

**SOCIAL IMPACT ASSESSMENT FOR THE  
PROPOSED VOGELFONTEIN COLLIERY MSUKALIGWA LOCAL MUNICIPALITY,  
MPUMALANGA PROVINCE**

**June 2021**

Prepared by:



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## DETAILS OF PROJECT

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Report Title : Proposed Vogelfontein Colliery Msukaligwa Local Municipality, Mpumalanga Province

DMR Reference No. : MP30/5/1/2/2/10214MR

Author : Dr Neville Bews

Project Developer : Grammatikos Construction & Mining CC

Environmental Consultant : **Nsovo Environmental Consulting**

Review Period : 25 June 2021

Status of Report : First Draft Report

## **EXECUTIVE SUMMARY**

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### **INTRODUCTION**

Grammatikos Construction & Mining CC has proposed the mining of Portions 1, 4, 5 and 13 of the farm Vogelfontein 245 IS, and a portion of the Remainder Extend (RE) of the Farm Kranspoort 827 IS, located close to Breyten in Ward 13 of the Msukaligwa Local Municipality, Gert Sibanda District Municipality, Mpumalanga Province. The proposed mining activity is to be known as the Vogelfontein Colliery. In this regard, Dr Neville Bews & Associates was appointed by Nsovo Environmental Consulting to undertake the Social Impact Assessment for the Vogelfontein Colliery.

### **PROJECT DESCRIPTION**

It is proposed to access the underground coal reserves, which are estimated at 35 million tons, extending over an area of 380 ha, by means of a 9 degree decline shaft system entering the shallower B seam at a depth of approximately 70 m below surface. The intention is to mine both seams by means of continuous miners (CM) supported by mechanical ancillary equipment. The coal will be cut by CM, loaded onto shuttle cars and transported and deposited into mechanical feeder breakers for size reduction purposes. From here the coal will be transported on conveyor belts towards the surface stockpile area where a secondary crushing and screening operation will be conducted.

Due to the depth of the coal seams below surface (70 m to 160 m), it is intended to perform secondary pillar extraction in order to maximise the reserve potential. After the primary extraction process has been conducted by CM's underground, it is planned to conduct secondary extraction by means of mining the support pillars, previously left intact by means of a combination of partial pillar extraction and full pillar extraction methods. This will enable the optimisation of the full resource over the life of the project.

The mine will be a conventional underground operation employing mechanised Bord and Pillar mining techniques and will require the following infrastructure.

- Run of Mine (ROM) yard
- ROM stockpile
- Pollution control dam (PCD)
- Overburden stockpile
- Topsoil stockpile
- Berm

- Shaft entrance
- Offices
- Workshops
- Change house and lamp room
- Stores
- Parking area
- Stone dust silo
- Security access
- Sewage plant
- Fans and electricity
- Water tanks
- Diesel tanks and
- Fence.

Coal will be transported via conveyors and it is estimated that, once established, underground mining will occur at a rate of 120 000 tons per month. The intention is to offer the product to Eskom as a raw crushed product for the local power generation market.

## **LOCATION**

The location of the proposed Vogelfontein Colliery is on the farm Vogelfontein 245 IS, within wards 10 and 13 of the Msukaligwa Local Municipality, Gert Sibande District Municipality, Mpumalanga Province. It is situated approximately 40 km east northeast of Bethal and 10 km north northwest of Ermelo calculated in a straight line. Breyten and Kwazanele respectively lie some 9 and 8 km to the east northeast of the proposed project. Access to the shaft area of the proposed colliery will be obtained via a new access road leading off the N11 national road.

## **POTENTIAL SOCIAL IMPACTS**

The following potential social impact variables were identified in association with the project:

### **Health and social well-being**

- Air quality
- Climate change
- Noise
- Hazard exposure
- Increase in crime
- Increased risk of HIV infections
- Influx of job seekers.

### **Quality of the living environment (Liveability)**

- Annoyance factor, access, and disruption of daily living patterns
- Disruptions to social and community infrastructure
- Transformation of the sense of place
- Traffic.

### **Economic**

- Job creation and skills development
- Local economic development.

### **Cultural**

At a social level, it is likely that any cultural impacts would be associated with sensitive archaeological and/or heritage sites that may be found. In this regard, an archaeological and heritage impact assessment was undertaken and is used as a basis on which to assess this impact.

## **DISCUSSION**

The adverse affects of coal mining on public health and the environment has for some time been well documented and needs to be noted (Fourie, 2020; Gasparotto, Juciano; Da Boit Martinello, Kátia, 2021; Harrisa, McManus, Sainsbury, Viliani, & Emily, 2021; Hendryx & Ahern, 2008; Leonard, Zulfikar, & Stansbury, 2020; Morrice & Colagiur, 2013; Osborne, 2020). Although the project will lead to the creation of jobs over the medium term, it is also likely to result in a high risk to the environment over the longer term<sup>1</sup>. This will be exacerbated on a cumulative basis considering the extent of development across the region. The community benefits associated with coal mining become less desirable when external factors associated with the activity are factored in (De Valck, Williams, & Kuika, 2021).

In this sense the creation of jobs due to coal mining must be considered against the context of environmental damage, global warming and the resultant health risks faced by local communities. Poor community health, because of climate risk and environmental degradation, can lead to premature mortality rates, a loss of household income and results in a cycle of poverty amongst rural communities (Pillay-van Wyk & Bradshaw, 2017; Hansen, et al., 2019). As Shongwe points out:

*“Although South Africa has advanced policies and regulations, designed to protect the environment and people living in mining communities, governance and implementation*

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<sup>1</sup> See for instance Environmental Monitoring Group, 2010; Kekana, 2018; Gray H, 2019; Laisani & Jegede, 2019; SAnews.gov.za, 2019; Vlavianos, 2019; West, 2019; Adesinal, PikethI, Qhekwanal, Language, & Mkhathshwall, 2020; Gilder & Rumble, 2020; Makoni, 2020; amongst many others.

*remains problematic and highly contentious. This, coupled with inadequate consultation and communication with communities, has led to a situation which is dominated by highly politicised agendas with little factual basis or stakeholder co-operation”* (Shongwe, 2017, p. 88).

With this in mind, it is important that developers consider outcomes that reach beyond the operational life of the mine and leave a positive legacy; with some value being added to the lives of local communities (Franks, 2012, p. 8). If this could be achieved, it may mitigate somewhat against current environmental damage, however; despite the damage and associated health risks identified over several years in the area, there is little evidence of either the political or corporate will to address these concerns.

Apart from this, and with respect to the legislative and policy fit of the project, it would be important that the six principles, as laid out in the **Mining and Biodiversity Guideline: Mainstreaming biodiversity into the mining sector** and listed below are applied to the project.

- “1. Apply the law*
- 2. Use the best available biodiversity information*
- 3. Engage stakeholders thoroughly*
- 4. Use best practice environmental impact assessment (EIA) to identify, assess and evaluate impacts on biodiversity*
- 5. Apply the mitigation hierarchy in planning any mining-related activities and to develop robust environmental management programmes (EMP)*
- 6. Ensure effective implementation of the EMP, including adaptive management”<sup>2</sup>.*

### **Conclusion and Recommendations**

The Climate Impact Assessment rated the effects of the Vogelfontein Colliery on GHG emissions, with or without mitigation measures, at 70 High; but shows that “...the intensity of the impact can be reduced, notably by reducing the quantity of GHG emissions.” Considering this, against the background of the discussion above, it is recommended that the proposed Vogelfontein Colliery proceed in a responsible manner. It is imperative that the necessary mitigation and optimisation measures are implemented, monitored, and when and where necessary, adjusted to limit any adverse effects on both the social and physical environments. What, however remains of great concern, is that there will be a negative impact in respect of

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<sup>2</sup> Department of Environmental Affairs, Department of Mineral Resources, Chamber of Mines, South African Mining and Biodiversity Forum, and South African National Biodiversity Institute, 2013, p4.

GHG emissions and climate change, and that climate change has been directly linked to community health and the cycle of poverty. In this regard, serious consideration must be given to what these affects will be on a cumulative basis, as well as at a global level, and that the social consequences of this be seriously considered over the medium to long term. This needs to be done with particular reference to securing sustainable livelihoods amongst the vulnerable communities.

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## LIST OF ABBREVIATIONS

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<b>AQMP</b>	Air Quality Management Plan
<b>CM</b>	Continuous Miners
<b>DM</b>	District Municipality
<b>DMRE</b>	Department of Mineral Resources and Energy
<b>EIA</b>	Environmental Impact Assessment
<b>EMF</b>	Environmental Management Framework
<b>EMPr</b>	Environmental Management Programme
<b>EMPR</b>	Environmental Management Programme Report
<b>GHG</b>	Greenhouse Gass Emissions
<b>HIV</b>	Human Immunodeficiency Virus
<b>I&amp;APs</b>	Interested and Affected Parties
<b>IDPs</b>	Integrated Development Plans
<b>IRR</b>	Issue and Response Register
<b>IWUL</b>	Integrated Water Use Licence
<b>IWULA</b>	Integrated Water Use Licence Application
<b>IWWMP</b>	Integrated Water and Waste Management Plan
<b>LDP</b>	Local Development Plan
<b>LM</b>	Local Municipality
<b>LOM</b>	Life of Mine
<b>NIMP</b>	Noise Impact Management Plan
<b>NU</b>	Non-urban area
<b>PCD</b>	Pollution Control Dam
<b>PPP</b>	Public Participation Process
<b>ROM</b>	Run of Mine
<b>SACPVP</b>	South African Council for the Property Valuers Profession
<b>SANRAL</b>	South African National Road Agency Limited
<b>SIA</b>	Social Impact Assessment
<b>Stats SA</b>	Statistics South Africa

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## QUALIFICATIONS AND EXPERIENCE OF SPECIALIST

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### **Qualifications:**

University of South Africa: B.A. (Honours) – 1984

Henley Management College, United Kingdom: The Henley Post-Graduate Certificate in Management – 1997

Rand Afrikaans University: M.A. (cum laude) – 1999

Rand Afrikaans University: D. Litt. et Phil. – 2000

### **Projects:**

The Social Impact Assessment (SIA) for the Gautrain Rapid Rail Link; The impact assessment for the Australian – South African sports development programme; SIA for Kumba Resources, Sishen South Project; Evaluation of a Centre for Violence Against Women for The United Nations Office on Drugs and Crime; SIAs for the following Exxaro Resources Ltd.'s mines, Leeuwpan Coal Mine Delmas, Glen Douglas Dolomite Mine Henley-on-Klip, Grootegeluk Open Cast Coal Mine Lephalale; SIA for the South African National Road Agency Limited (SANRAL) on Gauteng Freeway Improvement Project; SIA for SANRAL on the N2 Wild Coast Toll Highway; Research into research outputs of the University for the University of Johannesburg; SIA for Waterfall Wedge housing and business development in Midrand Gauteng; SIA for the Environmental Management Plan for Sedibeng District Municipality; Social and Labour Plan for the Belfast Project on behalf of Exxaro Resources Ltd; SIA for the Transnet New Multi-Product Pipeline (Commercial Farmers) on behalf of Golder Associates Africa (Pty) Ltd; SIA for the Proposed Vale Moatize Power Plant Project in Mozambique on behalf of Golder Associates Africa (Pty) Ltd; SIA for Kumba Resources Ltd.'s proposed Dingleton Resettlement Project at Sishen Iron Ore Mine on behalf of Water for Africa (Pty) Ltd; SIA for Gold Fields West Wits Project for EcoPartners; SIA for the Belfast Project for Exxaro Resources Ltd; SIA for Eskom Holdings Ltd.'s Proposed Ubertas 88/11kV Substation on behalf of KV3 Engineers (Pty) Ltd; SIA for the Mokolo and Crocodile River (West) Water Augmentation Project for the Department of Water and Sanitation on behalf of Nemai Consulting and the Trans Caledonian Water Authority; Assisted Octagon Consulting with the SIA for Eskom's Nuclear 1 Power Plant on behalf of Arcus GIBB Engineering & Science. SIA for the 150MW Photovoltaic Power Plant and Associated Infrastructure for Italgest Energy (Pty) Ltd, on behalf of Kalahari Survey Solutions cc. SIA for Eskom Holdings Limited, Transmission Division's Neptune-Poseidon 400kV Power Line on behalf of Nemai Consulting. Ncwabeni Off-Channel Storage Dam for security of water supply in Umzumbe, Mpumalanga.

Social Impact assessment for Eskom Holdings Limited, Transmission Division, Forskor-Merensky 275kV ±130km Powerline and Associated Substation Works in Limpopo Province. Social impact assessment for the proposed infilling of the Model Yacht Pond at Blue Lagoon, Stiebel Place, Durban. ABC Prieska Solar Project; Proposed 75 MWp Photovoltaic Power Plant and its associated infrastructure on a portion of the remaining extent of ERF 1 Prieska, Northern Cape. Sekoko Wayland Iron Ore, Molemole Local Municipalities in Limpopo Province. Langpan Chrome Mine, Thabazimbi, Limpopo; Jozini Nodal Expansion Implementation Project, Mpumalanga, on behalf of Nema Consulting; SIA for Glen Douglas Dolomite Burning Project, Midvaal Gauteng, on behalf of Afrimat Limited; SIA for Lyttelton Dolomite mine Dolomite Burning Project, Marble Hall Limpopo on behalf of Afrimat Limited; Tubatse Strengthening Phase 1 – Senakangwedi B Integration for Eskom Transmission on behalf of Nsovo Environmental Consulting; Department of Water and Sanitation, South Africa (2014). Environmental Impact Assessment for the Mzimvubu Water Project: Social Impact Assessment DWS Report No: P WMA 12/T30/00/5314/7. Umkhomazi Water Project Phase 1 – Raw Water Component Smithfield Dam - 14/12/16/3/3/3/94; Water Conveyance Infrastructure - 14/12/16/3/3/3/94/1; Balancing Dam - 14/12/16/3/3/3/94/2. Umkhomazi Water Project Phase 1 – Potable Water Component: 14/12/16/3/3/3/95. Expansion of Railway Loops at Arthursview; Paul; Phokeng and Rooiheuwel Sidings in the Bojanala Platinum District Municipality in the North West Province for Transnet Soc Ltd; Basic Social Impact Assessment for the Cato Ridge Crematorium in Kwazulu-Natal Province; SIA for the Kennedy Road Housing Project, Ward 25 situated on 316 Kennedy Road, Clare Hills (Erf 301, Portion 5); Eskom's Mulalo Main Transmission Substation and Power Line Integration Project, Secunda;

Regularly lecture in the Department of Sociology at the University of Johannesburg and collaborated with Prof. Henk Becker of Utrecht University, the Netherlands, in a joint lecture to present the Social Impact Assessment Masters course via video link between the Netherlands and South Africa. Presented papers on Social Impact Assessments at both national and international seminars. Published on both a national and international level.

**Affiliation:**

The South African Affiliation of the International Association for Impact Assessment.

Registered on the database for scientific peer review of iSimangaliso GEF project outputs.

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**DECLARATION OF INDEPENDENCE**

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I, Neville Bews, as the appointed independent specialist, in terms of the 2014 EIA Regulations, hereby declare that:

- I act as the independent specialist in this application;
- I perform the work relating to the application in an objective manner, even if this results in views and findings that are not favorable to the applicant;
- I regard the information contained in this report as it relates to my specialist input/study to be true and correct, and do not have and will not have any financial interest in the undertaking of the activity, other than remuneration for work performed in terms of the NEMA, the Environmental Impact Assessment Regulations, 2014 and any specific environmental management Act;
- I declare that there are no circumstances that may compromise my objectivity in performing such work;
- I have expertise in conducting the specialist report relevant to this application, 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 have no, and will not engage in, conflicting interests in the undertaking of the activity;
- I have no vested interest in the proposed activity proceeding;
- 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;

Social Impact Assessment for the proposed Vogelfontein Colliery Msukaligwa Local Municipality  
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- all the particulars furnished by me in this specialist input/study are true and correct;  
and
- I realise that a false declaration is an offence in terms of regulation 48 and is punishable  
in terms of section 24F of the Act.

