



63 Wessel Road, Rivonia, 2128 PO Box 2597, Rivonia, 2128 South Africa  
Tel: +27 (0) 11 803 5726 Fax: +27 (0) 11 803 5745 Web: www.gcs-sa.biz

# Environmental Authorisation Amendment Application Booyesendal South, Mpumalanga Province

## Amendment Application Report

Version -Final

October 2022



Booyesendal Platinum (Proprietary) Limited

GCS Project Number: 21-0123 (BS)

DMR Reference: MP 30/5/1/2/3/2/1 (127) MR

Client reference: Booyesendal South Amendment



## Environmental Authorisation Amendment Application Booyesendal South, Mpumalanga Province

Final



October 2022

### DOCUMENT ISSUE STATUS

<b>Report Issue</b>	Final		
<b>GCS Reference Number</b>	21-0123 (BS)		
<b>Client Reference</b>	Booyesendal South Amendment		
<b>Title</b>	Environmental Authorisation Amendment Application Booyesendal South, Mpumalanga Province		
	<b>Name</b>	<b>Signature</b>	<b>Date</b>
<b>Author</b>	Janice Callaghan <i>Cand.Sci.Nat: 122924</i> <i>EAPASA: 2019/955</i>		September 2022
<b>Environmental Unit Manager</b>	Gerda Bothma <i>Pr.Sci.Nat: 117348</i>		September 2022
<b>Director</b>	Magnus van Rooyen <i>Pr.Sci.Nat: 400335/11</i>		October 2022

### LEGAL NOTICE

This report or any proportion thereof and any associated documentation remain the property of GCS until the mandator effects payment of all fees and disbursements due to GCS in terms of the GCS Conditions of Contract and Project Acceptance Form. Notwithstanding the aforesaid, any reproduction, duplication, copying, adaptation, editing, change, disclosure, publication, distribution, incorporation, modification, lending, transfer, sending, delivering, serving or broadcasting must be authorised in writing by GCS.

In compliance with the Protection of Personal Information Act, No. 37067 of 26 November 2013, please ensure the following:

- Any personal information provided herein has been provided exclusively for use as part of the public participation registration process, and may therefore not be utilised for any purpose, other than that for which it was provided.
- No additional copies may be made of documents containing personal information unless permission has been obtained from the owner of said information.
- All documentation containing personal information must be destroyed as soon as the purpose for which the information was collected has run out.

## PURPOSE OF THIS DOCUMENT

The applicant is Booysendal Platinum (Pty) Ltd (Booysendal), a subsidiary of Northam Platinum Ltd, operates Booysendal Mine, a Platinum Group Metal. The Booysendal Mine is located approximately 33 km west of Mashishing (Lydenburg), 40km south-southwest of Steelpoort, 32km north of Dullstroom and 21km northeast of Roossenekal. The Booysendal Mine operates under two mining rights (MR), namely Booysendal North MR (Department of Mineral Resources and Energy (DMRE) reference number: LP 30/5/1/3/2/1 (188) MR) and Booysendal South MR (DMRE reference number: MP 30/5/1/2/3/2/1 (127) (10333) MR). The Booysendal South MR was acquired from Aquarius Platinum (Pty) Ltd in 2015. Although the two MRs have not been consolidated, the Booysendal Mine is managed as one integrated operation.

Booysendal South (BS) is further subdivided into BS1/2; the old Everest Mine, including the Valley Boxcut (BS4); and a new Booysendal Central Merensky Adit (referred to as BCM1), just north of BS1/2 and associated infrastructures, however BCM1 form part of the Booysendal North MR.

This amendment application relates to BS, for authorisation for the development of two ventilation shafts and associated linear infrastructures.

GCS Water and Environmental Consultants (Pty) Ltd (GCS) was appointed by Booysendal as the independent Environmental Assessment Practitioner (EAP) to compile and submit the reports contemplated in Regulation 31 (Part 2 Amendment Application) of the National Environmental Management Act (Act No. 107 of 1998) (NEMA): Environmental Impact Assessment (EIA) Regulations (2014), as amended (EIA Regulations 2014) in support of this application to amend the Environmental Authorisations (EA) issued by the Mpumalanga DMRE and the Mpumalanga Department of Economic Development and Tourism (MDEDET) for the Valley Boxcut EMPR Amendment on 17 May 2010 (Reference number: MP30/5/1/2/3/2/1(127)EM) and NEMA Listed Activities on 24 May 2010 (Reference number 17/2/1/15-E-5) (Valley Boxcut EA).

## CONTENTS PAGE

<b>1</b>	<b>INTRODUCTION .....</b>	<b>1</b>
1.1	PROJECT OVERVIEW .....	1
1.2	AUTHORISATIONS RELATED TO THE PROJECT .....	1
1.3	AMENDMENT APPLICATION PROCESS .....	2
1.4	REPORT CONTENTS .....	3
<b>2</b>	<b>PROJECT DETAILS.....</b>	<b>1</b>
2.1	APPLICANT .....	1
2.2	ENVIRONMENTAL ASSESSMENT PRACTITIONER .....	1
2.3	PROJECT LOCATION.....	2
<b>3</b>	<b>ENVIRONMENTAL BASELINE.....</b>	<b>6</b>
3.1	AIR QUALITY.....	6
3.2	TOPOGRAPHY .....	8
3.3	GEOLOGY.....	8
3.4	HYDROGEOLOGY.....	9
3.5	HYDROLOGY .....	9
3.6	AQUATIC ECOLOGY .....	10
3.7	TERRESTRIAL ECOLOGY .....	11
3.8	SOCIO-ECONOMIC.....	11
3.9	CULTURAL HERITAGE.....	12
3.10	NOISE AND VIBRATION .....	12
3.11	TRAFFIC.....	12
3.12	VISUAL .....	13
<b>4</b>	<b>SCOPE OF PROPOSED AMENDMENTS.....</b>	<b>14</b>
4.1	DESCRIPTION OF PROPOSED AMENDMENTS .....	14
4.2	NEMA LISTED ACTIVITIES ASSOCIATED WITH THE PROPOSED AMENDMENTS.....	16
<b>5</b>	<b>LEGAL FRAMEWORK.....</b>	<b>18</b>
5.1	AMENDMENT PROCESS REQUIREMENTS.....	18
5.2	LEGISLATION APPLICABLE TO BOOYSENDAL.....	19
<b>6</b>	<b>MOTIVATION FOR THE PROPOSED AMENDMENT .....</b>	<b>29</b>
<b>7</b>	<b>IMPACT ASSESSMENT OF PROPOSED AMENDMENT.....</b>	<b>30</b>
7.1	IMPACT ASSESSMENT METHODOLOGY .....	30
7.2	ASSESSMENT OF CONSTRUCTION PHASE IMPACTS OF THE PROPOSED AMENDMENTS .....	33
7.2.1	<i>Potential Impacts on Air Quality and Climate.....</i>	<i>33</i>
7.2.2	<i>Potential Impact on Terrestrial Ecology.....</i>	<i>34</i>
7.2.3	<i>Potential Impact on Aquatic Resources .....</i>	<i>37</i>
7.2.4	<i>Potential Impact on Soils, Land Capability and Land Use .....</i>	<i>39</i>
7.2.5	<i>Potential Impact Hydrogeology and Hydrology.....</i>	<i>40</i>
7.2.6	<i>Potential Visual Impacts .....</i>	<i>41</i>
7.2.7	<i>Potential Noise Impacts .....</i>	<i>41</i>
7.2.8	<i>Potential Heritage and Paleontological Impacts .....</i>	<i>42</i>
7.2.9	<i>Potential Socio-Economic Impacts.....</i>	<i>42</i>
7.2.10	<i>Potential Traffic Impacts.....</i>	<i>43</i>
7.3	ASSESSMENT OF OPERATIONAL PHASE IMPACTS OF THE PROPOSED AMENDMENT .....	43
7.3.1	<i>Potential Impacts on Air Quality and Climate.....</i>	<i>43</i>
7.3.2	<i>Potential Impact on Terrestrial Ecology.....</i>	<i>43</i>
7.3.3	<i>Potential Impact on Aquatic Resources .....</i>	<i>43</i>
7.3.4	<i>Potential Impact on Soils, Land Capability and Land Use .....</i>	<i>44</i>
7.3.5	<i>Potential Impact Hydrogeology and Hydrology.....</i>	<i>44</i>
7.3.6	<i>Potential Visual Impacts .....</i>	<i>45</i>

7.3.7	Potential Noise Impacts .....	45
7.3.8	Potential Heritage and Paleontological Impacts .....	45
7.3.9	Potential Socio-Economic Impacts .....	45
7.3.10	Potential Traffic Impacts .....	46
7.4	ASSESSMENT OF DECOMMISSIONING PHASE IMPACTS OF THE PROPOSED AMENDMENTS .....	46
7.2.1	Potential Impacts on Air Quality and Climate .....	46
7.2.2	Potential Impact on Terrestrial Ecology .....	47
7.2.3	Potential Impact on Aquatic Resources .....	49
7.2.4	Potential Impact on Soils, Land Capability and Land Use .....	51
7.2.5	Potential Impact Hydrogeology and Hydrology .....	52
7.2.6	Potential Visual Impacts .....	52
7.2.7	Potential Noise Impacts .....	53
7.2.8	Potential Heritage and Paleontological Impacts .....	53
7.2.9	Potential Socio-Economic Impacts .....	53
7.2.10	Potential Traffic Impacts .....	54
<b>8</b>	<b>ENVIRONMENTAL MANAGEMENT PROGRAMME .....</b>	<b>55</b>
<b>9</b>	<b>PUBLIC PARTICIPATION PROCESS .....</b>	<b>69</b>
9.1	PURPOSE OF PUBLIC PARTICIPATION .....	69
9.2	PUBLIC CONSULTATION PROCESS .....	69
9.3.1	Stakeholder database .....	69
9.3.2	Introductory Public Consultation .....	70
9.3.3	Advertisements .....	70
9.3.4	Background Information Documents .....	70
9.3	PUBLIC REVIEW OF DRAFT AMENDMENT REPORT .....	70
9.4	SUMMARY OF ISSUES RAISED .....	71
9.5	COMMENTS AND RESPONSE REPORT .....	75
<b>10</b>	<b>EAP RECOMMENDATIONS AND CONCLUSION .....</b>	<b>76</b>
<b>11</b>	<b>EAP UNDERTAKING .....</b>	<b>81</b>
<b>12</b>	<b>REFERENCES .....</b>	<b>82</b>

## LIST OF FIGURES

Figure 2-1: Regional Locality of Booyesendal Mine .....	4
Figure 2-2: Locality of proposed BS4 Vent Shaft Projects .....	5
Figure 4-1: BS4 Vent Shaft 1 Project .....	15
Figure 4-2: BS4 Vent Shaft 2 Project .....	16

## LIST OF TABLES

Table 1-1: Contents of the Amendment Application Report and relevant section in this report. ....	3
Table 2-1: Details of the Applicant. ....	1
Table 2-2: Details of the EAP. ....	1
Table 2-3: Property SG details .....	2
Table 2-4: GPS Co-ordinates of the BS4 Vent Shaft Projects .....	3
Table 5-1: Legislation applicable to Activities at Booyesendal Mine. ....	19
Table 7-1: Severity or magnitude of impact .....	30
Table 7-2: Spatial Scale of activity .....	31
Table 7-3: Duration of activity .....	31

Table 7-4: Frequency of activity (how often activity is undertaken).....	31
Table 7-5: Frequency of incident/impact (how often activity impacts environment) ...	31
Table 7-6: Legal Issues - governance of activity by legislation.....	31
Table 7-7: Detection (how quickly/easily impacts/risks of activity on environment, people and property are detected) .....	32
Table 7-8: Impact significance ratings. ....	32
Table 7-9: Irreplaceability of resource caused by impacts .....	33
Table 7-10: Reversibility of impacts .....	33
Table 8-1: Impact Management Actions (Amec Foster Wheeler, 2018) .....	56
Table 11-1: Key impacts identified.....	76

## LIST OF APPENDICES

Appendix A: PROJECT SPECIFIC INFORMATION .....	83
Appendix B: PUBLIC PARTICIPATION.....	84
Appendix C: SPECIALIST INVESTIGATIONS .....	85
Appendix D:IMPACT TABLES.....	86
Appendix E: S24G PHASE 1 EMP .....	87
Appendix F: EAP INFORMATION .....	88

## ABBREVIATIONS AND ACRONYMS

BIC	Bushveld Igneous Complex
BN	Booyesdal North
BS	Booyesdal South
CARA	Conservation of Agricultural Resources Act (Act 43 of 1983)
CBA	Critical Biodiversity Area
CA	Competent authority
CI	Conservation important
DFFE	Department of Forestry, Fisheries and the Environment
DMRE	Department of Mineral Resources and Energy
DWS	Department of Human Settlements, Water and Sanitation
EAP	Environmental Assessment Practitioner
EI	Ecological importance
EIA	Environmental Impact Assessment,
EIA Regulations 2014	Environmental Impact Assessment Regulations, promulgated in terms of NEMA in GN 982 of GG 38282 on 4 December 2014 (as amended in 2017).
EIS	Ecological importance and sensitivity
EMPr	Environmental Management Programme
ES	Ecological sensitivity
FEPA	Freshwater ecosystem priority area
GCS	GCS Water and Environmental Consultants Proprietary Limited
IDP	Integrated Development Plan
Listing Notice 1	Environmental Impact Assessment Regulations, promulgated in terms of NEMA in GN 983 of GG 38282 on 4 December 2014 (as amended).
Listing Notice 3	Environmental Impact Assessment Regulations, promulgated in terms of NEMA in GN 985 of GG 38282 on 4 December 2014 (as amended).
LoM	Life of Mine
I&APs	Interested and Affected Parties
mbgl	m below ground level
MPRDA	Mineral and Petroleum Resources Development Act (Act 28 of 2002)
MR	Mining Right
NEMA	National Environmental Management Act (Act 107 of 1998)
NEM:AQA	National Environmental Management: Air Quality Act (Act 39 of 2004)
NEM:BA	National Environmental Management: Biodiversity Act (Act 10 of 2004)
NEM:WA	National Environmental Management: Waste Act (Act 59 of 2008)
NWA	National Water Act (Act 36 of 1998)

PES	Present Ecological Status
RLS	Rustenburg Layered Suite
SCPE	Sekhukhune Centre of Plant Endemism
UG2	Upper Group 2



## 1 INTRODUCTION

### 1.1 Project Overview

Booyesendal Platinum (Pty) Ltd (Booyesendal), a subsidiary of Northam Platinum Ltd, operates Booyesendal Mine, a Platinum Group Metal mine. The Booyesendal Mine is located approximately 33 km west of Mashishing (Lydenburg), 40 km south-southwest of Steelpoort, 32 km north of Dullstroom and 21 km northeast of Roosenekal. The Booyesendal Mine operates under two mining rights (MR), namely Booyesendal North MR (Department of Mineral Resources and Energy (DMRE) reference number: LP 30/5/1/3/2/1 (188) MR) and Booyesendal South MR (DMRE reference number: MP 30/5/1/2/3/2/1 (127) (10333) MR). The Booyesendal South MR was acquired from Aquarius Platinum (Pty) Ltd in 2015. Although the two MRs have not been consolidated, the Booyesendal Mine is managed as one integrated operation. Refer to Figure 2-1 for a locality map depicting the aforementioned.

The northern section of the Booyesendal North MR falls in the Limpopo Province, while the southern section of the Booyesendal North MR and the entire Booyesendal South MR falls in the Mpumalanga Province. The operational division for day-to-day management is in accordance with the provincial divide, where the northern section of the Booyesendal North MR is managed as Booyesendal North (BN) and the southern section (which is a combination of the southern section of the Booyesendal North MR and the entire Booyesendal South MR) as Booyesendal South (BS). BS consists of BS1/2; the Booyesendal Central Merensky Adit (referred to as BCM1); and the old Everest Mine, which includes the Valley Boxcut (BS4).

Booyesendal intends to develop two ventilation shafts for the Valley Boxcut (BS4), including associated linear infrastructure (power lines and access roads) (the BS4 Vent Shaft Projects). It is in this regard that GCS was appointed for the Part 2 Amendment Application.

### 1.2 Authorisations Related to the Project

The following list is a summary of the authorisations currently held by Booyesendal in respect of the BS MR, and which are related to this Part 2 Amendment Application. (Please note, other, non-related authorisations have not been included in this list):

- An Environmental Management Programme (EMPR) for the BS Mine, which was approved by the Mpumalanga Regional Office of the DMRE (MP DMRE) on 11 June 2003 (Reference: OT6/2/2/491) and the MR which was converted by the MP DMRE in 2006.
- An EMPR amendment for the BS Decline Project for the BS Mine, which was approved by the MP DMRE on 15 December 2009 (Reference: MP30/5/1/2/3/2/1 (127)EM).

- An EMPR amendment for the Valley Boxcut Project (BS4) dated September 2009 and approved by the MP DMRE on 17 May 2010 (Reference: MP30/5/1/2/3/2/1 (127)EM) (2009 MP DMRE Valley Boxcut EMPR Amendment).
- Environmental Authorisation (EA) for the BS4 Project, dated 24 May 2010, issued by the Mpumalanga Department of Economic Development, Environment and Tourism (MDEDET) (Reference: 17/2/1/15 E-5) (2010 MDEDET Valley Boxcut EA).
- S24G EA for the Booyensdal Phase 1 Expansion Project for the rectification of various activities across the entire Booyensdal Mining Right Area (BS & BN), issued by the Limpopo DMRE on 5 January 2018 (Reference: LP 118 & MP 127 EM).
- A Water Use License (WUL) issued in terms of the National Water Act (Act 36 of 1998), by the Department of Water and Sanitation (DWS), dated 31 March 2021 (Reference: 06/B41G/ABCFGIJ/10251).
- Booyensdal applied to the MP DMRE in 2018 for an EA for the Booyensdal Phase 2 Expansion Project. The EA was issued in October 2021 however contains errors in relation to inter alia the relevant properties, which will need to be rectified by the MP DMRE.

The application for amendment has specific reference to the following authorisations:

- 2009 MP DMRE Valley Boxcut EMPR Amendment.
- 2010 MDEDET Valley Boxcut EA.

### 1.3 Amendment Application Process

This Part 2 Amendment Application consists of the following steps, in line with the requirements of the EIA Regulations 2014 as amended:

1. Submission of Application Form;
2. Compilation of draft Part 2 Amendment Report;
3. 30-day public participation process (PPP) associated with the documentation that is prepared through the Part 2 Amendment Application (completed 26 September 2022);
4. Finalisation and submission of the Part 2 Amendment Report to the DMRE Mpumalanga (this submission); and
5. Decision on application to be issued by DMRE Mpumalanga.

## 1.4 Report Contents

This document serves as the final Part 2 Amendment Report for competent authority decision. It describes the details of the applicant and the Environmental Assessment Practitioner (EAP), the project background, scope and impacts of the proposed amendments; and the process to be followed. Regulation 32 of the EIA Regulations 2014 specifies the information which must be included in this Report. Table 1-1 below details these requirements and indicates the relevant sections within the Report in each respect.

**Table 1-1: Contents of the Amendment Application Report and relevant section in this report.**

REQUIREMENT	SECTION IN THIS REPORT
<b>The Applicant must within 90 days of receipt of the application for amendment by the CA, submit a report reflecting:</b>	
(1) (a) (i) An assessment of all impacts related to the change;	Section 7
(ii) Advantages and disadvantages associated with the proposed change;	Section 7 & 10
(iii) Measures to ensure avoidance, management and mitigation of impacts associated with such proposed change; and	Section 7 & 8
(iv) Any changes to the EMPr	Section 8
<b>which report -</b>	
(aa) had been subjected to a PPP process which had been agreed to by the CA and which was appropriate to bring the proposed change to the attention of potential and registered I&APs including organs of state which have jurisdiction in respect of any aspect of the relevant activity and the CA, and	Section 9
(bb) reflects the incorporation of comments received including any comments of the CA, or	Section 9
(1) (b) a notification in writing that the report will be submitted within 140 days of receipt of the application by the CA as significant changes have been made or significant new information has been added to the report which changes or information was not contained in the report consulted on during the initial PPP contemplated in sub-regulation (1)(a) and that the revised report will be subjected to another public participation process of at least 30 days.	N/A

## 2 PROJECT DETAILS

### 2.1 Applicant

The details of the Applicant are provided in Table 2.1 below.

**Table 2-1: Details of the Applicant.**

ITEM	DETAILS
Company Name	Booyendal Platinum (Pty) Ltd
Company Representative	Wonderboy Kekana
Contact Person	Hennie Wood
Telephone No.	+27 87 158 7055
Facsimile No.	N/A
E-mail Address	Hennie.Wood@norplats.co.za
Postal Address	Postnet Suite #199, Private Bag X20097, Lydenburg, 1120, South Africa

### 2.2 Environmental Assessment Practitioner

GCS has been appointed as the independent EAP by Booyendal to undertake this Part 2 Amendment Application on behalf of the Applicant. The contact details of the EAPs are provided in Table 2.2 and the EAP CVs are attached in Appendix F.

**Table 2-2: Details of the EAP.**

ITEM	DETAILS
Company Name	GCS Water and Environmental Consultants (Pty) Ltd
Company Representative	Janice Callaghan / Gerda Bothma
Telephone No.	+27 (0)11 803 5726
Facsimile No.	+27 (0)11 803 5745
E-mail Address	<a href="mailto:janicec@gcs-sa.biz">janicec@gcs-sa.biz</a> / <a href="mailto:gerdab@gcs-sa.biz">gerdab@gcs-sa.biz</a>
Postal Address	PO Box 2597, Rivonia, 2128

Ms Janice Callaghan is an Environmental Assessment Practitioner at GCS since April 2018 with 4 years' experience. She forms part of the GCS Environmental Unit and has undertaken various applications including Water Use License Applications, Integrated Water and Waste Management Plans, Environmental Impact Assessments and Environmental Management Programmes. Ms Callaghan pays great attention to detail and is passionate about the environment with a particular interest in biogeography and conservation.

Mrs Bothma is the Environmental Unit Manager at GCS since 2019 has over 25 years' experience within the environmental and waste management field. Mrs Bothma has been involved in several engineering projects as the Environmental Assessment Practitioner as well as the Environmental Control Officer during construction working closely with the Occupational Health and Safety Officer. She also has been involved in projects where waste

licensing as well as water use licensing processes formed an integral part of the services offered and have extensive experience in environmental auditing and compliance monitoring.

GCS has no conflict of interest related to the contents of this Report. GCS has no personal financial interests in the property and/or activity being assessed in this report. GCS has no personal or financial connections to the relevant property owners, developers, planners, financiers or consultants of the property or activity, other than fair remuneration for professional services rendered for this Report to the CA. GCS declares that the opinions expressed in this Report are independent and a true reflection of their professional expertise. As such, GCS meets the requirements of an Independent EAP as per the NEMA: EIA Regulations (2014), as amended.

### 2.3 Project Location

As mentioned previously, Booyensdal Mine is located within both the Limpopo and Mpumalanga Provinces and operates under two MRs, namely BN MR and BS MR. BS, within which the BS4 Vent Shaft Projects are located, fall within the jurisdiction of the Thaba Chweu Local Municipality (TCLM) of the Ehlanzeni District Municipality (EDM) in the Mpumalanga Province. Refer to Figure 2-1 below.

The proposed location of the BS4 Vent Shaft Projects is on an area of Portion 5 of the Farm Sterkfontein 52JT, Mpumalanga Province (Project Area), owned by Booyensdal and held under the BS MR. Refer to Figure 2-2 below.

