

**FINAL BASIC ASSESSMENT REPORT  
AND  
ENVIRONMENTAL MANAGEMENT PROGRAMME**

**In Support of an Environmental Authorisation Amendment Application for Prospecting**

**Prepared on Behalf of  
SUNSHINE MINERAL RESERVES (PTY) LTD**

**AS PER CHAPTER 4 OF THE NATIONAL ENVIRONMENTAL MANAGEMENT ACT, 1998  
(ACT 107 OF 1998) AND SECTION 16 OF THE MINERAL AND PETROLEUM  
RESOURCES DEVELOPMENT ACT, 2002 (ACT 28 OF 2002)**

**Department of Mineral Resources and Energy Reference Number:  
FS 30/5/1/1/2/10445 PR**

**30 APRIL 2021**



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## FINAL BASIC ASSESSMENT REPORT AND ENVIRONMENTAL MANAGEMENT PROGRAMME

FS 30/5/1/1/2/10445 PR

### ADAMSONS VLEY AMENDMENT

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REVISION AND AMENDMENTS		
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0	26 March 2021	Draft Basic Assessment Report and Environmental Management Programme
1	30 April 2021	Final Basic Assessment Report and Environmental Management Programme

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## EXECUTIVE SUMMARY

### 1. Introduction to the Project

Sunshine Mineral Reserves (Pty) Ltd (Sunshine) holds an executed Prospecting Right (FS 30/5/1/1/2/10445 PR) and the associated granted Environmental Authorisation (FS 30/5/1/1/3/2/1/10445 EM) in respect of the farms Adamsons Vley 655, Jonkers Rust 72, Du Preez Leger 324 and Stille Woning 703, to prospect for the commodities tabled below (Table A).

Table A: List of minerals issued per farm in respect of FS10445PR.

FS 10445 PR	Jonkers Rust 72	Du Preez Leger 324	Adamsons Vley 655	Stille Woning 703
<b>Commodities</b>	Gold			
	Silver			
	Uranium			
	Platinum Group Metals	Platinum Group Metals		
	Base Metals	Base Metals		
	Diamonds		Diamonds	Diamonds
	Sulphur	Sulphur		
Coal	Coal			

Sunshine wish to make changes to the executed Prospecting Right by adding the following commodities to the farm Adamsons Vley 655:

1. Gold
2. Silver
3. Uranium
4. Platinum Gold Metals
5. Sulphur
6. Sulphur (in pyrite)
7. Coal
8. Pyrite
9. Heavy Minerals.

The above-mentioned commodities were initially held by Sibanye-Stillwater on the farm Adamsons Vley 655 under the granted Prospecting Right FS 30/5/1/1/2/10324 PR. On the 24th February 2020, Sibanye-Stillwater and Sunshine signed a contract and agreed on record that:

1. Sibanye-Stillwater will abandon the Prospecting Right to enable Sunshine to incorporate this right into Sunshine's existing right through a Section 102 Amendment Application; and
2. Sibanye-Stillwater will hand over to Sunshine all relevant data and reports in its possession relating to the Prospecting Right.

In order to amend the current Prospecting Right, it is necessary that a Section 102 Template, accompanied by an Environmental Authorisation Application Form and supported by documents as requested by the regulatory authority – the Department of Mineral Resources and Energy (DMRE), are prepared and submitted to the DMRE, for adjudication.

Sunshine submitted an online Amendment Application to the Department of Mineral Resources and Energy of the Free State Province. The Environmental Authorisation Amendment Application was



acknowledged on the 8<sup>th</sup> January 2021 and the DMRE has requested that a Basic Assessment Report and Environmental Management Programme (BAR and EMPR) as well as a report on the results of the Public Consultation Process (PPP) must be completed and submitted to the DMRE in support of this Amendment Application. Imbokodo Services (Pty) Ltd (Imbokodo) has been appointed by Sunshine as the Environmental Assessment Practitioner (EAP) to assist in complying with these requirements.

If approved, this amendment application will allow Sunshine to prospect for additional commodities on the farm Adamsons Vley 655.

According to the associated Prospecting Work Programme, no invasive prospecting (i.e., drilling of boreholes, excavations, trenching, etc.) is planned on site.

## **2. Purpose of this Document**

This document has been compiled in support of the Amendment Application and aims to assess any impacts associated with prospecting.

## **3. Project Location**

The application area is approximately 2 398.65 hectares (ha) in aerial extent. It is situated in the Magisterial District of Virginia, approximately 8 kilometres (km) west of the town of Virginia in the Free State Province of South Africa. Four (4) farm portions extend over the application area.

## **4. Project Activities**

Only non-invasive prospecting activities will be undertaken as part of the proposed Prospecting Work Programme. The Prospecting Work Programme will be based on a phased approach over approximately five years. Continuation of the prospecting activities will be dependent on the successful completion of tasks constituting an orderly geological investigation. The scope of these activities is as follows:

1. Desktop study and data acquisition
2. QA/QC of all data and database complication
3. Database finalisation and initial modelling
4. Field mapping
5. Capturing of any new data
6. Updating resource estimates
7. Finalisation of resource estimates
8. Scoping and/or (pre)feasibility studies

## **5. Exploration Targets**

The surface geology of the prospecting area contains (i) thin Quaternary sediments, mostly recent sand and gravel in the river valleys, as well as (ii) the Karoo Dolerite Suite and (iii) the sedimentary rocks of the Karoo Supergroup. The Witwatersrand Supergroup which hosts gold is generally overlain by 300 to 400 m of Karoo Supergroup strata, which is predominantly consisting of horizontally bedded sandstones and shales of the Ecca Group.

In addition to gold and uranium, the gold in the reefs of the Witwatersrand is known to contain approximately 10% silver, apart from a small quantity of base metals. Platinum Group Metals are known to be present in some reefs of the Witwatersrand Basin.