Signature of the specialist:



Name of Specialist: Neville Bews

Date: 30 June 2021

## **1. INTRODUCTION**

Grammatikos Construction & Mining CC has proposed the mining of Portions 1, 4, 5 and 13 of the farm Vogelfontein 245 IS, and a portion of the Remainder Extend (RE) of the Farm Kranspoort 827 IS, located close to Breyten in Ward 13 of the Msukaligwa Local Municipality, Gert Sibanda District Municipality, Mpumalanga Province. The proposed mining activity is to be known as the Vogelfontein Colliery. In this regard, Dr Neville Bews & Associates was appointed by Nsovo Environmental Consulting to undertake the Social Impact Assessment for the Vogelfontein Colliery.

### **1.1. PURPOSE OF REPORT**

The purpose of the report is to.

- Describe the social baseline conditions under which the proposed project will unfold.
- Identify the social impacts likely to be associated with the project.
- Assess these social impacts and propose appropriate optimisation and mitigation measures.

### **1.2. STRUCTURE OF REPORT**

This specialist study is undertaken in compliance with Requirements of Appendix 6 – GN R326 EIA Regulations 2014, as amended on 7 April 2017. **Table 1** shows how the requirements of Appendix 6 have been fulfilled in this report.



**Table 1: Report content requirements in terms of EIA Regulations**

Requirements of Appendix 6 – GN R326 EIA Regulations 2014, as amended on 7 April 2017	Section of Report
1. (1) A specialist report prepared in terms of these Regulations must contain-	
(a) details of-	
(i) the specialist who prepared the report; and	Page xii
(ii) the expertise of that specialist to compile a specialist report including a curriculum vitae;	
(b) a declaration that the specialist is independent in a form as may be specified by the competent authority;	Page xiii
(c) an indication of the scope of, and the purpose for which, the report was prepared;	Section 1.1 & 1.3
(cA) an indication of the quality and age of base data used for the specialist report;	Section: 1.5.2
(cB) a description of existing impacts on the site, cumulative impacts of the proposed development and levels of acceptable change;	Section 6, 7, 8 & 9
(d) the duration, date and season of the site investigation and the relevance of the season to the outcome of the assessment;	N/A
(e) a description of the methodology adopted in preparing the report or carrying out the specialised process inclusive of equipment and modelling used;	Section 1.3 & 1.4
(f) details of an assessment of the specific identified sensitivity of the site related to the proposed activity or activities and its associated structures and infrastructure, inclusive of a site plan identifying site alternatives;	Section 6 & 7
(g) an identification of any areas to be avoided, including buffers;	N/A
(h) a map superimposing the activity including the associated structures and infrastructure on the environmental sensitivities of the site including areas to be avoided, including buffers;	Section 4 Figure 1
(i) a description of any assumptions made and any uncertainties or gaps in knowledge;	Section 1.5
(j) a description of the findings and potential implications of such findings on the impact of the proposed activity, <b>[including identified alternatives on the environment]</b> or activities;	Section 6, 7, 8 & 9
(k) any mitigation measures for inclusion in the EMPr;	Section 7
(l) any conditions for inclusion in the environmental authorisation;	N/A
(m) any monitoring requirements for inclusion in the EMPr or environmental authorisation;	Section: 7, 8 & 9
(n) a reasoned opinion-	
(i) <b>[as to]</b> whether the proposed activity, activities or portions thereof should be authorised;	
(iA) regarding the acceptability of the proposed activity or activities; and	Section 8 & 9
(ii) if the opinion is that the proposed activity, activities or portions thereof should be authorised, any avoidance, management and mitigation measures that should be included in the EMPr, and where applicable, the closure plan;	
(o) a description of any consultation process that was undertaken during the course of preparing the specialist report;	N/A
(p) a summary and copies of any comments received during any consultation process and where applicable all responses thereto; and	N/A -No feedback has yet been received from the public participation process regarding the visual environment
(q) any other information requested by the competent authority.	N/A. No information regarding the SIA has been requested from the competent authority to date.
2) Where a government notice <i>gazetted</i> by the Minister provides for any protocol or minimum information requirement to be applied to a specialist report, the requirements as indicated in such notice will apply.	N/A

### **1.3. APPROACH TO STUDY**

Data was gathered by the following means:

- The project description prepared by the project proponent;
- Statistics South Africa, Census 2011 and other relevant demographic data generated by Stats SA such as the Quarterly Labour Force Survey and Mid-year population estimates;
- A literature review of the following specialist reports was undertaken.
  - Ambient Air Quality Impact Assessment
  - Aquatic Biodiversity Impact Assessment
  - Climate Change Impact Assessment
  - Environmental Noise Impact Assessment
  - Hydrogeological Impact Assessment
  - Hydrological Impact Assessment
  - Hydropedological Assessment
  - Noise Impact Assessment
  - Soil, Land Use and Land Capability Assessment
  - Terrestrial Biodiversity Impact Assessment
  - Traffic Impact Assessment
  - Visual Impact Assessment.

### **1.4. IMPACT ASSESSMENT TECHNIQUE**

The assessment technique used to evaluate the social impacts was provided by Nsovo Environmental Consulting and is largely based on the Department of Environmental Affairs and Tourism's (1998) Guideline Document: Environmental Impact Assessment Regulations and is as follows:

#### **Status of the Impact**

The impacts are assessed as either having a:  
Negative effect (i.e. at a `cost' to the environment)  
Positive effect (i.e. a `benefit' to the environment) or  
Neutral effect on the environment.

#### **Extent of the Impact**

- (1) Site (site only)
- (2) Local (site boundary and immediate surrounds)
- (3) Regional (within the municipal area)
- (4) National or

(5) International.

### Duration of the Impact

The length that the impact will last for is described as either:

- (1) immediate (<1 year)
- (2) short term (1-5 years)
- (3) medium term (5-15 years)
- (4) long term (ceases after the operational life span of the project)
- (5) Permanent.

### Magnitude of the Impact

The intensity or severity of the impacts is indicated as either:

- (0) No impact
- (2) Minor
- (4) Low
- (6) Moderate (environmental functions altered but continue)
- (8) High (environmental functions temporarily cease) or
- (10) Very high / Unsure (environmental functions permanently cease).

### Probability of Occurrence

The likelihood of the impact occurring is indicated as either:

- (0) None (the impact will not occur)
- (1) improbable (probability exceptionally low due to design or experience)
- (2) low probability (unlikely to occur)
- (3) medium probability (distinct probability that the impact will occur)
- (4) high probability (most likely to occur) or
- (5) Definite.

### Significance of the Impact

Based on the information contained in the points above, the potential impacts are assigned a significance rating (**S**). This rating is formulated by adding the sum of the numbers assigned to extent (**E**), duration (**D**) and magnitude (**M**) and multiplying this sum by the probability (**P**) of the impact.  $S=(E+D+M)P$

### The significance ratings are given below

(<30) low (i.e. where this impact would not have a direct influence on the decision to develop in the area)

(30-60) medium (i.e. where the impact could influence the decision to develop in the area unless it is effectively mitigated)

(>60) high (i.e. where the impact must have an influence on the decision process to develop in the area).

## **1.5. ASSUMPTIONS AND LIMITATIONS**

The following assumptions and limitations apply in respect of this report.

### **1.5.1. ASSUMPTIONS**

It is assumed that the technical information provided by Grammatikos Construction & Mining CC, Nsovo Environmental Consulting and the various specialists is credible and accurate at the time of compiling the report. It is also assumed that the data provided by the various specialists as used in this report are credible and accurate.

### **1.5.2. LIMITATIONS**

Most of the demographic data used in this report was sourced from Statistics South Africa and is based on data gathered during Census 2011. This data is somewhat outdated but where possible is supplemented with the latest Stats SA's survey data such as the 2018 Mid-year population estimates and the latest Quarterly Labour Force Survey. The limitation of this is that this survey data is restricted to a provincial level and does not extend to a municipal and main place level.

The study was undertaken during Stage 3 of the State of National Disaster declared in South Africa as a result of the COVID-19 pandemic. Accordingly, the need for social distancing and limiting unnecessary interpersonal contact and travel was respected throughout this study.

## **2. PROJECT DESCRIPTION**

It is proposed to access the underground coal reserves, which are estimated at 35 million tons, extending over an area of 380 ha, by means of a 9 degree decline shaft system entering the shallower B seam at a depth of approximately 70 m below surface. The intention is to mine both seams by means of continuous miners (CM) supported by mechanical ancillary equipment. The coal will be cut by CM, loaded onto shuttle cars and transported and deposited into mechanical feeder breakers for size reduction purposes. From here the coal will be transported on conveyor belts towards the surface stockpile area where a secondary crushing and screening operation will be conducted.

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extraction process has been conducted by CM's underground, it is planned to conduct secondary extraction by means of mining the support pillars, previously left intact by means of a combination of partial pillar extraction and full pillar extraction methods. This will enable the optimisation of the full resource over the life of the project.

The mine will be a conventional underground operation employing mechanised Bord and Pillar mining techniques and will require the following infrastructure.

- Run of Mine (ROM) yard
- ROM stockpile
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- Workshops
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- Stores
- Parking area
- Stone dust silo
- Security access
- Sewage plant
- Fans and electricity
- Water tanks
- Diesel tanks and
- Fence.

Coal will be transported via conveyors and it is estimated that, once established, underground mining will occur at a rate of 120 000 tons per month. The intention is to offer the product to Eskom as a raw crushed product for the local power generation market.

## **2.1. LOCALITY OF PROJECT**

The location of the proposed Vogelfontein Colliery is on the farm Vogelfontein 245 IS, within wards 10 and 13 of the Msukaligwa Local Municipality, Gert Sibande District Municipality, Mpumalanga Province. It is situated approximately 40 km east northeast of Bethal and 10 km north northwest of Ermelo calculated in a straight line. Breyten and Kwazanele respectively lie

some 9 and 8 km to the east northeast of the proposed project. Access to the shaft area of the proposed colliery will be obtained via a new access road leading off the N11 national road.

### **3. LEGISLATION AND POLICY GUIDELINES**

The following legislation and policy documents apply.

#### **National legislation and guidelines:**

- Constitution of the Republic of South Africa, 1996 (Act 108 of 1996) (Constitution)
- The National Environmental Management Act (107 of 1998) (NEMA)
- National Development Plan (2030)
- National Integrated Resource Plan for South Africa (2010-2030)
- Strategic Infrastructure Projects (SIPs)
- Occupational Health and Safety Act (Act 85 of 1993)
- Mining and Biodiversity Guideline: Mainstreaming biodiversity into the mining sector (2013)
- Construction Regulations (2014)
- Guideline for Involving Social Assessment Specialists in EIA Processes (Barbour, 2007)
- Social Impact Assessment: Guidance document (2015)
- International Labour Office. Resource guide on gender issues in employment and labour market policies: working towards women's economic empowerment and gender equality.

#### **Provincial and municipal policies:**

- Mpumalanga Annual Performance Plan, 2021/22 – 2019/2020
- Gert Sibanda District Municipality, Integrated Development Plan 2021/22 (2021)
- Msukaligwa Local Municipality, IDP 2018/2019.

#### **3.1. APPLICATION OF LEGISLATION AND POLICY GUIDELINES**

An overview of the more relevant legislation, policies and guidelines, as they relate to the project is provided below.

##### **The Constitution of the Republic of South Africa (Act 108 of 1996)**

The Constitution is relevant in that it stipulates a number of basic rights enjoyed by South African citizens which, amongst others, include:

- **Section 24:** The right to an environment that is not harmful to their health or wellbeing and to have the environment protected for the benefit of present and future generations;
- **Section 25:** The right to property and no law may permit arbitrary deprivation of property, limited in that property may only be expropriated under a law of general application, for a public purpose and subject to compensation.

The project needs to comply with the provisions of the constitution, as indicated above.

### **The National Environmental Management Act (107 of 1998) (NEMA)**

The preamble of Act 107 of 1998 indicates that:

*“everyone has the right to an environment that is not harmful to his or her health or well-being;*

*the State must respect, protect, promote and fulfil the social, economic and environmental rights of everyone and strive to meet the basic needs of previously disadvantaged communities;*

*inequality in the distribution of wealth and resources, and the resultant poverty, are among the important causes as well as the results of environmentally harmful practices;*

*sustainable development requires the integration of social, economic and environmental factors in the planning implementation and evaluation of decisions to ensure that development serves present and future generations”.*

Chapter 1 of the Act emphasises that development must be socially, environmentally and economically sustainable. The SIA considers the project in respect of the social sustainability of the social environment.

### **National Development Plan (2030)**

The National Development Plan (NDP) is a long-term National strategic plan to reduce inequality and eliminating poverty by 2030. The plan focuses on the following four broad objectives:

1. The establishment of overarching objectives to be achieved by 2030.

2. To find consensus on the key obstructions to the achievement of these objectives and to what needs to be accomplished in overcoming these obstacles.
3. To advance the long-term goals of the NDP through the establishment of a commonly shared long-term strategic framework against which future planning can occur.
4. To create a framework against which choices can be made as to how best to utilise limited resources.

The following core elements of a decent standard of living are identified in the NDP:

- Housing, water, electricity and sanitation
- Safe and reliable public transport
- Quality education and skills development
- Safety and security
- Quality health care
- Social protection
- Employment
- Recreation and leisure
- Clean environment
- Adequate nutrition.

The project is in accordance with the NDP with specific focus being placed on the Strategic Infrastructure Projects as indicated below.

### **Strategic Infrastructure Projects (SIPs)**

The Government's Strategic Infrastructure Projects (SIPs) identifies the following five core functions:

1. To unlock opportunity
2. Transform the economic landscape
3. Create new jobs
4. Strengthen the delivery of basic services, and
5. Support the integration of African economies.

A balanced approach is being fostered through encouraging an environmentally sympathetic economy, boosting energy security, promoting integrated municipal infrastructure investment, facilitating integrated urban development, accelerating skills development, investing in rural development, and enabling regional integration (National Planning Commission, 2012).



### **Occupational Health and Safety Act (Act 85 of 1993)**

The purpose of this Act is:

*“To provide for the health and safety of persons at work and for the health and safety of persons in connection with the use of plant and machinery; the protection of persons other than persons at work against hazards to health and safety arising out of or in connection with the activities of persons at work; to establish an advisory council for occupational health and safety; to provide for matters connected therewith.”*

The activities associated with the construction of the project will be subjected to the provisions of this Act and will influence the construction associated mitigation measures throughout this report.

### **Construction Regulations (2014)**

These regulations apply to all persons involved in construction work and would need to be considered during the construction phase of the project.

### **Guideline for Involving Social Assessment Specialists in EIA Processes** (Barbour, 2007)

These guidelines direct the role of social assessment specialists in the Environmental Impact Assessment (EIA) process within the South African context.

### **Social Impact Assessment: Guidance document (2015)** (Vanclay, Esteves, Aucamp, & Franks, 2015).

This document encapsulates the core values of the international SIA community providing a set of principles to guide SIA practitioners in incorporating the social element into environmental impact assessments.

### **International Labour Office (ILO). Resource guide on gender issues in employment and labour market policies: working towards women’s economic empowerment and gender equality** (Otope, 2014):

*“The objective of this resource guide is to strengthen the capacities of ILO constituents and development policy makers in the formulation of employment policies. There is a well-known proclivity among many policy-makers and practitioners to treat employment as a “residual” of economic growth.”*

### **Mining and Biodiversity Guideline: Mainstreaming biodiversity into the mining sector** (2013).

Aimed at the promotion of cross-sectoral interaction and cooperation in an effort to improve biodiversity conservation and management in the mining industry:

*“This guideline provides the mining sector with a practical, user-friendly manual for integrating biodiversity considerations into planning processes and managing biodiversity during the developmental and operational phases of a mine, from exploration through to closure. This Guideline does not exempt the user from complying with the relevant pieces of legislation and should be used as a guideline”.*

### **North West Provincial Development Plan – 2030**

It is pointed out in the provincial development plan that mining is the primary economic sector in the province and that;

*“Mining contributes more than a quarter (39%) to the total provincial economy influenced largely by the significant mining activity in the BPDM and the DKKDM. As a result the provincial economy is somewhat dependent on the demand for metals and minerals from foreign economies and the subsequent fluctuation in commodity prices.”*  
And that “...the mining sector was responsible for 21% of employment in 2012 (North West Province, 2013, p. 39 & 43).