The Surveyor-general 21 digit site information for the above property is provided in Table 2-3 below.

**Table 2-3: Property SG details**

Property	SG Code
Portion 5 of the Farm Sterkfontein 52	T0JT00000000005200005

Figure 2-2 indicates the approximate locations of the proposed BS4 Vent Shaft Projects, which are proposed to be developed at BS.

The approximate Global Positioning System (GPS) coordinates for the proposed BS4 Vent Shaft Projects are provided in Table 2-1.

**Table 2-4: GPS Co-ordinates of the BS4 Vent Shaft Projects**

	Latitude	Longitude
BS4 Vent Shaft 1 Corner Points	25° 9'1.32"S	30° 7'42.93"E
	25° 9'2.10"S	30° 7'43.48"E
	25° 9'3.00"S	30° 7'41.87"E
	25° 9'2.17"S	30° 7'41.32"E
BS4 Vent Shaft 1 - Access road/OHPL Start	25° 9'1.32"S	30° 7'42.93"E
BS4 Vent Shaft 1 - Access road/OHPL Middle	25° 8'58.12"S	30° 7'46.88"E
BS4 Vent Shaft 1 - Access road End	25° 8'53.68"S	30° 7'44.98"E
BS4 Vent Shaft 1 - OHPL End	25° 8'57.58"S	30° 7'47.85"E
BS4 Vent Shaft 2 Corner Points	25° 9'14.18"S	30° 7'60.00"E
	25° 9'14.95"S	30° 8'0.49"E
	25° 9'15.76"S	30° 7'58.92"E
	25° 9'14.98"S	30° 7'58.40"E
BS4 Vent Shaft 2 - Access road/OHPL Start	25° 9'15.25"S	30° 7'59.81"E
BS4 Vent Shaft 2 - Access road/OHPL Middle	25° 9'16.55"S	30° 8'2.07"E
BS4 Vent Shaft 2 - Access road/OHPL End	25° 9'17.35"S	30° 8'4.09"E

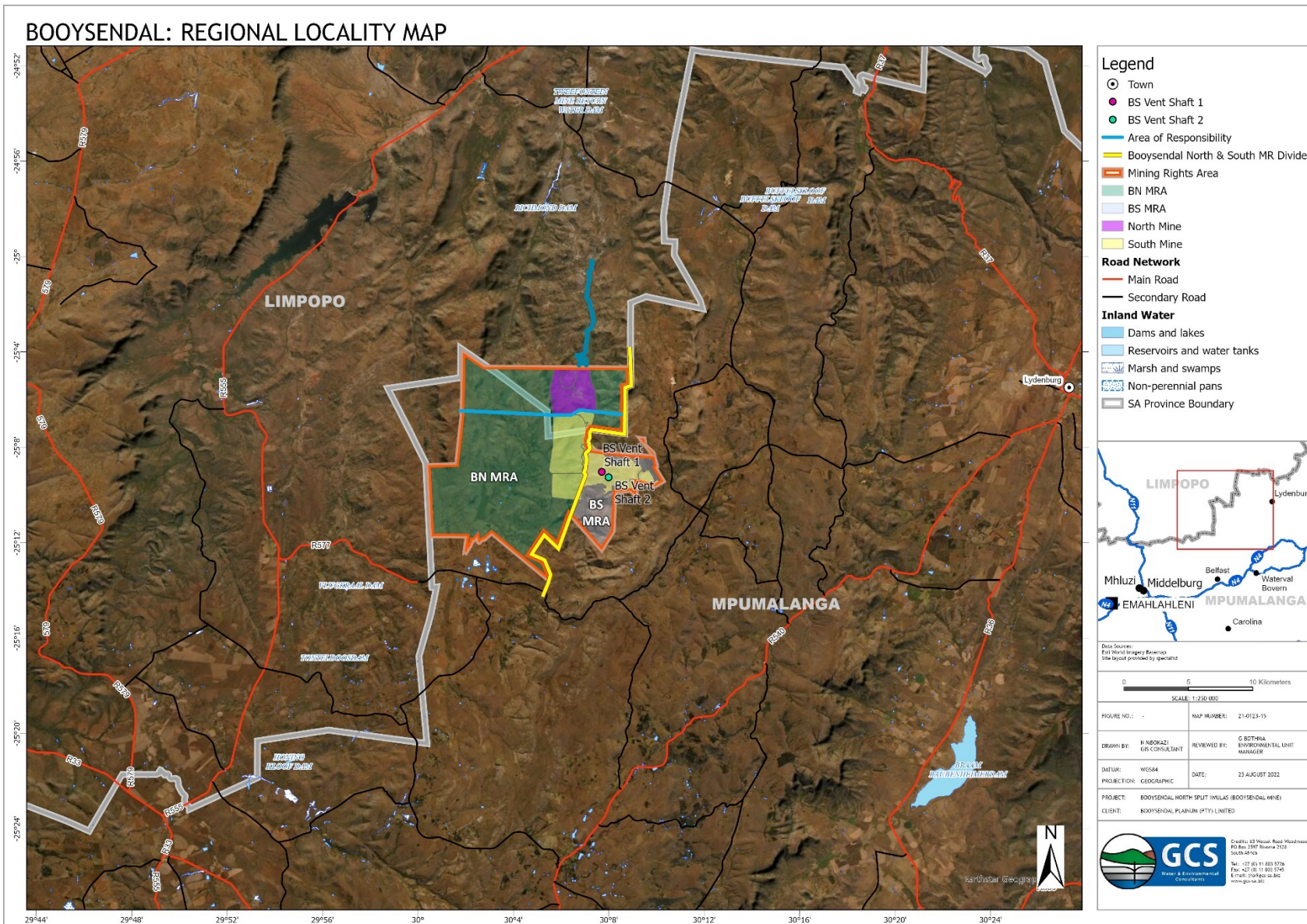


Figure 2-1: Regional Locality of Booyseendal Mine





### 3 ENVIRONMENTAL BASELINE

The environment in which Booyesendal is located is socially and environmentally sensitive. The biophysical environment has a high conservation value due to its almost pristine nature; the number of conservation important (CI) species it contains; the biomes and transition zones; its specific location and soil types; and the presence of a variety of wetlands. The section below describes the receiving environment which has been obtained from the (i) Everest Platinum Mine EIA/EMP Amendment for the Extension of Mining Activities [Valley Boxcut] (Metago Environmental Engineers, 2009); (ii) Booyesendal South Expansion Project (Phase 1) Section 24G Environmental Impact Assessment Report (Amec Foster Wheeler, 2017); (iii) Booyesendal South Expansion Project: Phase 2 EIA (Amec Foster Wheeler, 2018); (iv) Heritage Statement for the Part 2 Amendment for the Booyesendal BS4 Vent Shaft Project (Beyond Heritage, 2022); and (v) Screening Assessment associated with the establishment of infrastructure at the Northam Booyesendal South Mine near Mashishing (GCS, 2022).

#### 3.1 Air Quality

Surrounding land uses of the Booyesendal Mine comprise wilderness/conservation, mining, agriculture (livestock and subsistence farming) and residential (scattered farmsteads and semi-formal housing). Source types present in the area and the pollutants associated with such source types include:

- **Mining** - Booyesendal current practices. Particulates represent the main pollutant of concern at mining operations, whether it is underground, open pit or waste facilities. Based on the complex topography of the area, it is unlikely that mining activities (due to the nature of their localised impacts) will influence background pollution levels of the area.
- **Fugitive Dust** - These sources are termed fugitive because they are not discharged to the atmosphere in a confined flow stream. Sources of fugitive dust identified to potentially occur in the project area include paved and unpaved roads, agricultural operation, and wind erosion of sparsely vegetated surfaces. Emissions from unpaved roads and to a lesser extent from paved roads contribute to the particulate load of the atmosphere.
- **Domestic fuel combustion** - Domestic households are known to have the potential to be one the most important sources contributing to poor air quality within residential areas. Individual households are low volume emitters, but their cumulative impact is significant. It is likely that households within the local communities/settlements utilise coal or wood for cooking and / or space heating (mainly during winter) purposes. Pollutants from wood burning include respirable particulates, nitrogen dioxide, and carbon monoxide. Particulate emissions from wood burning have been

found to contain about 50% elemental carbon and about 50% condensed hydrocarbons.

- **Biomass burning** - Biomass burning includes the burning of evergreen and deciduous forests, woodlands, grasslands, and agricultural lands. Within the project vicinity, crop-residue burning and wildfires (locally known as veldt fires) may represent significant sources of combustion-related emissions.
- **Vehicle tailpipe emissions** - Emissions resulting from motor vehicles can be grouped into primary and secondary pollutants. While primary pollutants are emitted directly into the atmosphere, secondary pollutants form in the atmosphere because of chemical reactions. Significant primary pollutants emitted combustion engines include carbon dioxide, carbon, sulphur dioxide, oxides of nitrogen, particulates and lead. Secondary pollutants include nitrogen dioxide, photochemical oxidants such as ozone, sulphur acid, sulphates, nitric acid, and nitrate aerosols (particulate matter). Transport to, from and within the mine site includes trucks, buses and private vehicles and these can be sources of tailpipe emissions.
- **Informal refuse burning** - Additional sources of emissions come from the waste sector and typically include informal refuse and tyre burning. The informal burning of refuse tips within former, township areas and burning of waste at local municipal landfill sites represents a source of concern in all provinces. (Metago, 2009)

Current sources of air pollutants in the Booyensdal area include mainly dust particles. These sources can be attributed to dust from construction activities, windblown dust and mobilisation of dust through vehicle movement, equipment, machinery materials handling, crushing, ore processing and tailings deposition (Wood, 2009).

Booyensdal has an existing air quality monitoring programme in place for the Booyensdal Mine. Results from the monitoring campaigns indicate that ambient air quality for dust outfall mainly falls in the residential air quality limit range of less than 600mg/m<sup>2</sup>/day (National Environmental Management: Air Quality Act, 2004; (Act No. 39 of 2004) National Dust Control Regulations), even though Booyensdal Mine falls within a non-residential area as classified through the local town planning scheme. (Skyside, 2021)

Potential sensitive receptor sites in the BS4 Vent Shafts Project area are limited due to the area's relative inaccessibility. The only potential receptor sites currently in the Groot Dwars River Valley include the natural flora and fauna of the valley. (Metago, 2009). In 2017, the air quality dispersion model indicated that with a 50% dust and emissions mitigation implemented, dispersion will be reduced to within the Phase 1 S24G Project footprint, and mainly within the valley.

### 3.2 Topography

Booyensdal Mine is located on a terrace in the upper reaches of the Groot Dwars River valley (Metago, 2009), with the Steenkampsberge stretching from east of BS to the south, after which it turns in northwesterly direction where it rises to 2 024mamsl. The Groot Dwars River is one of the perennial rivers which has its origin in this mountainous terrain. It runs through the Booyensdal Mine and is responsible for the steep and rugged valley terrain, which makes out the majority of the Booyensdal Mine. (Amec Foster Wheeler, 2018).

### 3.3 Geology

Booyensdal Mine is set in the Bushveld Igneous Complex (BIC), an intrusive igneous body, extending approximately 400km from east to west and about 350km from north to south. There are two lithologically distinct units: a lower sequence of layered ultramafic-mafic layers, known as the Rustenburg Layered Suite (RLS); and an overlying unit of granites, known as the Lebowa Granite Suite. BIC consists of four main geological limbs, namely: the Northern Limb, the Eastern Limb, the Southern Limb and the Western Limb.

The RLS is subdivided into the Marginal, Lower, Critical, Main and Upper zones. Rocks in the RLS range from ultravasic pyroxenites and norites in the lower parts to norite, gabbro and magnetite gabbro in the upper parts. The Critical Zone pyroxenites, norites and anorthosites host all the significant platinum group mines and chromite deposits. The Lower, Critical and Main Zones become attenuated towards the southern end of the Eastern Limb. Booyensdal Mine has been the focus of intensive recent exploration for both UG2 and Merensky Reef Platinum Group Element bearing horizons.

On a regional level, there are two major lineaments (geological structures) in the Eastern Bushveld, being the Steelpoort and Wonderkop faults, which divide the Eastern Bushveld into three zones: the southern, central and western zones.

Several faults and dolerite dykes have been identified in the area, generally associated with higher yielding ground water occurrences. Packer testing performed on exploration boreholes in the valley also confirmed the presence of zones of high hydraulic conductivity associated with these structures. The implication of this is that the faults and dykes can serve as preferential flow paths for contaminants, should it enter the groundwater regime.

There is some evidence of minor faulting. The dominant fracture zone is a north-south trending zone underlying the Groot Dwars River. There is some suggestion that a fractured zone up to 900m wide is extensively intruded by dolerite dykes, narrowing southwards. (Amec Foster Wheeler, 2018).

### 3.4 Hydrogeology

There are two types of aquifers in the Project Area, namely the Weathered Zone Aquifer and Fracture Rock Aquifer:

**Weathered Zone Aquifer:** The upper aquifer resulted from the vertical infiltration of recharging rainfall through the weathered material being retarded by the underlying lower permeability material. Groundwater collecting above the contact migrates downgradient along the contact to lower lying areas. In places where the contact is near surface the groundwater can daylight on surface as one of the many springs that occur in the area, or seep as baseflow into the surface water bodies. This aquifer therefore plays an important role in water provision to communities within 2km from the Project Area; and it furthermore contributes to recharge of surface water resources. The shallower weathered zones are associated with the steep valley sides. Because of the steep valley sides the recharge of the aquifer is low. The depth to groundwater/ water table ranges between surface and 12m below ground level (mbgl), while the groundwater is contained at levels up to depths of 35m.

**The Fractured Rock Aquifer:** This is an underlying competent and fractured rock aquifer, found under the weathered zone aquifer. Groundwater flows in the lower aquifer are associated with the secondary fracturing in the competent rock and, as such, will be along discrete pathways associated with the fractures. The depth of the water table/ groundwater level in the fractured aquifer ranges between 22 and 42 mbgl. Most groundwater flows in this aquifer are expected to be along the upper 40 to 50m. It is expected that groundwater will not be encountered below 80m. The fractured aquifers are mainly associated with flat and valley areas.

Groundwater quality at Booyensdal Mine can be described as naturally hard, with naturally elevated levels of Calcium (Ca), Magnesium (Mg) and electrical conductivity (EC) due to rock-water interactions. Groundwater quality generally falls within the South African National Standard (SANS) 241:2015 water quality guidelines for domestic use. (Amec Foster Wheeler, 2018).

### 3.5 Hydrology

The BS4 Vent Shaft Projects fall within quaternary catchment B41G, which is classified as a freshwater ecosystem priority area (FEPA). The Groot Dwars River is the main river running from south to north through Booyensdal. Several smaller non-perennial drainage lines drain into the Groot Dwars River.

The De Brochen Dam is located downstream of BN on the Remainder of the Farm De Brochen 7JT and Portion 2 of the Farm De Brochen 7JT. This Dam is a significant surface water body located downstream of the Project Area. The Groot Dwars River and the De Brochen Dam are

the most sensitive surface water resources found within the proximity of the Booyensdal Mine.

The 1:100yr flood lines or 100m buffer lines, whichever is the furthest delineation are regarded as the sensitive no-go areas around watercourses. Where FEPAs and wetlands are present, such as at Booyensdal Mine, generally and in the absence of delineated buffers as determined in accordance with the national protocol for buffer determination (MacFarlane et al., 2010), 1km and 500m buffers are respectively required for watercourses and wetlands. (Amec Foster Wheeler, 2018). The BS4 Vent Shaft Projects are not within any of these buffer zones.

### 3.6 Aquatic Ecology

Various aquatic and wetland investigations have been undertaken for the Booyensdal Mine and was summarised within the various environmental investigations undertaken in support of the BS MR EMP amendment and EA application processes. A succinct summary has been distilled from these reports herein.

Three types of aquatic ecosystems were identified in 2009 (Metago, 2009):

- A perennial river, the Groot Dwars River
- Ephemeral tributaries, found along drainage lines in the study area
- Wetlands

As previously indicated the mine falls in quaternary catchment B41G with the main river in the project area being the Groot Dwars River which is a National Freshwater Ecosystem Priority Area (FEPA). A desktop assessment of the Ecological Importance (EI) and Ecological Sensitivity (ES) of the sub-quaternary reach of the Dwars River within the catchment, classified it to be of HIGH EI and VERY HIGH ES (DWS 2013). Moving from south to north, the Present Ecological Status (PES) of the catchment varies from pristine, to moderately modified, to largely modified as the impacts of mining activities influences water regimes.

The ES is very high, due to the high levels of sensitivity of the expected fish and aquatic macroinvertebrate communities to flow modifications and impacts on water quality. The aquatic system is therefore dependent on maintenance of background flow, habitat and water quality, as it struggles to recover from disturbance and change and in some instances does not recover. (Amec Forster Wheeler, 2017 & 2018)

The wetlands within the Booyensdal Mine fall in the Central Bushveld Group 1 (endangered) and the Mesic Highveld Group 7 (critically endangered) wetland vegetation types. In addition, the wetlands are FEPA wetlands. (Amec Foster Wheeler, 2017). The following wetland types are found within Booyensdal Mine:

- Channeled valley bottom

- Unchanneled valley bottom
- Riparian wetland
- Riparian zone
- Seep
- Sheetrock seep
- Drainage line

These wetlands can be described as an interconnected system of perennial and non-perennial drainage systems, perched sheetrock wetlands and valley bottom wetlands, which are all connected to the larger Groot Dwars River.

Most of the wetlands within the Booyensdal Mine area are largely natural to moderately modified, with a PES category between B and C. The Ecological Importance and Sensitivity (EIS) of the wetlands are mainly high to moderate. (Amec Forster Wheeler, 2017 & 2018).

### **3.7 Terrestrial Ecology**

Booyensdal Mine is in the Sekhukhune Centre of Plant Endemism (SCPE) and is rich in species diversity and conservation important (CI) fauna and flora species, making it ecologically very sensitive and of High EI. The mine is also situated in an area rated as highly significant by the Mpumalanga Biodiversity Conservation Plan (MBCP). In addition, the Groot Dwars River valley is indicated as an important terrestrial ecological corridor providing an intact mega-pathway for long-term biological movement (Metago, 2009). More recently, the Booyensdal Mine area has also been classified as a Critical Biodiversity Area (CBA), in terms of the Mpumalanga Biodiversity Section Plan of 2013 and the Limpopo Biodiversity Classification (Amec Foster Wheeler, 2018).

Although the general area has a high diversity and is deemed highly sensitive and of ecological importance, the affected project sites are located mostly within areas previously disturbed by mining activities, with limited vegetation clearance required for project implementation.

### **3.8 Socio-economic**

The Integrated Development Plan (IDP) for Ehlanzeni District Municipality in which the BS is located states that in 2011 the unemployment rate for people between the ages of 15 and 65 was 32,32%, and that most the population in Ehlanzeni are dependent on social grants. This all contributes to a high dependency ratio, resulting in surrounding communities characterised by a weak economic base and disposable income, inadequate infrastructure, major service backlogs and lack of basic and medical services and dispersed human settlements. This complicates provision of services, high poverty levels, high unemployment rates and low skills base high dependency ratios. However, a clinic has been constructed by

the mine at the Kiwi Community to provide basic health services to the surrounding community up to the Draaikraal community. There is a high dependency on mines in the area to provide jobs and assist in socio-economic upliftment.

### 3.9 Cultural Heritage

Booyensdal Mine has a rich cultural heritage history, dating back to between 2.4 million and 250 000 years. Several cultural heritage sites have been identified over the years. The following heritage resource types are present in the study area (i.e., the larger Booyensdal Mine):

- Early Stone Age, dating back from 2.5 million to 250 000 years ago;
- Middle Stone Age, dating back 250 000 to 22 000 years ago. A limited number of these artefacts are present on site;
- Late Stone Age, dating back around 20 000 years ago. Some rock gravings dating back to this period were found on the eastern slopes of the Groot Dwars River; and
- Late Iron Age, stretching from AD1600 into the nineteenth century. Stone walled settlements along the eastern edge of the Groot Dwars River Valley associated with the Choma and Phetla Tribes especially dates to this era. (The historical period in this area is associated with the Ndzundaza-Ndebele and Voortrekkers settling in the area).

However, the heritage survey of the proposed BS4 Vent Shaft Projects development footprint found that none of the previously identified heritage resources will be impacted on and no surface evidence of any heritage sites of significance was noted. (Beyond Heritage, 2022).

### 3.10 Noise and Vibration

Booyensdal Mine is located upstream of the main mining cluster of the Groot Dwars River, in a mainly remote rural area.

Currently daytime noise levels on the outer perimeter of Booyensdal Mine are below 45dBA during the day and lower than 35dBA during night times.

Human sensitive receptors are all the people who might be affected by an increase in noise levels. Fauna is known to be impacted by human activities and noise, especially noise frequencies influencing breeding patterns, migration routes and habitat preference. Fauna within and close to the Booyensdal Mine are therefore regarded as sensitive receptors.

### 3.11 Traffic

The main roads used by Booyensdal around BS include the:

- D874 from BS connecting into Lydenburg-Roosenekal R577;
- gravel road passing the communities to the East of BS;

- R577; and
- D212 Sekhukhune Road.

Sensitive receptors include the various farmers, and local communities using and living next to the roads.

### **3.12 Visual**

The visual character of the north and south of Booyesdal Mine differs significantly. To the north, the natural landscape has been heavily impacted due to mining activities, settlements, transmission lines, roads etc.

The southern area generally is in a natural, elevated 'vessel' that opens to the north and which is contained by the dramatic Steenkampsberg on three sides. From higher vantage points, the rural nature and rugged character of the scene are evident. These factors combine to create the perception that the place has a unique natural and biodiversity quality and character.

Sensitive receptors are mainly the local communities within a 10km radius who could be impacted by night light. Communities to the east could be impacted by the visual intrusion of the mine infrastructure.



## 4 SCOPE OF PROPOSED AMENDMENTS

### 4.1 Description of Proposed Amendments

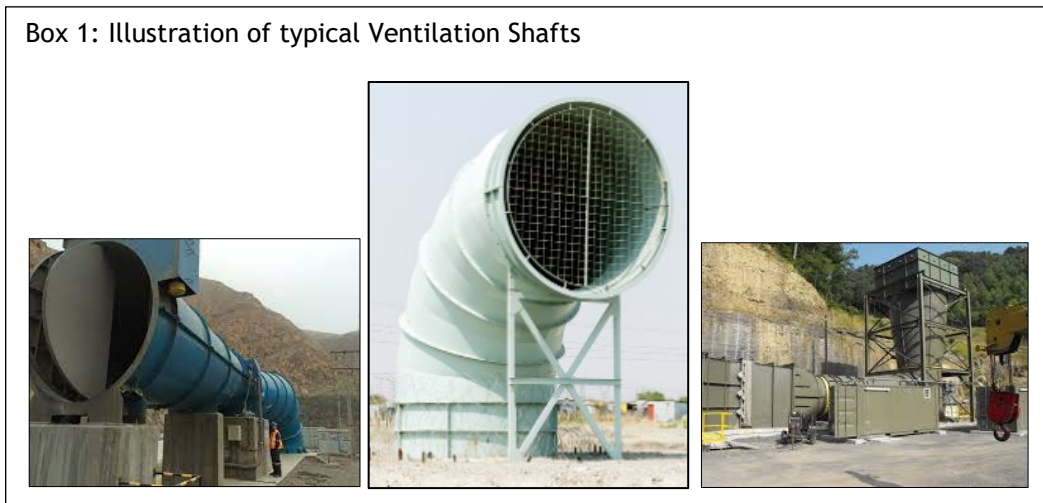
The applicant wishes to develop two ventilation shafts for the BS4 Mine (the BS4 Vent Shafts) and ancillary infrastructure (BS Vent Shafts Projects).