Alluvial diamonds are potentially present in the drainage channels of the current surface. The catchment area of the Sand River drains a large area known to host diamondiferous kimberlites.

The application area is also known to host coal seams which are present in the Ecca Formation of the Karoo Supergroup.

## **6. Baseline Assessment of the Receiving Environment**

Owing to the limited scope and short duration of the proposed project which will include non-invasive activities only, specialist studies were not undertaken. Only desktop baseline assessments were undertaken, namely:

1. General description of the application area
2. Socio-economic
3. Biodiversity (fauna and flora)
4. Surface hydrology
5. Heritage
6. Palaeontology.

The key findings of the desktop assessment are detailed below.

### **6.1 General Description of the Application area**

The application area is defined by the Sand River that traverses the four farms. The area is generally flat and it is characterised by agricultural activities. The topography of the application area varies in altitude between 1 274 and 1 355 metres above mean sea level. The area is characterised by mild to hot summer temperatures in excess of 30°C and cold winter temperatures with severe frost.

### **6.2 Socio-Economic**

The application area can be found in Wards 9 and 24 of the Matjhabeng Local Municipality, which is part of the Lejweleputswa District Municipality. According to the 2016 census data, the Matjhabeng Local Municipality has a population of 429 113. Matjhabeng represents the hub of mining activity in the Free State Province. A large number of the surrounding population is employed by mining companies, such as Harmony Gold and Sibanye Gold.

### **6.3 Flora**

The application area falls within two vegetation types according. These two vegetation types are Highveld Alluvial Vegetation and Vaal-Vet Sandy grassland.

The Highveld Alluvial Vegetation is considered least threatened. Nearly 10% has been statutorily conserved in conserved areas and Nature Reserves. This vegetation is prone to infestation by a number of weeds, obviously encouraged by the high nutrient status of soils and ample water supply. Woody species often dominate either riverine thickets or grasslands or form rural communities in disturbed habitats. The undergrowth of the alluvial riparian thickets and the accompanying grasslands suffer from heavy overgrazing in many places.

The Vaal-Vet Sandy Grassland is considered Endangered. Only 0.3% of this vegetation type is statutorily conserved around dams and in Nature Reserves. A loss in the vegetation type is generally



associated with transformed land for cultivation, for commercial crops and grazing for cattle and sheep. No threatened or protected floral species were identified.

#### **6.4 Fauna**

A desktop search for protected or threatened fauna species was conducted using a quarter degree search (2726BC) on the South African National Biodiversity Institute's (SANBI) database, the SANBI Integrated Biodiversity Information System (SIBIS) Database, now replaced by the new 'Plants of southern Africa' website. According to the database, there are no faunal species of concern that fall within the study area. An alternative search for sensitive species within the study area was undertaken in the Animal Demography Unit – Virtual Museum (VM). The VM database contains information on species ranges and catalogued data regarding where and when a species was seen. No threatened or protected faunal species were identified by the VM database.

#### **6.5 Surface Water**

The application area falls within the Vaal Water Management Area. The Vaal Water Management Area comprises 12 tertiary catchment areas. The application area is situated in the DC 18 quaternary catchment, with the Sand River traversing the area. In addition, 18 wetlands were found to occur on the application area, which is proposed for non-invasive, on-foot field mapping. However, all activities will be performed away from the wetlands and main rivers. The current assessment finds that a 100 m buffer zone should be recognised from the edge of the wetlands and riparian areas. The proposed activities will not have any impact on the water resources because they are all non-invasive.

#### **6.6 Heritage**

Previous studies conducted over the application area indicate that a number of built environment and landscape features have been recorded. Over 20 built environment features north of the Sand River on the farms Jonkers Rust 72 and Du Preez Leger 324 have been recorded, such as homesteads and kraals. These features are located north and south of the canal that cuts across the two farms. On Adamsons Vley 655, over 12 built environment features have been recorded, which are mostly homesteads. On the farm Stille Woning 703, several ruins have been recorded.

The cadastral database shows that there are over 32 built environment features located on the four affected farms. Based on experience and knowledge gained on similar projects, most of the farming community homestead and kraals contain burial grounds and graves and the likelihood of finding such is high.

#### **6.7 Palaeontology**

According to the Palaeontological Sensitivity Map developed by the South African Heritage Resources Agency, the area is classified as having moderate fossil sensitivity.

### **7. Environmental Impact Assessment**

This Basic Assessment was undertaken in order to identify all of the potential impacts associated with each phase of prospecting. Each of the identified risks and impacts were assessed following the



impact methodology described in the body of this report. The assessment criteria include nature, extent, duration, magnitude/intensity, reversibility, probability, public response, cumulative impact and irreplaceable loss of resources. Based on the impact assessment conducted by the Environmental Assessment Practitioner and the various specialists, the environmental impacts associated with the proposed prospecting activities are expected to be localised and of low significance. The significance of the impacts can be reduced to low and the mitigation measures are implemented.

The following negative impacts were identified and assessed in the Basic Assessment Report:

- Safety and security risks to landowners and lawful occupiers
- Interference with land-use
- Sense of place
- Perceptions and expectations.

In terms of positive impacts, the following key benefits have been identified:

- Job creation during prospecting operations
- Discovery of economically viable mineral resources.

## **8. Environmental Management Programme Mitigation Measures**

The Environmental Management Programme has identified appropriate mechanisms for avoidance and mitigation of negative impacts. It is anticipated that the implementation of the mitigation measures stipulated in the Environmental Management Programme will result in effective mitigation of the negative impacts. Conversely the implementation of the mitigation measures designed to maximise the positive aspects of the project will result in a significant positive influence as a result of the prospecting operation.