Mining remained the mainstay of the North West economy in 2020 with mining in the province contributing;

*“...approximately (R91,7bn) 33,8% to the total industries GVA (Current prices) in the province and 24,4% to national mining GDP and 14.0% to North West formal employment (122 000 jobs) and 32,7% to national mining employment (North West Development Corporation, 2020, p. 18).*

### **District and Local Municipal Integrated Development Plans**

Local municipalities are required, in accordance with The Municipal Systems Act (No.32) of 2000 to prepare Integrated Development Plans (IDPs). The IDP provides a framework against which municipal authorities manage development within their areas of jurisdiction.

The IDPs of the following municipalities are applicable in respect of the proposed project.

- Gert Sibanda District Municipality
  - Msukaligwa Local Municipality.

In this regard, the Gert Sibanda DM IDP places a focus on mining as a ‘..primary economic core pillar’ and indicates that the:

*“Key areas for intervention to facilitate growth and job creation in the mining industry are as follow:*

- *Upgrading and maintenance of the coal haulage network.*
- *Increase the level of higher skilled graduates.*
- *Expand the water network and increase reliance on water transfer schemes.*
- *Increase South Africa's load and improve alternate energy supply.*
- *Establishment of a mining supplier park to enhance enterprise development in the*
- *province.*
- *Resolve land claims to release land for development.*
- *Comprehensive support to small-scale mining enterprises to exploit opportunities*
- *presented by corporate social investment initiatives, retreatment of sub-economic*
- *deposits and dumps, and dimension stones.*
- *Improving rail haulage of minerals to reduce shipping costs (currently done by road)".*

And commits to;

*"Facilitate and accommodate mining in the District in a sustainable manner in order to support local electricity generation and industrial development" (Gert Sibande District Municipality, 2021, pp. 19, 25 & 171).*

The Msukaligwa Local Municipalities IDP also lists mining amongst the main economic sectors of the municipality, indicating that;

*"Key areas for intervention to facilitate growth and job creation in the mining industry*

- *Upgrading and maintenance of the coal haulage network*
- *Increase the level of higher skilled graduates*
- *Expand the water network and increase reliance on water transfer schemes*
- *Increase South Africa's base load and improve alternate energy supply*
- *Establishment of a mining supplier park to enhance enterprise development in the province*
- *Resolve land claims to release land for development*
- *Comprehensive support to small scale mining enterprises to exploit opportunities presented by corporate social investment initiatives, retreatment of sub economic deposits and dumps, and dimension stones" (Msukaligwa Local Municipality, 2021, p. 21 & 22).*

Although the mining sector plays an important part in the economy of these municipalities and creates a significant number of jobs, it is also clear that the industry is the source of a range of pollutants that need to be responsibly managed. In this regard, it is pointed out in the Msukaligwa LM's IDP that there is a need to diversify the economy and prepare for a decline in the coal mining sector due to dwindling coal deposits and the need to move away from a carbon-based economy (Msukaligwa Local Municipality, 2021, p. 137).

### **3.2. PROJECT LEGISLATION AND POLICY FIT**

In considering the legislation and policy applicable to the project, it is important to recognise the contradiction that exists in balancing the economic needs of the area against long-term environmental damage and consequent long-term economic sustainability. A consortium of governmental departments, and industry based employer organisations and NGOs have recognised the need to introduce a more sustainable approach to the management of the country's resources, and have developed certain guidelines to mitigate this damage (Department of Environmental Affairs, Department of Mineral Resources, Chamber of Mines, South African Mining and Biodiversity Forum, and South African National Biodiversity Institute, 2013). It is important that the project developers keep these guidelines in mind throughout the planning, construction, operational and closure phases of the project, in order to ensure legislative and policy fit.

It is also important that the developers note the land use conflict between mining, environmental sustainability, agriculture and human settlements in the area. In the Msukaligwa LM's IDP it is pointed out that it is;

*“ ...highlighted in both the EMF and SDF that mining operations put a lot of pressure on the environment as well as on the Municipality's future spatial development landscape. Therefore monitoring systems should be in place to ensure that economic activities taking place within the municipality are carried out without compromising the biodiversity and the spatial structure of the area (Msukaligwa Local Municipality, 2021, pp. 140-141).*

On 26 November 2007, the then Minister of Environmental Affairs and Tourism, Marthinus van Schalkwyk, formally declared the Highveld a national air pollution hotspot. Msukaligwa LM is one of the nine local municipalities, five from within the Gert Sibande district, included under this Highveld Priority Area. This area later became subject to “The Highveld Priority Area Air Quality Management Plan” (Government Gazette, 5 May 2011 General Notice 270 of 2011). This places tremendous pressure on the municipalities, both district and local, to

address the issue of air quality in the region as it is at a level that makes it detrimental to the health of the citizens of the area.

#### **4. DESCRIPTION OF THE AFFECTED ENVIRONMENT**

The project is located within wards 10 and 13 the Msukaligwa LM, which falls under the Gert Sibanda district within Mpumalanga Province, as illustrated in **Figure 1**.

At the Statistics South Africa's Census 2011 Main and Sub Place levels, the project falls within the Msukaligwa Non-Urban (NU) Main Place 861002 and Sub Place 861002001 which covers the same area. Accordingly, demographic data pertaining to this area is presented below, commencing at the provincial level and progressing through the municipal to the main place levels.

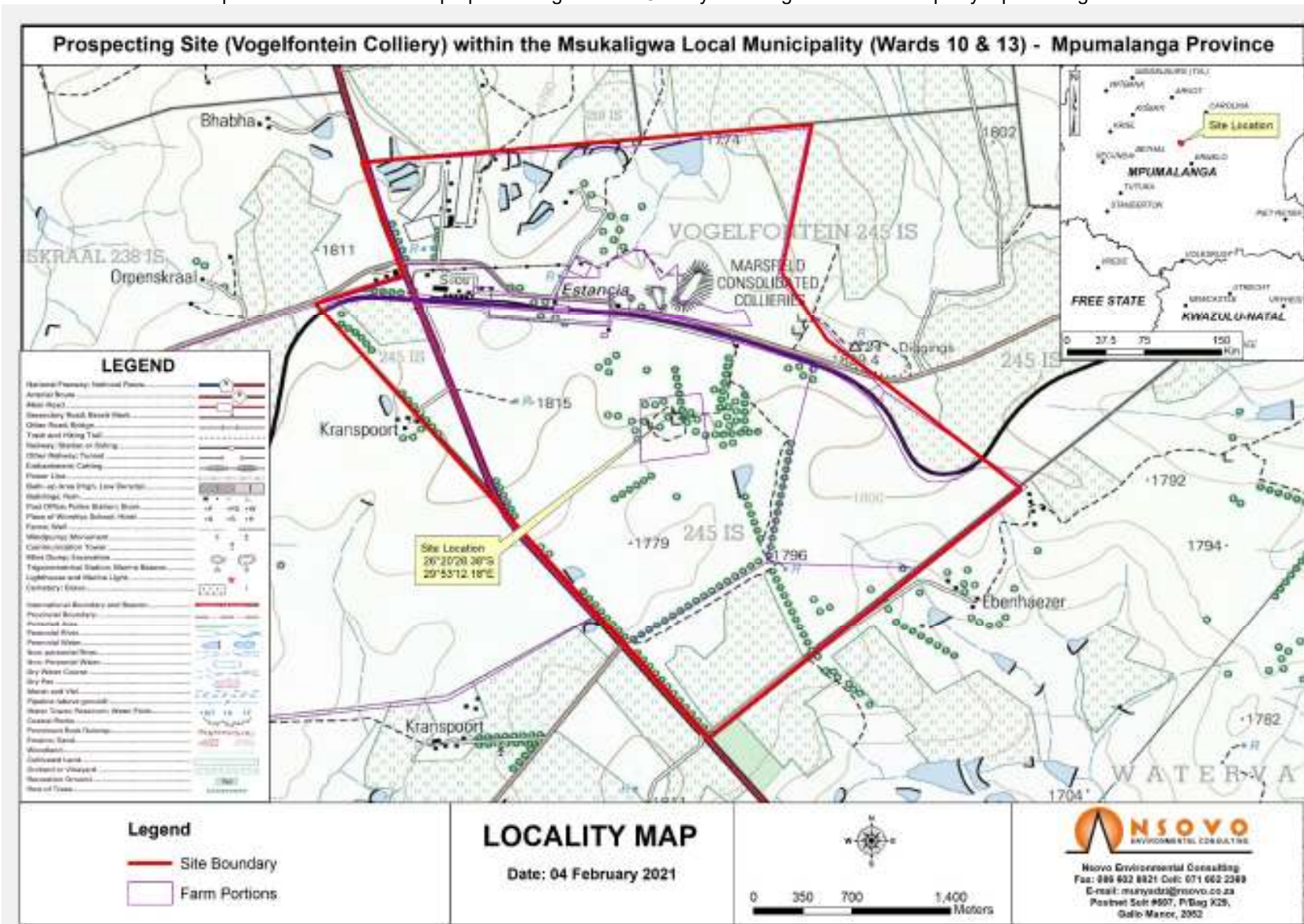


Figure 1: Proposed Vogelfontein Colliery locality map

With the project falling within Ward 13 of the Msukaligwa LM and Gert Sibande District Municipality in Mpumalanga Province, a demographic description of these areas is provided below.

#### **4.1. PROVINCIAL**

Mpumalanga, which covered an area of 76 544.3 square kilometres in 2016, is the second-smallest province in South Africa after Gauteng. The province shares international borders with Swaziland and Mozambique to the east, and provincial borders with Limpopo, Gauteng, Free State and KwaZulu-Natal. In 2016, with a population of 4 335 963 people, the population density of the province was 56.6/km<sup>2</sup>.

At an administrative and political level, Limpopo is divided into five district municipalities, which are subdivided into 22 local municipalities, as follows.

- Ehlanzeni District Municipality
  - Bushbuckridge Local Municipality
  - City of Mbombela Local Municipality
  - Nkomazi Local Municipality
  - Thaba Chweu Local Municipality
- Gert Sibande District Municipality
  - Chief Albert Luthuli Local Municipality
  - Dipaleseng Local Municipality
  - Dr Pixley Ka Isaka Seme Local Municipality
  - Govan Mbeki Local Municipality
  - Lekwa Local Municipality
  - Mkhondo Local Municipality
  - Msukaligwa Local Municipality
- Nkangala District Municipality
  - Dr JS Moroka Local Municipality
  - Emakhazeni Local Municipality
  - Emalahleni Local Municipality
  - Steve Tshwete Local Municipality
  - Thembisile Hani Local Municipality
  - Victor Khanye Local Municipality.

The following major towns/cities are also within the province.

- Mbombela (previously Nelspruit) which is the Provincial Capital
- eMalahleni (previously Witbank)
- Standerton
- eMkhondo (previously Piet Retief)
- Malalane
- Ermelo
- Barberton and
- Sabie.

With the province having rich coal reserves, the economy is largely based on mining, agriculture and tourism and is home to South Africa's major coal-fired power stations.

eMalahleni is the biggest coal producer in Africa and is also the site of Sasol II, the country's second oil-from-coal plant. Forestry and paper milling activities occur in the province's northeast, around Sabie, with heavier manufacturing occurring in the southern Highveld region. Major tourist attractions include the Kruger National Park, the Sudwala Caves and the Blyde River Canyon.

The agricultural sector is characterised by a mixture of commercialised, subsistence and livestock farming producing.

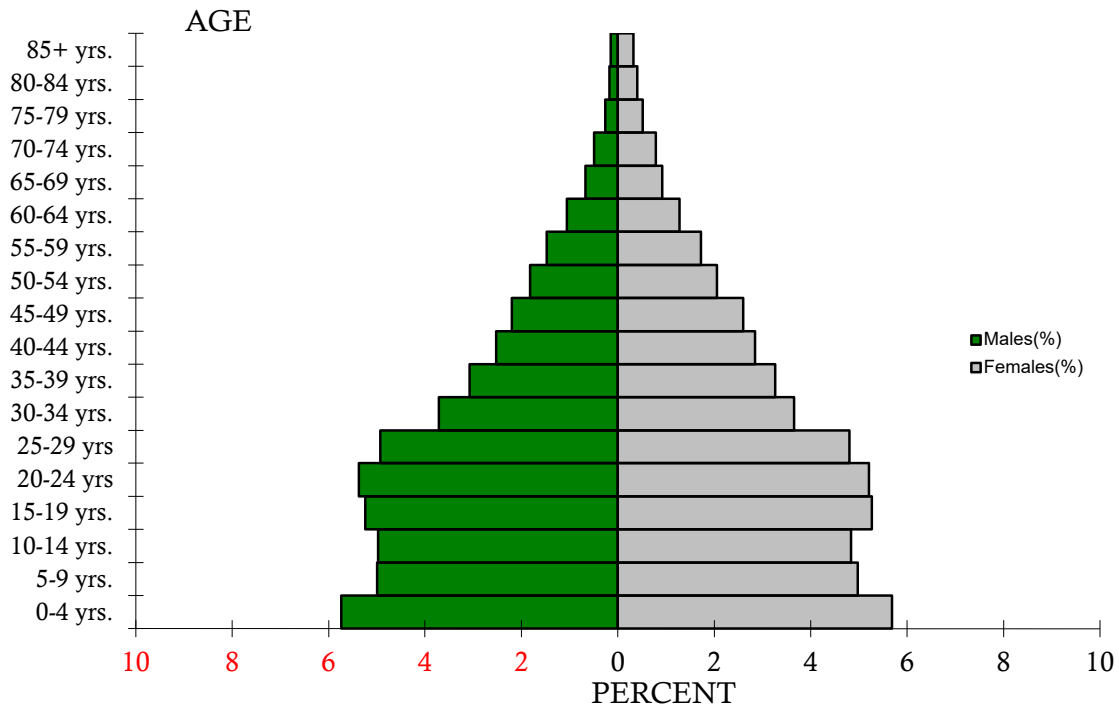
- Beef
- Dairy products
- Mutton
- Poultry and
- Wool.

The following crops are also produced in the province.

- Barley
- Citrus
- Cotton
- Maize
- Nuts
- Potatoes
- Subtropical fruits
- Sunflowers
- Tobacco
- Vegetables and
- Wheat.

According to data gathered by Statistics South Africa during the Community Survey 2016, the median age of the population was 24 years, 39.1% of the population of Mpumalanga were below 18 years while 56.6% were between 18 and 64 years of age and 4.3% were above 64 years. At 97.4%, there was a higher percentage of females in the province. The population pyramid of Mpumalanga is illustrated in **Figure 2**.





Source: (Statistics South Africa, 2011)

**Figure 2: Population pyramid Mpumalanga Province**

In respect of population grouping, the dominant population group in Limpopo are black African people at 93.6%, followed by white people at 5.2% with coloured and Indian or Asian people respectively accounting for 0.8 and 0.5 percent of the population. Most of the population, 28.5% speak SiSwati at home with 28.2% speaking isiZulu and 9.9% isiNdebele followed by Xitsonga (9.4%), Sepedi (8.9%) and Afrikaans (4.8%).