The establishment of the BS4 Vent Shafts is crucial for the development of the the BS4 underground complex, established for mining of the UG2 Reef, and to ensure the health and safety of workers underground. The BS4 Vent Shafts are also required to comply with the mine health and safety requirements. The ventilation design and requirements will be based on the mine design, production profile and underground equipment.

The BS4 Vent Shafts will comprise of the following:

- earthworks terraces, including layer works, ground stabilization and a possible stormwater cut off drain, if necessary;
- concrete foundations for the raisebore and vent fan;
- construction of the vent hole by means of raisebore; and
- mechanical installation of the horizontal vent fans.

Box 1: Illustration of typical Ventilation Shafts

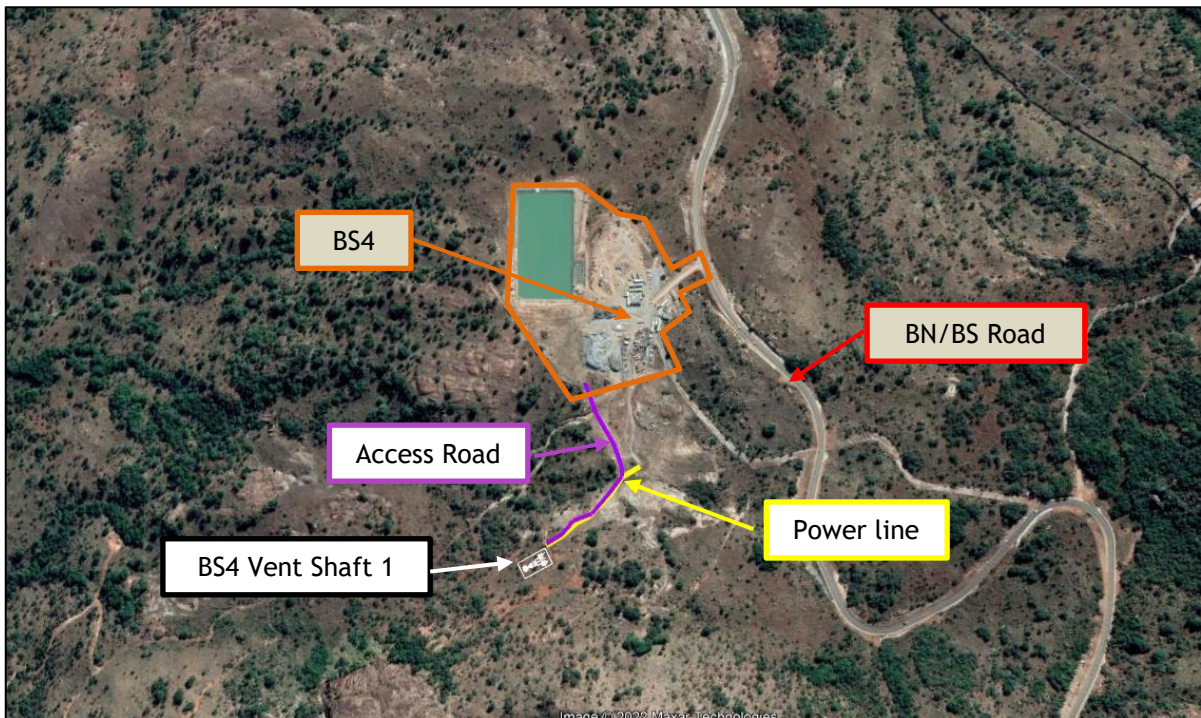


Ancillary infrastructure required for the BS4 Vent Shafts include:

- a containerized motor control centre for power supply and reticulation;
- two temporary water circulation tanks for the raisebore construction, of approximately 20 000l each; and
- overhead 11kV power supply lines and access roads

The first proposed ventilation shaft, BS4 Vent Shaft 1, with an extent of 0.2ha (including the vent fans, terrace and possible stormwater cut off drain), is located south-south-west of BS4. Refer to Figure 4-1.

It will be accessed by a proposed 295m road, of less than 4m in width, which will be developed on an existing track (see purple line) in a north-easterly direction towards BS4. A 11kV overhead powerline (OHPL) line of 180m, following the access road route, will tee off from existing OHPL.



**Figure 4-1: BS4 Vent Shaft 1 Project**

The second proposed ventilation shaft, BS4 Vent Shaft 2, also with an extent of 0.2ha (including the vent fans, terrace and possible stormwater cut off drain), is located south-west of BS4, towards the old Everest Mine on the main BN to BS mine access road (BN/BS Road). Refer to Figure 4-2.

It will be accessed by a proposed 136m road, of less than 4m in width, which will join the BN/BS Road, through a previously disturbed area (see dark blue line) in a south-easterly direction towards BS4. A 11kV OHPL of 136m will be constructed following the new access road route, will tee off from existing powerline at the start of the new access road.



Figure 4-2: BS4 Vent Shaft 2 Project

The BS4 Vent Shafts Projects' footprint will thus be  $\pm 0,9$  ha in extent, including linear infrastructure.

During their operational phase, activities at the BS4 Vent Shafts will be limited to maintenance work on the ventilation system and the power lines and roads, with dust suppression.

#### 4.2 NEMA Listed Activities associated with the proposed Amendments

No new Listed Activities as per the EIA Regulations 2014, will be triggered by the development of the proposed BS4 Vent Shaft Projects at BS Mine, as explained below.

Although the proposed BS4 Vent Shaft Projects fall within a CBA, they are not anticipated to affect any indigenous vegetation or watercourses to the extent that it will trigger a new Listed Activity.

BS4 Vent Shaft 1 footprint area is located on an area that was disturbed through the development of the BS4 Adit (circa 2012/2013), and although the access road will cross a small seasonal watercourse approximately 140m from the Vent Shaft location, it is understood that the crossing structure associated with the access road will not need any infrastructure that has a footprint larger than 10m<sup>2</sup> or will require the infilling of more than 5m<sup>3</sup> into the watercourse.

BS4 Vent Shaft 2 footprint area mostly aligns with the footprint of existing roadways and there are no watercourses in the vicinity.

As such, none of the thresholds depicted within Listing Notice 1 or Listing Notice 3 will be exceeded and therefore no additional new Listed Activities will be triggered for the proposed development of the BS4 Vent Shaft Projects.

## 5 LEGAL FRAMEWORK

### 5.1 Amendment Process Requirements

In terms of Regulations 31 and 32 of the EIA Regulations 2014, Booyesdal has submitted a Part 2 Amendment Application to amend the Valley Boxcut EA issued by MDEDET on 24 May 2010 (Reference number 17/2/1/15-E-5) and the EMPR Amendment EA issued by DMRE Mpumalanga on 17 May 2010 (Reference number: MP30/5/1/2/3/2/1(127)EM). Regulation 31 of the EIA Regulations 2014 states that: *“An environmental authorisation may be amended by following the process prescribed in this Part if the amendment will result in a change to the scope of a valid environmental authorisation where such change will result in an increased level or change in the nature of impact where such level or change in nature of impact was not: a) assessed and included in the initial application for environmental authorisation; or; or (b) taken into consideration in the initial environmental authorisation; and the change does not, on its own constitute a listed or specified activity.”*

The proposed amendments will not trigger any Listed Activities under the EIA Regulations 2014 (as amended), as explained above. Therefore, it is appropriate for the applicant to follow a Part 2 Amendment Application, rather than obtain an EA in accordance with NEMA.

### 5.2 Legislation applicable to Booyesdal

The legislation outlined in Table 5-1 is also applicable to activities at the Booyesdal Mine.

**Table 5-1: Legislation applicable to Activities at Booyesdal Mine.**

LEGISLATION/GUIDELINE	OBJECTIVE & RELEVANCE
<b>LEGISLATION</b>	
<p>Constitution of the Republic of South Africa of 1996 (Act 108 of 1996)</p>	<p>The Constitution is the supreme governing all other legislation. Environmental legislation is shaped by the Bill of Rights set out in the Constitution. The Constitution sets out the rights for every citizen of South Africa and aims to address past social injustices. With respect to the environment, Section 24 of the constitution states that:</p> <p><i>“Everyone has the right:</i></p> <ul style="list-style-type: none"> <li><i>a) To an environment that is not harmful to their health or well-being;</i></li> <li><i>b) To have the environment protected, for the benefit of present and future generations, through reasonable legislative and other measures that:</i> <ul style="list-style-type: none"> <li><i>i. Prevent pollution and ecological degradation;</i></li> <li><i>ii. Promote conservation; and</i></li> <li><i>iii. Secure ecologically sustainable development and use of natural resources while promoting justifiable economic and social development”.</i></li> </ul> </li> </ul> <p>In fulfilment of its constitutional mandate to take reasonable legislative measures that gives effect to section 24 of the Constitution, the government has promulgated several environmental laws. These laws provide a legal framework that embodies internationally recognised legal principles. The principal act governing activities that affect the environment is NEMA.</p> <p>The Constitution itself has no permitting requirements. However, the manner in which the environmental right is applied implies that environmental impacts associated with developments should be considered separately and cumulatively.</p> <p>Furthermore, section 24 includes the notion that justifiable economic and social development should be promoted, through using natural resources and ecologically sustainable development.</p> <p>Booyesdal must ensure that environmental impacts are avoided, mitigated or managed as far as possible throughout the lifecycle of the project.</p>
<p>Environmental Conservation Act (73 of 1989) (ECA), as amended</p>	<p>The ECA has now largely been replaced by the NEMA but certain provisions remain in force.</p> <p>Section 21 of the ECA relates to the control of activities that may have a detrimental effect on the environment, which required written authorization issued by the relevant authority prior to NEMA coming into force.</p> <p>The national Noise Control Regulations (GN R154 in Government Gazette No. 13717 dated 10 January 1992) (NCR) were promulgated in terms of Section 25 of the ECA, relating to noise, vibration and shock. The NCRs were revised under GN155 of 10 January 1992 to make it obligatory for all authorities to apply the regulations. In accordance with the ECA, two procedures exist for assessing and controlling noise, respectively:</p> <ul style="list-style-type: none"> <li>• South African National Standard (SANS) 10328:2008 “Methods for environmental noise impact assessments”;</li> <li>• SANS 10103:2004 ‘The measurement and rating of environmental noise with respect to annoyance and speech communication’; and</li> <li>• Other SANS.</li> </ul>

LEGISLATION/GUIDELINE	OBJECTIVE & RELEVANCE
	<p>The proposed development is likely to increase ambient noise levels during the construction (temporary) and operational phases. Noise impacts are closely related to construction activities and heavy traffic volumes. The EMPr includes mitigation measures relating to the mitigation of noise impacts.</p>
<p>National Environmental Management Act (Act 107 of 1998) (NEMA), as amended.</p>	<p>NEMA is the framework law giving effect to the constitutional environmental right and for regulatory tools in respect of environmental impacts. Section 24 of NEMA regulates EAs.                      Section 28(1) includes a statutory duty of care, providing that <i>“Every person who causes, has caused or may cause significant pollution or degradation of the environment must take reasonable measures to prevent such pollution or degradation from occurring, continuing or recurring, or, in so far as such harm to the environment is authorised by law or cannot reasonably be avoided or stopped, to minimise and rectify such pollution or degradation of the environment”</i>.                      In terms of sections 24(2) and 24D of NEMA, the then Minister of Environmental Affairs promulgated certain activities that may not commence without an EA. Activities promulgated in terms of GN983 and GN9835 require a basic assessment process, while activities promulgated in terms of GN984 require that a full scoping and EIA process be conducted. GNs 983, 984 and 985 are promulgated under NEMA in GG 38282 of 4 December 2014 (as amended).                      Section 24C(2A) of NEMA indicates that where listed activities are directly related to the extraction and primary processing of a mineral or petroleum resource the Minister of Mineral Resources and Energy is the competent authority or officials at the DMRE to whom he has delegated his authority, being the Regional Managers.</p> <p>No new Listed Activities as per the EIA Regulations 2014, will be triggered by the development of the proposed BS4 Vent Shaft Projects at BS Mine, as explained in Section 4.2.</p>
<p>EIA Regulations, 2014</p>	<p>Chapter 6 of the 2014 EIA Regulations provides for the requirements for public participation, which must be carried out as part of the EA application process. In terms of Regulations 21 and 23, the outcome of the PPP must be reported in the FSR and EIAR submitted to the CA. The PPP, <i>“must give all potential or registered interested and affected parties, including the competent authority a period of at least 30 days to submit comments on each of the EMPR, scoping report and environmental impact assessment report, and where applicable the closure plan, as well as the report contemplated in regulation 32, if such reports or plans are submitted at different times”</i> (Regulation 40 (1)).</p> <p>Public participation will be undertaken in accordance with chapter 6 of the EIA Regulations, 2014.</p>
<p>National Environmental Management: Waste Act (Act 59 of 2008) (NEMWA), as amended</p>	<p>NEMWA's purpose is to: assist in regulating waste management; ensure the protection of human health; and prevent pollution and environmental degradation through sound waste management principles and guidelines. It furthermore provides for:</p> <ul style="list-style-type: none"> <li>• national norms and standards for regulating waste management by all spheres of government;</li> <li>• licensing and control of waste management activities;</li> <li>• remediation of contaminated land;</li> <li>• a national waste information system; and</li> <li>• provision for compliance and enforcement.</li> </ul> <p>The NEMWA defines waste broadly.<sup>1</sup></p>

<sup>1</sup> “(a) any substance, material or object, that is unwanted, rejected, abandoned, discarded or disposed of, or that is intended or required to be discarded or disposed of, by the holder of that substance, material or object, whether or not such substance, material or object can be re-used, recycled or recovered and includes all wastes as defined in Schedule 3 to this Act; or

LEGISLATION/GUIDELINE	OBJECTIVE & RELEVANCE
	<p>The NEMWA imposes a general duty upon waste holders to take reasonable measures to avoid waste generation and, where this is impossible, to: minimise the toxicity and quantities of waste generated; reuse, reduce, recycle and recover waste; and ensure that it is treated and disposed of in an environmentally sound way. Failure to do so is a criminal offence, with a maximum fine of R10 million or imprisonment of up to 10 years, or both.</p> <p>It is necessary to hold a waste management licence (WML) for defined waste management activities. The then Department of Environmental Affairs promulgated the 2013 WML Regulations, which provides that a WML is required for undertaking certain waste management activities ("Waste Listed Activities"). The Waste Listed Activities are separated into three categories, namely Category A, Category B and Category C. Category A and B Waste Listed Activities require a WML, for which either a basic assessment or an EIA process needs to be undertaken that complies with the 2014 EIA Regulations. The procedures for licensing Waste Listed Activities are stipulated in Chapter 5 of NEMWA. Category C activities do not require a WML but must comply with <i>inter alia</i> the Norms and Standards for Storage of Waste, 2013.<sup>2</sup> Such facilities need to be registered with the DFFE 90 days before construction commences. Classification of certain waste streams is required in terms of the Waste Classification and Management Regulations,<sup>3</sup> to ensure that the correct waste management standards and disposal methods are implemented.</p> <p>The National Norms and Standards for the Assessment of Waste for Landfill Disposal and the National Norms and Standards for the Disposal of Waste to Landfill<sup>4</sup> provide the norms and standards for disposal of waste to landfill.</p> <p>The National Waste Information Regulations<sup>5</sup> regulate the collection of data and information to fulfil the objectives of the national waste information system, as set out in section 61 of the NEMWA, and includes reporting obligations. A registered person must keep a record of the information submitted to the SAWIS or the DFFE.</p> <p>While no WML is required for the BS4 Vent Shaft Projects, the Applicant must ensure that waste is appropriately managed throughout the life cycle of the Projects.</p> <p>Waste generated on site will be sorted and separated into appropriate containers and / or banded areas. All waste will be collected and transported to licensed waste disposal sites through registered service providers.</p> <p>Hazardous waste, such as cement bags, will be handled by a hazardous waste contractor and disposed of at a licenced landfill site.</p>
National Environmental Management: Air Quality Act (Act 39 of 2004) (NEMAQA)	NEMAQA was promulgated to ensure the protection and regulation of air quality and provide measures that will prevent pollution and sustainability. Under NEMAQA, the Minister of Environmental Affairs, Forestry and Fisheries must identify substances in ambient air which present a threat to health, wellbeing or the environment and establish national standards for ambient air quality, including the permissible quantity or concentration of each substance in ambient air.

*(b) any other substance, material or object that is not included in Schedule 3 that may be defined as a waste by the Minister by notice in the Gazette but any waste or portion of waste, referred to in paragraphs (a) and (b), ceases to be a waste—*

- (i) once an application for its re-use, recycling or recovery has been approved or, after such approval, once it is, or has been re-used, recycled or recovered;*
- (ii) where approval is not required, once a waste is, or has been re-used, recycled or recovered;*
- (iii) where the Minister has, in terms of section 74, exempted any waste or a portion of waste generated by a particular process from the definition of waste; or*
- (iv) where the Minister has, in the prescribed manner, excluded any waste stream or a portion of a waste stream from the definition of waste."*

<sup>2</sup> Published in GN 926 of GG 37088 on 29 November 2013

<sup>3</sup> Published in GN634 of GG 36784 on 23 August 2013

<sup>4</sup> Published under GN R635 and GN R636 respectively in GG 36784 of 23 August 2013

<sup>5</sup> Published in GN 625 of GG 35583 on 13 August 2012



LEGISLATION/GUIDELINE	OBJECTIVE & RELEVANCE
	<p>The National Dust Control Regulations, published in GN 827 of GG 36974 on 1 November 2013, provide that an acceptable dust fallout rate for a non-residential area is considered more than 600 mg/m<sup>2</sup>/day but less than 1200 mg/m<sup>2</sup>/day (30-day average), with maximum allowable two exceedances per year, provided these exceedances do not take place in consecutive months. Where the dust fallout rate is exceeded, a dust fallout monitoring programme must be developed, as prescribed in terms of the Regulations, and include:</p> <ul style="list-style-type: none"> <li>the establishment of a network of dust monitoring points, using method ASTM D1739:1970 (or an equivalent standard), sufficient in number to: establish the contribution to dust fallout in residential and non-residential areas near the premises; monitor identified or likely sensitive receptor locations; and establish the baseline dust fall for the district; and</li> <li>a schedule for submitting to the air quality officer dust fallout monitoring reports annually or at more frequent intervals, if requested by the air quality officer.</li> </ul> <p>Greenhouse gases have been declared priority pollutants under the Declaration of Greenhouse Gases as Priority Air Pollutants, published in GN 710 of GG 40996 on 21 July 2017</p> <p>An air emissions licence will not be required for the BS4 Vent Shaft Projects; however, a duty of care should be employed during construction to minimise air pollution as far as possible. The Applicant must take all reasonable measures to minimise the generation of dust and ensure compliance with the Dust Control Regulations.</p>
<p>National Environmental Management: Biodiversity Act (Act 10 of 2004) (NEMBA)</p>	<p>In line with the Convention on Biological Diversity, NEMBA aims to legally provide for biodiversity conservation, sustainable use and equitable access and benefit sharing. NEMBA creates a basic legal framework for the formation of a national biodiversity strategy and action plan and identification of biodiversity hotspots and bioregions, which may then be given legal recognition. It imposes obligations on landowners (state or private) regarding alien invasive species. NEMBA requires that provision be made by a site developer to remove any aliens which have been introduced to the site or are present on the site.</p> <p>The NEMBA also provides for listing of threatened or protected ecosystems in one of four categories: critically endangered, endangered, vulnerable or protected. Threatened ecosystems are listed to reduce the rate of ecosystem and species extinction, by preventing further degradation and loss of structure, function and composition of threatened ecosystems. The purpose of listing protected ecosystems is primarily to conserve sites of exceptionally high conservation value.</p> <p>Section 53 of NEM:BA provides that:</p> <p><i>"(1) The Minister may, by notice in the Gazette, identify any process or activity in a listed ecosystem as a threatening process.</i></p> <p><i>(2) A threatening process identified in terms of subsection (1) must be regarded as a specified activity contemplated in section 24(2)(b) of the NEMA and a listed ecosystem must be regarded as an area identified for the purpose of that section."</i></p> <p>No notices have been published yet under this section.</p> <p>Picking parts of, or cutting, chopping off, uprooting, damaging or destroying, any specimen of a listed threatened or protected species is a restricted activity under NEMBA. A permit is required for a restricted activity involving a listed threatened or protected (TOPS) species without a permit. Chapter 7 of the NEMBA regulates the process for application of a permit under NEMBA.</p> <p>The following notices have been published in terms of section 56(1) of NEMBA:</p> <ul style="list-style-type: none"> <li>National List of Ecosystems that are Threatened and in need of protection (TOPS List),<sup>6</sup> which contains the National List of Ecosystems that are threatened and in need of protection. This includes preventing further degradation and loss of structure,</li> </ul>

<sup>6</sup> Published under GN1002 in GG34809 of 9 December 2012

LEGISLATION/GUIDELINE	OBJECTIVE & RELEVANCE
	<p>function and composition of threatened ecosystems and preserving witness sites of exceptionally high conservation value. The purpose of listing threatened ecosystems is primarily to reduce the rate of ecosystem and species extinction.</p> <ul style="list-style-type: none"> <li>• Lists of Critically Endangered, Endangered, Vulnerable and Protected Species;<sup>7</sup> and</li> <li>• Threatened and Protected Species Regulations.<sup>8</sup></li> </ul> <p>Chapter 5 of NEMBA pertains to alien and invasive plants (AIP) and provides that a person may not carry out a restricted activity involving a specimen of an AIP without a permit issued in terms of Chapter 7 of NEMBA. Such permit can only be issued after a prescribed assessment of risks and potential impacts on biodiversity is carried out. Applicable, and exempted AIP are contained within the Alien and Invasive Species List 2020.<sup>9</sup></p> <p>The NEMBA Alien and Invasive Species Regulations<sup>10</sup> categorises the different types of alien and invasive plant and animal species and how they should be managed.</p> <p>No protected species were identified on the affected properties.</p> <p>Should protected species be encountered, a permit will be required from the DFFE to remove or relocate protected species.</p> <p>Booyensdal must control and eradicate alien and invasive species in line with the NEMBA Alien and Invasive Species Regulations.</p>
<p>Conservation of Agricultural Resources Act 43 of 1983 (CARA)</p>	<p>In terms of CARA, landowners are legally responsible for the control of weeds and alien vegetation. CARA makes provision for three categories of AIP:</p> <ul style="list-style-type: none"> <li>• Category 1a: must immediately be removed and destroyed;</li> <li>• Category 1b: need to be immediately removed and contained;</li> <li>• Category 2: requires a permit to retain the species on site and it must be ensured that they do not spread. All category 2 plants in riparian zones need to be removed; and</li> <li>• Category 3: require a permit to retain these species. All category 3 plants in the riparian zone need to be removed.</li> </ul> <p>CARA also regulates the conservation of soil and states that degradation of the agricultural potential is illegal. It furthermore requires the protection of land against soil erosion and the prevention of water logging and associated salinization.</p> <p>Permissions / permits are required under CARA for the ‘cultivation’ of ‘virgin soil’; cultivation and/or draining vleis, marshes or water sponges; and cultivation of an area within a watercourse’s flood area.</p> <p>Measures to mitigate potential impacts on agricultural resources, such as soil erosion, alien invasion and protection of vegetation and water resources are included in the EMPr.</p> <p>Permissions / permits required under CARA are not necessary for the BS4 Vent Shaft Projects.</p>
<p>National Water Act 36 of 1998 (NWA)</p>	<p>The NWA is the primary legislation controlling and managing the use of water resources and pollution thereof. It provides for fundamental reformation of legislation relating to water resource use. The NWA’s preamble recognises that the ultimate aim of water resource management is to achieve sustainable use of water for the benefit of all users and that water resources quality protection is necessary to ensure sustainability of the nation’s water resources in the interests of all water users. The NWA’s purpose is stated in section 2 and enforced by the DWS.</p>