## **9. Public Participation**

Public Participation is a requirement of several pieces of South African Legislation and aims to ensure that all relevant I&AP's are consulted, involved and their opinions are taken into account and a record included in the reports submitted to the Authorities. The process ensures that all stakeholders are provided this opportunity as part of a transparent process which allows for a robust and comprehensive environmental study.

It is important that the Interested and Affected Parties are provided with an opportunity to review and comment on the assessment report, thereby contributing to the Basic Assessment process and assisting in identifying any additional risks or impacts that may be experienced. As such, a Public Participation Process (PPP) is being undertaken as part of this amendment application.

The PPP was initiated on the 26<sup>th</sup> March 2021 with the draft BAR and EMPR being made available from the 26<sup>th</sup> March 2021 to the 28<sup>th</sup> April 2021. I&AP's were given a period of at least 30 days to register and provide comment on the draft BAR and EMPR. The comments received from I&AP's during the commenting period have been captured in an I&AP summary table included in this final BAR and EMPR as well as in the Public Consultation Report.



The comments received from I&AP's will be considered by the Competent Authority, the Department of Mineral Resources and Energy, in their decision-making regarding this amendment application.

#### **10. Need and Desirability of the Project**

Should prospecting prove successful and a resource quantified, it would indicate a potential viable economic activity in the form of mining. Mining will greatly stimulate the local and national economy through direct employment, future business opportunities, royalties and tax revenues.

#### **11. Conclusion**

The application area has been selected based predominantly on historical data available for the region, which indicates the potential for economically viable resources to occur. No invasive work will be undertaken for the proposed amendment application. There will therefore be no impacts on the biophysical and cultural environments. The only impacts on the social environment can be mitigated through open communication with the landowners.

If this amendment application is granted, it will allow Sunshine to determine if economically viable mineral deposits are present in the area. Should prospecting prove successful and a resource quantified, it would indicate a potential viable economic activity in the form of mining. Mining will contribute greatly to the socio-economic status quo in the form of increased income, employment and other benefits that would cascade through the local, regional and national levels. It is therefore the opinion of the EAP that the proposed activity should be authorised.

It is further noted that the Amended Prospecting Right will not provide the required authorisation for mining activities to be undertaken. As such, any future intention to undertake mining within the application area would require a further application, investigation and public consultation process.





# FINAL BASIC ASSESSMENT REPORT AND ENVIRONMENTAL MANAGEMENT PROGRAMME REPORT

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

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## IMPORTANT NOTICE

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

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

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

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

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



## OBJECTIVE OF THE BASIC ASSESSMENT PROCESS

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

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

This report has been designed to meet the requirements for a Basic Assessment Report and Environmental Management Programme as stipulated in the 2014 Environmental Impact Assessment Regulations (as amended) promulgated under the National Environmental Management Act, 1998 (Act 107 of 1998).

The adjudicating authority for this application is the Department of Mineral Resource and Energy (DMRE). This report has been compiled in accordance with the applicable DMRE Guidelines and Basic Assessment Report and Environmental Management Programme Template.



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## APPENDICES

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Appendix C: Prospecting Work Programme
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## Definitions

<b>Abbreviation</b>	<b>Definition</b>
<b>EA</b>	Environmental Authorisation. This constitutes the approval or dismissal of a project as issued by the relevant Competent Authority.
<b>Applicant</b>	The person or party applying for Environmental Authorisation for a listed activity and who is responsible for ensuring the development complies with all relevant legislation whether or not they are the land owner.
<b>BAR and EMPR</b>	Basic Assessment Report and Environmental Management Programme. DMRE document for joint BAR and EMP related for mineral applications.
<b>CA</b>	Competent Authority.
<b>DMRE</b>	The Department of Mineral Resources and Energy. CA in South Africa for mineral right applications.
<b>DWS</b>	The Department of Water and Sanitation – both national offices and their various regional offices, which are divided across the country on the basis of water catchment areas.
<b>DWAF BPG</b>	Department of Water Affairs and Forestry Best Practice Guidelines.
<b>EAR</b>	Environmental Audit Report.
<b>EAP</b>	Environmental Assessment Practitioner.
<b>EIA Regulations</b>	Environmental Impact Assessment Regulations.
<b>EIR and EMP</b>	Environmental Impact Report and Environmental Management Programme. DMRE document for joint EIR and EMP related to mineral applications.
<b>Environment</b>	The Environment is defined in terms of the National Environmental Management Act (Act 107 of 1998) as the surroundings within which humans exist and that are made up of: The land, water and atmosphere of the earth: Micro-organisms, plant and animal life, any part or combination of the first three items and the inter-relationships between them the physical, chemical, aesthetic and cultural properties and conditions of the foregoing that influence human health and wellbeing.
<b>Financial Provision Regulations</b>	Regulations pertaining to the financial provision for prospecting, exploration, mining or production operations No. 1147 (effective 20 November 2015).
<b>FRDCP</b>	Final Rehabilitation, Decommissioning and Closure Plan.
<b>Fauna</b>	All living biological creatures, usually capable of motion, including insects and predominantly of protein-based consistency.
<b>Fence</b>	A physical barrier in the form of posts and barbed wire or any other concrete construction, (“palisade”-type fencing included), constructed with the purpose of keeping humans and animals within or out of defined boundaries.
<b>Flora</b>	All living plants, grasses, shrubs, trees, etc., usually incapable of easy natural motion and usually capable of photosynthesis.
<b>GN</b>	Government Notice.
<b>HSE</b>	Health, Safety and Environment.
<b>I&amp;AP</b>	Interested and Affected Party.
<b>MEC</b>	Member of the Executive Council.
<b>MPDRA</b>	Minerals and Petroleum Development Act, No 28 of 2002.
<b>NEMA</b>	National Environmental Management Act.
<b>NEMWA</b>	National Environmental Management Waste Act.
<b>NWA</b>	National Water Act.
<b>NHRA</b>	National Heritage Resources Act No 25 of 1999.
<b>OSHA</b>	Occupational Health and Safety Act 85 of 1993.
<b>PR</b>	Prospecting Right in terms of the MPRDA.
<b>SAHRA</b>	South African Heritage and Resources Act, No25 of 1999.
<b>SAMRAD</b>	The web-based portal for mineral right applications and management – managed by the DMRE.
<b>SANS</b>	South African National Standards.



