concerns raised by affected parties provide a list of the issues raised and an assessment/ discussion of the mitigations or site layout alternatives available to accommodate or address their concerns, together with an assessment of the impacts or risks associated with the mitigation or alternatives considered).

Biodiversity (Terrestrial and Freshwater):

- ▶ Extend the existing Alien and Invasive Plant Species (AIP) control plan to include this project area, prior to vegetation clearance activities to limit the dispersal of AIP species and seeds during such activities.
- ▶ Limit the footprint areas to what is absolutely essential;
- ▶ Clearly demarcate the boundaries of the footprint area and ensure that personnel and vehicles do not move outside of the footprint area;
- ▶ Edge effect control needs to be implemented to ensure no further degradation and potential loss of habitat outside of the proposed = footprint area occurs;
- ▶ No indiscriminate driving through the surrounding habitat or clearing of vegetation outside of the footprint;
- ▶ No uncontrolled fires are to be allowed by personnel/contractors;
- ▶ No disposal of waste material within the surrounding habitats or burning of waste;
- ▶ Rehabilitate and revegetate all disturbed areas that are no longer in use so as to limit bare soil areas as well as minimise the opportunities for AIP proliferation.
- ▶ Prior to vegetation clearance activities a walk down of the proposed footprints should be undertaken in the appropriate season in order to ascertain and verify the presence of any floral SCC. Should any floral SCC be observed the appropriate permits will have to be applied for prior to the removal of the species;
- ▶ Removal of floral SCC are to be overseen by a suitably qualified specialist; and

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- ▶ No collecting or harvesting of floral SCC or medicinal plants is to occur from either the footprint areas or the surrounding habitats by mine personnel.
- ▶ Construction should be initiated by first constructing clean and dirty water separation systems thus ensuring that as site clearing takes place, dirty water runoff is appropriately managed;
- ▶ Protect exposed topsoils by means of a geotextile such as hessian sheeting;
- ▶ Ensure contractor laydown areas are placed outside of the wetland and the associated 100m GN704 Zone of Regulation. A designated area should be approved by the Environmental Control Officer (ECO) prior to use;
- ▶ Ensure no soil stockpiles are higher than 3m;
- ▶ Any concrete mixing/temporary storage must be undertaken in bunded areas or on batter boards only. Care must be taken to prevent any spillage within the wetland or surrounding environment; and
- ▶ Dust suppression measures must be implemented throughout construction/operation and rehabilitation to prevent excessive dust which may smother wetland vegetation or cause a nuisance.

Soil, land use and land capability:

- ▶ Optimisation of proposed infrastructure layouts: All effort should be made to ensure that the proposed mining footprint falls within the allocated and disturbed areas.
- ▶ The footprint of the proposed infrastructure areas should be clearly demarcated to restrict vegetation clearing activities as far as practically possible.
- ▶ Bare soils can be regularly dampened with water to suppress dust during the construction/operational phase, especially when strong wind conditions are predicted according to the local weather forecast.
- ▶ All disturbed areas adjacent to the mining areas and related infrastructure can be re-vegetated with an indigenous grass mix if necessary to re-establish a protective cover in order to minimise soil erosion and dust emission.
- ▶ A spill prevention and emergency spill response plan to be implemented, as well as dust suppression.
- ▶ An emergency response contingency plan should be put in place to address clean up measures should a spill and/or a leak occur as well as preventative measures to prevent ingress.
- ▶ Burning of any waste including rubble domestic waste, empty containers on the site should be strictly prohibited and all construction rubble waste must be removed to an approved waste management site in line with the Zero Waste to Landfill (ZW2L) initiatives at the mine.