<sup>7</sup> Published under GNR151 in GG 29567 of 23 February 2007  
<sup>8</sup> Published under GNR152 in GG 29657 of 23 February 2007  
<sup>9</sup> Published under GNR 1003 in GG 43726 of 18 September 2020  
<sup>10</sup> Published under GNR1020 dated 25 September 2020

LEGISLATION/GUIDELINE	OBJECTIVE & RELEVANCE
	<p>The NWA presents strategies to facilitate sound management of water resources; provides for the protection of water resources; and regulates use of water by means of Catchment Management Agencies, Water User Associations, Advisory Committees and International Water Management. As the NWA is founded on the principle of trusteeship, the government has overall responsibility for and authority over water resource management, including the equitable allocation and beneficial use of water in the public interest. Industry (including mines) can therefore only be entitled to use water if the use is permissible under the NWA.</p> <p>Section 19 of the NWA provides for pollution prevention and requires that a person who owns, controls, occupies or uses the land in question, is responsible for taking reasonable measures to prevent pollution of water resources. A catchment management agency may take action to prevent or remedy the pollution and recover all reasonable costs from the responsible party.</p> <p>In terms of section 21 of the NWA, certain consumptive and non-consumptive water uses are identified and can only commence once authorised. Water use is broadly defined in the NWA and includes taking and storing water; activities which reduce stream flow; waste discharges and disposals; controlled activities; altering a watercourse; removing water found underground for certain purposes; and recreation. Consumptive water uses include taking water from a water resource (section 21(a) of NWA) and storing water (section 21(b)). Non-consumptive water uses include impeding or diverting a watercourse's flow (section 21(c)); altering a watercourse's bed, banks, course or characteristic or impeding the flow of a watercourse (sections 21 (c) and (i)); and disposal of waste in a matter that may detrimentally impact on a watercourse (section 21(g)).</p> <p>Where a water use constitutes a Scheduled 1 Use (permissible use without an authorisation requirement); permissible water uses in terms of section 22 of the NWA; or is authorised in terms of a General Authorisation (GA), a WUL is not required. Various GAs have been published under the NWA, including for Sections 21(c),(i),(g), and (a) water uses. In respect of sections 21(c) and (i) water uses, activities can be conducted within 100m of a watercourse and 500m of a wetland without a WUL if the impacts to the watercourse / wetland are low. Water uses that will be conducted under a GA need to be registered with the DWS.</p> <p>The DWS is to be approached to determine whether the BS4 Vent Shaft Projects require authorisation in terms of the Act.</p>
<p>Government Notice 704 (GN 704)</p>	<p>GN 704, promulgated under section 26(1) of the NWA is specifically aimed at the protection of water resources associated with mining related activities. It provides minimum requirements which need to be adhered to for water resource protection on a mine. GN 704 regulates the use of water; management of dirty and clean water infrastructure; and related activities at mines. This includes minimum requirements for infrastructure that hold dirty water. A mine can apply for exemptions from these requirements and could be granted approval, should sufficient management measures be put in place to ensure environmental protection. Regulation 4 of GN 704 places some restrictions in terms of the locality of certain infrastructure which could have an impact on water resources.</p>
<p>National Heritage Resources Act (Act No. 25 of 1999) (NHRA)</p>	<p>The protection and management of South Africa's heritage resources are controlled by the NHRA. The national enforcing authority for the NHRA is the South African Heritage Resources Agency (SAHRA). In terms of the NHRA, historically important features, such as graves, archaeology and fossil beds, are protected. Similarly, culturally significant symbols, spaces and landscapes are also afforded protection. In terms of section 38 of the NHRA, a permit is required for certain categories of development as follows:</p> <p><i>“(1) (a): The construction of a road, wall, power line, pipeline, canal or other similar form of linear development or barrier exceeding 300m in length;</i></p> <p><i>(c): Any development or other activity which will change the character of a site -</i></p> <ul style="list-style-type: none"> <li><i>i. exceeding 5 000 m<sup>2</sup> in extent;</i></li> <li><i>ii. involving three or more existing erven or subdivisions thereof;</i></li> <li><i>iii. involving three or more erven or divisions thereof which have been consolidated within the past 5 years; or</i></li> </ul>

LEGISLATION/GUIDELINE	OBJECTIVE & RELEVANCE
	<p><i>iv. the costs of which will exceed a sum in terms of regulations by SAHRA or a provincial heritage resource authority.”</i></p> <p>In terms of Section 38(8) of the NHRA, section 38(1) approval from SAHRA is not required where an environmental impact assessment is undertaken under NEMA, including a HIA, and SAHRA’s requirements are considered by the CA when granting the EA. Section 38(8) of the NHRA provides that:</p> <p><i>“The provisions of this section do not apply to a development as described in subsection (1) if an evaluation of the impact of such development on heritage resources is required in terms of the ECA, or the integrated environmental management guidelines issued by the Department of Environment Affairs and Tourism, or the Minerals Act, 1991 (Act No. 50 of 1991), or any other legislation: Provided that the consenting authority must ensure that the evaluation fulfils the requirements of the relevant heritage resources authority in terms of subsection (3), and any comments and recommendations of the relevant heritage resources authority with regard to such development have been taken into account prior to the granting of the consent.”</i></p> <p>A Part 2 Amendment Application requires an assessment of all impacts, including heritage impacts. Accordingly, if such a heritage assessment complies with the NHRA, a separate application for consent under the NHRA is not required.</p>
<p>National Veld and Forest Fire Act (Act 101 of 1998) (NVFFA)</p>	<p>The NVFA’s purpose is to prevent and combat veld, forest and mountain fires throughout South Africa. The Act applies to the open countryside beyond the urban limit and puts in place a range of requirements. The Act sets out the responsibilities of landowners or persons in control of the land which includes:</p> <ul style="list-style-type: none"> <li>• Prepare and maintain firebreaks on their side of the boundary if there is a reasonable risk of veld fire. The NVFA sets out the procedure in this regard and the role of neighbouring landowners and the fire protection association;</li> <li>• Have such equipment, protective clothing and trained personnel for extinguishing fires as are prescribed (in the regulations);</li> <li>• If there are no regulations, reasonably required in the circumstances, take all reasonable steps to notify the FPO of the local FPA (if there is one) when a fire breaks out; and</li> <li>• Do everything in their power to stop the spread of the fire.</li> </ul> <p>Landowners must ensure that: (i) firebreaks are wide and long enough to have a reasonable chance of preventing a veldfire from spreading to or from neighbouring property, (ii) that it does not cause soil erosion; and (iii) it is reasonably free of inflammable material capable of carrying a veldfire across it.</p> <p>The BS4 Vent Shaft Projects are in the countryside beyond the urban limit, and thus the provisions of the Act are applicable. Measures to mitigate the risk of veld fires have been included in this EMP.</p>
<p>Hazardous Substance Act (Act No. 15 of 1973) (HSA)</p>	<p>The HSA aims to control the production, import, use, handling and disposal of hazardous substances. Under the HSA, hazardous substances are defined as substances that are toxic, corrosive, irritant, strongly sensitising, flammable and pressure generating under certain circumstances and may injure, cause ill-health or even death in humans.</p> <p>Where hazardous substances from any of the 4 groups below are to be used, (see below) care must be taken that they are sourced, transported, handled and disposed of in compliance with the provisions of the Act.</p> <ul style="list-style-type: none"> <li>• Group I: industrial chemicals (IA) and pesticides (IB);</li> <li>• Group II: 9 classes of wastes excluding Class 1: explosives and class 7: radioactive substances;</li> <li>• Group III: electronic products and group; and</li> <li>• Group IV: radioactive substances.</li> </ul> <p>The list of group IA hazardous substances is provided in the HSA.</p> <p>The HSA provides for the:</p>

LEGISLATION/GUIDELINE	OBJECTIVE & RELEVANCE
	<ul style="list-style-type: none"> <li>• Control of certain electronic products;</li> <li>• Division of such substances or products into the groups above in relation to the degree of danger, with licensing requirements for certain activities undertaken in respect of Groups I and III;</li> <li>• Prohibition and control of the importation, manufacture, sale, use, operation, application, modification, disposal or dumping of such substances and products; and</li> <li>• Matters connected therewith.</li> </ul> <p>Hazardous substances may be stored, handled or transported as part of the proposed projects and include diesel and other liquid fuel, oil and hydraulic fluid, cement, etc.</p>
<p>Mineral and Petroleum Resources Development Act (Act 28 of 2002) (MPRDA), as amended</p>	<p>The MPRDA governs mineral resources in South Africa, regulates mining and mining authorisations and has as one of its principal objectives the equitable access and the sustainable development of the South Africa's mineral resources. It provides mechanisms that will ensure the protection of the environment throughout the Life of Mine.</p> <p>Section 5A of the MPRDA indicates that: <i>"No person may prospect for or remove, mine, conduct technical co-operation operations, reconnaissance operations, explore for and produce any mineral or petroleum or commence with any work incidental thereto on any area without - (a) an environmental authorisation"</i>.</p> <p>Booyensdal already complies with the MPRDA and will continue to do so in respect of the BS4 Vent Shaft Projects.</p>
<p>Mine Health and Safety Act (Act No. 29 of 1996) (MHSA)</p>	<p>The MHSA aims to provide for protection of the health and safety (HS) of all employees and other personnel at RSA mines. Its main objectives are:</p> <ul style="list-style-type: none"> <li>• Protection of the HS of all persons at mines;</li> <li>• Requiring employers and employees to identify hazards and eliminate, control and minimise the risks relating to health and safety at mines;</li> <li>• Giving effect to the public international law obligations of South Africa that concern HS at all mines.</li> <li>• To promote:             <ul style="list-style-type: none"> <li>○ a culture of HS in the mining industry;</li> <li>○ training in HS in the mining industry; and</li> <li>○ cooperation and consultation on HS between the State, employers, employees and their representatives.</li> </ul> </li> <li>• Providing for:             <ul style="list-style-type: none"> <li>○ employee participation in matters of HS through HS representatives and the HS committees at mines;</li> <li>○ effective monitoring of HS conditions at mines;</li> <li>○ enforcement of HS measures at mines; and</li> <li>○ investigations and inquiries to improve HS at mines.</li> </ul> </li> </ul> <p>Booyensdal already complies with the MHSA and will continue to do so in respect of the proposed projects.</p>
<p>Compensation for Occupational Injuries and Diseases Act (Act No. 130 of 1993) (COIDA)</p>	<p>Under COIDA, employers are not held liable for compensation for injuries sustained by employees or compensation to dependants due to the death of an employee which occurred during the course and scope of their employment. Compensation is paid out of a statutory fund, administered by the Compensation Commissioner (appointed under COIDA), which is set in accordance with a tariff prescribed in COIDA. The fund is a trust fund that is controlled by the Compensation Commissioner, which the employer contributes</p>

LEGISLATION/GUIDELINE	OBJECTIVE & RELEVANCE
	<p>to. The Compensation Commissioner is appointed to administer the fund and approve claims lodged by employees or their dependants. The Compensation Commissioner compensates the employee or their dependants directly.</p> <p>Booyensdal will take cognisance of the requirements of the COIDA as part of daily operations and as incidents occur.</p>
<p>Restitution of Land Rights Act (Act 22 of 1994) (RLRA)</p>	<p>The RLRA governs land restitution claims. Initially, the RLRA only allowed land claims to be lodged until December 1998 (“Initial Period”). This period was amended with the promulgation of the Restitution of Land Rights Amendment Act of 2014 and the process for the lodgement of claims was extended to 2019 (“Extended Period”). However, a few months thereafter, the Constitutional Court delivered a judgment, <i>Access Movement of South Africa and Others v Chairperson of the National Council of Provinces and Others</i> 2016(5) SA 635 (CC) (“LAMOSAs”) In terms of the LAMOSAs judgment, the DRDLR is interdicted from processing those claims lodged after December 1998 until those lodged prior to this date have been finalised.</p> <p>Under section 11(7) of the RLRA no person may sell, exchange, donate, lease, subdivide, rezone or develop a land in respect of which a land claim has been published in a GG without having given the Regional Land Claims Commissioner (“LCC”) one month’s written notice of the intention to do so.</p> <p>Booyensdal shall duly notify the Land Claims Commissioner, if required, of the Part 2 Amendment Application and prior to developing on the Project Area. Portion 5 of the Farm Sterkfontein 52JT is subject to a successful land claim by the Bakoni Ba Phetla Communal Property Association (Bakoni CPA) and the property will in due course be transferred to the CPA and subsequently sublet to Booyensdal in terms of the existing long terms registered notarial lease with the Bakoni CPA.</p>
<p>Occupational Health and Safety Act, 1993 (Act No. 85 of 1993) (OHSA)</p>	<p>The MHSA provides that OHSA is not applicable to any matter in respect of which any provision of the MHSA is applicable.</p>
<p>Other Legislation and Policy</p>	<p>Other policies, legislation and associated regulations (where applicable) considered as part of the application process include:</p> <ul style="list-style-type: none"> <li>• National Development Plan 2030.</li> <li>• National Forestry Act, No 84 of 1998</li> <li>• Protection of Personal Information Act, No. 4 of 2013.</li> <li>• Spatial Planning and Land Use Management Act, No 16 of 2013.</li> <li>• Subdivision of Agricultural Land Act 70 of 1970.</li> <li>• Traditional Leadership and Governance Framework Amendment Act, No 41 of 2003</li> <li>• National House of Traditional Leaders Act, No 22 of 2009</li> <li>• Traditional and Khoi-San Leadership Act, No. 3 of 2019.</li> <li>• Mpumalanga Nature Conservation Act 10 of 1998.</li> <li>• Mpumalanga Town Planning and Land related Laws repeal Act of 2 of 2016.</li> <li>• Draft Mpumalanga Spatial Planning and Land Use Management Act, 2016.</li> <li>• Spatial Development Framework (SDF) 2019: Mpumalanga Province, as amended.</li> <li>• Municipal Systems Act, No 32 of 2000</li> <li>• Ehlanzeni District Municipality final IDP and budget review 2020/2021 and draft IDP and Budget Review 2021/2022.</li> <li>• Ehlanzeni District Municipality Spatial Development Framework.</li> <li>• Thaba Chweu Spatial Planning and Land Use Management By-law, 2016</li> <li>• Thaba Chweu Review Integrated Development Plan 2021/2022.</li> </ul>

LEGISLATION/GUIDELINE	OBJECTIVE & RELEVANCE
	<ul style="list-style-type: none"> <li>• Thaba Chweu Local Municipality Water Supply By-Laws 2007.</li> <li>• Thaba Chweu Local Municipality (Lydenburg Municipality) Refuse (Solid Wastes) And Sanitary By-Laws 1980 (as amended).</li> <li>• Thaba Chweu Local Municipality Cleaning Services / Solid Waste Management By-Law 2019.</li> <li>• Thaba Chweu Local Municipality (transitional local council for Lydenburg) (lydenburg Municipality) drainage by-laws 1994.</li> <li>• Thaba Chweu Community Fire Safety By-laws for Fire and Rescue Services, 2019</li> </ul>
GUIDELINES	
Standards and Guidelines	<p>In addition to the abovementioned Acts and their associated Regulations, the following guidelines and standards are applicable to Booyendal Mine.</p> <ul style="list-style-type: none"> <li>□ DMRE/DFFE Consultation Guidelines</li> <li>□ National web based environmental screening tool (GN R960 of GG 42561, dated 5 July 2019) and Procedures for the Assessment and Minimum Criteria for Reporting on Identified Environmental Themes in terms of Sections 24(5)(a) and (h) and 44 of NEMA<sup>11</sup>. SANS 10103 of 2008.</li> <li>□ SANS 10210 of 2004.</li> <li>□ NEMA Implementation Guidelines: Sector Guidelines for Environmental Impact Assessment Regulation (published under GN 654 in GG 3333 of 29 June 2010).</li> <li>□ DEA (2011): A user friendly guide to the National Environmental Management: Waste Act, 2008. South Africa, Pretoria.</li> <li>□ Department of Environmental Affairs and Tourism (2004): Criteria for determining Alternatives in EIA, Integrated Environmental Management, Information Series 11.</li> <li>□ Guideline for Implementation: Public Participation in the EIA Process (published in under GN 807 in GG 35769 of 10 October 2012).</li> <li>□ Publication of Public Participation Guideline (GN 807 of 10 October 2012 GG No. 35769)</li> <li>□ <i>Best Practice Guidelines for Water Resource Protection in the South African Mining Industry (Department of Water Affairs, 2006):</i> <ul style="list-style-type: none"> <li>▪ Series A: Best Practice (BP) Guidelines</li> <li>▪ Series G: BP Guidelines</li> <li>▪ Series H: BP Guidelines</li> </ul> </li> </ul>

<sup>11</sup> Published in GN R320 of GG 43110 on 20 March 2020 and GN R1150 of GG 43855 on 30 October 2020

## 6 MOTIVATION FOR THE PROPOSED AMENDMENT

The expansion of mining activities as approved with the EA's for the Phase I and II Booyesendal Expansion Projects resulted in the associated economic benefits resulting from increased platinum production and local socio-economic benefits due to job creation, capital expenditure on contractors, materials and equipment, as well as ensuring an extension of the Life of Mine (LoM) in the long term, which will prevent retrenchments and early mine closure.

To ensure the continuation of these benefits, the additional requirements to comply with various ancillary legislation such as the MHSA is necessary. The additions of the BS4 Vent Shafts, which will function as ventilation shafts to the Booyesendal South 1, 2 and 4 underground complexes, established for mining of the UG2 Reef, will fulfil part of Booyesendal's obligations in term of the mine health and safety requirements and allow for continued underground mining.

In furtherance to the above, it must be noted that ventilation is among the most important requirements in a mining operation. Since ventilation directly affects the health and safety of employees working underground, the regulation of air flow through a mine is seriously considered by mine owners and the competent authorities. Underground mine ventilation provides a flow of sufficient volume of air to the underground workings of a mine, to dilute and remove dust and noxious gases (typically nitrogen oxides, sulphur oxides, methane, carbon dioxide and carbon monoxide) and regulate temperature. The sources of these gases are equipment that runs on diesel engines; blasting with explosives; and the ore body itself.

The new ventilation shafts are therefore considered imperative for the continued operation of the underground mining complex, and to ensure the health and safety of workers underground.



## 7 IMPACT ASSESSMENT OF PROPOSED AMENDMENT

This Amendment Report illustrates the risk assessment undertaken of potential biophysical and socio-economic aspects and impacts of the BS4 Vent Shaft Projects on the receiving environment. This report summarises the risks and findings of various specialist studies undertaken and outlines avoidance, mitigation and management actions which will assist in minimising the impact of the project as far as possible.

### 7.1 Impact Assessment Methodology

Possible impacts are identified through comments from I&APs, specialist reports, and from the EAP's experience. Note that due to the availability of extensive specialist information collated as part of the previous EA application processes (Everest Platinum Mine EIA/EMP Amendment for the Extension of Mining Activities (Metago Engineers, 2009); Booyesdal South Expansion Project (Phase 1) Section 24G EIA (Amec Foster Wheeler, 2017); Booyesdal South Expansion Project: Phase 2 Final EIA (Amec Foster Wheeler, 2018)), the nature and scale of the projects, and the limited anticipated environmental impacts, no additional investigations have been undertaken, only site verification screening investigations for biodiversity and heritage aspects (Screening Assessment associated with the establishment of infrastructure at the Northam Booyesdal South Mine (GCS, 2022); and Heritage Statement for the Part 2 Amendment for the Booyesdal BS4 Vent Shaft Project (Beyond Heritage, 2022)) were undertaken and included with all pertinent previous specialist investigations covering the project area, as part of this Part 2 Amendment Application.

The assessment of potential impacts was addressed in a standard manner to ensure that a wide range of impacts were comparable. The ranking criteria and rating scales were applied to all specialist studies for this project. To enable a scientific approach to the determination of the environmental significance (importance), a numerical value is linked to each rating scale.

Clearly defined rating and rankings scales (Table 7-1 to Table 7-7) were used to assess the impacts associated with the proposed activities. The impacts identified by each specialist study and through public participation were combined into a single impact rating table for ease of assessment.

**Table 7-1: Severity or magnitude of impact**

Not applicable/none/negligible	0
Minor/insignificant/non-harmful (no loss of species/habitat)	2
Low/small/potentially harmful (replaceable loss with minimal effort)	4
Moderate/significant/slightly harmful (replaceable loss of species/habitat with great effort and investment)	6

High/highly Significant/harmful (impact to human health or welfare/loss of species/habitat)	8
Very High/extremely significant/extremely harmful/within a regulated sensitive area (loss of human life/irreplaceable loss of Red Data species/conservation habitat)	10

**Table 7-2: Spatial Scale of activity**

Not applicable/none/negligible	0
Site only	1
Local (within 5km)	2
Regional/neighbouring areas (5 km to 50 km)	3
National	4
International	5

**Table 7-3: Duration of activity**

Not applicable/none/negligible	0
Immediate (immediately reversible with minimal effort)	1
Short-term (0-5 years - reversible)	2
Medium-term (5 to 15 years - difficult to reverse with effort)	3
Long-term/life of the activity (very difficult to reverse with extensive effort)	4
Permanent/beyond life of the activity (not reversible)	5

**Table 7-4: Frequency of activity (how often activity is undertaken)**

Not applicable/none/negligible	0
Improbable /almost never/annually or less	1
Low probability/very seldom/6 monthly	2
Medium probability/infrequent/temporary/monthly	3
Highly probable/often/semi-permanent/weekly	4
Definite/always/permanent/daily	5

**Table 7-5: Frequency of incident/impact (how often activity impacts environment)**

Almost never/almost impossible/>20%	1
Very seldom/highly unlikely/>40%	2
Infrequent/unlikely/seldom/>60%	3
Often/regularly/likely/possible/>80%	4
Daily/highly likely/definitely/>100%	5

**Table 7-6: Legal Issues - governance of activity by legislation.**

No legislation	1
Fully covered by legislation	5

**Table 7-7: Detection (how quickly/easily impacts/risks of activity on environment, people and property are detected)**

Immediately (easier to mitigate)	1
Without much effort	2
Need some effort	3
Remote and difficult to observe	4
Covered (more difficult to mitigate)	5

Each impact identified must be assessed in terms of probability (likelihood of occurring), the consequence of the impact (spatial scale, severity and duration) and the associated risk (impact significance).

Consequence was then determined as follows:

$$\text{CONSEQUENCE} = \text{Severity} + \text{Spatial Scale} + \text{Duration}$$

The probability or likelihood of occurrence of the activity was then calculated based on frequencies of the activity and impact, whether the activity is governed by legislation and how easily it can be detected:

$$\text{LIKELIHOOD} = \text{Frequency of Activity} + \text{Frequency of Impact} + \text{Legal issues} + \text{Detection}$$

The significance or risk of each identified impact was then based on the product of consequence and likelihood:

$$\text{Environmental Significance/Risk} = \text{Consequence} \times \text{Likelihood}$$

Impacts were rated as either of high, medium or low significance on the basis provided in Table 7-8. Each impact was also assessed in terms of the level to which there is an irreplaceable loss of resources and its degree of reversibility. The ratings as described in Table 7-9 and Table 7-10.