## PART A:

# SCOPE OF ASSESSMENT AND BASIC ASSESSMENT REPORT

## 1. INTRODUCTION

Sunshine Mineral Reserves (Pty) Ltd (Sunshine) holds an executed Prospecting Right (FS 30/5/1/1/2/10445 PR) and the associated granted Environmental Authorisation (FS 30/5/1/1/3/2/1/10445 EM) in respect of the farms Adamsons Vley 655, Jonkers Rust 72, Du Preez Leger 324 and Stille Woning 703 to prospect for the commodities tabled below (Table 1).

Table 1: List of minerals issued per farm in respect of FS 10445 PR.

FS 10445 PR	Jonkers Rust 72	Du Preez Leger 324	Adamsons Vley 655	Stille Woning 703
<b>Commodities</b>	Gold			
	Silver			
	Uranium			
	Platinum Group Metals	Platinum Group Metals		
	Base Metals	Base Metals		
	Diamonds		Diamonds	Diamonds
	Sulphur	Sulphur		
	Coal	Coal		

Sunshine wish to make changes to the executed Prospecting Right by adding the following commodities to the farm Adamsons Vley 655:

1. Gold
2. Silver
3. Uranium
4. Platinum Gold Metals
5. Sulphur
6. Sulphur (in pyrite)
7. Coal
8. Pyrite
9. Heavy Minerals.

The above-mentioned commodities were initially held by Sibanye-Stillwater on the farm Adamsons Vley 655 under the granted Prospecting Right FS 30/5/1/1/2/10324 PR. On the 24th February 2020, Sibanye-Stillwater and Sunshine signed a contract and agreed on record that:

1. Sibanye-Stillwater will abandon the Prospecting Right to enable Sunshine to incorporate this right into Sunshine's existing right through a Section 102 Amendment Application; and
2. Sibanye-Stillwater will hand over to Sunshine all relevant data and reports in its possession relating to the Prospecting Right.

In order to amend the current Prospecting Right, a Section 102 Template, accompanied by an Environmental Authorisation Application Form and supported by documents as requested by the regulatory authority – the DMRE, are prepared and submitted to the DMRE, for adjudication.



Imbokodo Services (Pty) Ltd (Imbokodo) has been appointed by Sunshine as the Environmental Assessment Practitioner (EAP) to assist in complying with these requirements.

This document has been designed to meet the requirements for a BAR and EMPR as stipulated in the EIA 2014 Regulations (as amended) promulgated under the NEMA. The Competent Authority for this application is the DMRE and this report has been compiled in accordance with the applicable DMRE guidelines and BAR template.

## 1.1 LOCATION OF THE ACTIVITY

Table 2 indicates the property details of the application area. The area of interest occupies a total of 2 398.65 hectares ha and it is located approximately 8 km west of the town of Virginia, in the Free State Province of South Africa. It is situated in the Virginia Magisterial District and falls under the Matjhabeng Local Municipality, within the Lejweleputswa District Municipality. Four farm portions extend over the application area (Figure 1).

Table 2: Locality details.

<b>Application area (ha)</b>	The application area extends over four farm portions with a total area of 2 398.65 ha			
<b>Magisterial district</b>	Virginia Magisterial District Matjhabeng Local Municipality Lejweleputswa District Municipality			
<b>Distance and direction from nearest town</b>	The application area is located approximately 8 km west of Virginia in the Free State Province			
<b>21 digit Surveyor General Code for each Portion</b>	<b>Farm Name</b>		<b>Portion</b>	<b>SG Code</b>
	1	Adamsons Vley 655	0 (RE)	F03500000000065500000
	2	Jonkers Rust 72	0	F03500000000007200000
	3	Du Preez Leger 324	0 (RE)	F03500000000032400000
	4	Stille Woning 703	0	F03500000000070300000