In 2011, 37.5% of the population of Mpumalanga was employed, with 68.8% working in the formal sector and 16.5% in the informal sector. Official unemployment then stood at 17.3% with 39.4% not being economically active. The unofficial rate of unemployment, which included discouraged work-seekers was 23.1%. In the 1<sup>st</sup> Quarter of 2021, the official unemployment rate in the province was 33.5%. These figures must, however, be considered with caution as the official unemployment rate is defined by Stats SA as follows;

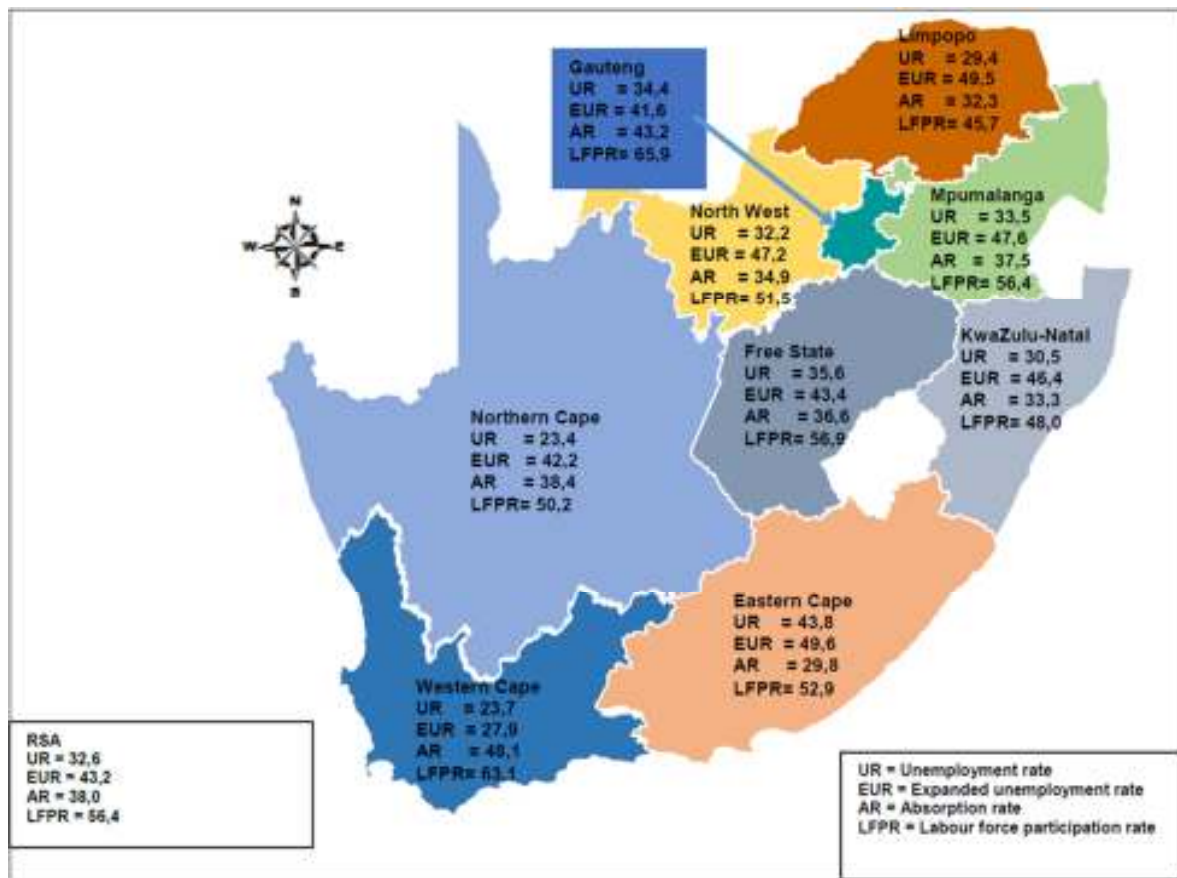
*“Unemployed persons are those (aged 15–64 years) who:*

- a) Were not employed in the reference week and;*
- b) Actively looked for work or tried to start a business in the four weeks preceding the survey interview and;*

c) Were available for work, i.e. would have been able to start work or a business in the reference week or;

d) Had not actively looked for work in the past four weeks but had a job or business to start at a definite date in the future and were available.”. (Statistics South Africa, 2021, p. 18)

In the first quarter of 2021, the expanded unemployment rate in Mpumalanga stood at 47.6%; the labour absorption rate at 37.5%, and the labour force participation rate at 56.4%. A summary of the labour market indicators, illustrated on a comparative basis across South Africa, is provided in **Figure 3**.



Source: (Statistics South Africa, 2021, p. 10)

**Figure 3: Labour market indicators 1<sup>st</sup> Quarter 2021**

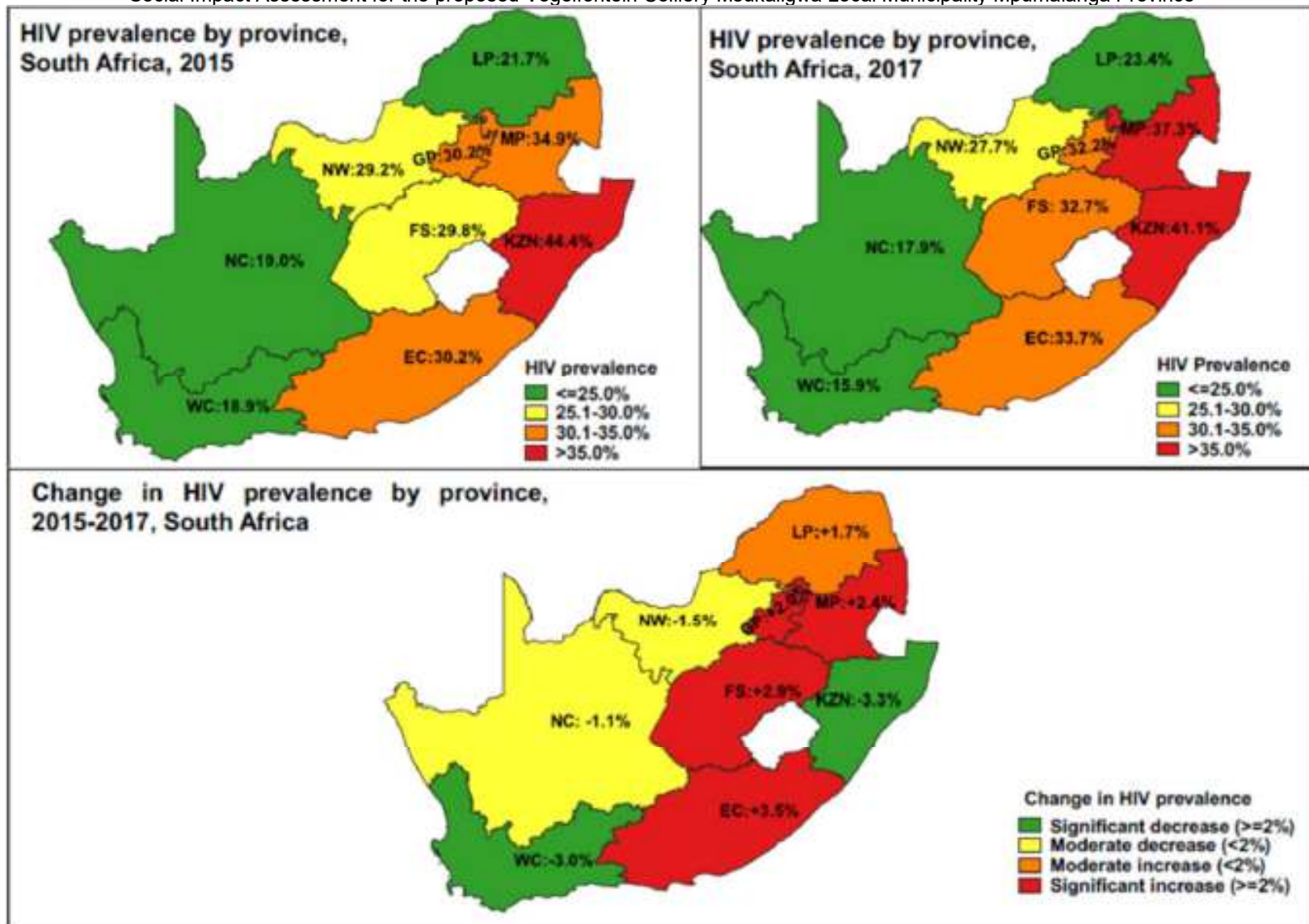
Regarding households, the 2016 Community Survey showed that there were 1 238 861 households in Mpumalanga. Of these households 39.7% were female-headed, 10.9% lived in informal houses and 68.6% owned and had fully paid off their dwellings.

Regarding household services in 2016, 47.5% of households in Mpumalanga had pit toilets with 42.1% having flush toilets connected to the sewerage system, 36.9% had their refuse

removed regularly, 27.9% had piped water delivered inside the dwelling and 81.4% had an in-house prepaid electricity meter.

Concerning HIV prevalence, the Northern Cape had the lowest prevalence rate across South Africa at 8.3% in 2017 followed by the Western Cape with a prevalence rate of 8.9%. KwaZulu-Natal, with a prevalence rate of 18.1% had the highest rate with the national HIV prevalence rate at 14.0% in 2017. HIV prevalence rate between 2012 and 2017 as it stood across all South African provinces is illustrated in **Figure 4**.

The 2017 National HIV Prevalence Survey extended to the district level, which showed that at the time the survey was undertaken, the HIV prevalence rate in Mpumalanga was 37.3%. The prevalence of HIV as it occurred across 3 district municipalities in 2017 is illustrated in **Figure 4** and **Table 2**Error! Reference source not found..



Source: (Woldesenbet, et al., 2019, p. 25)

Figure 4: HIV by province – South Africa 2015 – 2017

**Table 2: HIV prevalence by district, Mpumalanga, 2012-2017**

District	2012		2013		2014		2015		2017	
	%	95% CI	%	95% CI	%	95% CI	%	95% CI	%	95% CI
Ehlanzeni	35.1	32.3 - 38.0	37.6	34.2 - 41.1	39.2	35.8 - 42.7	38.5	35.0 - 42.2	40.4	37.1 - 43.8
Gert Sibande	40.5	35.8 - 45.3	40.8	36.1 - 45.6	36.1	32.0 - 40.4	38.6	33.7 - 43.7	41.4	38.2 - 44.7
Nkangala	32.1	27.4 - 37.3	34.4	29.5 - 39.6	30.0	26.7 - 33.5	25.1	21.2 - 29.5	31.4	28.5 - 34.5
Mpumalanga province	35.6	33.3 - 37.9	37.5	35.1 - 40.0	35.8	33.7 - 37.9	34.9	32.5 - 37.3	37.3	35.4 - 39.2

Source: (Woldesenbet, et al., 2019, p. 78)

Attention is now turned towards a demographic description of the municipalities, wards and small areas affected by the project.

## 4.2. MUNICIPAL

**Gert Sibande District Municipality DC30:** The district, which covers an area of 32 097.3 km<sup>2</sup>, incorporates the following local municipalities.

- Chief Albert Luthuli Local Municipality
- Dipaleseng Local Municipality
- Dr Pixley Ka Isaka Seme Local Municipality
- Govan Mbeki Local Municipality
- Lekwa Local Municipality
- Mkhondo Local Municipality
- Msukaligwa Local Municipality.

The following towns are also located within the Ehlanzeni district with Modimolle being the seat of the Ehlanzeni DM.

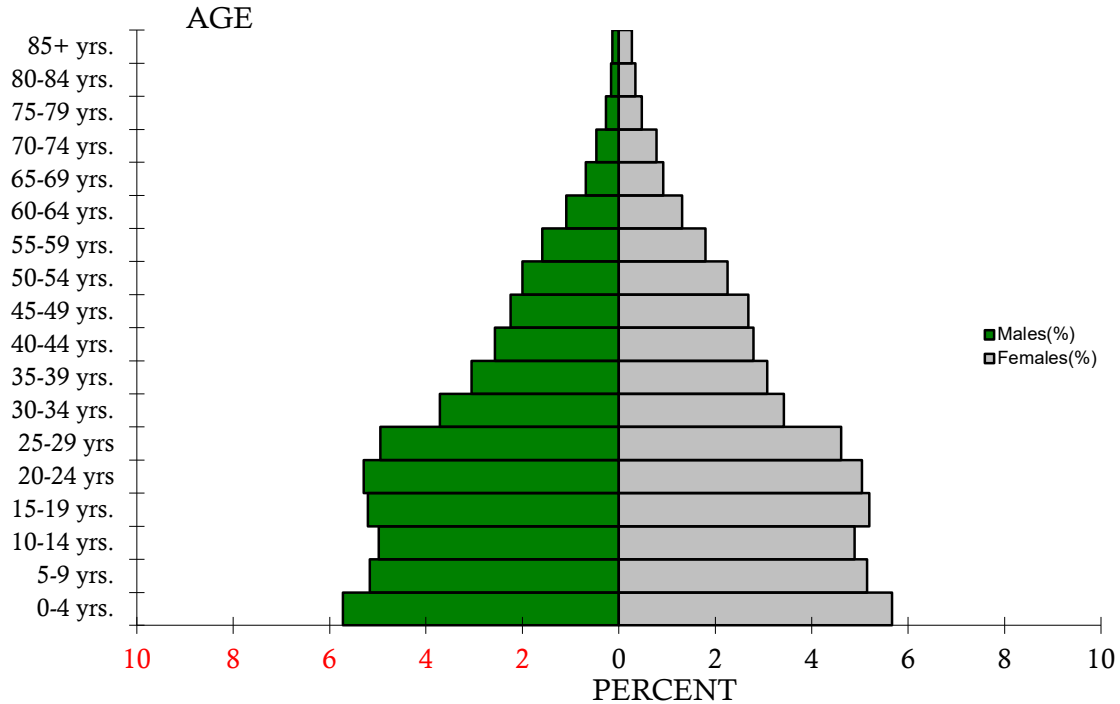
- Amersfoort
- Amsterdams
- Balfour
- Bethal
- Breyten
- Carolina
- Charl Cilliers
- Chrissiesmeer
- Davel
- Ekulindeni
- Embalenhle
- Empuluzi
- Ermelo
- Evander
- Greylingstad
- Grootvlei
- Kinross
- Leandra
- Lothair
- Morgenzon
- Perdekop
- Secunda
- Standerton
- Trichardt
- Volksrust
- Wakkerstroom
- eManzana
- eMkhondo (Piet Retief).

The main economic sectors of the district include.

- Manufacturing (49.4%)
- Agriculture (38.1%)
- Transport (31.4%)
- Trade (29.2%)
- Community services (26.9%)
- Construction (26.6%)
- Electricity (26.1%)
- Finance (23.8%)
- Mining (23.3%).

With a population of 1 135 409 people, the Gert Sibande DM has a population density of 35.4/km<sup>2</sup>. According to Community Survey, 2016 the district has a sex ratio of 51.9 with 29.3%

of the population being under 15 years; 65.8% being between 15 and 65 years and 4.9% being over 65 years of age. The population pyramid of the Gert Sibande District Municipality is illustrated in Figure 5.



Source: (Statistics South Africa, 2011)

**Figure 5: Population pyramid Gert Sibande District**

The demographic data pertaining to Gert Sibande District Municipality, based on both Census 2011 and Community Survey 2016, is presented below.