**Table 7-8: Impact significance ratings.**

SIGNIFICANCE	ENVIRONMENTAL RISK RATING	COLOUR CODE
High (positive)	>240	H
Medium (positive)	120 to 240	M
Low (positive)	<120	L
Neutral	0	N
Low (negative)	>-120	L
Medium (negative)	-120 to -240	M
High (negative)	<-240 (max = 400)	H

**Sub-categories:**

Significance	Extreme	Very High	High	Moderate	Significance	Extreme	Very High	High	Moderate
High	260-400	320-359	280-319	241-279	High	260-400	320-359	280-319	241-279
Significance	High	Moderate	Medium		Significance	High	Moderate	Low	
Medium	200-240	160-199	120-159		Medium	200-240	160-199	120-159	
Significance	Moderate	Moderate	Low		Significance	High	Moderate	Negligible	
Low	80-119	40-79	1-39		Low	80-119	40-79	1-39	

**Table 7-9: Irreplaceability of resource caused by impacts**

No irreplaceable resources will be impacted (the affected resource is easy to replace/rehabilitate)	Low
Resources that will be impacted can be replaced, with effort	Medium
Project will destroy unique resources that cannot be replaced	High

**Table 7-10: Reversibility of impacts**

Low reversibility to non-reversible	Low
Moderate reversibility of impacts	Medium
High reversibility of impacts	High

The significance of an impact gives one indication of the level of mitigation measures required to minimise negative impacts and reduce environmental damage during the construction, operational and decommissioning phases. Suitable and appropriate mitigation measures, to ensure avoidance, management and mitigation of impacts, were identified for each of the potential impacts based on specialist recommendations and GCS expertise.

## 7.2 Assessment of Construction Phase Impacts of the proposed Amendments

The construction phase impacts identified for the construction of the proposed BS4 Vent Shafts are discussed below and the significance rating for each impact is presented in the Construction Impact Assessment Matrix in Appendix D.

### 7.2.1 Potential Impacts on Air Quality and Climate

Localised impacts on ambient air quality are anticipated through the site clearance, topsoil removal, stockpiling, grading, infilling, excavations, infrastructure removal, etc.

Due to the temporary nature of construction phase and the limited footprint areas associated with the B4 Vent Shaft Projects, the potential impacts were considered to have a **Low**

significance. With the implementation of the dust suppression control measures such as listed below, the impacts are **Negligible**.

- Maintenance of vehicles and wet suppression or chemical treatment on exposed surfaces, unpaved roads, and materials handling areas-where feasible.
- Reduction of speed limit (max 20km/h) and restriction of construction vehicle movement to designated construction areas.
- Minimise extent of disturbed areas.
- Reduction of frequency of disturbance.
- Early/concurrent rehabilitation and re-vegetation, as appropriate on disturbed areas.
- Stabilisation (chemical, rock cladding or vegetative) of disturbed soil.
- Implement measures to prevent dust outfall on vegetation.

GHGs, which contribute to global climate change, will be generated throughout the construction phase of the BS4 Vent Shaft Projects. Direct GHG emissions include exhaust fumes from equipment, vehicles and backup generators (when required).

The expected impact of the construction activities on GHG emissions and climate, considering the scale of the BS4 Vent Shaft Projects, is anticipated to be of **Low** significance.

Fuel-saving and energy efficiency measures should be implemented to reduce this impact, including optimal vehicle and equipment use scheduling, servicing and maintenance, use of fuel-saving technology and high-efficiency generators, and use of low carbon and sulphur fuels.

### *7.2.2 Potential Impact on Terrestrial Ecology*

The proposed clearing and excavation of the footprint areas will result in the loss of vegetation. This impact refers to the direct physical destruction and/or modification of terrestrial habitat and includes habitat loss impacts; habitat and vegetation degradation impacts (e.g., petrochemical and waste contamination and species composition and abundances changes); loss of floral species of conservation importance (CI); loss of catchment area; decreased water inputs; and invasive alien plant proliferation.

A detailed investigation and impact assessment was undertaken for terrestrial ecology by Natural Scientific Services CC in 2017 for the Phase 2 application process. Impacts identified for both the Phase 2 Project's construction and operational project phases included widespread destruction of floral communities and faunal habitats, extensive fragmentation of floral communities and faunal habitats, widespread establishment of invasive alien flora, widespread loss of CI and other flora, etc.

However, the current ecological status of the present footprint areas needs to be considered when determining potential impacts of the BS4 Vent Shaft Projects and their significance.

Although some of the vegetation at the BS4 Vent Shaft 2 site is considered to be indigenous in nature, as the topsoil on the site has not been disturbed in the preceding 10 years, the vegetation at the BS4 Vent Shaft 1 site is considered not to meet the definition of “indigenous vegetation” as defined by the EIA Regulations as the vegetation on this site has been disturbed (lawfully) during the establishment of the BS4 Adit. The BS4 Vent Shaft Projects’ footprint areas have thus been found to be largely degraded and to a significant extent devoid of indigenous vegetation.

With the implementation of appropriate mitigation, construction related impacts potentially resulting in ecological degradation, such as dust generation, erosion and sedimentation, contamination, invasive alien species proliferation, etc., can be successfully mitigated from Medium to Low significance. Potential mitigation measures include:

- Demarcate construction footprint area clearly.
- Restrict site clearance to the footprint area only.
- Edge effects of construction activities need to be actively managed.
- Vegetation outside of the designated construction area must be left undisturbed.
- Restrict the movement of personnel and construction vehicles to where they are needed within designated areas only.
- Upon completion of construction activities, it must be ensured that all bare areas are revegetated and that no bare areas remain.
- Ensure the implementation of an Alien Invasive Species Management Plan which must make provision for the following:
  - Identification of the alien invasive species that have settled on the site;
  - Clear instructions on how to eradicate these species;
  - A schedule of eradication; and
  - A schedule of regular monitoring of the success of the implementation of the eradication.
- No deliberate killing or poaching of fauna must be tolerated under any circumstances.
- In areas where snakes are abundant, snake deterrents are to be deployed.
- All plant and equipment that make use of petrochemical substances must be checked for leakages on a daily basis before operations commence.
- All plant and equipment that are found to be leaking must be removed from the property and only returned once the leakages have been addressed.

- 
- If any petrochemical substances are stored on the construction site, this storage must be done on an impermeable surface in a bunded area that makes provision for 110% of volume of the substances that are stored.
  - All refueling of plant and equipment must be conducted over a drip-tray or designated bunded areas.
  - If any plant or equipment is to be parked on the site, these must be parked within the demarcated construction footprint that has been cleared.
  - If any spillages from plant or equipment occur, the spill must be immediately contained, the contaminated soils must be collected and bagged in impermeable bags and stored on site to be removed and disposed of by a registered service provider.
  - Skips must be made available on-site into which all construction waste can be discarded.
  - All construction waste must be cleared from the site on a daily basis and placed in these skips.
  - The capacity of these skips must be monitored on a daily basis to ensure that a replacement skip can be arranged on the same day as the filled skips are removed.
  - The disposal of the content of these skips must be done at a municipal landfill site.
  - No dumping of construction waste on open areas on the property will be allowed.
  - No burial of construction waste within the project site or in the surrounding areas will be allowed.
  - Implement a waste management plan and monitor levels of litter constantly.
  - A designated eating area must be established within the construction site.
  - Covered domestic waste bins must be present at the eating area to receive all the domestic waste generated by the labour.
  - The capacity of these domestic waste bins must be monitored on a daily basis to ensure that they are emptied timeously.
  - The domestic waste from these waste bins must be removed off site and disposed of at a municipal landfill site on a weekly basis or more regularly if the bins fill up quicker.
  - Only portable chemical toilets with a sealed reservoir will be allowed on site.
  - The capacity of the reservoirs in the portable chemical toilets must be monitored on a daily basis to ensure that they can be serviced timeously.

- All removal of the collected sewage waste from the portable chemical toilets must be conducted by a registered service provider for disposal at a municipal waste water treatment facility.
- Implement speed control measures (e.g. speed limits, traffic calming measures).
- Restrict driving to daylight hours only, except for emergencies.
- Strict adherence to the Construction EMP.
- Constant monitoring through the appointed Environmental Officer.

### *7.2.3 Potential Impact on Aquatic Resources*

Although it has been well documented that the Booyesendal Mine finds itself situated within an area of high ecological importance and very high ecological sensitivity when it comes to aquatic resources pertaining to both riverine and wetland features, the location and extent of the proposed BS4 Vent Shaft Projects, as well as the purpose of the projects, must be taken into consideration when reviewing the potential impact of these projects on the aquatic resources.

As indicated previously, the project footprints are located mostly within previously disturbed areas, and it is understood that the extent of further disturbance will be limited to the final footprint required for the operation and maintenance of the ventilation shafts. The access road to BS4 Vent Shaft 1 will cross a small seasonal watercourse approximately 140m from the vent shaft location, but it is understood that the crossing structure associated with the access road will not need any infrastructure that has a footprint larger than 10m<sup>2</sup> or will require the infilling of more than 5m<sup>3</sup> into the watercourse. No direct impacts on any aquatic resources are envisaged at BS4 Vent Shaft 2 as there are no such features within close proximity. In general, potential impact on aquatic resources during construction activities in most instances results from inadequate waste management, inadequate stormwater management, leakages from the portable chemical toilets, petrochemical spillages from plant and equipment, and leaking or spills from storage facilities. The aforementioned would lead to potential increased surface water turbidity due to sediment inputs and/or erosion, contamination and physio-chemical pollution related to potential spillages during construction. Turbidity impacts are likely to be limited, given the temporary nature of onsite earthworks. Vegetation clearance could lead to erosion and consequently siltation and potential steep slopes could lead to further erosion affecting the aquatic features. Construction activities could also affect the biodiversity of the aquatic features as a result of the spreading of alien invasive species.



It is anticipated that the impacts during the construction phase of the activity will be of **Medium** significance for all expected impacts before mitigation and it can be lowered to a **Low** impact if the proposed mitigation measures are implemented.

Proposed mitigation measures include:

- Ensure adequate stormwater management measures are implemented to prevent potential soil erosion and sedimentation.
- Demarcate construction footprint area clearly.
- Minimise site clearance to the footprint area only.
- Edge effects of construction activities need to be actively managed.
- Vegetation outside of the designated Works area must be left undisturbed.
- Restrict the movement of personnel and construction vehicles to where they are needed.
- Upon completion of construction activities, it must be ensured that no bare areas remain.
- If any petrochemical substances are stored on the property, this storage must be done on an impermeable surface in a bunded area that makes provision for 110% of the volume of the substances containers that are stored.
- The bunded area must consist of an impermeable floor as well as walls and be fitted with a valve that can be used to drain any spillages.
- Suitable spill prevention measures to be in place and spills should be cleaned up on occurrence.
- Implementation of appropriate waste management and control procedures.
- Ensure vehicles are in good condition and not leaking fuel or oil when entering the construction site.
- All plant and equipment that make use of petrochemical substances must be checked for leakages on a daily basis before operations commence.
- Maintenance to be done in suitably designed areas, preferably off site.
- All plant and equipment that are found to be leaking must be removed from the property and only returned once the leakages have been addressed.
- All refuelling of plant and equipment must be conducted over a drip-tray or designated bunded areas.
- If any spillages from plant or equipment occur, the spill must be immediately contained, the contaminated soils must be collected and bagged in impermeable bags and stored on site to be removed and disposed of by a registered service provider.
- An integrated waste management approach, taking cognisance of the waste management hierarchy and other proposed mitigation measures, must be developed and implemented.

- Only portable chemical toilets with a sealed reservoir will be allowed on site.
- The capacity of the reservoirs in the portable chemical toilets must be monitored on a daily basis to ensure that they can be serviced timeously.
- All removal of the collected sewage waste from the portable chemical toilets must be conducted by a registered service provider for disposal at a licensed waste water treatment facility.
- Ensure that no material is dumped outside of the designated areas.
- Strict adherence to the Construction EMP.
- Constant monitoring through the appointed Environmental Officer.

#### *7.2.4 Potential Impact on Soils, Land Capability and Land Use*

Given the topography, there is a risk of soil erosion associated with the construction activities. However, most of the impacts can be mitigated through the implementation of the EMP. The impact of the BS4 Vent Shaft Projects on soil erosion is considered of **Medium** significance pre-mitigation. Through effective soil erosion prevention measures (terracing, operations on contour), the impact can be reduced to **Low**.

During construction, erosion control measures must be implemented in areas sensitive to erosion, such as exposed soil, trenches cut for construction, etc. These measures include but are not limited to - the use of sandbags, hessian sheets, silt fences and retention or replacement of vegetation.

Soil loss and contamination could occur due to improper stormwater management, erosion control, vegetation stripping, poor management of construction activities, poor waste management, spillages and uncontrolled maintenance of vehicles and machinery on site.

The impact of soil contamination due to construction activities is anticipated to be **Low** if the development footprint area is restricted to the works area and clearly demarcated; and the movement of construction activities outside of this area is restricted. Edge effects of construction activities need to be carefully and actively managed through ensuring good housekeeping and strict management of activities, with specific consideration to erosion control and alien floral species management.

Maintenance of vehicles must take place with care. If any spills occur, they should be immediately cleaned up; and the recollection of spillage should be practised, preventing the ingress of hydrocarbons into the topsoil. All hazardous materials should be stored within a bund capable of containing 110% of the stored capacity, to prevent potential spillages and soil contamination. Maintenance should not be conducted on the project area, and bunds and spill kits should be available, particularly during refuelling. Appropriate sanitary facilities must be provided during the construction phase and all waste must be removed to an appropriate waste facility.

The current land use on the site comprises infrastructure, veld, and disturbed areas. The proposed construction activity will have a short-term, negative impact due to the temporary change in land use from open veld to construction. This will occur due to the restriction on access through fencing and securing of the construction area; an influx of construction staff, machinery, equipment; and the establishment of a site office, construction camp/s and laydown area/s.

Vehicle and employee movement should be restricted to within the construction footprint. Working hours should be limited and an open channel of communication with surrounding residents and landowners must be ensured, to mitigate all intrusive impact and complaints. The existing complaints register should be maintained on site, to ensure that all complaints are addressed.

The proposed construction activities may impact on existing land use, which is anticipated to be **Low** given the scale of the footprint of the project area. The project area should be rehabilitated to be safe, non-eroded, free of contaminants, suitably vegetated and aligned with post closure land use. With the implementation of the proposed mitigation measures, the impact on land use will be **Low**.

#### *7.2.5 Potential Impact Hydrogeology and Hydrology*

Water quality impacts during construction will likely be limited to potential increased surface water turbidity due to sediment inputs and/or erosion; and physio-chemical pollution related to potential spillages of cement and fuels during construction. Turbidity impacts are likely to be limited, given the temporary nature of onsite earthworks. Spillages of fuel and other harmful substances could alter the physio-chemical and biological characteristic of surface water and contaminate watercourse substrate, with potential consequences for both vegetation and wildlife communities. If poorly managed, impacts to water quality could be of **Medium** significance where turbidity and sediment and/or pollution risks are not effectively mitigated. Where best practical mitigation is implemented, this can be potentially limited to **Low** and environmentally acceptable level. Mitigation measures proposed include:

- Vegetation stripping must be limited to the minimum width required.
- The topography of all disturbed areas must be rehabilitated, in such a manner that it blends with the surrounding natural area. This will reduce soil erosion and improve natural revegetation.
- The necessary flood attenuation and erosion control structures have to be put in place.
- Continued implementation of the surface- and groundwater monitoring programme(s) in place.

### 7.2.6 *Potential Visual Impacts*

The construction phase of the activity will involve the clearing of vegetation in an already disturbed area to make way for the proposed infrastructure i.e., the BS Vent Shafts and associated infrastructure. This will inevitably cause negative impacts on aesthetics and a change in the visual landscape to some extent, keeping in mind the existing mining and industrial activities within the area. However, considering that the proposed project area falls within the ambit of the Booyensdal mining area, with no sensitive receptors in close proximity, no potential visual impact is foreseen on any sensitive receptors.

This impact can be limited to the project area only if the existing vegetation bordering the proposed firebreaks on either side of the perimeter fence is maintained as far as possible, to assist in screening these BS4 Vent Shaft Projects.

During the construction phase, night lighting at the laydown area and for security purposes will be required. The type and positioning of this lighting should be carefully considered. The primary goal should be to contain the light to the areas that need illumination and prevent glare from the activities.

It is anticipated that the impacts during the construction phase of the BS4 Vent Shaft Projects will be of **Low** significance for all expected impacts before mitigation and can be lowered to a **Negligible** impact if the proposed mitigation measures are implemented.

### 7.2.7 *Potential Noise Impacts*

As the entire Booyensdal Mine is situated within a valley enclosed by mountains, it effectively provides natural noise barriers for the operations. Noise levels and noise disturbance in the immediate vicinity of the project area are expected to increase during construction activities due to:

- The use of plant machinery to be used to excavate and shape the project area;
- The movement of construction and earth-moving vehicles;
- Increased traffic entering and exiting the project area;
- Operation of generators;
- Noise from hydraulic hammers and winches; and
- General construction noise.

Noise impacts is not expected to exceed regulated limits and standards. The anticipated noise impact of the construction activities are expected to be **Low** with the implementation of appropriate mitigation measures.

### *7.2.8 Potential Heritage and Paleontological Impacts*

Several assessments were conducted in the project area (e.g., Van der Walt 2018, Pistorius 2017, van der Walt & Celliers 2016, Huffman & Schoeman 2001, 2002a & b). The combined studies recorded 68 heritage sites/features, consisting of Iron Age Sites, ruins, cemeteries and graves; and stone cairns and terracing. In addition to the recorded heritage features, low-density scatters of isolated Stone Age artefacts were noted by Van der Walt (2018). These artefacts are classified as Middle Stone Age and consist of flakes and Levalois-type cores usually found in vertic soils and are not in-situ. This background scatters of artefacts do not constitute an archaeological site and are scattered too sparsely to be of any significance; apart from noting their presence, which has been done in previous reports (Huffman & Schoeman 2002a, van der Walt & Celliers 2016). None of these resources will be impacted on by the proposed BS4 Vent Shaft Projects.

The paleontology of the Booyesendal South Expansion Project was assessed by Rubidge (2017), and the study area is indicated as insignificant to low paleontological sensitivity on the SAHRA paleontological sensitivity map; and no further studies are required for this aspect.

A physical inspection of the proposed BS4 Vent Shafts showed these to be in degraded areas that are already disturbed; and no surface evidence of heritage sites of significance was noted.

Should any such sites be discovered, a Chance find Protocol is to be adopted. As such, these impacts are anticipated to be **Negligible**.

### *7.2.9 Potential Socio-Economic Impacts*

Positive impacts on the socio-economic environment related to the construction phase are anticipated to include temporary job creation (approximately 80 positions) and some associated local economic growth. This is a positive impact, rated as moderately **Low**. Generally, with large scale mining projects, negative impacts on the social environment related to the construction phase may include an increase in annoyance and nuisance related aspects; an influx of construction workers and the associated increase in crime; an increase in the exposure to health and well-being hazards; and daily living patterns and social and community infrastructure may be disrupted. Through ensuring continued implementation of appropriate mitigation measures, this impact will be **Low**. It must also be understood that although these impacts may potentially be caused by the BS4 Vent Shaft Projects, the extent of the impacts experienced will in all probability be negligible cumulatively, as they are already existing impacts from previous projects at Booyesendal Mine. Additionally, considering that the proposed projects are to be implemented and managed by an existing mine with existing mitigation and management measures outlined in various documents such as previous EMPRs and the Mine's Social and Labour Plan, speaking to socio-economic aspects associated

with the operation of the mine and the various construction activities associated with continued mine expansion and maintenance, no further mitigation measures are proposed for this project.

#### *7.2.10 Potential Traffic Impacts*

An increase in traffic volumes on the road network surrounding the project area will be experienced during the construction phase. The resultant impact will be on the surrounding road network, increasing dust generation, noise and necessary road maintenance.

Based on the scale of the development, the impact of increased construction related vehicular movement on the surrounding road network is anticipated to be **Medium**, whilst the anticipated impact associated with abnormal loads is **Low**.

### **7.3 Assessment of Operational Phase Impacts of the proposed Amendment**

The potential impacts identified for the operational phase are discussed below and the significance rating for each impact is presented in the Operational Phase Impact Matrix in Appendix D.

#### *7.3.1 Potential Impacts on Air Quality and Climate*

There are no additional anticipated impacts on air quality and climate for the BS4 Vent Shaft Projects due to their nature nor are there any additional mitigation measures required. Upon construction completion, the BS4 Vent Shaft Projects will not require activities associated with the generation of particulate and gaseous matter such as crushing, materials transport, tipping, etc.

#### *7.3.2 Potential Impact on Terrestrial Ecology*

As discussed, in the construction phase assessment of potential impacts, although the overall site wide impact significance of the impact on terrestrial ecology received a very high significance rating for the Phase 2 Project, the current ecological status and the extent of the project area needs to be considered when determining potential impact significance. Consequently, operational related impacts potentially resulting in ecological degradation, such as dust generation, contamination, etc., can also be regarded as being of **Low** negligible significance.

#### *7.3.3 Potential Impact on Aquatic Resources*

The main potential impacts anticipated during the operational phase are on aquatic water quality due to spillages and leaks from vehicles, plant equipment, and dust generation, which

could impact on the aquatic biodiversity. Potential sedimentation resulting from increased run-off, even months after the finalization of construction, could occur during the operational phase. Similarly, erosion due to the increased run-off and catchment modification could occur. Care should be taken to prevent and manage potential water contamination from chemical, fuel and oil leaks and spills.

Considering the aforementioned, and the scale of the proposed projects as discussed earlier, the anticipated level of impact significance pertaining to aquatic features is considered **Low** with the implementation of appropriate mitigation measures. Mitigation measures may include regular management and maintenance of vehicles, plant and equipment to ensure the risk of leakages are managed, and implementation of appropriate stormwater and erosion control measures.

#### *7.3.4 Potential Impact on Soils, Land Capability and Land Use*

Once the operational phase has commenced, the land will be used for mining and supporting infrastructure and given the nature of the activities, the soil will no longer be suitable for wildlife or grazing. However, due to the nature, locality and scale of the BS4 Vent Shaft Projects, there are no additional impacts anticipated or mitigation proposed for the operational phase. The main potential impact anticipated during the operational phase is potential soil contamination resulting from spillages or leaks from vehicles and equipment. With the continued implementation of appropriate mitigation measures, is considered to be **Low**.

#### *7.3.5 Potential Impact Hydrogeology and Hydrology*

The impacts associated with the operational phase are similar to the impacts associated with the construction phase of the BS4 Vent Shaft Projects, i.e., surface and groundwater contamination.

Surface water contamination, resulting from erosion due to increased run-off and catchment modification, can occur. Care should be taken to prevent and manage potential water contamination from chemical spills, fuel and oil leaks and spills. The anticipated impact can be managed as **Low** significance with the implementation of appropriate mitigation. Proposed mitigation measures include:

- Retain as much indigenous vegetation as possible.
- Soil erosion control measures, such as protection berms, should be employed where necessary.
- Monitoring the revegetation and the functioning of drains and the maintenance of roads.
- All spills must be cleaned up immediately.

- Equipment should be adequately maintained.
- Continued implementation of the surface- and groundwater monitoring programme(s) in place.

### *7.3.6 Potential Visual Impacts*

During the operational phase, as with the construction phase, night lighting at the laydown area and for security purposes will be required. The type and positioning of this lighting should be carefully considered. The primary goal should be to contain the light to the areas that need illumination and to prevent glare from the activities.