## 1.2 LOCALITY MAP

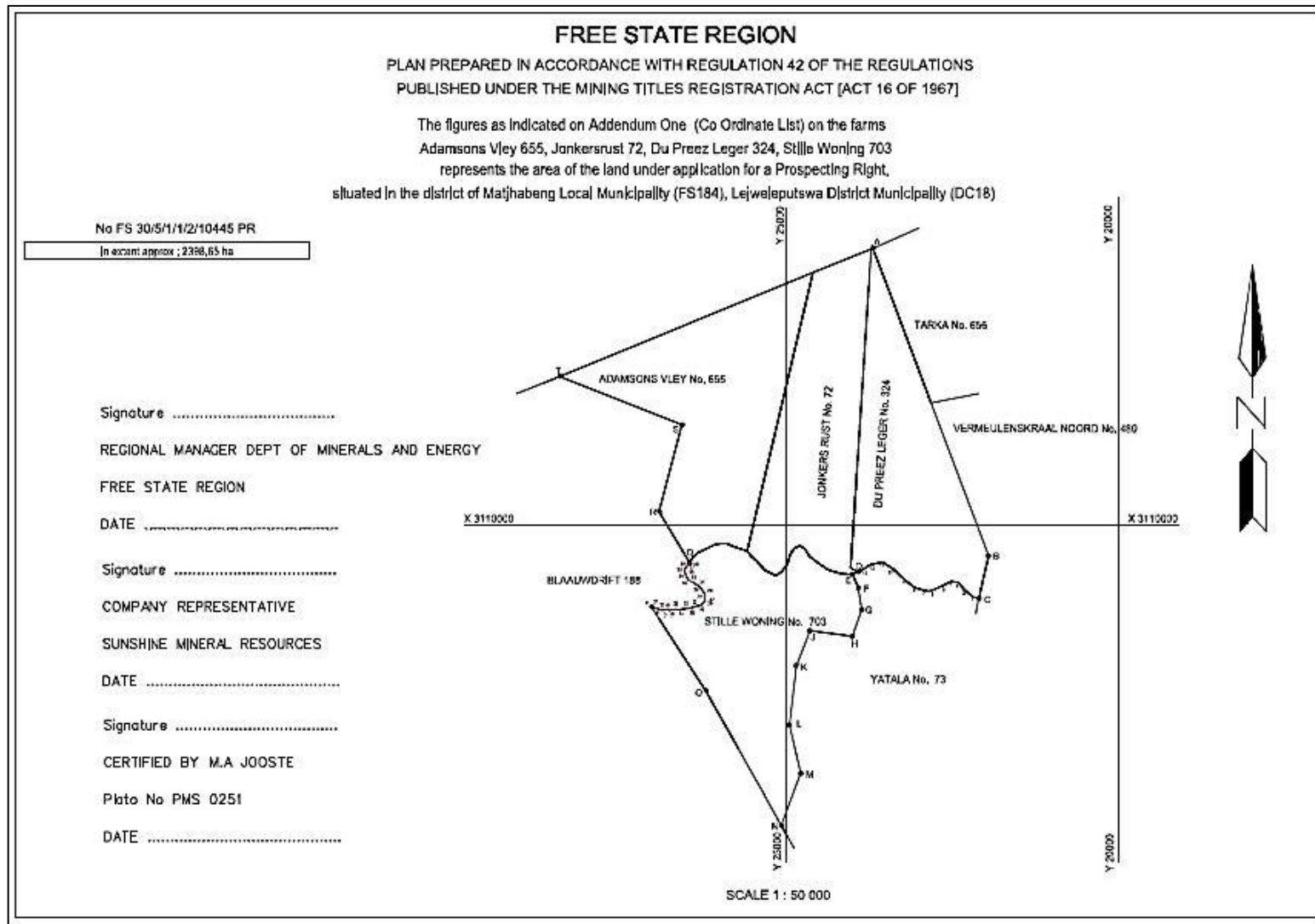


Figure 1: Locality map of the project indicating the farm portions.



### **1.3 DETAILS OF THE ENVIRONMENTAL ASSESSMENT PRACTITIONER**

Imbokodo was appointed by Sunshine as the Environmental Assessment Practitioner (EAP) to compile this report. The contact details of the Imbokodo consultant who compiled this report are:

1. Name of the EAP: Imbokodo Services (Pty) Ltd
2. Contact persons: Sibongiseni Siwendu
3. Tel No.: 010 141 0243
4. Fax No.: 086 679 8040
5. E-mail address: environmental@imbokodoservices.co.za.

### **1.4 EXPERTISE OF THE EAP**

#### **1.4.1 Qualifications of the EAP**

In terms of Regulation 13 of the NEMA 2017 EIA Regulations (Government Notice Regulation 326) an independent EAP must be appointed by the Applicant to manage the application. Imbokodo has been appointed by the Applicant as the EAP and is compliant with the definition of an EAP as defined in the 2014 EIA Regulations and the NEMA which includes, inter alia, the requirement that the company is:

1. Objective and independent
2. Have expertise in conducting EIA's
3. Comply with the NEMA, the Regulations and all other applicable legislation
4. Take into account all relevant factors relating to the application
5. Provide full disclosure to the Applicant and the relevant environmental authority.

#### **1.4.2 Summary of EAP's Past Experience**

Imbokodo registered as K2019127779 (South Africa) and is a private and independent environmental and geological consulting firm that was established in 2019. Imbokodo is growing steadily to become a significant player in the environmental and geological consulting industry and has in excess of ten years' professional experience. Imbokodo is a 100% black owned company specialising in environmental and geological consulting services.

The declaration of independence of the EAP and the Curriculum Vitae (indicating the experience with environmental impact assessment and relevant application processes) of the consultant that was involved in the Basic Assessment process and the compilation of this report are attached as Appendix B.

#### **1.4.3 Specialist Consultants**

Owing to the limited scope and short duration of the proposed project which will include non-invasive activities only, specialist studies were not undertaken. Only desktop baseline assessments were undertaken, namely:

1. General description of the application area



2. Socio-economic
3. Biodiversity (fauna and flora)
4. Surface hydrology
5. Heritage
6. Palaeontology.

## 2. DESCRIPTION AND SCOPE OF THE PROPOSED ACTIVITY

Only non-invasive prospecting activities will be undertaken as part of the proposed Prospecting Work Programme (Appendix C). The Prospecting Work Programme will be based on a phased approach over approximately five years. Continuation of the prospecting activities will be dependent on the successful completion of tasks constituting an orderly geological investigation. The scope of these activities is as follows:

1. Desktop study
2. Data acquisition
3. QA/QC of all data and database compilation
4. Database finalisation and initial modelling
5. Capturing of any new data
6. Updating resource estimates
7. Finalisation of resource estimate
8. Scoping and/or (pre)feasibility studies and updating thereof, if required.