Blasting:

- ▶ RPM should implement a vibration and air blast measurement programme to allow the monitoring of all blasts during the first year. This data must be analysed and the blast impact assessment be reviewed and updated. If no complaints are registered the blast monitoring can be ceased.
- ▶ The Blasting Impact Assessment Report (and EMPr which contains mitigation measures) must be updated if the blast design is changed where more than 2,500 kg explosives are detonated per charge.
- ▶ Notification signs informing the public about blast times should be erected.
- ▶ The charge per delay should be reduced (less than 1,000 kg) to ensure that maximum ground vibration levels are less than 2.54 mm/s when blasting has to take place within 1,000m from residential houses.
- ▶ Blasts should be planned and all structures located within the potential zone of influence should be identified. For a blast of 2,484 kg, buildings and structures located within 260 m should be relocated mainly due to the risk of flyrock damaging the structures. As part of the Scoping process it has been determined that existing power pylons and pipelines in close proximity to the opencast pits will be relocated. This is shown on Figure 8-24 adjacent to the proposed eastern overburden stockpile.
- ▶ A forum should be initiated to inform close residents about the likely vibration associated with blasting, the proposed schedule as well as the warning methodology which will be employed prior to a blast (this could include warning sirens, the erection of notice boards in the area as well as the relocation of people and livestock within 500 m from the active blast site).

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Traffic:

- ▶ The additional heavy traffic that the development can generate has already been minimised in that most of the ore will be transported by rail to the Amandelbult concentrator plant and further to the markets.
- ▶ Regular traffic safety awareness and training is recommended at part of on-site safety briefing for employees and suppliers or partners. Signage should be reviewed near the D1590 / Site access intersection to ensure sufficient warning of crossing heavy vehicles is provided to general road users.
- ▶ Localised surface upgrade or rehabilitation is recommended at the intersection of the D1590 with the proposed development access, to improve current conditions and to better accommodate the additional development traffic.

Visual:

Several mitigation measures have been identified to address the anticipated visual impact. There is limited scope for potential mitigation measures during the construction and operational phases of the project. The focus should be on the reclaiming and rehabilitation of the long-term visual quality of the landscape during the decommissioning and closure phases.

All disturbed areas should be correctly shaped and contoured to facilitate free draining, and as far as possible, reflect the natural form and topography of the landscape. Where sufficient resources (topsoil) are available, disturbed areas should be actively rehabilitated using locally occurring indigenous grasses. To break the geometric profile of the overburden dump, it is also recommended that existing indigenous trees be considered for establishment during the rehabilitation of the facility.

8.8 The outcome of the site selection Matrix

No site selection matrix was compiled since there are no feasible location alternatives. Once the public review period has been completed, all comments received during the consultation process will be considered for input into the design, where feasible and applicable.

8.9 Final Site Layout Plan

The final site layout plan is included as Figure 8-24.

8.10 Motivation where no alternative sites were considered

The project plan proposes extending the existing mining operations through the mining of shallow Merensky and UG2 reefs within the Amandelbult Complex Mining Right Boundary. Since this is an existing mine complex, and since the footprint of the proposed project is not expected to extend beyond the existing mining right boundary of the Merensky and UG2 reefs, determining alternative options in terms of property, location, and type of activity was deemed impractical and unnecessary since such alternatives would increase the environmental impact. Furthermore, it needs to be noted that the ore seams dictate where mining takes place, and these locations are fixed.

Technology alternatives are also limited since the proposed mining operations will be located within an existing open pit mine. This existing pit will be mined using a conventional truck and shovel open pit method. The process for the mining method involves stripping, drilling, blasting, loading and hauling of overburden to waste dumps, followed by hauling the RoM to the ore stockpile area at the mobile crusher. As such, no technology, operational or process alternatives could be considered as viable options. Important to add here is that opencast mining is the preferred option during increased commodity pricing periods.

The option of not implementing the activity (also called the no-go option) involves comparing the proposed activities with that of the current status quo of the existing Amandelbult Mine or, more specifically, the Merensky and UG2 reefs. Implementing this option negates the need for appointing unskilled, semi-skilled and skilled mine

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workers and cancels the positive contribution that this project may have on the local, provincial and national economy. In contrast, this option also prevents the increase in environmental impacts related to construction activities, such as air and noise pollution. This no-go option will be assessed during the detailed impact assessment that will be conducted as part of the EIA phase.