It is anticipated that all expected impacts during the operational phase of the BS4 Vent Shaft Projects will be of **Low** significance before mitigation and can be lowered to a **Negligible** impact if the proposed mitigation measures are implemented.

### *7.3.7 Potential Noise Impacts*

As noted above, the entire Booyesdal Mine is situated within a valley enclosed by mountains, which effectively provides natural noise barriers for the operations. It is however expected that the operation of the BS4 Vent Shafts and road utilisation will potentially generate additional noise disturbance. Previous investigations determined that noise impacts will not exceed regulated limits and standards. Considering the similarities of the BS4 Vent Shaft Projects with the vent shaft assessed during the previous environmental application process, the anticipated impact of the operational activities can be extrapolated from the previous specialist investigation. The impact significance was therefore determined to be **Medium** and can be reduced to **Low** with the implementation of the proposed mitigation measures. Proposed mitigation measures are similar to the proposed construction mitigation measures.

### *7.3.8 Potential Heritage and Paleontological Impacts*

There are no additional anticipated impacts on heritage and paleontological resources for the BS4 Vent Shaft Projects upon completion of construction as there were no resources of significance identified during the investigations at the project sites nor are there any additional mitigation measures required.

### *7.3.9 Potential Socio-Economic Impacts*

There are no additional anticipated impacts related to socio-economic aspects for the BS4 Vent Shaft Projects nor any additional mitigation measures required upon construction completion. The operation and maintenance of the BS4 Vent Shaft Projects, including their associated infrastructure, will be undertaken by the Mine's existing staff complement. As such, no socio-economic impact is anticipated for this phase of the project.



### *7.3.10 Potential Traffic Impacts*

There are no additional anticipated impacts on traffic for the BS4 Vent Shaft Projects nor any additional mitigation measures required. Upon construction completion, the BS4 Vent Shaft and associated infrastructure will not require activities associated with the increase in traffic surrounding the project area.

## **7.4 Assessment of Decommissioning Phase Impacts of the proposed Amendments**

The potential impacts identified for the decommissioning phase are discussed below and the significance rating for each impact is presented in the Decommissioning Phase Impact Matrix in Appendix D.

### *7.2.1 Potential Impacts on Air Quality and Climate*

Localised impacts on ambient air quality are anticipated through the activities associated with site decommissioning, e.g., infrastructure removal, site clearance, ripping and soil reinstatement, excavations, infilling, vegetation establishment, etc.

Due to the temporary nature of the decommissioning phase and the limited footprint areas associated with the B4 Vent Shaft Projects, the potential impacts were considered to have a **Low** significance overall. With the implementation of the dust suppression control measures such as listed below, the impacts are **Negligible**.

- Maintenance of vehicles and wet suppression or chemical treatment on exposed surfaces, unpaved roads, and materials handling areas-where feasible.
- Reduction of speed limit (max 30km/h) and restriction of vehicle movement to designated work areas.
- Minimise extent of disturbed areas.
- Reduction of frequency of disturbance.
- Early/concurrent rehabilitation and re-vegetation, as appropriate on disturbed areas.
- Stabilisation (chemical, rock cladding or vegetative) of disturbed soil.
- Implement measures to prevent dust outfall on vegetation.

GHGs, which contribute to global climate change, will be generated throughout the decommissioning phase of the BS4 Vent Shaft Projects. Direct GHG emissions include exhaust fumes from equipment, vehicles and backup generators (when required).

The expected impact of the decommissioning activities on GHG emissions and climate, considering the scale of the BS4 Vent Shaft Projects, is anticipated to be of **Low** significance.

Fuel-saving and energy efficiency measures should be implemented to reduce this impact, including optimal vehicle and equipment use scheduling, servicing and maintenance, use of fuel-saving technology and high-efficiency generators, and use of low carbon and sulphur fuels.

### *7.2.2 Potential Impact on Terrestrial Ecology*

The proposed decommissioning and associated demolition of surface infrastructure of the BS4 Vent Shaft Projects may result in the loss of vegetation due to disturbance of the surrounding area. This impact refers to the direct physical destruction and/or modification of terrestrial habitat and includes habitat loss impacts; habitat and vegetation degradation impacts (e.g., petrochemical and waste contamination and species composition and abundances changes); loss of floral species of CI and invasive alien plant proliferation.

With the implementation of appropriate mitigation, decommissioning related impacts potentially resulting in ecological degradation, such as dust generation, erosion and sedimentation, contamination, invasive alien species proliferation, etc., can be successfully mitigated from Medium to Low significance. Potential mitigation measures include:

- Demarcate activity footprint allowed clearly.
- Restrict demolishing activities to the footprint area only.
- Edge effects of decommissioning activities need to be actively managed.
- Vegetation outside of the designated footprint area must be left undisturbed.
- Restrict the movement of personnel and vehicles to where they are needed within designated areas only.
- Upon completion of decommissioning activities, it must be ensured that all bare areas are revegetated and that no bare areas remain.
- Ensure the implementation of an Alien Invasive Species Management Plan which must make provision for the following:
  - Identification of the alien invasive species that have settled on the site;
  - Clear instructions on how to eradicate these species;
  - A schedule of eradication; and
  - A schedule of regular monitoring of the success of the implementation of the eradication.
- No deliberate killing or poaching of fauna must be tolerated under any circumstances.
- In areas where snakes are abundant, snake deterrents are to be deployed.

- 
- All plant and equipment that make use of petrochemical substances must be checked for leakages on a daily basis before operations commence.
  - All plant and equipment that are found to be leaking must be removed from the property and only returned once the leakages have been addressed.
  - If any petrochemical substances are stored on the site, this storage must be done on an impermeable surface in a bunded area that makes provision for 110% of volume of the substances that are stored.
  - All refueling of plant and equipment must be conducted over a drip-tray or designated bunded areas.
  - If any plant or equipment is to be parked on the site, these must be parked within the demarcated footprint.
  - If any spillages from plant or equipment occur, the spill must be immediately contained, the contaminated soils must be collected and bagged in impermeable bags and stored on site to be removed and disposed of by a registered service provider.
  - Skips must be made available on-site into which all demolition waste can be discarded.
  - All demolition waste must be cleared from the site on a daily basis and placed in these skips.
  - The capacity of these skips must be monitored on a daily basis to ensure that a replacement skip can be arranged on the same day as the filled skips are removed.
  - The disposal of the content of these skips must be done at a municipal landfill site.
  - No dumping of demolition waste on open areas on the property will be allowed.
  - No burial of demolition waste within the project site or in the surrounding areas will be allowed.
  - Implement a waste management plan and monitor levels of litter constantly.
  - A designated eating area must be established within the site.
  - Covered domestic waste bins must be present at the eating area to receive all the domestic waste generated by the labour.
  - The capacity of these domestic waste bins must be monitored on a daily basis to ensure that they are emptied timeously.

- The domestic waste from these waste bins must be removed off site and disposed of at a municipal landfill site on a weekly basis or more regularly if the bins fill up quicker.
- Only portable chemical toilets with a sealed reservoir will be allowed on site.
- The capacity of the reservoirs in the portable chemical toilets must be monitored on a daily basis to ensure that they can be serviced timeously.
- All removal of the collected sewage waste from the portable chemical toilets must be conducted by a registered service provider for disposal at a municipal waste water treatment facility.
- Implement speed control measures (e.g. speed limits, traffic calming measures).
- Restrict driving to daylight hours only, except for emergencies.
- Strict adherence to the Decommissioning EMP.
- Constant monitoring through the appointed Environmental Officer.

### *7.2.3 Potential Impact on Aquatic Resources*

Decommissioning of BS4 Vent Shaft 2 is not anticipated to have any significant potential environmental impact, other than generic impacts associated with decommissioning as outlined below, on aquatic resources as no such sensitive resources is present in its close proximity.

The potential decommissioning and demolition of the access road to BS4 Vent Shaft 1 which traverses a small seasonal watercourse approximately 140m from the vent shaft location, will potentially impact the watercourse negatively in the short term, however, with the potential removal of the infrastructure and the rehabilitation of the area, the watercourse may potentially be positively impacted on. The anticipated impact significance is considered to be **Low**.

In general, potential impacts on aquatic resources during decommissioning activities in most instances result from inadequate waste management, inadequate stormwater management, leakages from the portable chemical toilets, petrochemical spillages from plant and equipment, and leaking or spills from storage facilities. The aforementioned could lead to potential increased surface water turbidity due to sediment inputs and/or erosion, contamination and physio-chemical pollution related to potential spillages during decommissioning. Turbidity impacts are likely to be limited, given the temporary nature of onsite demolition activities. Vegetation clearance and removal of surface infrastructure could lead to erosion and consequently siltation and potential steep slopes could lead to

further erosion affecting the aquatic features. Demolition activities may also affect the biodiversity of the aquatic features as a result of the spreading of alien invasive species.

It is anticipated that the general impacts during the decommissioning phase of the activity will be of **Medium** significance for all expected impacts before mitigation and it can be lowered to a **Low** impact if the proposed mitigation measures are implemented.

Proposed mitigation measures include:

- Ensure adequate stormwater management measures are implemented to prevent potential soil erosion and sedimentation.
- Demarcate footprint area clearly.
- Minimise site clearance to the footprint area only.
- Edge effects of decommissioning activities need to be actively managed.
- Vegetation outside of the designated Works area must be left undisturbed.
- Restrict the movement of personnel and vehicles to where they are needed.
- Upon completion of decommissioning activities, it must be ensured that no bare areas remain.
- If any petrochemical substances are stored on the property, this storage must be done on an impermeable surface in a bunded area that makes provision for 110% of the volume of the substances containers that are stored.
- The bunded area must consist of an impermeable floor as well as walls and be fitted with a valve that can be used to drain any spillages.
- Suitable spill prevention measures to be in place and spills should be cleaned up on occurrence.
- Implementation of appropriate waste management and control procedures.
- Ensure vehicles are in good condition and not leaking fuel or oil when entering the site.
- All plant and equipment that make use of petrochemical substances must be checked for leakages on a daily basis before operations commence.
- Maintenance to be done in suitably designed areas, preferably off site.
- All plant and equipment that are found to be leaking must be removed from the property and only returned once the leakages have been addressed.
- All refuelling of plant and equipment must be conducted over a drip-tray or designated bunded areas.
- If any spillages from plant or equipment occur, the spill must be immediately contained, the contaminated soils must be collected and bagged in impermeable bags and stored on site to be removed and disposed of by a registered service provider.

- An integrated waste management approach, taking cognisance of the waste management hierarchy and other proposed mitigation measures, must be developed and implemented.
- Only portable chemical toilets with a sealed reservoir will be allowed on site.
- The capacity of the reservoirs in the portable chemical toilets must be monitored on a daily basis to ensure that they can be serviced timeously.
- All removal of the collected sewage waste from the portable chemical toilets must be conducted by a registered service provider for disposal at a licensed waste water treatment facility.
- Ensure that no material is dumped outside of the designated areas.
- Strict adherence to the Decommissioning EMP.
- Constant monitoring through the appointed Environmental Officer.

#### *7.2.4 Potential Impact on Soils, Land Capability and Land Use*

Given the topography, there is a risk of soil erosion associated with the decommissioning activities. However, most of the impacts can be mitigated through the implementation of the EMP. The impact of the BS4 Vent Shaft Projects on soil erosion is considered of **Medium** significance pre-mitigation. Through effective soil erosion prevention measures, the impact can be reduced to **Low**.

During decommissioning, erosion control measures must be implemented in areas sensitive to erosion, such as exposed soil, trenches cut for demolition, etc. These measures include but are not limited to - the use of sandbags, hessian sheets, silt fences and retention or replacement of vegetation.

Soil loss and contamination could occur due to improper stormwater management, erosion control, vegetation stripping, poor management of decommissioning activities, poor waste management, spillages and uncontrolled maintenance of vehicles and machinery on site.

The impact of soil contamination due to decommissioning activities is anticipated to be **Low** if the development footprint area is restricted to the works area and clearly demarcated; and the movement of decommissioning activities outside of this area is restricted.

If any hydrocarbon/petrochemical spills occur, they should be immediately cleaned up; and the recollection of spillage should be practised, preventing the ingress of such substances into the soil. All hazardous materials should be stored within a bund capable of containing 110% of the stored capacity, to prevent potential spillages and soil contamination. Maintenance should not be conducted on the project area, and bunds and spill kits should be available, particularly during refuelling. Appropriate sanitary facilities must be provided during the construction phase and all waste must be removed to an appropriate waste facility.

Vehicle and employee movement should be restricted to within the footprint. Working hours should be limited and an open channel of communication with surrounding residents and landowners must be ensured, to mitigate all intrusive impact and complaints. The existing complaints register should be maintained on site, to ensure that all complaints are addressed.

#### *7.2.5 Potential Impact Hydrogeology and Hydrology*

Water quality impacts during decommissioning will likely be limited to potential increased surface water turbidity due to sediment inputs and/or erosion; and physio-chemical pollution related to potential spillages of cement and fuels during construction. Turbidity impacts are likely to be limited, given the temporary nature of onsite activities. Spillages of fuel and other harmful substances could alter the physio-chemical and biological characteristic of surface water and contaminate watercourse substrate, with potential consequences for both vegetation and wildlife communities. If poorly managed, impacts to water quality could be of **Medium** significance where turbidity and sediment and/or pollution risks are not effectively mitigated. Where best practical mitigation is implemented, this can be potentially limited to **Low** and environmentally acceptable level. Mitigation measures proposed include:

- The topography of all disturbed areas must be rehabilitated, in such a manner that it blends with the surrounding natural area. This will reduce soil erosion and improve natural revegetation.
- The necessary flood attenuation and erosion control structures have to be put in place.
- Continued implementation of the surface- and groundwater monitoring programme(s) in place.

#### *7.2.6 Potential Visual Impacts*

The construction phase of the activity will involve the demolition and removal of surface infrastructure, clearing of vegetation and associated rehabilitation activities. The negative impacts on aesthetics and a change in the visual landscape experienced as a result of the construction of the BS4 Vent Shaft Projects will be negated with this action. However, do note that the final end use for the mine is still to be confirmed closer to the intended decommissioning, and as such this investigation is based on preliminary assessments which is to be updated upon closure.

Similar to the construction phase, decommissioning activities is not expected to have a significant impact on any sensitive receptors, due to there not being sensitive receptors in close proximity to the sites.

During the decommissioning phase, night lighting at the laydown area and for security purposes will be required. The type and positioning of this lighting should be carefully

considered. The primary goal should be to contain the light to the areas that need illumination and prevent glare from the activities.

It is anticipated that the impacts during the decommissioning phase of the BS4 Vent Shaft Projects will be of **Low** significance for all expected impacts before mitigation and can be lowered to a **Negligible** impact if the proposed mitigation measures are implemented.

#### *7.2.7 Potential Noise Impacts*

As the entire Booyesendal Mine is situated within a valley enclosed by mountains, it effectively provides natural noise barriers for the operations. Noise levels and noise disturbance in the immediate vicinity of the project area are expected to increase during decommissioning activities due to:

- The use of plant machinery to be used to excavate and shape the project area;
- The movement of demolition and earth-moving vehicles;
- Increased traffic entering and exiting the project area;
- Operation of generators;
- Noise from hydraulic hammers and winches; and
- General demolition noise.

Noise impacts is not expected to exceed regulated limits and standards. The anticipated noised impact of the decommissioning activities are expected to be **Low** with the implementation of appropriate mitigation measures.

#### *7.2.8 Potential Heritage and Paleontological Impacts*

There are no additional anticipated impacts on heritage and paleontological resources for the BS4 Vent Shaft Projects for the decommissioning phase as there were no resources of significance identified during the investigations at the project sites nor are there any additional mitigation measures required.

#### *7.2.9 Potential Socio-Economic Impacts*

Positive impacts on the socio-economic environment related to the decommissioning phase are anticipated to include temporary job creation (approximately 80 positions) and some associated local economic growth. This is a positive impact, rated as moderately **Low**. Generally, with large scale mining projects, negative impacts on the social environment related to the construction phase may include an increase in annoyance and nuisance related aspects; an influx of construction workers and the associated increase in crime; an increase in the exposure to health and well-being hazards; and daily living patterns and social and community infrastructure may be disrupted. Through ensuring continued implementation of appropriate mitigation measures, this impact will be **Low**.



### *7.2.10 Potential Traffic Impacts*

An increase in traffic volumes on the road network surrounding the project area will be experienced during the decommissioning phase. The resultant impact will be on the surrounding road network, increasing dust generation, noise and necessary road maintenance.

Based on the scale of the development, the impact of increased decommissioning related vehicular movement on the surrounding road network is anticipated to be **Medium**, whilst the anticipated impact associated with abnormal loads is **Low**.

## 8 ENVIRONMENTAL MANAGEMENT PROGRAMME

The impacts of an escape portal were assessed as part of the Amec Foster Wheeler Final EIR of September 2018, which has similar impacts to a vent shaft. Appropriate mitigation measures were developed in the 2018 EMPr. Some of the impacts will however not be experienced for the BS4 Vent Shaft Projects, given the differences in the site locations (with the previous escape portal requiring indigenous vegetation clearance for example). The content of the 2018 EMPr can to a large degree be utilised, save where certain mitigation measures are unnecessary.

Table 8 1 outlines the mitigation measures identified for the potential activities and impacts, based on the 2018 EMPr, updated where necessary with specific reference to the construction phase of the project

Upon completion of construction, for the operational phase of the BS4 Vent Shaft Projects, it is proposed that the mitigation and management measures associated with the operational phase as outlined in the aforementioned EMPr, be applied to the BS4 Vent Shaft Projects, where appropriate.

**Table 8-1: Impact Management Actions (Amec Foster Wheeler, 2018)**

Activity	Potential Impact	Mitigation/Management Measures and Compliance	Time-Frame	Responsible person	Annual Management Cost
<b>Construction</b>					
1.1. Site clearing and Topsoil stripping - all areas	1.1.1. Air/Dust Emissions	<p>Continue the implementation of Dust Management Plan and Method Statement for the Phase 2 Project by building on the Phase 1 project plan (EMPr 2017).                      Construction activities should remain within the delineated areas and not proceed outside of this area.                      Access to construction sites should be agreed prior to commencement of construction activities and these will be clearly signposted. No deviation from these access routes will be allowed unless agreed by the Environmental personnel and the appointed Environmental Officer.                      Maximum use of existing roads and servitudes will be made. All roads used for access to be maintained and on completion of the works be left in as good as or better condition. Access roads should follow the contours on the steep slopes.                      Vehicular traffic will be restricted to specified routes and strict speed controls will be applied. Unnecessary multiple tracks will not be allowed. Regulate on-site movements to reduce unnecessary traffic and keep dust generation to a minimum.                      All construction footprints need to be fenced, to ensure that there is no encroachment outside of footprint areas during construction and into the operational phase. Fencing will be maintained.                      Plan site layout so that machinery and dust causing activities are located away from receptors, as far as is possible.</p>	Immediate and ongoing	EPCM Project Manager EO	Included within capex
	1.1.1. Air/dust emissions	<p>Only remove the cover from small areas during clearing work and not all at once, as is practicable. Keep exposed areas to a minimum and strip topsoil only when required so that the vegetation cover is maintained for as long as possible, to prevent the erosion of organic matter, clay and silt.                      Fully enclose/extract dust emissions from specific operations (such as drilling) where there is a high potential for dust production and the site is active for an extensive period.                      Remove materials that have a potential to produce dust from site as soon as possible, unless being re-used on site. If the materials are being reused, they must be covered.</p>	Immediate and ongoing	EPCM Project Manager EO	Included within capex

Activity	Potential Impact	Mitigation/Management Measures and Compliance	Time-Frame	Responsible person	Annual Management Cost
<b>Construction</b>					
		Use sheltering to reduce wind speed at key dust production points. Ensure an adequate water supply on the site for effective dust/particulate matter suppression/ mitigation by wet suppression, using non-potable water where possible and appropriate and ensure stockpiles are properly dampened during dry weather. Wet suppress dust (with water or chemicals) in areas where problems of dust emissions are likely or evident.			
	1.1.1. Air/dust emissions	Debris through vegetation clearance will not be burned under any circumstances. This debris will be used for composting at the nursery or mulching to mitigate soil erosion or will be disposed in an approved and designated waste facility. Reduce slope gradients as far as possible along road cuts and disturbed areas to gradients at or below the angle of repose of those disturbed surfaces. Implement single handling practices for soil or loose materials. Sheet vehicles carrying loose materials when leaving the site if dust emissions become a problem. Use filtration equipment on exhaust emissions from equipment. Suspend operations under severe weather, particularly high winds during and after very dry periods. Service vehicles regularly to ensure emissions are controlled. Use electrical machinery where feasible. Regular maintenance of equipment. Equipment used intermittently should be shut down or throttled down between work periods.			
	1.1.1. Air/dust emissions	Notify potential receptors of activities that could cause high dust incidences and advise them of possible avoidance actions. Continue to record all dust and air quality complaints, identify cause(s), take appropriate measures to reduce emissions in a timely manner, and record the measures taken. Make the complaints log available to the relevant regulatory authorities when asked. Continue to record any exceptional incidents that cause dust and/or air emissions, either on- or off-site, and the action taken to resolve the situation in the environmental log book.	Immediate and ongoing	EPCM Project Manager EO	Included within capex and opex

Activity	Potential Impact	Mitigation/Management Measures and Compliance	Time-Frame	Responsible person	Annual Management Cost
<b>Construction</b>					
		Dust monitoring to be continued on a regular basis to establish if additional mitigation measures need to be employed.			
	1.1.2. Water erosion, sedimentation and pollution	<p>Continue to implement the Erosion Control Plan for the construction site and all activities</p> <p>Implement soil conservation measures - segregation, proper placement and stockpiling of clean soils and overburden material - and key factors such as placement, location, design, duration, coverage, reuse and single handling should be considered.</p> <p>Construction activities should remain within the delineated areas and not proceed outside of this area.</p> <p>Access to construction sites should be agreed prior to commencement of construction activities and these will be clearly signposted. No deviation from these access routes will be allowed, unless agreed by the environmental personnel and the appointed Environmental Officer.</p> <p>Maximum use of existing roads and servitudes will be made. All roads used for access to be maintained and on completion of the works be left in as good as or better condition. Access roads should follow the contours on any steep slopes.</p> <p>Vehicular traffic will be restricted to specified routes and strict speed controls will be applied. Unnecessary multiple tracks will not be allowed. On-site movements will be regulated to reduce unnecessary traffic.</p> <p>All construction footprints need to be fenced to ensure that there is no encroachment outside of footprint areas during construction and into the operational phase. Fencing will be maintained.</p>	Immediate and ongoing	EPCM Project Manager EO	Included within project capex
	1.1.2. Water erosion, Sedimentation and pollution	<p>Only remove the cover from small areas during clearing work and not all at once, as is practicable. Keep exposed areas to a minimum and strip topsoil only when required so that the vegetation cover is maintained for as long as possible, to prevent the erosion of organic matter, clay and silt.</p> <p>Soil stockpiles must be sampled, ameliorated (if necessary) and revegetated as soon after construction as possible. This is to limit raindrop and wind energy; and slow and trap runoff, thereby reducing soil erosion.</p>	Immediate and ongoing	EPCM Project Manager EO	Included within project capex