The following non-invasive prospecting activities have been conducted during Year 1 and Year 2:

<b>I. Data Gathering and Initial Data Manipulation:</b>	<b>Year 1</b>
<b>Desktop Studies:</b>	(Duration: 12 Months)
Data Acquisition	(Duration: 6 Months)
QA/QC of All Data and Database Compilation	(Duration: 6 Months)
Geological Mapping of the Surface	(Simultaneous with above)

<b>II. Geological Modelling and Initial Resources:</b>	<b>Year 2</b>
Database Finalisation and Initial Modelling	(Duration: 12 months)

As part of the amended PWP, the following non-invasive prospecting activities will be conducted during Year 3, Year 4 and Year 5 of the project:

**The following non-invasive prospecting activities will be conducted during Year 3:**

<b>III. Finalisation of Modelling and Resources, Scoping and Feasibility Studies:</b>	<b>Year 3</b>
---	---------------



### **Capturing of any new data**

(Duration: 1 Month)

After the potential acquiring of additional data and/or minerals, any new information and interpretations will be incorporated into the 2D and 3D, geological and software models of the underlying formations. The models will form the basis for the final resource estimation which will follow thereafter.

### **Finalising Resource Estimates**

(Duration: 1 Month)

All updated parameters will be incorporated in the finalised resource estimation for the different reefs of the project. Geostatistics and modern scientific procedures will be applied according to international code compliant reporting, like the South African 'SAMREC Code'.

### **Scoping and/or (Pre-)Feasibility Studies, if Required**

(Duration: 10 months)

After finalisation of the resource studies, a scoping study, and/or a (pre-) feasibility study could follow. A Scoping Study, typically investigates the mining options from a high-level observation. It considers the infrastructure from neighbouring mines, potential sinking of a new shaft in the most strategic position, ventilation requirements, gold plant, etc. It comprises an initial financial appraisal of an inferred mineral resource and involves a preliminary mine plan, and forms the basis for determining whether to proceed with exploration and more detailed engineering work.

A Preliminary Feasibility Study determines whether to proceed with a detailed feasibility study and is a "reality check" to determine areas within the project that require more attention. Conceptual or preliminary engineering and mine design are often completed.

The PWP accounted for three years, but a five-year Prospecting Right was applied for, in order to account for any potential delays in the programme. This was granted by the DMRE.

**No invasive exploration is planned.** A great deal of information and data have already been acquired by Sunshine, like diamond drilled core, multiple reports, geophysical, seismic and remote sensing data, etc. It is Sunshine's strategy to develop the prospecting project into a major gold-uranium mine without invasive prospecting. This will enable Sunshine to develop its resources with less capital layout in a shorter time-span than is usually required in greenfield or brownfield exploration. Should the proposed prospecting activities change, this will be indicated in the form of a Section 102 Amendment Application (of the MPRDA) together with the proposed revised prospecting programme.

## **2.1 LISTED AND SPECIFIED ACTIVITIES**

The need for Environmental Authorisation for prospecting came into effect after the promulgation of the NEMA Environmental Impact Assessment Regulations (2014) on the 8<sup>th</sup> December 2014. Prior to this, Prospecting Rights were subjected to the provisions of the MPRDA (2002). Since the 8<sup>th</sup> December 2014 a Prospecting Right and Environmental Authorisation are required in terms of the MPRDA (2002) and NEMA EIA Regulations (2014), respectively. The applicable NEMA EIA listed activity anticipated to be triggered by this project is outlined in Table 3.



Table 3: Listed and specified activities.

Name Of Activity	Aerial Extent Of Activity	Listed Activity	Applicable Listing Notice
<p>An Environmental Authorisation may be amended by following the process prescribed in this Part if the amendment will result in a change to the scope of a valid Environmental Authorisation where such change will result in increased level or change in the nature of impact where such level or change in nature of impact was not:</p> <ul style="list-style-type: none"> <li>(a) assessed and included in the initial application for Environmental Authorisation; or</li> <li>(b) taken into consideration in the initial Environmental Authorisation, and the change itself does not, on its own, constitute a listed or specified activity.</li> </ul>	2 398.65 ha	X	Activity 31 (Part 2) of GNR 326 (of 2017)
<p>Any activity including the operation of that activity which requires a prospecting right in terms of Section 16 of the Mineral and Petroleum Resources Development Act, 2002 (Act No. 28 of 2002), including (a) associated infrastructure, structures and earthworks, directly related to prospecting of a mineral or (b) the primary processing of a mineral resource including winning, extraction, classifying, concentrating, crushing, screening or washing; but excluding the secondary processing of a mineral resource, including the smelting, beneficiation, reduction, refining, calcining, or gasification of the mineral resource.</p> <p>The project involves only the following non-invasive prospecting activities within the application area:</p> <ul style="list-style-type: none"> <li>• Desktop studies and acquisition of historical data</li> <li>• Data inventory and capturing</li> <li>• Data synthesis and database creation</li> <li>• Field mapping</li> <li>• Generation of geological models</li> <li>• Resource estimations</li> <li>• Scoping and/or (pre-)feasibility studies and updating thereof, if required</li> </ul>	2 398.65 ha	X	Activity 20 of GNR 327 (of 2017)





## 2.2 DESCRIPTION OF ACTIVITIES TO BE UNDERTAKEN

Table 4: Planned non-invasive activities.