8.11 Statement motivating the preferred site

No alternative site has been considered since the project entails the re-mining of a previously mined area (existing) to access shallow Merensky and UG2 reefs within the Amandelbult Mining Right Boundary.

9 Plan of study for the Environmental Impact Assessment process

9.1 Description of alternatives to be considered including the option of not going ahead with the activity

The project plan proposes extending the existing mining operations through the mining of shallow Merensky and UG2 reefs within the Amandelbult Mining Right Boundary. Since this is in an existing mining complex, and since the footprint of the proposed project is not expected to extend beyond the existing mining right boundary of the Merensky and UG2 reefs, determining alternative options in terms of property, location, and type of activity was deemed unpractical and unnecessary since such alternatives would increase the environmental impact. Furthermore, it needs to be noted that the ore seams dictate where mining takes place, and these locations are fixed.

Technology alternatives are also limited since the proposed mining operations will be located within an existing open pit mine. This existing open pit will be mined using a conventional truck and shovel open pit method. The process for the mining method involves stripping, drilling, blasting, loading and hauling of overburden to waste dumps, followed by hauling the RoM to the ore stockpile area at the mobile crusher. As such, no technology, operational or process alternatives could be considered as viable options.

As such, the proposed layout, methods and technology as detailed in the project description will be assessed in detail during the EIA phase.

The option of not implementing the activity (also called the no-go option) involves comparing the proposed activities with that of the current status quo of the existing Amandelbult Mining complex or, more specifically, the Merensky and UG2 reefs. Implementing this option negates the need for appointing unskilled, semi-skilled and skilled mine workers and cancels the positive contribution that this project may have on the local, provincial and national economy. In contract, this option also prevents the increase in environmental impacts related to construction activities, such as air and noise pollution. This no-go option will be assessed during the detailed impact assessment that will be conducted as part of the EIA phase.

9.2 Description of the aspects to be assessed as part of the environmental impact assessment process

(The EAP must undertake to assess the aspects affected by each individual mining activity whether listed or not, including activities such as blasting, Loading, hauling and transport, and mining activities such as Excavations, stockpiles, discard dumps or dams, water supply dams and boreholes, accommodation, offices, ablution, stores, workshops, processing plant, storm water control, berms, roads, pipelines, power lines, conveyors, etc...etc...etc.).

The aspects that will be assessed during the EIA phase of the project tie in closely with the identified potential impacts and plan of study for EIA. These aspects will also be assessed by the appointed specialists as part of

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their impact descriptions. Please refer to Table 12 below for a list of aspects and activities and their potential impacts and mitigation measures.

9.3 Description of aspects to be assessed by specialists

Please refer to above statement regarding aspects. The entire project description has been provided to the various appointed specialists to assess as part of the EIA process.

9.4 Proposed method of assessing the environmental aspects including the proposed method of assessing alternatives

Please refer to the Impact Assessment Methodology in Appendix 6. This method of assessment has also been summarised in section 8.5.1 above.

9.5 The proposed method of assessing duration significance

Please refer to the Impact Assessment Methodology in Appendix 6. This method of assessment has also been summarised in section 8.5.1 above.

9.6 The stages at which the competent authority will be consulted

The competent authority, DMRE Limpopo, has been consulted as part of a pre-application phase. Copies of the minutes, emails and other forms of correspondence have been included in Appendix 5.