	2016	2011
<b>Population</b>	1 135 409	1 043 194
<b>Age Structure</b>		
Population under 15	29.3%	31.6%
Population 15 to 64	65.8%	63.9%
Population over 65	4.9%	4.5%
Dependency Ratio Per 100 (15-64)	51.9	56.5
<b>Sex Ratio</b>		
Males per 100 females	98.6	97.3
Population Growth Per annum	1.93%	n/a
<b>Labour Market</b>		
Unemployment rate (official)	n/a	29.7%
Youth unemployment rate (official) 15-34	n/a	38.4%
<b>Education (aged 20 +)</b>		

No schooling	10.8%	13.3%
Matric	32.4%	27.9%
Higher education	7.9%	9.1%
<b>Household Dynamics</b>		
Households	333 815	273 490
Average household size	3.4	3.7
Female headed households	39.1%	38.8%
Formal dwellings	78.0%	72.4%
Housing owned	59.5%	50.6%
<b>Household Services</b>		
Flush toilet connected to sewerage	67.1%	64.0%
Weekly refuse removal	54.3%	63.6%
Piped water inside dwelling	34.3%	44.3%
Electricity for lighting	88.5%	83.4%

### **Msukaligwa Local Municipality**

The Msukaligwa Local Municipality (MP302), which is one of the largest of the seven local municipalities in the Gert Sibande District, accounts for 19% of the geographical area of Mpumalanga. Msukaligwa is bordered by the Nkangalala District in the north, the Lekwa and Dr Pixley Ka Isaka Seme LMs in the south, Govan Mbeki LM in the west, and Mkhondo LM in the east. The Msukaligwa municipality accounts for 19% of the geographical area of Mpumalanga and has its political and administrative seat in Ermelo.

The following towns are also within the Msukaligwa LM

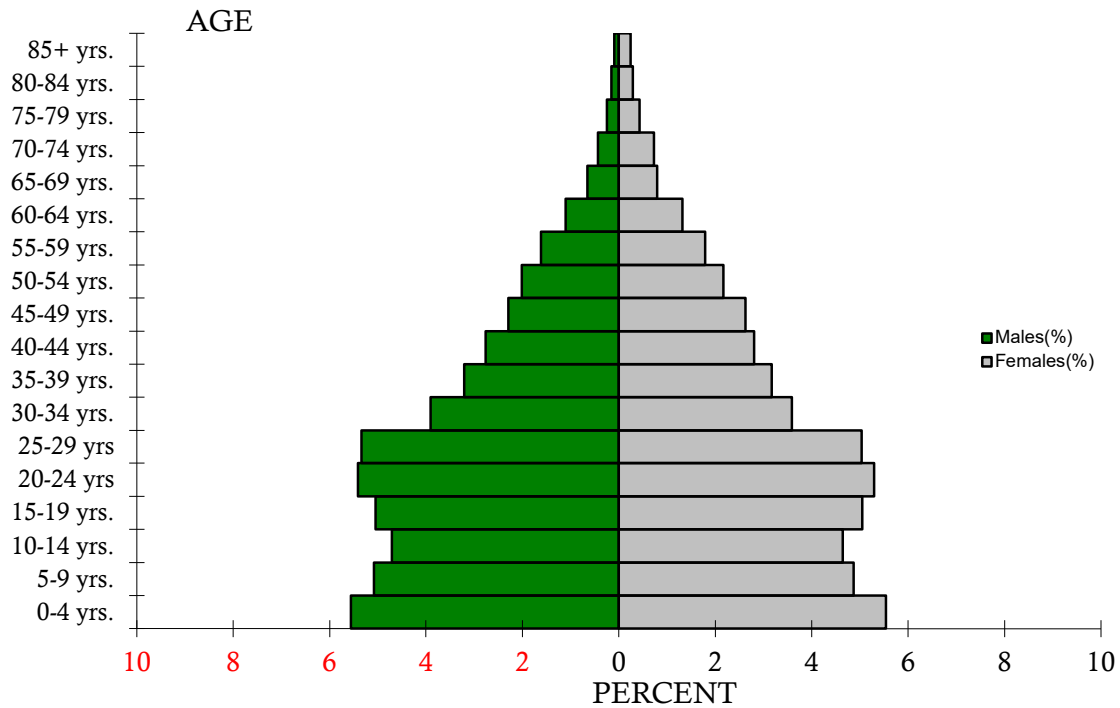
- Breyten
- Chrissiesmeer
- Davel
- Ermelo (Municipal seat)
- Lothair.

The main economic sectors

- Finance (23.8%)
- Community services (20.9%)
- Transport (17.5%)
- Trade (14.4%)
- Mining 12.2%.

With a population of 164 608 people, the Msukaligwa LM has a population density of 27.3/km<sup>2</sup>. According to Community Survey, 2016 the district has a sex ratio of 46.9 with 27.8% of the population being under 15 years; 68.1% being between 15 and 65 years and 4.1% being over 65 years of age. The population pyramid of the Gert Sibande District Municipality is illustrated in Figure 6.

Social Impact Assessment for the proposed Vogelfontein Colliery Msukaligwa Local Municipality  
Mpumalanga Province



Source: (Statistics South Africa, 2011)

**Figure 6: Population pyramid Msukaligwa Local Municipality**

The demographic data pertaining to the Msukaligwa Local Municipality, based on both Census 2011 and Community Survey 2016, is presented below.

	2016	2011
<b>Population</b>	164 608	149 377
<b>Age Structure</b>		
Population under 15	2.8%	30.4%
Population 15 to 64	68.1%	65.5%
Population over 65	4.1%	4.1%
Dependency Ratio		
Per 100 (15-64)	46.9	52.6
<b>Sex Ratio</b>		
Males per 100 females	100.3	98.5
Population Growth		
Per annum	2.21%	n/a
<b>Labour Market</b>		
Unemployment rate (official)	n/a	26.8%
Youth unemployment rate (official)15-34	n/a	34.5%
<b>Education (aged 20 +)</b>		
No schooling	10.6%	12.3%
Matric	31.6%	29.2%
Higher education	10.1%	9.6%



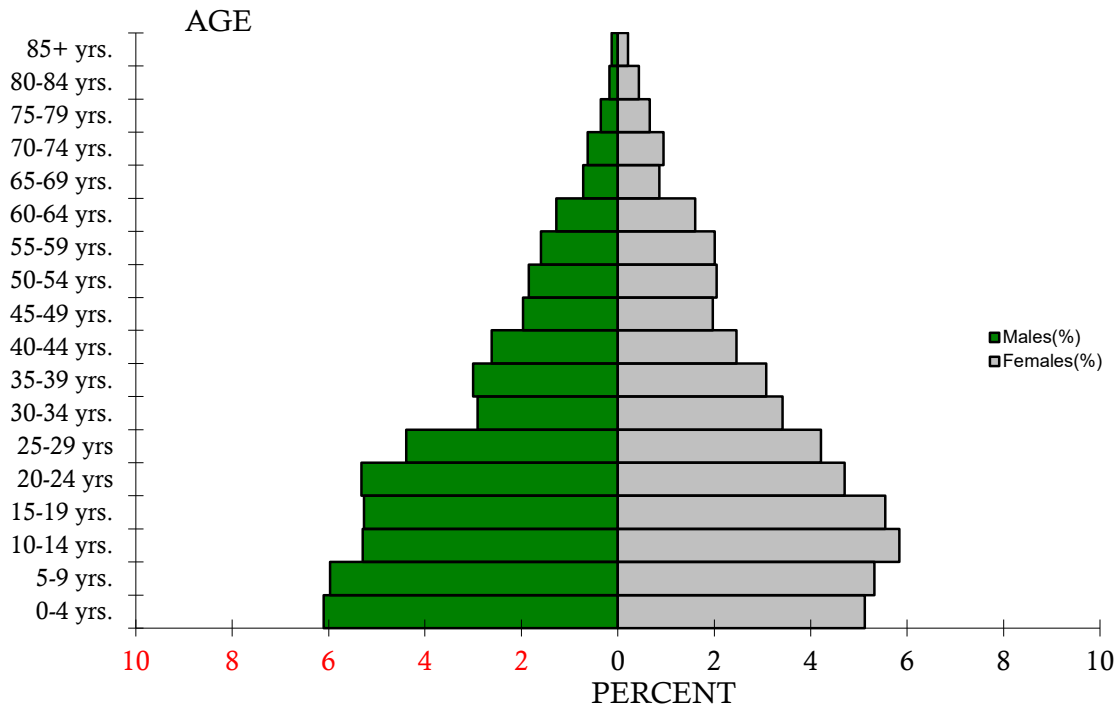
**Household Dynamics**

Households	51 089	40 932
Average household size	3.2	3.5
Female headed households	38.9%	37.8%
Formal dwellings	79.1%	75.3%
Housing owned	49.3%	43.4%

**Household Services**

Flush toilet connected to sewerage	74.3%	70.6%
Weekly refuse removal	62.3%	65.5%
Piped water inside dwelling	50.0%	53.0%
Electricity for lighting	82.4%	74.7%

**Ward 10 Msukaligwa (83002010):** Statistics SA data available for Ward 10 of Msukaligwa LM is only available in respect of Census 2011 data. On this basis, Ward 10 covers an area of 997.3 km<sup>2</sup> and has a population of 8 482 people, resulting in a population density of 8.5/km<sup>2</sup>. The median age of the population is 22 years, with 40.2% being under 18; 54.7% being between 18 and 64 and 5.1% being 65 and over. With a sex ratio of 98.38, there is a marginally higher proportion of females to males across the ward. The population pyramid of Ward 10 is illustrated in **Figure 7**.



Source: (Statistics South Africa, 2011)

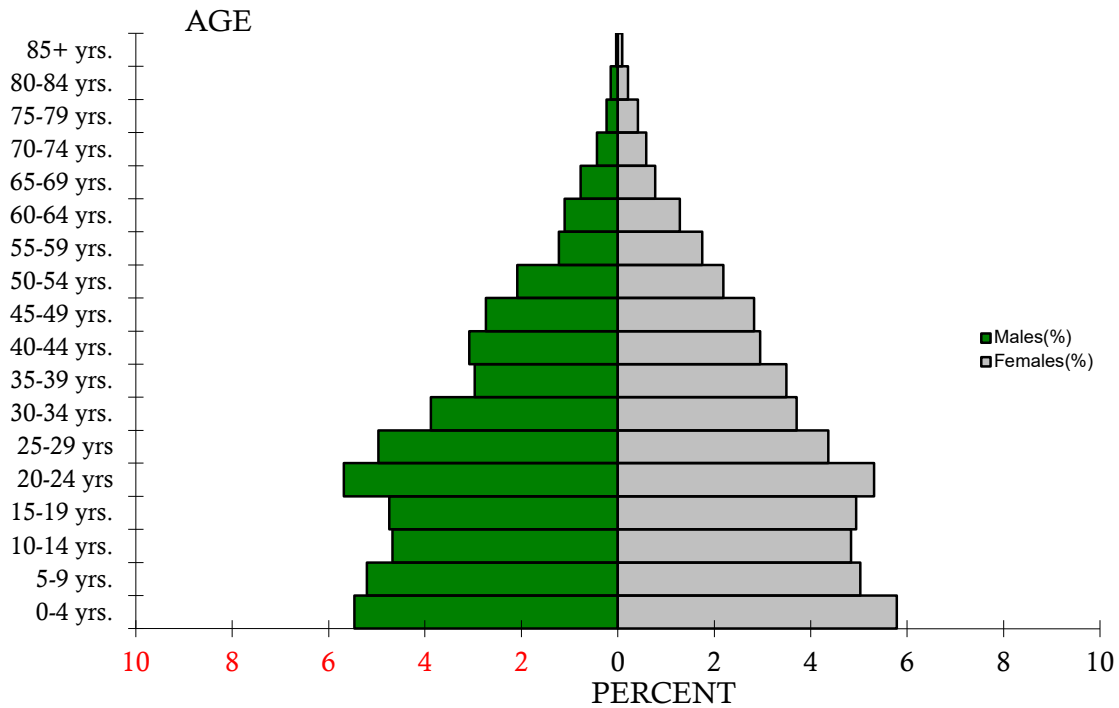
**Figure 7: Population pyramid Ward 10 Msukaligwa LM**

Regarding population group, at 95.6% black African people are the most prevalent population group in the ward followed by white – 3.4%, coloured – 0.8% and Indian or Asian people – 0.1%. At 83% isiZulu is the predominant home language spoken across the ward, followed by Afrikaans at 4.1%, isiNdebele – 4%, both at 4%; SiSwati – 2.1%, and English at 1.8% with Sesotho being at 1.4%. In terms of levels of education, 51.1% of the population has completed Grade 9 or higher and 24.5% have completed Matric or higher with 90.7% of school-aged children, between 5 and 17 years, attending school.

There are 2 193 households within Ward 10 of which 8% live within informal dwellings; 37% of dwellings are fully owned or are being paid off and 23% are occupied rent-free. The average annual household income of the ward is R29 400. Of these households, 68.6% receive water from a regional or local service provider; 71.3% have access to flush or chemical toilets; 50.9% are receiving a refuse disposal service from a local authority or private company, while 43.1% utilise their own refuse dump.

In 2011, 34.6% of the population were employed, of which 49.2% were employed within the formal and 39.9% within the informal sectors.

**Ward 13 Msukaligwa (83002013):** Statistics SA data available for Ward 13 of the Msukaligwa LM is only available regarding Census 2011 data. On this basis, Ward 13 covers an area of 234.8 km<sup>2</sup> and has a population of 8 953 people, resulting in a population density of 38.1/km<sup>2</sup>. The median age of the population is 24 years, with 37.2% being under 18; 59.1% being between 18 and 64 and 3.7% being 65 and over. With a sex ratio of 97.8, there is a slightly higher number of females to males across the ward. The population pyramid of Ward 13 is illustrated in Figure 8.



Source: (Statistics South Africa, 2011)

**Figure 8: Population pyramid Ward 13 Msukaligwa LM**

Regarding population group, at 90.7%, black African people are the most prevalent population group in the ward followed by white – 7.1%, coloured – 1.2% and Indian or Asian people at 0.8%. At 73.3% isiZulu is the predominant home language spoken across the ward, followed by Afrikaans – 7.4%, Siswati – 4.2%, English at 3.7% and isiNdebele at 2.4%. In terms of levels of education, 60.2% of the population has completed Grade 9 or higher and 33.5% have completed Matric or higher, with 92.9% of school-aged children, between 5 and 17 years, attending school.

There are 2 392 households within Ward 13 of which 8% live within informal dwellings; 42.3% of dwellings are fully owned or are being paid off and 11.3% are occupied rent-free. The average annual household income of the ward is R29 400. Of these households 94.2% receive water from a regional or local service provider; 88.9% have access to flush or chemical toilets; 75.8% are receiving a refuse disposal service from a local authority or private company, while 18.2% utilise their own refuse dump.

In 2011, 34.4% of the population were employed, of which 75% were employed within the formal and 8% within the informal sectors.

The project falls in the Msukaligwa Non-Urban (NU) Main Place 861002 from Census 2011. This is a wide region covering all the non-urban areas within the Msukaligwa LM. The demographics pertaining to Msukaligwa (NU) are as follows.