Year	Activity	Skill(s) Required	Timeframe	Outcome	Technical Expertise
1	Data search in the public domain and locate all historic information relating to previous exploration, reclamation and mining. Including desktop study	Qualified Geologist	2 months	Enter into agreements with companies who hold the required data	Senior Geologist
	Obtain the large amount of underground sampling, original borehole logs, core, reports. Re- logging and re-sampling of original boreholes		4 months	Establishment of databases	
	Data QA/QC, digitisation, compilation and synthesis of databases		6 months	Complete the detailed database of historic exploration, mining and results	
	Field mapping		Running simultaneously with above	Mapping of surface geology over a period of one month	
2	Database finalisation and initial modelling, utilising existing reports, previous code compliant resource calculations and data from re-logged and re-sampled boreholes	Qualified Geologist	6 months	Commercial agreements to obtain historical data and borehole core. Resampled old core for QA/QC and confidence for resource estimation	Resource, senior and principal Geologist
	Modelling of the geology: 2D and 3D models, palaeoflow reconstruction and resource calculations		6 months	Continued development of databases	
3	Finalisation of 2D and 3D geological models	Qualified Geologist	1 month	Final geological model	Senior Geologist
	Finalisation of resource potential for the target(s)		1 month	JORC compliant resource estimation	Resource, senior and principal Geologist
	Scoping and feasibility studies	Qualified Geologist, relevant engineers and metallurgist	10 months	Resources and/ or reserves/ initial mine layout	Principal Geologist, relevant Engineers and Metallurgist



## 2.3 GEOLOGICAL FORMATION AND PROSPECTING TARGETS

The application area has been selected based predominantly on historical data available for the region, which indicates the potential for economically viable resources to occur.

The Witwatersrand Basin is the largest known gold province in the world and the deposits have now been worked for nearly 130 years and are believed to have produced over 90% of South Africa's gold. The metal is produced from seven goldfields within the basin, mainly from conglomerate horizons of the Witwatersrand, but also from the overlying Ventersdorp and Transvaal Supergroups.

The Witwatersrand Basin is located on the Kaapvaal Craton in South Africa and is an oval-shaped basin, covering an area of some 400 km NE-SW and some 180 km NW-SE, of which approximately 84 000 km<sup>2</sup> consists of some outcrops, but mostly buried rocks.

The Free State Goldfield is generally overlain by Karoo strata, mostly horizontally bedded sediments of the Ecca Group containing coal, which is potentially exploitable. The Karoo Supergroup is known to host kimberlites in the application area (Figure 4).

There are two gold-bearing trends in the Free State Goldfield: the Target Trend to the west and the Homestead Trend to the east, separated by the low-potential de Bron Horst. Where the two trends meet at their southern extremities (Figure 3), good gold-potential is also encountered. The project area is located on the Target Trend, south of the dormant St. Helena and contiguous with the Unisel gold mines, currently being held by Harmony Gold.

The Witwatersrand Supergroup (or 'Basin') is underlain by an Archaean granite-greenstone basement more than 3 billion years old and the Dominion Group, which is about 3.074 to 3.086 billion years old. The Witwatersrand Supergroup is unconformably overlain by rocks of the Ventersdorp (2.7 billion years old), Transvaal (2.6 billion years old) and Karoo (302 to 180 million years ago) Supergroups.

The Basin is composed of the generally low-potential West Rand Group (also known as the 'Lower Witwatersrand') covering an area of some 54 000 km<sup>2</sup>, and the Central Rand Group, or 'Upper Witwatersrand', (Figure 2) consisting of gold- and uranium-rich terranes over an area of some 30 000 km<sup>2</sup>, in which the major producing gold and uranium mines of South Africa are found. The reefs found in the project area occur within the high-potential Central Rand Group.

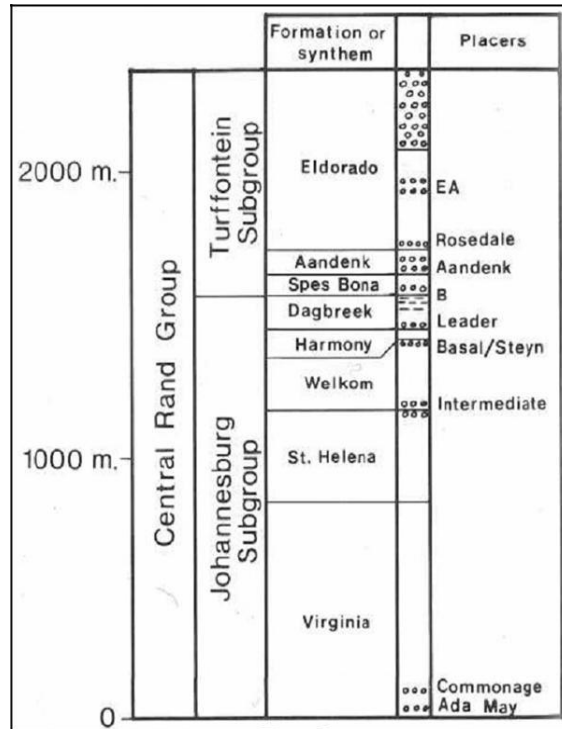


Figure 2: Simplified stratigraphic column of the Central Rand Group as preserved in the Free State Goldfield (after Mineral Deposits of Southern Africa, 1986).

The goldfields are considered to represent major, diachronous entry points of coarse-grained sediments into the Basin and appear to be laterally coalesced fluvial braid-plains. Gold was concentrated within conglomerates, which developed primarily on unconformities. In the Free State Goldfield, however, areas immediately adjacent to the western Border Fault also host Elsberg-type alluvial fans, which are potentially present directly west of the project area.

Deposition in the Witwatersrand Basin is considered to have taken place along the interface between a fluvial system and a major body of still water or an inland sea, with the source of the gold and uranium postulated to be a northerly Archaean Greenstone belt. The basin is filled with approximately 14 000 m of sedimentary and subordinate volcanic rocks, which have folded along a southwest to northeast axis into an asymmetrical syncline (Pretorius, 1974).

### Structural Controls of the Witwatersrand Basin

The Witwatersrand Basin has been affected by several superimposed structural events, which are differentiated as syndeposition and post-deposition deformations. Syndepositional deformation provided a key role in the distribution of sediments, controlled the locality of the auriferous and uraniferous conglomerates and the thickness of enclosing sedimentary sequences. Later faulting and folding of the sequence determined which parts of the basin remained buried, as well as the depths to mineable horizons relative to the present-day surface. Much of the Basin was buried by the ejected cast out of a huge crater created by a major meteorite impact, thus preserving Central Rand Group sediments to present day.