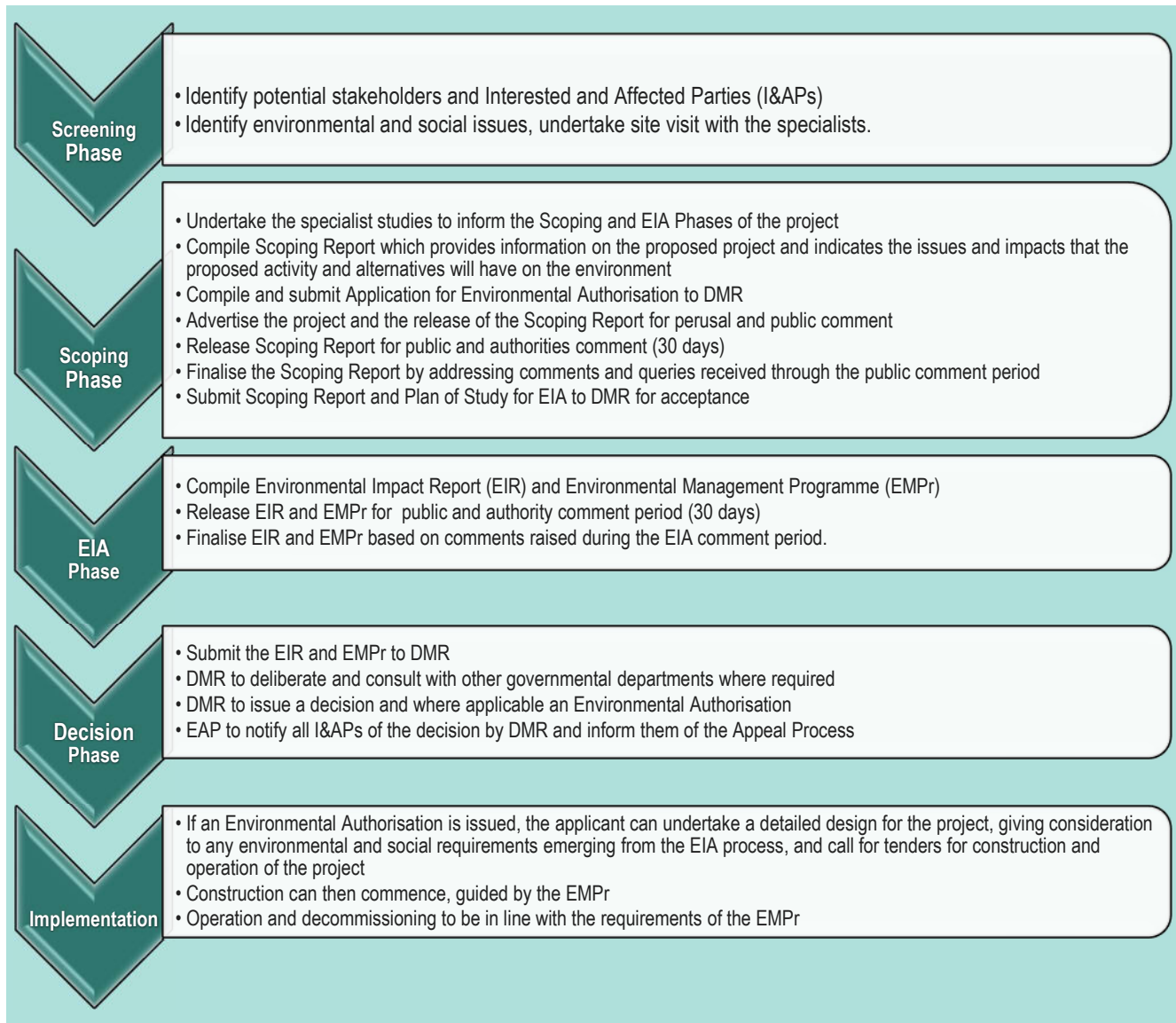
The competent authority will be provided with a copy of this Scoping Report for public review. A copy of the EIR for public review will also be submitted to the competent authority at that time.

Any comments received will be considered and included in the comments and response report. As always, Zutari welcomes the input from and correspondence with the Department.

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9.7 Particulars of the public participation process with regard to the Impact Assessment process that will be conducted

9.7.1 Steps to be taken to notify interested and affected parties.



9.7.2 Details of the engagement process to be followed.

(Describe the process to be undertaken to consult interested and affected parties including public meetings and one on one consultation. NB the affected parties must be specifically consulted regardless of whether or not they attended public meetings and records of such consultation will be required in the EIA at a later stage).