<b>Area</b>	5 910.53 km <sup>2</sup>	
<b>Population</b>	29 429	4.98 per km <sup>2</sup>
<b>Households</b>	6 365	1.08 per km <sup>2</sup>
<b>Gender</b>	<b>People</b>	<b>Percentage</b>
Male	14,797	50.28%
Female	14,632	49.72%
<b>Age</b>		
0–4	3,694	12.55%
5–9	3,423	11.63%
10–14	3,339	11.34%
15–19	3,240	11.01%
20–24	2,878	9.78%
25–29	2,441	8.29%
30–34	1,649	5.60%
35–39	1,672	5.68%
40–44	1,417	4.81%
45–49	1,335	4.54%
50–54	1,173	3.99%
55–59	1,100	3.74%
60–64	764	2.60%
65–69	448	1.52%
70–74	361	1.23%
75–79	231	0.78%
80–84	137	0.47%
85+	131	0.45%
<b>Population group</b>		
Black African	27,787	94.42%
White	1,517	5.15%
Other	60	0.20%
Coloured	47	0.16%
Indian or Asian	17	0.06%
<b>First language</b>		
isiZulu	21,800	74.18%
SiSwati	4,212	14.33%
Afrikaans	1,654	5.63%
isiNdebele	526	1.79%
English	391	1.33%
Setswana	201	0.68%

Sesotho	181	0.62%
isiXhosa	126	0.43%
Sepedi	88	0.30%
Xitsonga	64	0.22%
Other	50	0.17%
Sign language	49	0.17%
Tshivenda	46	0.16%
Not applicable	40	

### 4.3. AFFECTED PROPERTIES

The affected and surrounding properties are:

Farm	Portion	Owner Details	21 digit number
<b>Vogelfontein 245 IS</b>	1	Zwane Samson Boy	T0IS00000000024500001
	5	Steyn Dirk Johannes	T0IS00000000024500005
	6	Transnet Ltd	T0IS00000000024500006
	7	Transnet Ltd	T0IS00000000024500007
	8	Mkwebane Abnon	T0IS00000000024500008
	11	Marais Johan	T0IS00000000024500011
	12	ESCOM	T0IS00000000024500012
	13	Marais Johan	T0IS00000000024500013
	14	Afgri Operations Ltd	T0IS00000000024500014
	15	Afgri Operations Ltd	T0IS00000000024500015
	16	Lurie Alec	T0IS00000000024500016
	17	Transnet Ltd	T0IS00000000024500017
	19	Transnet Ltd	T0IS00000000024500019
	21	Transnet Ltd	T0IS00000000024500021
	23	Transnet Soc Ltd	T0IS00000000024500023
	24	SANRAL	T0IS00000000024500024
	25	SANRAL	T0IS00000000024500025
	26	SANRAL	T0IS00000000024500026
	30	SANRAL	T0IS00000000024500030
	11	Marais Johan	T0IS00000000024500011
32	Volschenk Isabella Maria	T0IS00000000024500032	
<b>Kranspoort 827 IS</b>	RE	Mooivlei Boerdery (Pty) Ltd	T0IS00000000082700000

### 5. CONSULTATION PROCESS

The assessment took place during the height of the third wave of COVID-19, making it irresponsible to undertake a series of face-to-face and group interactions. However, over the last few years, there has been a high level of interaction amongst an array of competent environmentalists and proponents of economic development in the area. This interaction is within the public domain; forming a solid indication of public opinion regarding similar developments in the area, and is discussed below.

## 5.1. ENVIRONMENTAL ACTIVISM IN MPUMALANGA

With the Highveld area of South Africa being associated with an elevated concentration of criteria pollutants, associated with various industrial and mining activities in the region,

The Mpumalanga area has a relatively long history of activism that has risen in response to high levels of air and water pollution and subsequent environmental degradation and risk to human health in the area (Fourie, 2020). As far back as 23 November 2007, a substantial part of the province was included under the Highveld Priority Area (HPA) and given high priority status by the then Minister of Environmental Affairs and Tourism. In 2019, Greenpeace identified the province as having the highest level of sulphur dioxide and nitrogen dioxide immersions in the world (Myllyvirta, 2019). A situation that presents a severe health hazard to the citizens of Mpumalanga and violates their constitutional right to a healthy environment (Williams, 2020). In this regard, the following organisations have been active in the area:

- Centre for Environmental Rights
- Greenpeace
- GroundWork
- Vukani Environmental Justice Movement in Action.

In contrast, the Congress of South African Trade Unions (COSATU) and the Coal Transporters Forum (CTF), have challenged the decommissioning of power stations and mine closures in the province. Both cite the risk this poses to businesses, jobs and the economies of mining towns in the province. COSATU has, however, recognised the delicate balance between environmental sustainability and unemployment with the Union's Parliamentary Coordinator, Matthews Parks, recently making the following statement in Parliament.

*“Both environmental and economic denialism are dangerous and should not be entertained. We think we can and must tackle climate change and unemployment simultaneously. All it requires is creativity, political will, planning and resources”* (Osborne, 2020).

Thus underlying the need for a balanced and responsible approach to the situation from government, industry and environmental activists. A requirement that must be kept in mind throughout this report in an effort to ensure every citizen's “...*right to an environment that is not harmful to their health or wellbeing and to have the environment protected for the benefit of present and future generations.* While at the same time ensuring every citizen's right to participating in the economy and securing a reasonable employment.

## **6. IDENTIFICATION OF POTENTIAL IMPACTS**

The potential social impact variables identified in association with the project are in accordance with Vanclay's list of social impact variables clustered under the following main categories as adapted by Wong (Vanclay, 2002; Wong, 2013) and include;

### **1. Health and social well-being**

- Air quality
- Climate change
- Noise
- Hazard exposure
- Increase in crime
- Increased risk of HIV infections
- Influx of job seekers.

### **2. Quality of the living environment (Liveability)**

- Annoyance factor, access, and disruption of daily living patterns
- Disruptions to social and community infrastructure
- Transformation of the sense of place
- Traffic.

### **3. Economic**

- Job creation and skills development
- Local economic development.

### **4. Cultural**

At a social level, it is likely that any cultural impacts would be associated with sensitive archaeological and/or heritage sites that may be found. In this regard, an archaeological and heritage impact assessment was undertaken and is used as a basis on which to assess this impact.

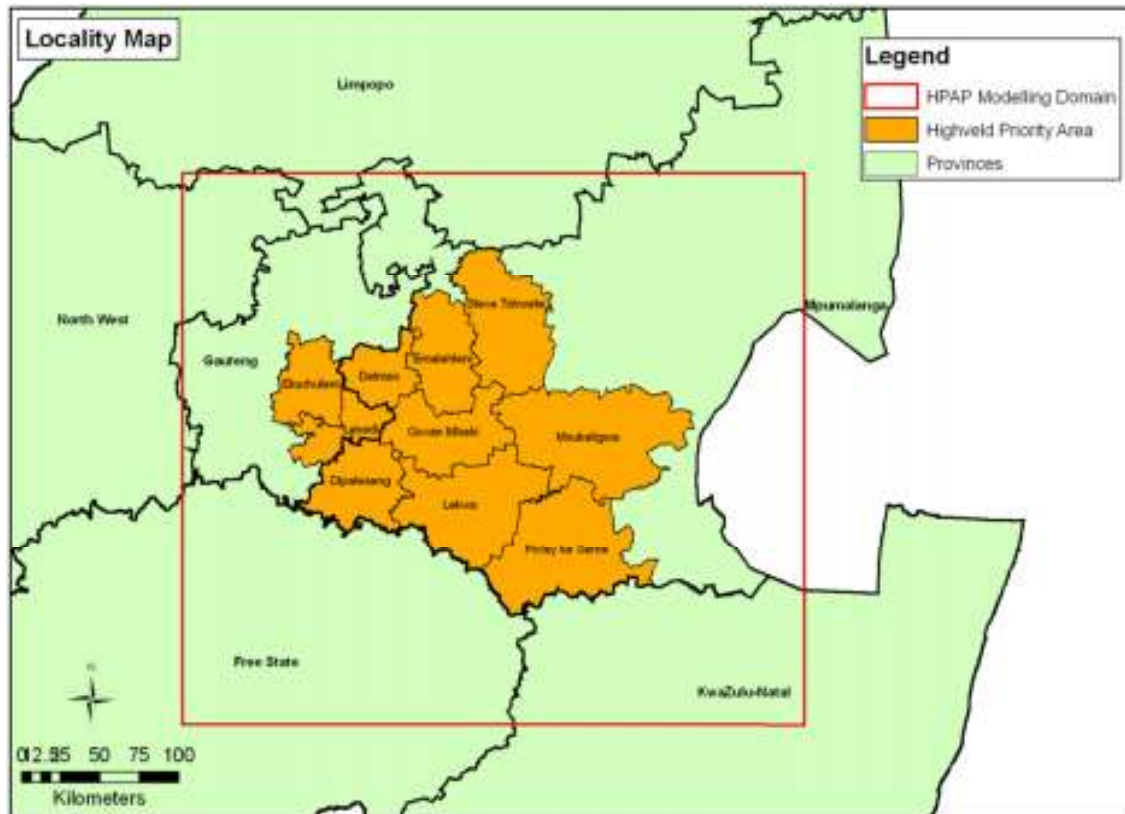
These categories are not exclusive and at times tend to overlap as certain processes may have an impact within more than one category. Most of these impacts listed above will apply to the construction phase of the project and should occur over the short-term.

### **6.1. HEALTH AND SOCIAL WELL-BEING**

The following issues related to the health and social well-being of the surrounding communities have been identified.

### 6.1.1. AIR QUALITY

The project falls within the Highveld Priority Area illustrated in **Figure 9**, and has received the attention of numerous Environmental Activists due to the poor ambient air quality and elevated concentrations of criteria pollutants in the area.



Source: (Department of Environmental Affairs, 2011, p. 1)

**Figure 9: Highveld Priority Area (HPA) Locality Map**

An Ambient Air Quality Impact Study was undertaken for the project in which, amongst the 22 key findings listed, the following points are made.

- *“Recent ambient monitoring data for the area and other national publications confirms the significant contribution of mining, material handling and mobile equipment operation to ambient fine particulate concentrations, correspondingly concluded from the emission inventory conducted for this project.*
- *The incremental impact of all pollutants during construction and rehabilitation is negligible. Current industry standard techniques should be maintained and supplemented with administrative control measures to maintain the residual impact at the nearest sensitive receivers at current background levels.*



- *Ambient monitoring should be used in combination with modelling and emission inventory to assess the effectiveness of control measures at source and receivers, on an annual basis.*
- *Strict monitoring of ambient air quality will assist effective air quality management and open communication to all stakeholders (EHRCON (Pty) Ltd, 2021a, pp. 100-102).*

### **6.1.2. CLIMATE CHANGE**

A Climate Change Impact Assessment was also undertaken for the project in which it is noted that.

*“Vogelfontein Colliery’s GHG emissions although negligible within the global context, will contribute indirectly to global energy related GHG emissions. Due to the global scope and prolonged time frames of GHG emissions, Vogelfontein Colliery’s GHG emissions will contribute to anthropogenic climate change. Climate change is likely to be accelerated and extended as GHG emissions accumulate in the atmosphere [and that].*

*Vogelfontein Colliery should take a proactive approach to climate adaptation for the following reasons:*

- *The supply of critical inputs to mining processes, such as water and energy, is likely to face greater constraints.*
- *Employee health and safety will be put at risk by increases in communicable diseases, exposure to heat-related illnesses and the likelihood of accidents related to rising temperatures.*
- *Obtaining and maintaining a social license to operate will become more difficult in communities in which climate change exacerbates existing vulnerabilities and increased direct competition between the company and the community for resources.*
- *Increased physical and nonphysical risks will make project financing more difficult to secure” (EHRCON (Pty) Ltd, 2021b, p. 49).*

The effects of climate change on humans are most relevant at a cumulative level and include a wide range of risks to both the physical and mental health of the population. These risks may include.

- **Direct**

- Air quality
  - Extreme temperatures
  - Air pollutants.
- Food security
  - Crop yield
  - Dwindling fish supplies
  - Livestock food security
  - Rodent damage.
- Infectious diseases
  - Dengue fever
  - Diarrhoea
  - Malaria
  - Tick-borne diseases.
- Diminished resources such as water
  - Resource conflict.
- Severe weather events
  - Damage to property
  - Displacement
  - Migration.

- **Indirect**

- General ill health
  - Pulmonary diseases
  - Vector-borne diseases
  - Water-borne diseases.
- Heat stress
- Hunger
- Impoverishment
- Psychological
  - Stress
  - Eco-anxiety
  - Eco-grief
  - Eco-anger.

Because of the scale of the issue, it would be beyond the scope of control of individual project developers to assess and address the cumulative impacts that may lead to climate change. Addressing climate change is a collective responsibility, making it more appropriate for the relevant authorities to urgently collaborate in assessing the situation, formulating an action plan, and enforce actions towards mitigating against the effects of climate change.

### **6.1.3. WATER QUALITY**

With the extent of industrial development and mining activities in the area the issue of water pollution is also a concern. In this respect see the comments regarding the impact on climate change under section 6.1.2 Climate Change, immediately above.

### **6.1.4. NOISE**

A Noise Impact Assessment undertaken regarding the project found that;

*“The proposed Vogelfontein Colliery Mine expansion project will be in line with the environmental noise standards and guidelines provided that all the noise mitigatory measures are in place and that the Noise Impact Management Plan (NIMP) and Noise Monitoring Plan (NMP) for Vogelfontein Colliery mine is adhered to.”* (dBAcoustics, 2021, p. 52).

The social assessment of this impact is based on these findings.

### **6.1.5. HAZARD EXPOSURE**

Hazard exposure is associated with the use of heavy equipment and vehicles and an increase in vehicle traffic within the vicinity of the construction site and the operation. The traffic impact assessment indicates that “[t]raffic impact significance scores of 24 and 28 are calculated for the construction and operational phases of the proposed project, respectively, which implies that the project can be authorized from a traffic engineering viewpoint. In addition, construction and operational activities will be confined to the mining rights area which, if granted, will be subject to the mine health and safety regulations which should help reduce the risk of hazard exposure.

There is some risk, particularly during the construction phase, that workers may ignite fires for cooking or warming purposes. To prevent these fires from spreading onto adjoining properties, fire safety protocols need to be put in place. The lighting of fires outside of designated areas needs to be controlled and any ‘hot work’, such as welding, needs to be undertaken with caution. In undertaking ‘hot work’, consideration must be given to weather conditions, such as

the presence of high winds, and any 'hot work' must cease well before leaving the site unattended, particularly at the end of the working day.

### **6.1.6. INCREASE IN CRIME**

The project falls within the Breyten Police Precinct which had a total of 365 reported crimes in 2020<sup>3</sup>. As the project will be confined to the mining area, it is most unlikely to result in any significant increase in crime over both the construction and operational phases.

### **6.1.7. INCREASED RISK OF HIV INFECTIONS**

The HIV prevalence rate amongst antenatal women in the Gert Sibande district is relatively high at 41,4%. With such a high prevalence rate in the area, and considering that the bulk of the workforce will be locally recruited, it is unlikely that the project will result in any significant increase in the risk of HIV infections in the area. Notwithstanding this, however, it is recognised that sexually transmitted diseases tend to be spread by construction and transport workers (Singh & Malaviya, 1994; Ramjee & Gouws, 2002; Meintjes, Bowen, & Root, 2007; World Bank Group, 2016; Bowen, Dorrington, Distiller, Lake, & Besesar, 2008; Bowen P. , Govender, Edwards, & Cattell, 2016; Kikwasi & Lukwale, 2017; Bowen P. , Govender, Edwards, & Lake, 2018). Consequently, the risk of HIV infection would be highest during the construction phase of the project, as the construction workforce increases, and materials and equipment are delivered to the site. However, because of the limited nature of the project, relatively small workforce and high prevalence level within the district, the risk of spreading HIV will remain limited across both the construct and operational phases of the project.

Despite this limited risk, it remains important to note the high level of HIV infections in the area and to ensure that the company installs an HIV/AIDS workplace policy. The function of the policy is to provide at least a basic framework for company action to reduce the spread and manage the impacts of HIV/AIDS.

### **6.1.8. INFLUX OF JOB SEEKERS**

It is likely that the expansion of mining activities will result in an influx of job seekers. This can be mitigated to within acceptable levels by recruiting from amongst the local communities as far as is possible. No employees will be housed at the mine. Most of the workers come from the neighbouring towns of Bethal, Carolina Ermelo and Hendrina.

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<sup>3</sup> Crime Stats SA <https://www.crimestatssa.com/>

### **6.1.9. QUALITY OF THE LIVING ENVIRONMENT (LIVEABILITY)**

The quality of the living environment of the surrounding communities is likely to be affected by the following issues related to the construction and operation of the project.

- Annoyance factor, access, and disruption of daily living patterns
- Disruptions to social and community infrastructure
- Transformation of the sense of place
- Traffic.

### **6.1.10. ANNOYANCE FACTOR, ACCESS, AND DISRUPTION OF DAILY LIVING PATTERNS**

Expansion activities are restricted to the existing authorised mining rights area, which should cause minimal disruption during both the construction and operational phases of the project. The traffic assessment also predicts a low level of traffic disruption over both the construction and operational phases of the project, see the discussion under 6.1.13 Traffic below and the traffic impact assessment report.