Activity	Potential Impact	Mitigation/Management Measures and Compliance	Time-Frame	Responsible person	Annual Management Cost
<b>Construction</b>					
		Protect slopes by stabilising steeper slopes with geotextiles or any other suitable material designed for this purpose. Implement an appropriate combination of contouring techniques, terracing, slope reduction/minimisation, runoff velocity limitation and appropriate drainage installations to reduce erosion in both active and inactive areas. Establish perimeter sediment controls - sediment fences along downslope verges of site. Where channelled or concentrated flow occurs, reinforced sediment fences or other sediment barriers, such as sediment basins, should be used. Conduct regular inspections and maintenance of sediment controls.			
	1.1.2. Water erosion, Sedimentation and pollution	Plan site layout so that potential contaminant point / diffuse sources are located away from receptors, as far as is possible. Temporary toilet facilities will be carefully designed, sited and maintained so that they do not spill or leak. Regular removal of effluent to be undertaken. Inspections to be carried out on a regular basis. Remove materials that have a potential to produce contamination from site as soon as possible, unless being re-used on site. If they are being re-used, cover and control as needed. As far as possible, conduct vegetation clearing and soil stripping in the dry season to minimise the impact of increased runoff and sediment transport downslope into sensitive habitats, such as wetlands and watercourses. Reduce slope gradients as far as possible along road cuts and disturbed areas to gradients at or below the angle of repose of those disturbed surfaces. Avoid site runoff of water or mud, other than into designated holding or settling ponds. Use drainage control measures and culverts to manage the natural flow of surface runoff. During construction of surface infrastructure avoid areas of shallow groundwater, if possible, where the risk of contamination is higher.	Immediate and ongoing	EPCM Project Manager EO	Included within project capex
	1.1.2. Water erosion, Sedimentation and pollution	Implement the Storm Water Management Plan for construction prior to vegetation clearing activities commencing. This Storm Water Management Plan should minimise sediment transport off site and prevent discharge of high velocity flows downslope, with sediment	Immediate and ongoing	EPCM Project Manager EO	Included within project capex

Activity	Potential Impact	Mitigation/Management Measures and Compliance	Time-Frame	Responsible person	Annual Management Cost
<b>Construction</b>					
		<p>traps and barriers installed where necessary and discharge points protected against erosion incorporating energy dissipaters. Control storm water flowing onto and through the site. Where required, storm water from upslope should be diverted around the construction site.</p> <p>The quality of mine effluents streams, including storm water and overall drainage, discharged into the environment, should be managed and treated to meet the applicable effluent discharge standard.</p> <p>Any discharges to surface water should not result in contaminant concentrations in excess of local ambient water quality criteria..</p>			
	1.1.2. Water erosion, Sedimentation and pollution	<p>Discharge storm water flows must be slow and diffuse. Ensure that no equipment is washed in the streams and wetlands of the area, and if washing facilities are provided, that these are placed no closer than 50m from a wetland or watercourse. No abstraction of water from the wetlands, rivers or dams should be allowed unless expressly authorised in the IWUL. Institute environmental best practice guidelines as per the Department of Water Affairs, Integrated Environmental Management Series for Construction Activities (2011). Biomonitoring and water monitoring will be conducted on a regular basis in accordance with existing programme to establish if additional mitigation measures need to be employed.</p>	Immediate and ongoing	EPCM Project Manager EO	Included within project capex
	1.1.2. Water erosion, Sedimentation and pollution	<p>Continue to implement existing Oil and Hazardous Substances Spill Management Plan Spills will be immediately contained and cleaned up. Contaminated areas will be remediated and post remediation verification carried out. Spills should be cleaned up with approved absorbent material such as “Drizit” or “Spillsorb”. These should be kept in sufficient quantities on site to deal with small spills. Absorbent material and contaminated soil should be disposed of at a registered hazardous waste site. In the event of major spills, the relevant authorities will be informed (i.e. DWS).</p>	Immediate and ongoing	EPCM Project Manager EO	Included within project capex and opex

Activity	Potential Impact	Mitigation/Management Measures and Compliance	Time-Frame	Responsible person	Annual Management Cost
<b>Construction</b>					
	1.1.2. Water erosion, Sedimentation and pollution	<p>Hazardous substances, such as diesel and oil/grease and cement and paint, should be stored in bunded areas outside riparian zones, so that spillages can be easily and quickly isolated before contaminating any soils or water.</p> <p>Identify potential areas where seepage and spills can occur into the natural environment and mitigate.</p> <p>Any fuel depots and workshops / laydown area will be located in designated areas on hard standings with collection and oil separation facilities to prevent contaminants from reaching the natural soils and the surrounding environment.</p> <p>Secondary containment will be provided at any storage facilities for fuels, chemicals and wastes, with appropriate drainage to collect spilt liquids.</p> <p>Spill and drip trays will be used when refuelling or maintaining vehicles off any hard standing.</p> <p>Any designated waste handling and storage facilities must be located outside of wetland and riparian areas at the start of the construction phase. These facilities must be located in bunded areas that do not allow seepage of pollutants into the ground or the run-off of polluted water.</p>	Immediate and ongoing	EPCM Project Manager EO	Included within project capex and opex
	1.1.2. Water erosion, Sedimentation and pollution	<p>The Emergency Response and Preparedness Plan (EPRP) containing administration, organisation, roles/responsibilities, communication systems, emergency response procedures, emergency resources, training and updating, and checklists must be updated and implemented to include the Project Area. This Plan is to be viewed as a dynamic document to be updated as and when needed to incorporate new projects.</p>	Immediate and ongoing	EPCM Project Manager EO	Included within project opex



Activity	Potential Impact	Mitigation/Management Measures and Compliance	Time-Frame	Responsible person	Annual Management Cost
<b>Construction</b>					
	1.1.3. Loss of vegetation and topsoil	<p>See 1.1 Site clearing and topsoil stripping, 1.1.1 Air/dust emissions &amp; 1.1.2 Water erosion, sedimentation and pollution. Vegetation clearance and topsoil management should be included in the Rehabilitation and Revegetation Plan referred to below. All new footprint areas must be surveyed by a qualified flora specialist before any clearance commences. Construction activities should remain within the delineated areas and not proceed outside of this area. Maximum use of existing roads and servitudes will be made. All roads used for access to be maintained and on completion of the works be left in as good as or better condition. Access roads should follow the contours on the steep slopes, if applicable. Vehicular traffic will be restricted to specified routes and strict speed controls will be applied. Unnecessary multiple tracks will not be allowed. On-site movements will be regulated. Access to construction sites should be agreed prior to commencement of construction activities and these will be clearly signposted. No deviation from these access routes will be allowed unless agreed by the SHEQ Manager and the appointed Environmental Officer. All construction footprints need to be fenced to ensure that there is no encroachment outside of footprint areas during construction and into the operational phase. Existing access routes and disturbed areas should be utilised as far as possible to access construction sites. Where no existing tracks are available, a single access track avoiding wetlands and other sensitive habitats should be used. All roads used for access to be maintained and on completion of the works be left in as good as or better condition. Implement soil conservation measures - segregation, proper placement and stockpiling of clean soils and overburden material - and key factors such as placement, location, design, duration, coverage, reuse and single handling should be considered.</p>	Immediate and ongoing	EPCM Project Manager EO	Included within project capex
	1.1.3. Loss of vegetation and topsoil	Delineate areas to be stripped and define suitable stockpile areas in non-sensitive areas. Locate all topsoil stockpiles in areas where they	Immediate and ongoing	EPCM Project Manager	Included within capex

Activity	Potential Impact	Mitigation/Management Measures and Compliance	Time-Frame	Responsible person	Annual Management Cost
<b>Construction</b>					
		<p>will not have to be relocated prior to replacement for final rehabilitation.</p> <p>Prompt stabilisation and re-vegetation of soils after disturbance and construction activities in an area are complete.</p> <p>Where topsoil is pre-stripped it should be stored for future site rehabilitation activities. Topsoil management should include maintenance of soil integrity in readiness for future use. Storage areas should be temporarily protected or vegetated to prevent erosion.</p> <p>Conserve the quality and composition of growth medium (e.g. for capping) up to and during site reclamation and closure activities.</p> <p>Ensure the growth medium is sufficient to support native plant species.</p> <p>When stripping with excavators and dump trucks, the excavator should only operate on the topsoil layer; the dump trucks must only operate on the basal/non-soil layer; and their wheels must not run on soil layers.</p> <p>Soil stripping operations should not start until the required soil moisture levels are reached. If significant rainfall occurs during operations, the stripping must be suspended.</p> <p>The operation must follow a detailed stripping plan showing soil units to be stripped, haul routes and the phasing of vehicle movements.</p> <p>Wherever possible, stripping and replacing of soils should be done in a single action. This is both to reduce compaction and also to increase the viability of the seed bank contained in the stripped surface soil horizons.</p>			
	1.1.3. Loss of vegetation and topsoil	<p>Develop a Rehabilitation and Revegetation Plan for all phases of mine development under the Amendment Projects based on the Phase 1 Project plan. Apply this plan to all revegetation and rehabilitation activities throughout the Amendment Projects life cycle.</p> <p>Concurrent/progressive rehabilitation to be implemented at all times and conducted as soon as possible. Rehabilitate and revegetate all disturbed areas which will not be further developed in the short term.</p> <p>As far as possible the habitat that was present prior to disturbance should be recreated.</p>	Immediate and ongoing	EPCM Project Manager EO	Included within project capex and opex

Activity	Potential Impact	Mitigation/Management Measures and Compliance	Time-Frame	Responsible person	Annual Management Cost
<b>Construction</b>					
		Revegetate earthworks and exposed areas/soil stockpiles with non-invasive vegetation, to stabilise surfaces as soon as practicable. Cover berms and soil stockpiles effectively with non-invasive vegetation or clad with large rock fragments, hessian, mulches or trackifiers where it is not possible to re-vegetate as soon as possible. Vegetate exposed areas, especially the walls of all dams used and stockpiles created, if necessary, as soon as possible using local indigenous flora. Rehabilitate all disturbed areas using effective, environmentally friendly methods, until erosion and sedimentation have been effectively halted, and the regenerated vegetation in these areas supports a balance of Decreaser and Increaser I climax plant taxa, e.g. <i>Andropogon</i> , <i>Cymbopogon</i> , <i>Festuca scabra</i> , <i>Loudetia simplex</i> , <i>Themeda triandra</i> , <i>Schizachyrum</i> , <i>Panicum natalensis</i> <i>Setaria sphacelata</i> and <i>Tristachya</i> on the valley slopes and rocky areas, and <i>Andropogon Cymbopogon</i> , <i>Themeda triandra</i> , <i>Setaria sphacelata</i> , <i>Cenchrus</i> in the Valley bottom. (see Section 4) Cover and seed completed long-term stockpiles as soon as is practicable to stabilise surfaces. Photo records of soil rehabilitation and revegetation measures to be documented and kept on file.			
1.6 Construction of Emergency Escape Portal	1.6.1 Air/dust emissions	See 1.1 Site clearing and topsoil stripping, 1.1.1 Air/dust emissions, 1.1.2 Water erosion, sedimentation and pollution & 1.1.3 Loss of vegetation and topsoil. Avoid scabbing (roughening of concrete surfaces) if possible. For smaller supplies of fine powder materials, ensure bags are sealed after use and stored appropriately to prevent dust. Restrict vehicular traffic to specified routes and apply strict speed controls. Re-vegetate and/or compact stockpiles to prevent wind whipping.	Immediate and ongoing	EPCM Project Manager EO	Included within project capex
	1.6.2 Water erosion and pollution	See 1.1 Site clearing and topsoil stripping, 1.1.1 Air/dust emissions, 1.1.2 Water erosion, sedimentation and pollution & 1.1.3 Loss of vegetation and topsoil. The clean and dirty water flow areas on should be identified and flood volumes quantified. Efforts should be made to minimize the dirty water catchment.	Immediate and ongoing	EPCM Project Manager EO	Included within project capex

Activity	Potential Impact	Mitigation/Management Measures and Compliance	Time-Frame	Responsible person	Annual Management Cost
<b>Construction</b>					
		Clean water cut-off trenches upstream of the dirty water areas need to be constructed to protect clean water.			
	1.6.3 Increased noise levels	See 1.1.6 Increased noise levels Implement the Road Safety and Traffic Management Plan that covers the transport of personnel, materials and goods to and from the Project site. Maintain normal working hours (6:00 to 18:00) as far as possible. Loading and unloading activities will be restricted to day time as much as possible. Ensure regular maintenance of machinery and equipment. Install silencers, mufflers or acoustic enclosures to reduce sound power level of noisy equipment at all times	Immediate	SHEQ Manager SEO EO	Included within project capex and opex
	1.6.4 Loss of vegetation and topsoil	See 1.1 Site clearing and topsoil stripping, 1.1.1 Air/dust emissions, 1.1.2 Water erosion, sedimentation and pollution & 1.1.3 Loss of vegetation and topsoil.			
	1.6.5 Wildlife disturbance and mortality	See 1.1 Site clearing and topsoil stripping, 1.1.1 Air/dust emissions, 1.1.2 Water erosion, sedimentation and pollution & 1.1.3 Loss of vegetation and topsoil.			
	1.6.6 Loss or disturbance of vegetation and faunal species or communities	See 1.1 Site clearing and topsoil stripping, 1.1.1 Air/dust emissions, 1.1.2 Water erosion, sedimentation and pollution & 1.1.3 Loss of vegetation and topsoil.	Immediate and ongoing	EPCM Project Manager EO	Included within project capex
	1.6.7 Loss of heritage resources	See 1.1 Site clearing and topsoil stripping, 1.1.1 Air/dust emissions, 1.1.2 Water erosion, sedimentation and pollution & 1.1.3 Loss of vegetation and topsoil.			
	1.6.8 Inefficient use of water	See 1.1 Site clearing and topsoil stripping, 1.1.1 Air/dust emissions, 1.1.2 Water erosion, sedimentation and pollution & 1.1.3 Loss of vegetation and topsoil	Immediate	SHEQ Manager SEO	Included within project opex
	1.6.9 Loss of visual and Aesthetic character	See 1.1 Site clearing and topsoil stripping, 1.1.1 Air/dust emissions, 1.1.2 Water erosion, sedimentation and pollution, 1.1.3 Loss of vegetation and topsoil & 1.3.9 Loss of visual and aesthetic character.			
1.12 Rehabilitation - all areas	1.12.1 Loss of vegetation and faunal species	See 1.1 Site clearing and topsoil stripping, 1.1.1 Air/dust emissions, 1.1.2 Water erosion, sedimentation and pollution & 1.1.3 Loss of vegetation and topsoil. Develop an Alien and Invasive Eradication Plan.	Immediate and ongoing	EPCM Project Manager EO	Included within project capex

Activity	Potential Impact	Mitigation/Management Measures and Compliance	Time-Frame	Responsible person	Annual Management Cost
<b>Construction</b>					
		<p>Any disturbed wetland and riparian areas should be effectively revegetated and rehabilitated to prevent further erosion and colonisation by alien vegetation.</p> <p>Storm water drains should be inspected to ensure that storm water does not discharge directly into wetlands, cause erosion or contain large sediment loads. Where this is not the case, erosion protection, flow attenuation or silt trapping measures should be implemented.</p> <p>Stream diversions should be rehabilitated to mimic natural flow rates and riparian or marginal vegetation habitats. Ideally, diversions should be sinuous (not canal-like) to slow flows. The side slopes should be gradual (4:1 to 3:1) to facilitate colonisation by wetland plants. The side slopes should be revegetated with an indigenous seed mix to prevent erosion and colonisation by alien plants, until such time as the wetland vegetation becomes established.</p>		SEO	
	1.12.2 Loss of vegetation and topsoil	<p>Final grading of disturbed areas, including preparation of overburden before application of the final layers of growth medium, should be along the contour as far as can be achieved in a safe and practical manner.</p> <p>Revegetation of disturbed areas, including seeding, should be performed immediately following application of the growth medium to avoid erosion.</p>	Immediate and ongoing	EPCM Project Manager EO	Included within project capex
	1.12.3 Loss of visual and Aesthetic character	<p>An ecological approach to rehabilitation and vegetative screening measures, as opposed to a horticultural approach to landscaping, should be adopted. For example, communities of indigenous plants enhance biodiversity and blend well with existing vegetation. This ecological approach to landscaping costs significantly less to maintain than conventional landscaping methods and is more sustainable. A registered landscape architect should be consulted for this purpose. It is important that landscaping be done concurrently from the onset of construction and throughout the operational phase and to rehabilitate exposed areas as soon as possible after construction activities are complete. Only indigenous vegetation should be used for rehabilitation / landscaping purposes.</p> <p>Trees and shrubs can be used to screen structures and break stark contrasting lines, if carefully planned and positioned. Where structures are silhouetted when viewed from local roads, the harsh</p>	Immediate and ongoing	EPCM Project Manager EO	Included within project capex

Activity	Potential Impact	Mitigation/Management Measures and Compliance	Time-Frame	Responsible person	Annual Management Cost
<b>Construction</b>					
		lines can be broken by planting fast growing indigenous trees along the edges of the stockpiles. Encouraging vegetation growth in disturbed areas can reduce the visual scarring of the landscape and potentially reduce the visual impacts on potential visual receptors. The re-vegetation of the disturbed areas around the proposed infrastructure during the operational phase should be considered only if it does not interfere with operations or pose a risk to the health and safety of people and animals			
<b>Operation</b>					
2.4. Operation of Emergency Escape Portal	2.4.1 Soil contamination and water pollution	See 1.1.2. Water erosion, sedimentation and pollution for spills management. All maintenance materials and equipment to be brought on site and removed after completed. All hazardous materials will be handled according to the requirements and any spills will be cleaned up according to the procedures.	From start of operational phase going forward	Mine Manager EO	Included within opex
2.10 Rehabilitation - all areas	2.10.1 Air/Dust emissions	Refer to 1.1 Site clearing and topsoil stripping, 1.1.1 Air/dust emissions, 1.1.2 Water erosion, sedimentation and pollution & 1.1.3 Loss of vegetation and topsoil.			
	2.10.2 Loss of vegetation and topsoil	Refer to 1.1 Site clearing and topsoil stripping, 1.1.1 Air/dust emissions, 1.1.2 Water erosion, sedimentation and pollution & 1.1.3 Loss of vegetation and topsoil. Topsoil resources should be inventoried and used judiciously for the revegetation of disturbed areas. An on-going account of topsoil volumes and locations should be reported. Final grading of disturbed areas, including preparation of overburden before application of the final layers of growth medium, should be along the contour, as far as can be achieved in a safe and practical manner. Revegetation of disturbed areas, including seeding, should be performed immediately following application of the growth medium to avoid erosion.	Immediate ongoing	Mine Manager SEO	Included in opex
	2.10.3 Loss of aquatic species	Refer to 1.1 Site clearing and topsoil stripping, 1.1.1 Air/dust emissions, 1.1.2 Water erosion, sedimentation and pollution & 1.1.3 Loss of vegetation and topsoil.	Immediate ongoing	Mine Manager EO	Included in opex

Activity	Potential Impact	Mitigation/Management Measures and Compliance	Time-Frame	Responsible person	Annual Management Cost
<b>Construction</b>					
	2.10.4 Water erosion and pollution	Refer to 1.1 Site clearing and topsoil stripping, 1.1.1 Air/dust emissions, 1.1.2 Water erosion, sedimentation and pollution & 1.1.3 Loss of vegetation and topsoil. Ensure that the disturbed areas, against the steep slopes especially, are well stabilised to prevent potential erosion and secondary and cumulative impacts;	Immediate ongoing	Mine Manager EO	Included in opex
	2.10.5 Loss of visual and aesthetic character	Refer to 1.1 Site clearing and topsoil stripping, 1.1.1 Air/dust emissions, 1.1.2 Water erosion, sedimentation and pollution & 1.1.3 Loss of vegetation and topsoil. An ecological approach to rehabilitation and vegetative screening measures, as opposed to a horticultural approach to landscaping, should be adopted. For example, communities of indigenous plants enhance biodiversity and blend well with existing vegetation. This ecological approach to landscaping costs significantly less to maintain than conventional landscaping methods and is more sustainable. A registered landscape architect should be consulted for this purpose. It is important that landscaping be done concurrently from the onset of construction and throughout the operational phase; and to rehabilitate exposed areas as soon as possible after construction activities are complete. Only indigenous vegetation should be used for rehabilitation / landscaping purposes. Trees and shrubs can be used to screen structures and break stark contrasting lines if carefully planned and positioned. Encouraging vegetation growth in disturbed areas can reduce the visual scarring of the landscape and potentially reduce the visual impacts on potential visual receptors. The re-vegetation of the disturbed areas around the proposed infrastructure during the operational phase should be considered only if it does not interfere with operations or pose a risk to the health and safety of people and animals.	Immediate ongoing	Mine Manager EO	Included in opex

## 9 PUBLIC PARTICIPATION PROCESS

The Public Participation Process (PPP) is a legislated requirement for Part 2 Amendment Applications. This section of the Part 2 Amendment Report documents the process, which was followed with respect to consultation of I&APs/stakeholders and government authorities. Refer to Appendix B for related documentation.

### 9.1 Purpose of Public Participation

The most important objective of PPP is to provide sufficient and accessible information to potential I&APs in an objective manner and to provide a platform for constructive participation in the Part 2 Amendment Application, thereby assisting I&APs to:

- Gain an understanding of the BS4 Vent Shaft Projects, the various components and the potential impacts (positive and negative);
- Raise issues of concern and suggestions for enhanced benefits;
- Verify that their issues have been recorded in the Comments and Responses Report (CRR) and considered in investigations; and
- Contribute relevant local information and traditional knowledge to the process.

### 9.2 Public Consultation Process

This section provides a summary of the various activities of the PPP to be undertaken in support of the amendment application process.

#### 9.3.1 Stakeholder database

A stakeholder database or list of I&APs was compiled and updated during the PPP process. The database was compiled: a) using lists of contact details of I&APs from previous environmental applications for Booyesdal Mine; b) using information provided by the applicant's community liaison officers; and c) including responses from I&APs.

The I&AP database was used to: convey information to stakeholders as part of the announcement of the Part 2 Amendment Application; and to provide the opportunity for I&AP consultation and the availability of the draft and final Part 2 Amendment Report as these became available for public review. For the BS4 Vent Shaft Projects, I&APs included the following:

- Owners of the land where the Amendment Project is to be undertaken (Project Area);
- Owners and occupiers of land adjacent to the Project Area;
- Provincial (Mpumalanga) and local government TCLM of the EDM;
- Organs of state, other than the CA having jurisdiction over any aspect of the proposed activities, including the MDEDET, the DMRE, Regional Land Claims Commissioner, etc.;



- Relevant residents' associations, agricultural unions, community based organisations, water user associations, and any catchment management authority and Non-Governmental Organisation (NGOs);
- Environmental organisations, forums, groups and associations; and
- Private sector organisations (businesses, industries) in the vicinity.

### **9.3.2 Introductory Public Consultation**

In preparation for the commencement of the amendment application process, an introductory consultation meeting was held with the identified BS I&APs in order to announce the intention of the Mine to apply for amendment of the BS authorisations for the BS4 Vent Shaft Projects. A meeting was held on the 26<sup>th</sup> of April at 10:00 at Laske Nakke Lodge and was attended by representatives of stakeholders, host communities and directly surrounding communities of the mine.

The purpose of the meeting was to share proposed planning for further developments at Booyesdal Mine before the authorization process commences and to get initial comments upfront from representative stakeholders on proposed developments. The proceedings of the meeting were captured and considered in the Draft AR. The Comments and Response Report (CRR) which includes all the comments/concerns raised and responses to each of these comments/concerns, the meeting presentation, and attendance register, is included in Appendix B.

### **9.3.3 Advertisements**

A newspaper advertisement detailing the BS4 Vent Shaft Projects was placed in the Steelburger newspaper on 25 August 2022.