Interested and Affected Parties (I&APs) were identified using the existing database from previous projects, Geographic Information Systems (GIS) and Cadastral information. The affected and adjacent property owners were identified using the Windeed Search website, <https://search.windeed.co.za>. Release of the BID to the I&APs identified through the previous Amendment Application process will be conducted before the finalisation of the Draft Scoping Report. I&APs will be notified of the proposed project and the availability of the report via e-mail and phone calls (including affected and neighbouring landowners, the Thabazimbi Local Municipality, the Department of Water and Sanitation, and the Department of Mineral Resources).

Site notices, BIDs and draft Reports for public comment will be put up at relevant locations:

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- ▶ Local post office,
- ▶ Hospital outside the mine (where medicals are conducted),
- ▶ Dishaba / Tumela Office security gate (where employees clock in),
- ▶ Smashblock, and
- ▶ Thabazimbi Local Municipality Offices.

Newspaper advertisements will be placed in the local newspaper, The Platinum Bushvelder. This will be done in English, Afrikaans, IsiXhosa and Setswana. The internal Social Performance team will also engage the internal communications team for putting the notices in the Amandelbult Times and Merafe Corner.

The documentation will be made available in soft copy on Zutari's website as well. Specific document addresses will be provided in the site notices, notification letters and newspaper advertisements.

Throughout the Public Participation Process (PPP), I&APs will have the opportunity to contact the EAP to discuss the project and raise any issues or concerns they might have. All comments received after the distribution of the Draft Scoping Report will be included in the Comments and Response report for the project and process. Responses to questions and comments will be provided in these reports, and where relevant, inputs will be incorporated into the Final Scoping Report to be submitted to the Competent Authority (CA).

9.7.3 Description of the information to be provided to Interested and Affected Parties.

(Information to be provided must include the initial site plan and sufficient detail of the intended operation and the typical impacts of each activity, to enable them to assess what impact the activities will have on them or on the use of their land).

The following information will be provided to I&APs:

- ▶ The draft site plan for scoping purposes (optimisation of the site layout and detail designs will be complete once the EIA phase has been reached);
- ▶ List of activities to be authorised;
- ▶ Scale and extent of activities to be authorised;
- ▶ Typical impacts of activities to be authorised;
- ▶ The duration of the activity; and
- ▶ Sufficient detail of the intended operation to enable all I&APs to assess what impact the activities will have on them or on the potential use of their land.

9.8 Description of the tasks that will be undertaken during the environmental impact assessment process

The following tasks will be undertaken during the EIA process:

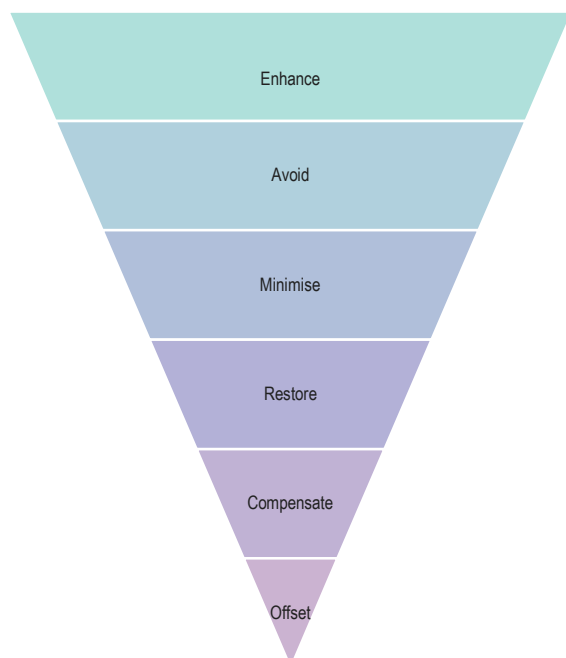
- ▶ Identify and assess the environmental (biophysical, socio-economic and cultural) impacts of the construction, operation, decommissioning and rehabilitation impacts of the proposed project. The cumulative impacts of the proposed project will also be identified and evaluated;
- ▶ Identify and evaluate potential management and mitigation measures that will reduce the negative impacts of the proposed development and enhance the positive impacts;
- ▶ Compile monitoring, management, mitigation and training requirements in the EMP; and
- ▶ Provide the Competent Authority with sufficient and accurate information in order to make a sound decision on the proposed development.