### **6.1.11. DISRUPTIONS TO SOCIAL AND COMMUNITY INFRASTRUCTURE**

The project is contained within a restricted area and the construction and operational work forces will be recruited from neighbouring communities, which will minimise any risk to social and community infrastructure in the area. The traffic assessment shows that access to the mine will be gained through a new access road at the existing intersection between the N11 and Road D1217 and that there are no vulnerabilities or sensitivities in the defined study area concluding *...that the proposed project will have an insignificant traffic impact on the surrounding road network* (SA Traffic Surveys (Pty) Ltd, 2021, pp. 10-11).

### **6.1.12. TRANSFORMATION OF THE SENSE OF PLACE**

Sense of place is a social phenomenon encompassing a wide range of uniquely interpreted human experiences based on a range of criteria (Tuan, 1980; Blake, 2002; Derr, 2002; Stedman, 2003). These criteria may include the vista, geography, urban layout, flora and fauna, community, history and fragrance of a place amongst many others, and are uniquely interpreted on an individual basis. Some individuals may embrace changes to the sense of place that others may reject and, for some, it may merely be a change in the demographics of an area that leaves them feeling threatened, vulnerable and insecure. Groups and group

membership can help to reinforce the sense of place of an area and can also reinforce fears and suspicions associated with pending changes to the sense of place. A sense of place has much to do with unique individual perceptions attached to the location and is subjective by nature.

The mine is on agricultural land used for commercial purposes and takes on somewhat of an industrial character because of previous mining activities. On a broader scale there are a few scattered human settlements, towns and agricultural communities in the area with mining being prominent and adding to the degraded character of the area. With the proposed mining activities being confined with activities being largely underground, the transformation of the sense of place of the area is likely to be limited.

One element effecting the sense of place is the visual. In this regard, a visual impact assessment was undertaken which considered the visual effect over both the construction and operational phases of the project on the following receptors,

- residents
- tourists and
- motorists.

The finding of this study showed that, after mitigation, the visual impact regarding residents is likely to be medium, while it is likely to be low for both tourists and motorists (Outline Landscape Architects cc, 2021, p. 33).

### **6.1.13. TRAFFIC**

According to the traffic assessment, it is estimated that during construction the mine is likely to generate 56 am and 56 pm daily peak hour traffic trips. Over the operational phase of the mine, it is likely to generate 51 am and 51 pm daily peak hour traffic trips. Considering this, the traffic assessment found the traffic impact, over both the construction and operational phases, to be of low significance with respective scores of 24 and 28 (SA Traffic Surveys (Pty) Ltd, 2021).

## **6.2. ECONOMIC**

It is likely that the project will result in the following economic benefits:

- Job creation and skills development
- Local economic development.

### 6.2.1. JOB CREATION AND SKILLS DEVELOPMENT

Over the construction phase, the project will lead to the creation of both direct and indirect jobs. It is estimated that the full production capacity of 60 000 R.O.M tonnes per month, per seam, can be realised over a six-month period.

In respect of the operational phase, Vogelfontein Colliery plans to utilise contract mining and exclusively operate underground for a production period of 8 to 12 years at a production capacity of between 120 Kt and 150 Kt ROM. Total personnel expenditure, with 37 permanent employees, is estimated at R11 538 000 for the first year and with 163 subcontracted employees at R63 588 787 for the first year. Financial provision for the implementation of the Human Resources Development Program is illustrated in Table 3.

**Table 3: Financial provision for the implementation of the HRD Program**

HRD Budget	Forecast					Total
	YEAR 1	YEAR 2	YEAR 3	YEAR 4	YEAR 5	
ABET Training	R80 000	R80 000	R80 000	R80 000	R80 000	R320 000
Technical/Safety Training	R500 000	R500 000	R500 000	R500 000	R500 000	R2 500 000
Operator Training (Community)	R300 000	R300 000	R300 000	R300 000	R300 000	R1 500 000
Bursaries	R200 000	R200 000	R200 000	R200 000	R200 000	R1 000 000
Lnr ships/Apprentice	R100 000	R100 000	R100 000	R100 000	R100 000	R500 000
Internships	R50 000	R50 000	R50 000	R50 000	R50 000	R250 000
<b>BUDGET ESTIMATE</b>	<b>R1 230 000</b>	<b>R1 230 000</b>	<b>R1 230 000</b>	<b>R1 230 000</b>	<b>R1 230 000</b>	<b>R6 150 000</b>

Source: Grammatikos Construction & Mining cc Mining Works Programme

## 6.2.2. LOCAL ECONOMIC DEVELOPMENT

The estimated initial capital expenditure of the project, as provided by Grammatikos Construction & Mining CC, is indicated in Table 4.

**Table 4: Initial capital expenditure**

Capital Requirements	Total
Land And MR Acquisition	18 000 000
Shaft Access Via A 9°, 450m Decline Shaft	16 000 000
Ventilation Up-Cast Shaft	15 000 000
Contractors Yard	150 000
Access Roads And Haul Roads	750 000
Rehab Guarantee	6 284 624
Underground Change House Facilities	1 500 000
Shaft Portal Establishment	1 700 000
Main Shaft Conveyor	3 375 000
Stockpile Loading Facility	1 200 000
Crushing Plant & Accessories	8 500 000
Pollution Control Facilities	1 750 000
Site Establishment	1 500 000
Industrial Access Main Road	5 000 000
Electrical Reticulation Underground	15 000 000
Ventilation Fans Underground	1 200 000
Fencing & Access Control Around Property	700 000
Mobile Offices And Change Houses	250 000
Water Accumulation Tanks For Underground Facilities	850 000
Weighbridge Control Room 40 M <sup>2</sup>	250 000
Weighbridge Dual System (Excluding Civil Works)	550 000
Stockpile Pre-Qualification Arrangement	2 500 000
Workshop Area	450 000
Tib X 1	2 500 000
Loaders X 2	9 000 000
Truck 20 Ton X 1	4 500 000
<b>Total Capital Required Plus 15% Contingency</b>	<b>110 083 750</b>
<b>Total R/Ton Capital Cost</b>	<b>12.41</b>

Source: Grammatikos Construction & Mining cc Mining Works Programme



Social Impact Assessment for the proposed Vogelfontein Colliery Msukaligwa Local Municipality  
Mpumalanga Province

The operating cost forecast for the first 10 years of the project, excluding the processing plant and labour, are illustrated in Table 5 and processing plant, excluding labour, in Table 6.

**Table 5: Operating cost forecast– first 10 years**

COST CATEGORY	YEAR 1	YEAR 2	YEAR 3	YEAR 4	YEAR 5	YEAR 6	YEAR 7	YEAR 8
Incentive Cost	910 000	2 920 000	2 920 000	2 920 000	2 920 000	2 920 000	2 920 000	2 920 000
Direct Mining Cost	15 000 000	120 590 718	120 590 718	120 590 718	173 643 609	173 643 609	173 643 609	173 643 609
Engineering Direct Costs	11 491 480	36 873 760	36 873 760	36 873 760	36 873 760	36 873 760	36 873 760	36 873 760
Total Development Cost	6 156 150	19 753 800	19 753 800	19 753 800	19 753 800	19 753 800	19 753 800	19 753 800
Brushing and Occasional Blasting	4 954 950	15 899 400	15 899 400	15 899 400	15 899 400	15 899 400	15 899 400	15 899 400
Total Sundry Cost	4 485 507	5 667 167	5 667 167	5 667 167	5 667 167	5 667 167	5 667 167	5 667 167
Engineering Overheads	5 055 050	16 220 600	16 220 600	16 220 600	16 220 600	16 220 600	16 220 600	16 220 600
Mining Working Cost Suspense	2 652 650	8 511 900	8 511 900	8 511 900	8 511 900	8 511 900	8 511 900	8 511 900
Engineering Working Cost Suspense	1 751 750	5 621 000	5 621 000	5 621 000	5 621 000	5 621 000	5 621 000	5 621 000
Insurance and Risk Margin	705 250	2 263 000	2 263 000	2 263 000	2 263 000	2 263 000	2 263 000	2 263 000
Capital & Finance Cost	3 600 000	30 052 891	30 052 891	30 052 891	-	-	-	-
Project Management Fee	6 825 000	21 900 000	21 900 000	21 900 000	21 900 000	21 900 000	21 900 000	21 900 000
<b>TOTAL COST</b>	<b>63 585 787</b>	<b>286 274 136</b>	<b>286 274 136</b>	<b>286 274 136</b>	<b>309 274 136</b>	<b>309 274 136</b>	<b>309 274 136</b>	<b>309 274 136</b>

Source: Grammatikos Construction & Mining cc Mining Works Programme

**Table 6: Operating cost forecast processing plant– first 10 years**

COST CATEGORY	YEAR 1	YEAR 2	YEAR 3	YEAR 4	YEAR 5	YEAR 6	YEAR 7	YEAR 8
Fuel for Processing	6 570 180	6 570 180	6 570 180	6 570 180	6 570 180	6 570 180	6 570 180	6 570 180
Electricity Crushing Plant	1 766 728	1 766 728	1 766 728	1 766 728	1 766 728	1 766 728	1 766 728	1 766 728
Water Dust Suppression	600 000	600 000	600 000	600 000	600 000	600 000	600 000	600 000
Replacement Parts: Segments, belting, screens etc.	750 000	750 000	750 000	750 000	750 000	750 000	750 000	750 000
Crushing Cost @ R18 / Feed Ton	8 190 000	26 280 000	28 080 000	28 080 000	28 080 000	28 080 000	28 080 000	24 646 095
Screening @ R15 / Feed Ton	4 550 000	14 600 000	15 600 000	15 600 000	15 600 000	15 600 000	15 600 000	13 692 275
Coal Handling @ R8.5 / Ton	2 957 500	9 490 000	10 140 000	10 140 000	10 140 000	10 140 000	10 764 000	9 447 670
<b>TOTAL COST</b>	<b>25 384 408</b>	<b>69 056 908</b>	<b>63 506 908</b>	<b>63 506 908</b>	<b>63 506 908</b>	<b>63 506 908</b>	<b>64 130 908</b>	<b>57 472 948</b>

Source: Grammatikos Construction & Mining cc Mining Works Programme

The financial provision for the implementation of the mine's Local Economic Development Program is illustrated in Table 7.

**Table 7: Financial provision for the implementation of the LED Program**

Activity	YEAR 1	YEAR 2	YEAR 3	YEAR 4	YEAR 5	Total
Infrastructure project.	R250 000	R250 000	R250 000	R250 000	R250 000	R1 250 000
Enterprise development	R250 000	R250 000	R250 000	R250 000	R250 000	R 1 250 000
<b>BUDGET ESTIMATE</b>	<b>R500 000</b>	<b>R500 000</b>	<b>R500 000</b>	<b>R500 000</b>	<b>R500 000</b>	<b>R 2 500 000</b>
<b>TOTAL SLP BUDGET ESTIMATE</b>	<b>R 1 730 000</b>	<b>R 1 730 000</b>	<b>R 1 730 000</b>	<b>R 1 730 000</b>	<b>R 550 000</b>	<b>R 7 470 000</b>

Source: Grammatikos Construction & Mining cc Mining Works Programme

### 6.2.3. CULTURAL

Cultural impacts are associated with the deterioration of archaeological and heritage sites, such as burial grounds. A heritage assessment was undertaken during the scoping phase and no such sites were identified, as the project is within an area used for crop farming and has been disturbed.

## 7. IMPACT ASSESSMENT

### 7.1. PLANNING AND DESIGN PHASE

It is evident that in certain respects, associated with national, provincial and municipal policy and legislation, the project fits with the intention to grow the economy over the short to medium-term and to create job opportunities. The urgency of economic development and job creation is even more relevant under the current economic crisis; a situation aggravated by the COVID-19 pandemic.

In contrast, the project clashes with an urgent need to arrest the current environmental degradation of the area, and to increase the chances of future populations being able to enjoy their constitutional right to a clean and healthy environment. From a planning and design perspective, it is important to note this and to incorporate these needs into the planning, design, construct, operational and decommissioning phases of the project.

## 7.2. CONSTRUCTION PHASE

Most of the impacts discussed above apply over the short-term to the construction phase of the project and include:

- Air quality
- Noise and vibration
- Hazard exposure
- Increase in crime
- Increased risk of HIV infections
- Influx of job seekers
- Annoyance factor, access, and disruption of daily living patterns
- Disruptions to social and community infrastructure
- Transformation of the sense of place
- Traffic
- Job creation and skills development
- Local economic development.

In this respect, the construction phase of the project is assessed with optimisation and mitigation measures being suggested in **Table 8**.

## 7.3. OPERATIONAL PHASE

The social impacts that apply to the operational phase of the project are:

- Air quality
- Climate change
- Noise and vibration
- Hazard exposure
- Increase in crime
- Increased risk of HIV infections
- Influx of job seekers
- Annoyance factor, access, and disruption of daily living patterns
- Disruptions to social and community infrastructure
- Transformation of the sense of place
- Traffic
- Job creation and skills development
- Local economic development.

The impacts associated with the operational phase of the project are assessed with suggested mitigation and optimisation measures being presented in **Table 8**.

#### **7.4. DECOMMISSIONING PHASE**

Considering the time between compiling this report and the final decommissioning of the mine, which will probably extend beyond 2031, thus amounting to over 9 years, it would be quite meaningless to attach assessment criteria to the decommission phase of the project. Considering that decommissioning will only occur after 9 years, it is most likely that the social dynamics of both the country and the regional area surrounding the project will be significantly different. It is most important to recognise the devastating effects that mine closure will have on those communities reliant on a mine based income, both direct and indirect, and to consider the following mitigation measures.

##### **Decommissioning mitigation measures**

- Ensure that a retrenchment package is in place.
- Ensure that staff have been trained to provide them with marketable skills within the job market.
- Consider the possibility of repurposing existing mine infrastructure in partnership with affected communities.
- Ensure that the site is responsibly rehabilitated and left in a safe condition.

#### **7.5. ASSESSMENT OF 'NO GO' ALTERNATIVE**

The 'no go' alternative would mean that the social environment is not affected as the status quo would remain. On a negative front, it would also mean that all positive aspects associated with the project would not materialise with no job creation and no revenue stream into the local economy. There are both positive and negative impacts associated with the 'no go' alternative that are extremely difficult to assess. The loss of job opportunities and a revenue stream is likely to last over the medium term while the environmental, health and sustainable livelihood damage that the project may cause is likely to extend over a far longer period.

#### **7.6. CUMULATIVE IMPACT**

Cumulative impacts cannot be addressed in isolation and need a concerted effort on all fronts to make any headway in mitigating against the impact of multiple developments across the region. As Dong-Kwan Kim pointed out in an article, which formed part of the World Economic

Forum Annual Meeting in 2020; cross-sector collaboration is becoming imperative in driving the global climate agenda.

- *“Collaboration across sectors is crucial in the fight against climate change.*
- *Strong partnerships can unlock the potential of climate-friendly technology.*
- *Working together is no longer optional - it is an imperative.*

*Partnerships between governments, the private sector, multilateral institutions and civil society will be essential to ensure we meet the UN Sustainable Development Goals (SDG) and the Paris Climate Agreement targets” (Kim, 2020).*

The effects of cumulative impacts need to be considered along similar lines. It is with this in mind that the cumulative impact of the project, as associated with other developments in the area, is assessed in **Table 8**.