### **9.3.4 Background Information Documents**

Background Information Documents (BIDs) was sent electronically to all registered I&APs, detailing the project and how to get involved.

## **9.3 Public Review of Draft Amendment Report**

The draft Part 2 Amendment Report was made available for public comment for 30 days from 26 August until 26 September 2022 at the following public venues:

- Lydenburg Public Library, 41 Viljoen Street, Lydenburg
- Maartenshoop Police Station, Naauwpoort Farm
- Thusong Centre, Mashishing

The Report was also available electronically via the GCS Website or a CD/USB was available upon request.

### 9.4 Summary of issues raised

The pertinent issues raised, and responses provided during the public consultation phase are tabulated below:

Issue/Comment	Response
<p>Host Communities the rightful landowners, need to benefit and be considered for employment opportunities.</p> <p>Concerned that the host communities are not benefitting/integrated into the development plans for the mine and that their requests/the communities are ignored/overlooked by the mine and the participation process as there is no mention in the BID of the host communities.</p>	<p>Comment was noted. It was explained that the current project is very small in scale and limited opportunities will be available. However, Booysendal will follow appropriate protocols for any employment opportunities that come available to ensure that the host communities and local labour is prioritised as far as practical.</p> <p>Attendees were assured that the host community was not overlooked, that they are key stakeholders, and the purpose of a BID was explained.</p>
<p>The Bakone Ba Phetla Community Property Association (CPA) further stated the following:</p> <ul style="list-style-type: none"> <li>• the mine must respect the host community, which is represented by the Bakone Ba Phetla CPA</li> <li>• there are three categories of stakeholders, i.e., Host community, Affected Parties and Interested Parties. All three types of stakeholders cannot be placed on the same level, as their benefits are weighed differently</li> <li>• the project team should work directly with people who have contractual agreements with the mine. The CPA is a legally registered entity with an existing lease contractual agreement with the mine. He added that Bakoni Ba Phetla does not have a registered Royal Council.</li> </ul>	<p>Public participation for the application is conducted as per the requirements of the National Environmental Management Act (NEMA). The NEMA provides for interested and affected parties (including host communities) to participate in and in terms of the application process under NEMA, all interested and affected parties may comment and participate in the process equally.</p>
<p>The Phetla Royal Council/Family expressed extreme dissatisfaction on 26 April regarding:</p> <ul style="list-style-type: none"> <li>• the manner in which the Royal Council/Family and the Kgosi was notified about the meetings and felt disrespected as appropriate protocols were not observed</li> <li>• meeting venues being far from where the invited community members reside, resulting in unsolicited expenses</li> <li>• stakeholder issues and concerns not being taken into consideration or addressed</li> <li>• the fact that the Kgosi requires a permit to enter the mine to visit, as the landowner/custodian of the land owned by Bakone Ba Phetla, he should be given the opportunity to enter the mine premises</li> </ul>	<p>The issue was noted, and the Stakeholder Engagement Unit of Booysendal was requested to address the matter.</p>

<p>On 7 September, similar issues were raised again:</p> <ul style="list-style-type: none"> <li>the notification process to attend the meeting was flawed, not all representatives from the Phetla Royal family are aware of the meeting</li> <li>it was suggested that the meeting be rescheduled due to limited attendance</li> <li>it was reiterated that the chief needs to be acknowledged. The issues relating to ignoring protocol will hinder the timeframes of the project</li> <li>it was reiterated and emphasised that there is a protocol that needs to be followed in terms of inviting the Royal family/ Council to an engagement meeting</li> <li>it is not acceptable for Mr Selowa not to be present at the meeting which he organised. There are pertinent issues that need to be addressed by relevant personnel from the mine.</li> </ul>	<p>It was agreed by all attendees that the project team be given an opportunity to proceed with the meeting, concerns outside the environmental authorisation process will be discussed separately with Mr. Jack Selowa. It was also explained that stakeholders may use various methods of commenting on the application and not just by attending a meeting. Stakeholders were invited to email their comments as per information provided in the BID, on site notices and the adverts which were published in the Steelburger newspaper, phone GCS with comments or to provide comment sheets to the mine for submission to GCS.</p> <p>Mr. Twarisani Rikhotso acknowledged the concerns raised by attendees in relation to Mr. Selowa’s absence. He indicated that an email will be sent to the relevant personnel to address concerns raised. The email was compiled and reviewed during the meeting to ensure that all in attendance were satisfied with its contents.</p>
<p>The Royal Family noted that it is understood that the project team engaged with Bakoni Ba Phetla CPA, it should be noted that there is no need for separate meetings as this shows division between the Royal Council and the CPA. The CPA and the Royal House are related and therefore should speak in unison.</p>	<p>The decision to have separate meetings was premised from the previous engagement where the Royal family requested that separate meetings be held with the Royal family and the CPA, however the comment is noted.</p>
<p>Several requests were raised for minutes from the previous meetings to be circulated prior to upcoming meetings, this will help with understanding the status of outstanding issues and the resolutions thereof.</p>	<p>Comment was noted. The meeting was assured that the record of the meeting (CRR) will be circulated to all attendees, and the Stakeholder Engagement Unit of Booyesendal was requested to ensure that the minutes of all meetings falling outside the formal participation process timeframes as per the EIA Process, are circulated. The comments, concerns and questions and the responses thereto, i.e., the CRR was also included in the Draft Amendment Report made available for public review.</p> <p>On the 6<sup>th</sup> of September 2022, it was indicated that minutes (the CRR) from the previous meeting (26 April 2022) were circulated to stakeholders via email from Ms Thato Choma on 5 July 2022. Attendees verbally confirmed receipt of a copy of the minutes. Mr. Twarisani Rikhotso read out the comments, concerns, questions and responses from the previous meeting. No additions and corrections to the comments and responses/ minutes were recorded.</p>
<p>Is the mine currently operating without ventilation shafts and emergency escape portals?</p>	<p>Mr. Hennie Wood explained that the mine currently has ventilation shafts and emergency escape portals. He added that as underground workings proceed to deeper levels more ventilation will be required. Mining takes place in a dynamic environment and the proposed development is part of the mine’s forward-thinking strategy as underground workings proceed. Mr. Wood reiterated that the mine is currently a safe and secure environment for employees and communities and that the proposed developments are for future safety and security purposes.</p>

<p>An advertisement for construction tender was seen in newspaper and concern was raised whether this is for the projects presented.</p> <p>The community was concerned that the “proposed” projects have been constructed.</p>	<p>It was confirmed that the tender advertised last year was for the construction of the ventilation bridge - which is a separate process from the proposed projects, and that construction of the proposed projects had not yet been commenced.</p> <p>The mine is prepared to arrange for individuals to go to site and confirm that the proposed projects have not yet been constructed. This is to be arranged via the Stakeholder Engagement Unit.</p>
<p>The fact that the DMRE is not present at the meetings were questioned again as it is believed that their presence is crucial to ensure that they understand the communities’ concerns. We do not want to mine to just do public participation to tick the necessary boxes.</p>	<p>Mr. Hennie Wood stated that he has been trying on several occasions to get hold of representatives from the DMRE but has not yet been successful, especially with the Mpumalanga regional office. He introduced Mr. Twarisani Rikhotso and said that it will be his main task to liaise with the DMRE on environmental matters.</p>
<p>Certain queries regarding non-related projects were raised:</p> <ul style="list-style-type: none"> <li>• status of the Tailings Storage Facility (TSF) feasibility studies and if landowners were notified of the outcome of the studies. Concerned regarding graves and kiwi farm which is their livelihood</li> <li>• concerned that there was no mention of the Booyesendal Central Complex in relation to the proposed infrastructure for Booyesendal South</li> </ul>	<p>It was indicated that the development of the TSF will be under a different application and relevant specialist studies will be undertaken to assess impacts and propose mitigation measures to avoid negative impacts on the community (their livelihood) and the environment.</p> <p>It was confirmed that Booyesendal Central Complex is currently operational, and the Life of Mine is 60 years (of which approximately 56 years are left). The Central Complex was not specifically mentioned in the presentation as the proposed application is specifically for Booyesendal South.</p>
<p>It was noted that in terms of the International Finance Corporation (IFC): Performance Standard 8, the importance of cultural heritage for current and future generations is to be considered. Community members have relied on certain vegetation such as shrubs and herbs for medicinal purposes and it was queried whether the Heritage and Paleontological specialist is familiar with local indigenous herbs.</p> <p>To promote transparency, it was suggested that two community representatives per engagement structure be nominated to undertake a site verification process, whereby pre-construction, construction and operational site conditions are observed and to ensure that cultural and heritage resources are protected. The nominated representatives from each engagement structures will inform the broader community members of their findings.</p>	<p>The proposed ventilation shafts will be constructed on previously disturbed mine areas and in terms of the management of heritage and cultural resources, a chance find procedure will be put in place, to outline actions required if previously unknown heritage resources are encountered during project construction or operation.</p> <p>Additionally, the mine has mapped previously identified cultural and heritage resources with the inputs of communities. However, every time the mine applies for a new environmental authorisation, heritage and cultural specialists again visit the area of relevance to ensure that there are no heritage or cultural features. Should anything relevant be found, the process as per the legislative regulations take its course.</p> <p>Relevant arrangements for site visits will be made via the Stakeholder Engagement Unit once the application for Environmental Authorisation was granted to the mine by the DMRE. Community representatives who will be undertaking a site visit to the mine must ensure that they have Personal Protective Equipment (PPE).</p>
<p>The following project specific concerns were raised:</p> <ul style="list-style-type: none"> <li>• are the gasses emitted through the extraction fan hazardous i.e., radioactive gases since they are emitted from a mine?</li> </ul>	<p>As there will be no processing of any materials in the ventilation shafts, only natural gasses found in air around us will be emitted. No hazardous gasses anticipated.</p>

<ul style="list-style-type: none"> <li>• concerned that their livestock could be affected by noise levels from the ventilation shafts</li> <li>• high dust levels during the construction phase could negatively affect livestock</li> <li>• concerned about the potential high noise levels associated with the development of ventilation shafts.</li> </ul>	<p>The location of the proposed ventilation shafts is in a previously disturbed mining area and far away from where livestock grazes.</p> <p>In terms of dust management, Booyesendal mine has placed dust buckets at various points to monitor dust fall-out which is monitored on a monthly-basis.</p> <p>Additionally, livestock will be moved to a safe site by escorting animals out of the mine site should animals be in the vicinity during construction.</p> <p>The noise impact was assessed as part of the Part 2 Amendment process, and from available information it was found that noise levels will be below the threshold.</p>
<p>The Directorate Biodiversity Conservation from the Department of Forestry, Fisheries and Environment indicated that the Department did not have any objection to the proposed amendment, provided the mitigation measures included in the EMPr are adhered to minimize the potential negative impacts on the receiving environment and further loss of biodiversity.</p>	<p>Comments noted. Booyesendal commits to the adherence to the mitigation measures included in the EMPR.</p>

For a detailed account of the above, please refer to the CRR appended to this Report.

## **9.5 Comments and Response Report**

All comments received during the application process have been captured in the CRR. The CRR was updated on a continuous basis and is now presented to the authorities and other I&APs, together with the final report, as a full record of issues raised, including responses on how the issues were considered during the application process. The final CRR is appended in Appendix B as indicated previously.

## 10 EAP RECOMMENDATIONS AND CONCLUSION

The investigation of potential environmental impacts associated with the proposed amendment indicates that the overall impact of the proposed amendment will be of Low overall significance after implementation of appropriate mitigation measures. The results of the impact assessment indicated that the most significant impacts on the receiving environment would be those listed below in Table 11-1.

**Table 11-1: Key impacts identified**

Environmental Aspect	Impacts
<b>Construction Phase</b>	
Air Quality & Climate	<ul style="list-style-type: none"> <li>• Generation of inhalable particle emissions and fugitive dust</li> <li>• GHG emissions during the construction activities</li> </ul>
Terrestrial Ecology	<ul style="list-style-type: none"> <li>• Potential loss of indigenous vegetation units</li> <li>• Potential increase in alien vegetation</li> <li>• Potential loss of floral/faunal species of conservation importance</li> <li>• Contamination of the area by petrochemical spillages</li> <li>• Contamination of the area by construction and domestic waste</li> <li>• Contamination of the area as a result of leaking portable toilet facilities.</li> <li>• Road Mortalities</li> </ul>
Aquatic Resources	<ul style="list-style-type: none"> <li>• Negative effect on aquatic resources due to water quality deterioration as a result of erosion and sedimentation, and/or inadequate stormwater management</li> <li>• Negative effect on aquatic resources due to water quality deterioration as a result of inappropriate management and storage of substances and/or dumping of material outside of designated areas</li> <li>• Negative effect on aquatic resources due to water quality deterioration as a result of contamination of the area by hydrocarbon/chemical spillages and/or dumping of material outside of designated areas</li> <li>• Negative effect on aquatic resources due to water quality deterioration as a result of contamination of the area by construction and domestic waste, and/or dumping of material outside of designated areas</li> <li>• Negative affect on aquatic resources due to water quality deterioration as a result of contamination of the area as a result of leaking portable toilet facilities.</li> </ul>
Soils, Land Capability and Land Use	<ul style="list-style-type: none"> <li>• Disruption of soil properties causing soil mixing and layer inversion, impacting on soil hydrological properties and functionality</li> </ul>

Environmental Aspect	Impacts
	<ul style="list-style-type: none"> <li>• Soil Contamination</li> <li>• Soil loss / Soil erosion</li> <li>• Loss of land capability</li> </ul>
Hydrogeology & Hydrology	<ul style="list-style-type: none"> <li>• Increase in water turbidity due to sediment inputs and/or erosion</li> <li>• Physio-chemical water pollution related to potential spillages of cement and fuels</li> </ul>
Visual	<ul style="list-style-type: none"> <li>• Negative visual impact on aesthetics</li> <li>• Change of visual landscape and character</li> <li>• Visual intrusion due to glare, light trespass and skyglow</li> </ul>
Noise	<ul style="list-style-type: none"> <li>• Noise disturbance</li> </ul>
Heritage & Paleontological	<ul style="list-style-type: none"> <li>• Loss of cultural heritage resources</li> <li>• Loss of palaeontological resources</li> </ul>
Socio-Economic	<ul style="list-style-type: none"> <li>• Increased annoyance, air quality, noise, crime, etc.</li> <li>• Influx of construction workers</li> <li>• Job creation and skills development</li> <li>• Positive economic impacts</li> </ul>
Traffic	<ul style="list-style-type: none"> <li>• Increase in traffic</li> <li>• Increase of incidents with pedestrians and livestock</li> <li>• Increase in dust from gravel roads</li> <li>• Additional abnormal loads</li> </ul>
Operational Phase	
Terrestrial Ecology	<ul style="list-style-type: none"> <li>• Spreading of alien invasive vegetation</li> <li>• Contamination of the area by petrochemical spillages</li> </ul>
Aquatic Resources and Wetlands	<ul style="list-style-type: none"> <li>• Negative affect on aquatic features due to water quality deterioration as a result of erosion and sedimentation</li> <li>• Negative affect on aquatic features due to water quality deterioration as a result of hydrocarbon leaks or spills</li> </ul>
Soils, Land Capability and Land Use	<ul style="list-style-type: none"> <li>• Soil Contamination</li> </ul>
Hydrogeology & Hydrology	<ul style="list-style-type: none"> <li>• Increase in water turbidity due to sediment inputs and/or erosion</li> <li>• Physio-chemical water pollution related to potential spillages / leakages of fuels and oils</li> </ul>
Visual	<ul style="list-style-type: none"> <li>• Landscape visual change</li> <li>• Change of visual character</li> <li>• Visual intrusion due to glare, light trespass and skyglow</li> </ul>
Decommissioning Phase	
Air Quality & Climate	<ul style="list-style-type: none"> <li>• Generation of inhalable particle emissions and fugitive dust</li> <li>• GHG emissions during the demolition activities</li> </ul>
Terrestrial Ecology	<ul style="list-style-type: none"> <li>• Potential loss of indigenous vegetation units</li> <li>• Potential increase in alien vegetation</li> </ul>



Environmental Aspect	Impacts
	<ul style="list-style-type: none"> <li>• Potential loss of floral/faunal species of conservation importance</li> <li>• Contamination of the area by petrochemical spillages</li> <li>• Contamination of the area by demolition and domestic waste</li> <li>• Contamination of the area as a result of leaking portable toilet facilities.</li> <li>• Road Mortalities</li> </ul>
Aquatic Resources	<ul style="list-style-type: none"> <li>• Positive effect on aquatic resources due to removal of surface infrastructure and rehabilitation of the area</li> <li>• Negative effect on aquatic resources due to water quality deterioration as a result of erosion and sedimentation, and/or inadequate stormwater management</li> <li>• Negative effect on aquatic resources due to water quality deterioration as a result of inappropriate management and storage of substances and/or dumping of material outside of designated areas</li> <li>• Negative effect on aquatic resources due to water quality deterioration as a result of contamination of the area by hydrocarbon/chemical spillages and/or dumping of material outside of designated areas</li> <li>• Negative effect on aquatic resources due to water quality deterioration as a result of contamination of the area by demolition and domestic waste, and/or dumping of material outside of designated areas</li> <li>• Negative affect on aquatic resources due to water quality deterioration as a result of contamination of the area as a result of leaking portable toilet facilities.</li> </ul>
Soils, Land Capability and Land Use	<ul style="list-style-type: none"> <li>• Soil Contamination</li> <li>• Soil loss / Soil erosion</li> </ul>
Hydrogeology & Hydrology	<ul style="list-style-type: none"> <li>• Increase in water turbidity due to sediment inputs and/or erosion</li> <li>• Physio-chemical water pollution related to potential spillages of cement and fuels</li> </ul>
Visual	<ul style="list-style-type: none"> <li>• Positive visual impact on aesthetics</li> <li>• Negative visual impact on aesthetics</li> <li>• Change of visual landscape and character</li> <li>• Visual intrusion due to glare, light trespass and skyglow</li> </ul>
Noise	<ul style="list-style-type: none"> <li>• Noise disturbance</li> </ul>
Socio-Economic	<ul style="list-style-type: none"> <li>• Increased annoyance, air quality, noise, crime, etc.</li> <li>• Influx of construction workers</li> <li>• Job creation and skills development</li> <li>• Positive economic impacts</li> </ul>

Environmental Aspect	Impacts
Traffic	<ul style="list-style-type: none"> <li>• Increase in traffic</li> <li>• Increase of incidents with pedestrians and livestock</li> <li>• Increase in dust from gravel roads</li> <li>• Additional abnormal loads</li> </ul>

Further to the above, the overarching potential advantages and disadvantages of the proposed amendments are noted as follows:

**Advantages:**

Ventilation is among the most important functions in a mining operation. Since ventilation directly affects the health and safety of employees working underground, the regulation of air flow through a mine is seriously considered by mine owners. Underground mine ventilation provides a flow of sufficient volume of air to the underground workings of a mine to dilute and remove dust and noxious gases (typically nitrous oxides, sulphur oxides, methane, and carbon mono- and dioxide) and to regulate temperature. The sources of these gases are equipment that run on diesel engines, blasting with explosives, and the ore body itself. The new ventilation shafts are therefore considered imperative for the continued development of the underground mining complex, and to ensure the health and safety of workers underground.

**Disadvantages:**

As can be seen from Table 11-1, the proposed project will have the following potential disadvantages:

- Limited increase in nuisance factors (dust/noise/traffic/visual/etc.) during the construction phase.
- Limited impact on surface/ground water quality during construction phase.
- Disturbance of aquatic features in the vicinity of the proposed amendments.
- Alteration of the visual and landscape character of the Project Area.
- Alteration/disturbance of the soil and land use.

Should the amendment not be granted, the continued operations at BS4 will be negatively affected and further expansion potentially not be realised, due to the fact that Booyesdal will no longer be able to comply with the health and safety requirements for underground mining, stipulated in the MHSa.

Importantly, there were no fatal flaws or fundamental issues identified for this amendment proposal during the assessment process. Based on the available information presented within this Amendment Report, which has been informed through various previous investigations, the EAP finds it reasonable to recommend that the amendments applied for be authorised.

## 11 EAP UNDERTAKING

I, Janice Callaghan, as the appointed Environmental Assessment Practitioner, declare that:

- I act as the independent environmental assessment practitioner in this application;
- I have expertise in conducting environmental impact assessments, including knowledge of the Act, Regulations and any guidelines that have relevance to the proposed activity;
- I will comply with the Act, Regulations and all other applicable legislation;
- I will perform the work relating to the application in an objective manner, even if this results in views and findings that are not favourable to the applicant;
- I will take into account, to the extent possible, the matters listed in Regulation 14 of the Regulations when preparing the application and any report relating to the application;
- I undertake to disclose to the applicant and the Competent Authority all material information in my possession that reasonably has or may have the potential of influencing - any decision to be taken with respect to the application by the Competent Authority; and - the objectivity of any report, plan or document to be prepared by myself for submission to the Competent Authority, unless access to that information is protected by law, in which case it will be indicated that such information exists and will be provided to the Competent Authority;
- I will perform all obligations as expected from an environmental assessment practitioner in terms of the Regulations;
- I am aware of what constitutes an offence in terms of Regulation 48 and that a person convicted of an offence in terms of Regulation 48(1) is liable to the penalties as contemplated in Section 49B of the Act; and
- I do not have and will not have any vested interest (either business, financial, personal or other) in the proposed activity proceeding other than remuneration for work performed in terms of the Regulations.

**Signature of the EAP:**



**Name of Company:**

GCS Water and Environmental Consultants (Pty) Ltd

**Date:**

10/10/2022

---

## 12 REFERENCES

Amec Foster Wheeler. 2017. Booyesendal South Expansion Project (Phase 1) Section 24G Environmental Impact Assessment Report.

Amec Foster Wheeler. 2018. Booyesendal South Expansion Project: Phase 2 Final Environmental Impact Assessment Report.

Beyond Heritage. 2022. Heritage Statement for the Part 2 Amendment for the Booyesendal BS4 Vent Shaft Project.

GCS Water and Environment. 2022. Screening Assessment associated with the establishment of infrastructure at the Northam Booyesendal South Mine near Mashishing, Mpumalanga Province.

Metago Environmental Engineers. 2009. Everest Platinum Mine EIA/EMP Amendment for the Extension of Mining Activities.

Skyside. 2021. Test Report: Monthly Dust Deposition Monitoring for Northam Booyesendal Platinum Mine SOUTH MINE (various months).

Wood. 2019. Consolidated Environmental Management Programme Booyesendal Platinum (Pty) Ltd.

## **APPENDIX A: PROJECT SPECIFIC INFORMATION**

*Appendix A1 - Authorisations applicable to Booyesdal South*

*Appendix A2 - Booyesdal South Mining Right Property Information*

*Appendix A3 - Copy of Amendment Application Form as submitted*

## Appendix A1 – Authorisations applicable to Booyendal South

Appendix A2 – Booyendal South Mining Right Property Information



Appendix A3 – Copy of Amendment Application Form as submitted

## **APPENDIX B: PUBLIC PARTICIPATION**

### *Public Participation and Comments and Response Report*

## **APPENDIX C: SPECIALIST INVESTIGATIONS**

*Appendix C1 - Heritage Statement*

*Appendix C2 - Environmental Biodiversity Screening Report*

## Appendix C1 – Heritage Statement

## Appendix C2 – Environmental Biodiversity Screening Report

## APPENDIX D:IMPACT TABLES

**APPENDIX E: S24G PHASE 1 EMP**

## APPENDIX F: EAP INFORMATION