Following the completion of these tasks, the Draft Environmental Impact Assessment Report (EIR) and EMP will be made available to the public and CA after which all comments will be incorporated into the Final EIR for decision making.

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9.9 Measures to avoid, reverse, mitigate, or manage identified impacts and to determine the extent of the residual risks that need to be managed and monitored.

The hierarchy below illustrates the actions which can be undertaken to respond to negative impacts and the order in which the actions should occur to effectively mitigate the impacts.



Impact avoidance: This step is most effective when applied at an early stage of project planning. It can be achieved by:

- Not undertaking certain projects or elements that could result in adverse impacts;
- Avoiding areas that are environmentally sensitive; and
- Putting in place preventative measures to stop adverse impacts from occurring.

Impact minimisation: This step is usually taken during impact identification and prediction to limit or reduce the degree, extent, magnitude, or duration of adverse impacts. It can be achieved by:

- Scaling down or relocating the proposal;
- Redesigning elements of the project; and
- Taking supplementary measures to manage the impacts.

Impact compensation: This step is usually applied to remedy unavoidable residual adverse impacts. It can be achieved by:

- Example, by habitat enhancement;
- Restoration of the affected site or environment to its previous state or better; and
- Replacement of the same resource values at another location (offset), for example, by wetland engineering to provide

The mitigation described in the above diagram represents the full range of plausible and pragmatic measures that can be implemented to mitigate identified impacts.

For each impact assessed, mitigation measures will be proposed to reduce and/ or avoid negative impacts and enhance positive impacts. The mitigation measures identified by the specialists will be reviewed for feasibility with the proponent and then incorporated into the EMPr during the EIA Phase to ensure that they are implemented throughout the lifecycle of the proposed project. The EMPr would become a legally binding document should this project receive Environmental Authorisation (EA).

Table 12 below provides a list of potential mitigation measures that are typically considered to avoid, minimise, restore, mitigate or manage anticipated impacts identified during the Scoping Phase.

Table 12: Potential mitigation measures for anticipated impacts identified during Scoping.

ACTIVITY	POTENTIAL IMPACT	MITIGATION TYPE	POTENTIAL FOR RESIDUAL RISK
Construction			
Establishment of construction contractor's laydown area.	- Emissions into the atmosphere through use of diesel-powered equipment, machinery and vehicles - Soil loss due to land clearing excavations for establishment of contractor's laydown area. - Increased runoff and associated potential silt-loading and contamination of water bodies and wetlands. - Alien invasive establishment and bush encroachment.	- Establish access control measures. - Consider and avoid sensitive areas including heritage sites. - Implementation of mine waste management plan. - Implement dust suppression measures with associated monitoring. - Implement noise management measures.	Possible