**Table 8: Impacts and mitigation measures**

Environmental Parameter	Impacts	Before Mitigation							Recommended Mitigation Measures to be included in the EMPr	After Mitigation						
		Status	Extent	Duration	Magnitude	Probability	Significance	Significance Rating		Status	Extent	Duration	Magnitude	Probability	Significance	Significance Rating
<b>Construction Phase</b>																
Health and social well-being	Air quality	Neg	3	3	6	4	48	M	<p>Where appropriate apply dust suppression measures on a regular basis. Ensure that vehicles used to transport sand and building materials are fitted with tarpaulins or covers.</p> <p>Put in place a monitoring system to monitor health risks throughout the life of the Project.</p> <p>Appoint a community liaison officer to deal with complaints and grievances from the public.</p> <p>Follow the Air Quality Management Approach recommended in the Air Quality Impact Assessment and ensure that. "Vogelfontein Colliery's vision and policy on air quality management should essentially reflect the vision, principles and approach defined in the National Air Quality Management Plan (NAQMP)".</p>	Neg	3	3	4	4	40	M
	Noise and vibration	Neg	2	2	4	3	24	L	<p>Maintain all vehicles and construction machinery to ensure the noise levels do not cause unnecessary and avoidable nuisance to the workforce and local communities.</p> <p>Noise attenuation structures should be employed to minimise operational noise levels in areas where this is identified as problematic.</p> <p>Blasting activities should be undertaken at specific agreed upon times to minimise disturbances.</p> <p>Follow the mitigation measures suggested by the noise and vibration quality specialist.</p>	Neg	2	2	4	3	24	L
	Hazard exposure	Neg	2	2	5	4	36	M	<p>During construction, the sites should be fenced off to prevent access.</p>	Neg	2	2	4	4	32	L

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									<p>Fencing should be inspected on a regular basis and properly maintained by the contactor.</p> <p>Ensure that the appropriate warning signs are erected on all boundary fences cautioning against entering the construction area.</p> <p>Ensure all construction equipment and vehicles are properly maintained at all times.</p> <p>Ensure that operators and drivers are properly trained and make them aware, through regular toolbox talks, of any risk they may pose to the community. Place specific emphasis on the vulnerable sector of the population, such as children and the elderly.</p> <p>Ensure that fires lit by construction staff are only ignited in designated areas and that the safety precautions, such as not lighting fires in strong winds and completely extinguishing fires before leaving them unattended, are strictly adhered to.</p> <p>Make staff aware of the dangers of runaway fire during regular tool box talks.</p>							
Increase in crime	Neg	2	2	2	2	12	L	<p>All workers should carry identification cards and wear identifiable clothing.</p> <p>Fence off the construction site and control access to the site.</p> <p>Encourage local people to report any suspicious activity associated with the construction site to the security company.</p> <p>If applicable, liaise with the Community Policing Forums within the vicinity of the mine.</p>	Neg	2	2	2	2	12	L	
Increased risk of HIV infections	Neg	3	2	2	2	14	L	<p>Ensure that an onsite HIV and AIDS policy is in place and that construction workers are exposed to a health and HIV/AIDS awareness educational programme within the first month of construction.</p>	Neg	3	2	2	2	14	L	

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									Provide voluntary and free counselling, free testing and condom distribution services to the workforce.  Where feasible extend the HIV/AIDS programme into the community with a specific focus on schools and youth clubs.							
<b>Health and social well-being</b>	Influx of job seekers	Neg	3	2	2	2	14	L	Communicate, through Community Leaders and Ward Councillors, the situation regarding job opportunities created by the project.  Develop and implement a local procurement policy which prioritises 'locals first' to prevent the movement of people into the area in search of work.  Draw up a recruitment policy in conjunction with Community Leaders and Ward Councillors and ensure compliance with this policy.	Neg	3	2	2	2	14	L
<b>Quality of the living environment (Liveability)</b>	Annoyance factor, access, and disruption of daily living patterns	Neg	2	2	4	3	24	L	All vehicles must be road worthy and drivers must be qualified, obey traffic rules, follow speed limits and be made aware of the potential road safety issues.  Heavy vehicles should be inspected regularly to ensure their road worthiness.	Neg	2	2	4	2	16	L
	Disruptions to social and community infrastructure	Neg	3	2	4	3	27	L	Regularly monitor the effect that the construction activities are having on public infrastructure and immediately report any damage to infrastructure to the appropriate authority.	Neg	3	2	4	2	18	L
	Transformation of the sense of place	Neg	2	2	4	4	32	M	Apply the mitigation measures suggested by the visual impact specialist.  The mitigation measures recommended in the Heritage Impact Assessment should be followed.	Neg	2	2	4	4	32	M
	Traffic	Neg	2	2	2	2	12	L	Implement the mitigation measures suggested by the traffic specialist.	Neg	2	2	2	2	12	L
<b>Economic</b>	Job creation and skills development	Pos	3	2	5	5	50	M	Wherever feasible, local residents should be recruited to fill jobs.  Women should be given equal employment opportunities and encouraged to apply for positions.  A skills transfer plan should be put in place at an early stage and workers should be given the opportunity to	Pos	3	2	6	5	55	M



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									develop skills which they can use to secure jobs elsewhere post-construction.							
<b>Economic</b>	Local economic development	Pos	3	2	5	4	40	M	A procurement policy promoting the use of local business should, where possible, be put in place to be applied throughout the construction phase.  Implement a monitoring system to ensure that Vametco and other contractors honour the local SMME recruitment preference policy.	Pos	3	2	6	4	44	M
<b>Cultural</b>	A heritage assessment was undertaken during the scoping phase and no such sites were identified, as the project is within an area used for crop farming and has been disturbed.															
<b>Operational Phase</b>																
<b>Health and social well-being</b>	Air quality	Neg	3	4	5	4	48	M	Where appropriate, apply dust suppression measures on a regular basis. Ensure that vehicles used to transport materials are fitted with tarpaulins or covers.  Put in place a monitoring system to monitor health risks throughout the life of the project.  Appoint a community liaison officer to deal with complaints and grievances from the public.  Follow the Air Quality Management Approach recommended in the Air Quality Impact Assessment and ensure that. "Vogelfontein Colliery's vision and policy on air quality management should essentially reflect the vision, principles and approach defined in the National Air Quality Management Plan (NAQMP)".	Neg	3	4	5	4	48	M
	Climate change	Neg	5	5	4	5	70	H	Follow the recommendations in the Climate Change Impact Assessment Report in taking a proactive approach to climate adaption.	Neg	5	5	4	5	70	H
	Noise and vibration	Neg	2	2	4	3	24	L	Maintain all vehicles and construction machinery to ensure the noise levels do not cause unnecessary and avoidable nuisance to the workforce and local communities.  Noise attenuation structures should be employed to minimise operational noise levels in areas where this is identified as problematic.  Blasting activities should be undertaken at specific agreed upon times to minimise disturbances.	Neg	2	2	4	3	24	L

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									Follow the mitigation measures suggested by the noise and vibration quality specialist.							
Hazard exposure	Neg	2	4	5	4	44	M	<p>Ensure that the appropriate warning signs are erected on all boundary fences cautioning against entering the area.</p> <p>Ensure all operational equipment and vehicles are properly maintained at all times.</p> <p>Ensure that operators and drivers are properly trained and are aware of any risk they may pose to the community. Place specific emphasis on the vulnerable sector of the population such as children and the elderly.</p>	Neg	2	4	4	3	30	M	
Increase in crime	Neg	2	4	2	2	16	L	<p>All workers should carry identification cards and wear identifiable clothing.</p> <p>Encourage local people to report any suspicious activity associated with the mine to the mine security office.</p> <p>If applicable, liaise with the Community Policing Forums within the vicinity of the mine.</p>	Neg	2	4	2	2	16	L	
Increased risk of HIV infections	Neg	3	4	2	2	18	L	<p>Ensure that an onsite HIV and AIDS policy is in place and that construction workers are exposed to a health and HIV/AIDS awareness educational programme.</p> <p>Provide voluntary and free counselling, free testing and condom distribution services to the workforce.</p> <p>Where feasible, extend the HIV/AIDS programme into the community with a specific focus on schools and youth clubs.</p>	Neg	3	4	2	2	18	L	
Influx of job seekers	Neg	2	2	2	2	12	L	<p>Communicate, through Community Leaders and Ward Councillors, the situation regarding job opportunities created by the project.</p> <p>Draw up a recruitment policy in conjunction with Community Leaders and Ward Councillors and ensure compliance with this policy.</p> <p>Cooperate with local authorities to ensure all legislation preventing illegal settlement is enforced at all times.</p>	Neg	2	2	2	2	12	L	

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Quality of the living environment (Liveability)	Annoyance factor, access, and disruption of daily living patterns	Neg	2	2	4	2	16	L	All vehicles must be roadworthy and drivers must be qualified, obey traffic rules, follow speed limits and be made aware of the potential road safety issues. Heavy vehicles should be inspected regularly to ensure their road worthiness.	Neg	2	2	3	2	14	L
	Disruptions to social and community infrastructure	Neg	2	4	4	2	20	L	Regularly monitor the effect that operational activities are having on public infrastructure and immediately report any damage to infrastructure to the appropriate authority.	Neg	2	4	2	2	16	L
Quality of the living environment (Liveability)	Transformation of the sense of place	Neg	2	2	4	4	32	M	Apply the mitigation measures suggested by the visual impact specialist.	Neg	2	2	4	4	32	M
	Traffic	Neg	2	4	2	2	16	L	Implement the mitigation measures suggested by the traffic specialist.	Neg	2	4	2	2	16	L
Economic	Job creation and skills development	Pos	3	3	5	5	55	M	Wherever feasible, recruit local residents to fill jobs. Women should be given equal employment opportunities and encouraged to apply for positions.	Pos	3	3	5	5	55	M
	Local economic development	Pos	4	4	6	4	56	M	A procurement policy promoting the use of local business should, where possible, be put in place. Implement a monitoring system to ensure that Vametco and other contractors honour the local SMME recruitment preference policy.	Pos	4	4	6	4	56	M
Cultural	A heritage assessment was undertaken during the scoping phase and no such sites were identified, as the project is within an area used for crop farming and has been disturbed.															

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**Decommissioning Phase**

The project is likely to extend over a limited period with decommissioning predicted to take place in 2031. It would be quite meaningless to attach assessment criteria to the decommission phase of the project as, by the time decommissioning occurred, it would be most likely that the social dynamics of both the country and the regional area surrounding the project will have significantly changes.

It is, however, most important to recognise the devastating effects that mine closure will have on those communities reliant on a mine based income, both direct and indirect, and to consider the following mitigation measures

Ensure that a retrenchment package is in place.

Ensure that staff have been trained in a manner that would provide them with saleable skills within the job market.

Consider the possibility of repurposing existing mine infrastructure in partnership with affected communities.

Ensure that the site is responsibly rehabilitated and left in a safe condition.

**Cumulative Impacts**

<b>Environment</b>	Air pollution Biodiversity Climate change Noise pollution Water pollution	Neg	3	5	8	5	80	H	<p>It remains beyond the scope of a single industrial establishment to be able to address the cumulative impacts of developments in the area. Any meaningful attempt in addressing cumulative impacts would require an interdisciplinary and multi-agency approach. It would be important to identify hotspots and critical environmental and community health issues in the broader area. Following which, a strategy would need to be established to address, monitor and enforce appropriate interventions to ensure a healthy living environment for citizens, with emphasis on protecting vulnerable populations.</p> <p>Any mitigation and optimisation measures would need to be considered on a cumulative basis and applied across all developments in the area. They would also need to be based on a sound understanding of the current regional state of the environment and based on robust scientific grounds.</p>
<b>Health</b>	Respiratory problems Sexually transmitted disease Water borne illnesses	Neg	3	5	8	5	80	H	
<b>Infrastructure</b>	Damage to roads Inadequate educational facilities Inadequate health facilities	Neg	3	5	8	5	80	H	
<b>Safety hazards</b>	Blasting activities Heavy haulage vehicles	Neg	3	5	8	5	80	H	
<b>Transformation of sense of place</b>	Abandoned mines Devaluation of surrounding farmland Environmental damage Industrial expansion Informal settlements Loss of agricultural land Reduction in tourism Population growth Visual impact.	Neg	3	5	8	5	80	H	
<b>Economic</b>	Job creation and skills development Local economic development.	Pos	4	4	8	5	80	H	

## 8. DISCUSSION

The adverse affects of coal mining on public health and the environment has for some time been well documented and needs to be noted (Fourie, 2020; Gasparotto, Juciano; Da Boit Martinello, Kátia, 2021; Harrisa, McManus, Sainsbury, Viliani, & Emily, 2021; Hendryx & Ahern, 2008; Leonard, Zulfikar, & Stansbury, 2020; Morrice & Colagiur, 2013; Osborne, 2020). Although the project will lead to the creation of jobs over the medium term, it is also likely to result in a high risk to the environment over the longer term<sup>4</sup>. This will be exacerbated on a cumulative basis considering the extent of development across the region. The community benefits associated with coal mining become less desirable when external factors associated with the activity are factored in (De Valck, Williams, & Kuika, 2021).

In this sense the creation of jobs due to coal mining must be considered against the context of environmental damage, global warming and the resultant health risks faced by local communities. Poor community health, because of climate risk and environmental degradation, can lead to premature mortality rates, a loss of household income and results in a cycle of poverty amongst rural communities (Pillay-van Wyk & Bradshaw, 2017; Hansen, et al., 2019). As Shongwe points out:

*“Although South Africa has advanced policies and regulations, designed to protect the environment and people living in mining communities, governance and implementation remains problematic and highly contentious. This, coupled with inadequate consultation and communication with communities, has led to a situation which is dominated by highly politicised agendas with little factual basis or stakeholder co-operation”* (Shongwe, 2017, p. 88).

With this in mind, it is important that developers consider outcomes that reach beyond the operational life of the mine and leave a positive legacy; with some value being added to the lives of local communities (Franks, 2012, p. 8). If this could be achieved, it may mitigate somewhat against current environmental damage, however; despite the damage and associated health risks identified over several years in the area, there is little evidence of either the political or corporate will to address these concerns.

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<sup>4</sup> See for instance Environmental Monitoring Group, 2010; Kekana, 2018; Gray H, 2019; Laisani & Jegede, 2019; SAnews.gov.za, 2019; Vlavianos, 2019; West, 2019; Adesinal, Pikethl, Qhekwanal, Language, & Mkhathswall, 2020; Gilder & Rumble, 2020; Makoni, 2020; amongst many others.

Apart from this, and with respect to the legislative and policy fit of the project, it would be important that the six principles, as laid out in the **Mining and Biodiversity Guideline: Mainstreaming biodiversity into the mining sector** and listed below are applied to the project.

- “1. Apply the law*
- 2. Use the best available biodiversity information*
- 3. Engage stakeholders thoroughly*
- 4. Use best practice environmental impact assessment (EIA) to identify, assess and evaluate impacts on biodiversity*
- 5. Apply the mitigation hierarchy in planning any mining-related activities and to develop robust environmental management programmes (EMP)*
- 6. Ensure effective implementation of the EMP, including adaptive management”<sup>5</sup>.*

## **9. CONCLUSION AND RECOMMENDATIONS**

The Climate Impact Assessment rated the effects of the Vogelfontein Colliery on GHG emissions, with or without mitigation measures, at 70 High; but shows that “...the intensity of the impact can be reduced, notably by reducing the quantity of GHG emissions.” Considering this, against the background of the discussion above, it is recommended that the proposed Vogelfontein Colliery proceed in a responsible manner. It is imperative that the necessary mitigation and optimisation measures are implemented, monitored, and when and where necessary, adjusted to limit any adverse effects on both the social and physical environments. What, however remains of great concern, is that there will be a negative impact in respect of GHG emissions and climate change, and that climate change has been directly linked to community health and the cycle of poverty. In this regard, serious consideration must be given to what these affects will be on a cumulative basis, as well as at a global level, and that the social consequences of this be seriously considered over the medium to long term. This needs to be done with particular reference to securing sustainable livelihoods amongst the vulnerable communities.

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<sup>5</sup> Department of Environmental Affairs, Department of Mineral Resources, Chamber of Mines, South African Mining and Biodiversity Forum, and South African National Biodiversity Institute, 2013, p4.

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