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ACTIVITY	POTENTIAL IMPACT	MITIGATION TYPE	POTENTIAL FOR RESIDUAL RISK
	- Irresponsible use of water and ultimate wastage of water. - Compaction and alteration of physical characteristics of soil. - Poor management of waste or burning of waste resulting in land, water and soil contamination	- Identification, permitting and relocation of protected flora and fauna. - Stripping, clearing and stockpiling of topsoil for the purpose of rehabilitation.	
Vegetation clearance	- Loss of fertile topsoil layer and loss through erosion. - Loss in grazing potential, loss of soil and deterioration of soil characteristics. - Potential damage to sensitive flora and fauna in the riparian habitats. - Increase in IAP infestations		Possible
Establishment / upgrading of access and haul roads	- Loss of fertile topsoil layer through clearance and erosion. - Compaction and alteration of physical characteristics of soil. - Loss in grazing potential, loss of soil and deterioration of soil characteristics. - Potential damage to flora and fauna in the riparian habitats. - Potential damage to flora and fauna through littering and waste toxins. - Liberation of dust from vehicles on unpaved roads and construction activities - Emissions into the atmosphere through use of diesel-powered equipment, machinery, and vehicles.		Possible
Construction of ancillary infrastructure	- Loss of fertile topsoil layer through clearance and erosion. - Compaction and alteration of physical characteristics of soil. - Loss in grazing potential, loss of soil and deterioration of soil characteristics. - Potential damage to flora and fauna in the riparian habitats. - Potential damage to flora and fauna through littering and waste toxins. - Liberation of dust from vehicles on unpaved roads and construction activities - Emissions into the atmosphere through use of diesel-powered equipment, machinery, and vehicles.		Possible
Operation			



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ACTIVITY	POTENTIAL IMPACT	MITIGATION TYPE	POTENTIAL FOR RESIDUAL RISK
Removal / mining of material from pits	• Generation of dust and spillages could contaminate water bodies in close proximity to the project. • Emissions into the atmosphere through use of diesel-powered equipment, machinery, and vehicles. • Change in groundwater aquifers and alteration of groundwater flow. • Pit receiving contaminated runoff that would need to be managed to allow mining to continue	• Implement dust suppression measures and associated monitoring. • Implement and maintain stormwater management controls and pumping where required. • Implement safety measures to prevent injury. • Restrict access to all moving infrastructure e.g. conveyor belts etc.	Possible
Stockpiling of material	• Increased runoff and associated potential silt-loading and contamination of waterbodies in close proximity to the project. • Alien invasive establishment and bush encroachment. • Possible leachate penetrating soil. • The visual impact as a result on the height of the stockpile • Dust generation from the deposition activity	• Implementation of mine waste management plan. • Maintain vegetation cover within the project footprint and restrict access outside of the development footprint. • Implement a spill management plan due to proximity to the Bierspruit. • Regulate and monitor water levels with PCDs.	Possible
Loading and hauling of material	• Emissions into the atmosphere through use of diesel-powered equipment, machinery and vehicles. • Generation of dust along haul roads. • Irresponsible use of water and water wastage.	• Implement leak detection management plans due to proximity to the Bierspruit. • Monitor vegetation cover on the topsoil stockpiles (vegetation establishment should take place based on the inherent seedbanks present in the vertic soils). • Protect exposed topsoils by means of a geotextile such as hessian sheeting to avoid erosion prior to vegetation establishment.	Possible
Decommissioning and closure			
Removal and rehabilitation of infrastructure areas	• Poor drainage if area is not adequately rehabilitated. • Lack of functional vegetation due to poor rehabilitation. • Damage to topsoil if not properly stored during construction and operation. • Potential damage to groundwater aquifers and alteration of groundwater flow.	• Implement alien invasive species management plan. • Rip project impacted areas and rehabilitate the areas with topsoil and natural vegetation. • Implement dust suppression measures and associated monitoring. • Implement and maintain stormwater management controls.	Possible



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10 Other Information required by the competent Authority

10.1 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:-

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

The following potential negative socio-economic impacts have been identified. An overall Social Impact Assessment (SIA) for the Amandelbult Complex is currently underway as a separate appointment. As a result, this necessitates a comparison between what has been identified as part of the scope of this study (Bierspruit Opencast project) and the overall measured impacts for Amandelbult Complex.

- ▶ A loss of land and assets to the pit and surrounding infrastructure area;
- ▶ A population influx (due to the influx of jobseekers into the area), with a possible concomitant increase in social pathologies and increased pressure on existing infrastructure and services;
- ▶ Disruption of access routes and daily movement patterns as a result of mining in close proximity to two district roads;
- ▶ Impacts on sense of place. Such impacts may arise as a result of the visual intrusion of project-related infrastructure, as well as noise impacts during mining.
- ▶ Dust caused by the mining works and from movement of heavy equipment. During the mining activities, the local community and construction workers would be inconvenienced by the dust generated by the mining works.
- ▶ Noise and vibration due to the mining works and blasting.
- ▶ Socio-cultural differences and conflicts between migrant workers and the local community.
- ▶ The presence of migrant mine workers could create social conflicts, usually as a result of cultural differences, alcohol abuse or being away from their wives or partners for extended periods of time. A possible reason for conflict would be the perception among locals that the outsiders are taking up jobs that could have gone to unemployed members of the local community.
- ▶ Various social pathologies, such as drug / alcohol abuse, abuse of women and children and incidences of sexually transmitted infections (STIs) may increase with the influx of jobseekers into the area.
- ▶ An inflow of construction workers and job seekers may also be accompanied by an increase in crime. Even if specific instances of crime are not as a result of the newcomers, they may still be ascribed to them by local communities.

Further to the possible negative impacts listed above, the following potential positive socio-economic impacts are also applicable:

- ▶ A positive impact on continued permanent employment of mine workers and sub-contractors will be probable due to the proposed project as the long-term economic viability of the mine will be possible. Further details regarding the project's positive impact in line with the Social and Labour Plan for the Amandelbult Section will be provided and assessed as part of the EIA Report.

SCOPING REPORT

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

A single small, stonewalled enclosure was identified a short distance to the west within the development area proposed for Tumela Mine Parking (refer to site Bierspruit 1 (BSPR 1) in Figure 8-26 above). It seems likely for this small stone enclosure to have been a peripheral element to the main site identified by Van Schalkwyk (1994) in-between two of the current development footprint areas.

Due to the low heritage significance of site referenced as BSPR 1, the significance is expected to be low negative. No cultural heritage resources, graves or palaeontological resources will be affected by the proposed opencast mine. However, the possible risk for unmarked stillborn graves at the structure identified in 1994 requires that an archaeological watching brief must be implemented for any pre-construction and construction activities on the surface and within 100m from the coordinates recorded for the site during the original heritage survey 25 years ago (S 24.797639 E 27.311083).

The proposed development near Thabazimbi is completely underlain by the Pyramid Gabbro-Norite Formation of the Rustenburg Layered Suite (Bushveld Complex). According to the PalaeoMap of South African Heritage Resources Information System the Palaeontological Sensitivity of this layer is insignificant or zero.

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

As indicated in section 8.1 of this report, no site alternatives have been considered as mining can only be undertaken in areas where economically mineable resources occur.

The option of not implementing the activity will also be investigated. The main consequence of the “No-Go Option” is the potential closure of the Amandelbult Section mine altogether. Other opportunities that could be lost include: the opportunity to develop a high-quality mineral resource with an estimated LoM of 24 months which has the potential for economic benefits on local level in terms of employment and a sizeable contribution to processed PGE resources.

SCOPING REPORT

11 Undertaking

UNDERTAKING REGARDING CORRECTNESS OF INFORMATION

I *Natanya Whitehorn* herewith undertake that the information provided in the foregoing report is correct, and that the comments and inputs from stakeholders and Interested and Affected parties has been correctly recorded in the report.

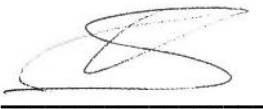


Signature of the EAP

DATE: 01/12/2022

UNDERTAKING REGARDING LEVEL OF AGREEMENT

I *Natanya Whitehorn* herewith undertake that the information provided in the foregoing report is correct, and that the level of agreement with interested and Affected Parties and stakeholders has been correctly recorded and reported herein.



Signature of the EAP

DATE: 01/12/2022

-END-

Appendix 1: EAP Qualifications and Registration

Appendix 2: Curriculum Vitae of EAP

Appendix 3: Project Maps

Appendix 4: Design Drawings

Appendix 5: Public Participation Records

Appendix 6: Impact Assessment Methodology

In diversity there is beauty and there is strength.

MAYA ANGELOU

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