Sunshine's exploration program is targeting the gold-bearing Central Rand Group sediments that traditionally host highly economic gold-uranium-bearing conglomerate reefs. These include the well-known A, B, Aandenk, VS5, Kalkoenkrans, Leader, Basal and Beisa, but also the deeper Intermediate, Commonage and Beisa Reefs of the Free State Goldfield. Gold values of several thousands of cmg/t are known to be common in the reefs. Uranium values of over 5 cmkg/t was intersected by one of the surface boreholes close to the northeastern boundary of the application area. Several code and non-code compliant resources have been reported over the years, covering and/or partly covering the area. The reports, compiled by different parties and during different periods have all indicated significant gold and uranium resources between an intermediate depth of 1 000 to 2 000 metres below surface.

### The Presence of Other Minerals

In addition to gold and uranium (Figure 3), the gold in the reefs of the Witwatersrand is known to contain approximately 10% silver, apart from a small quantity of base metals. Platinum Group Metals are known to be present in some reefs of the Witwatersrand Basin. Alluvial diamonds are potentially present in the drainage channels of the current surface. The catchment area of the Sand River covers a large area known to host diamondiferous kimberlite (Figure 4). The application area is also known to host coal seams, which are present in the Ecca Formation of the Karoo Supergroup.

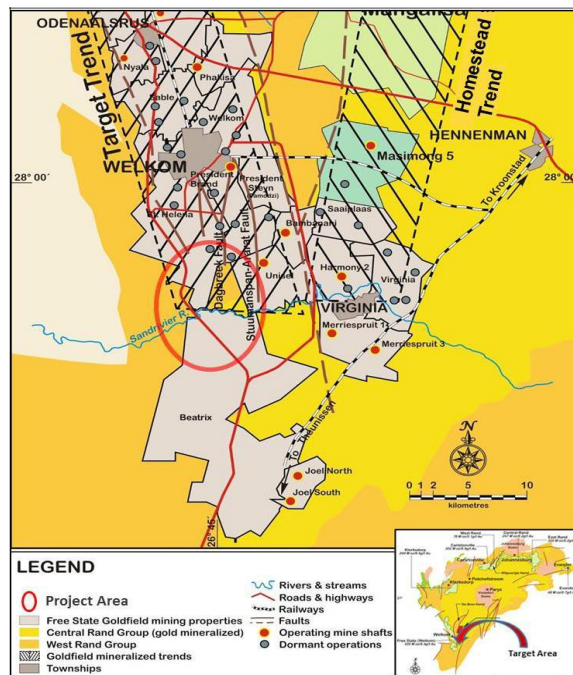


Figure 3: Geological map showing the distribution of the Lower and Upper Witwatersrand rocks, some surface infrastructure and major gold mines. The various rock formations that cover the Witwatersrand rocks have been removed in this depiction for demonstration purposes. (Image: courtesy of Superior Mining)

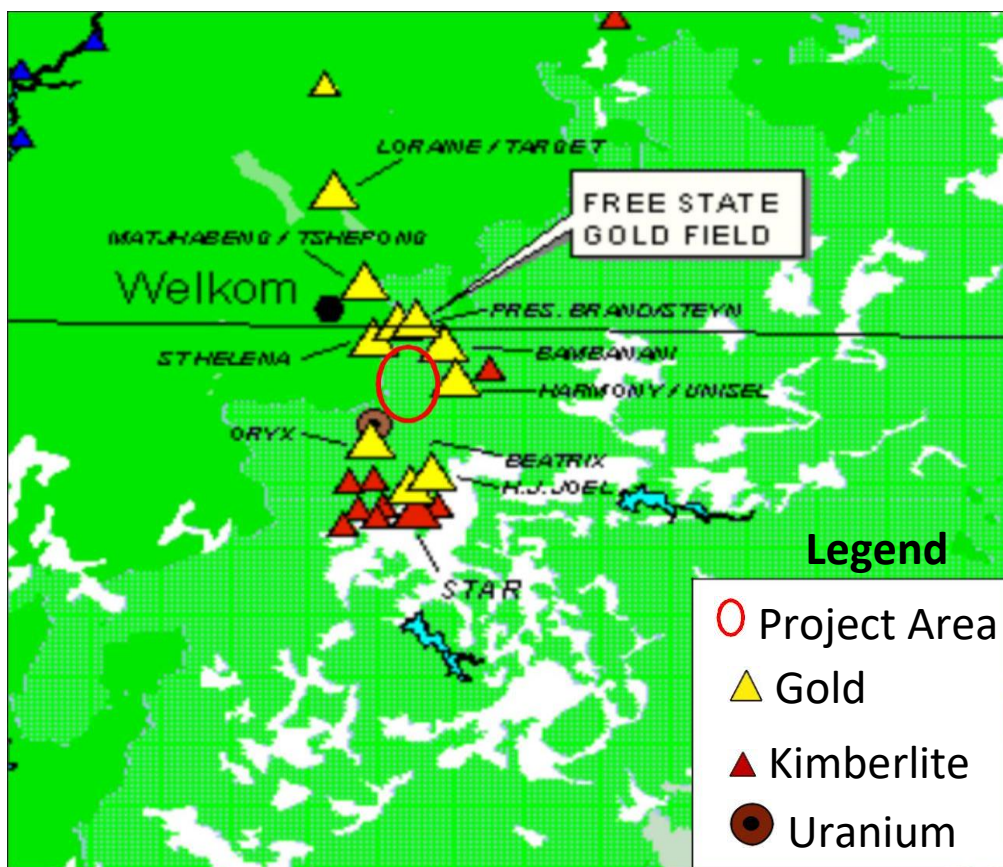


Figure 4: Distribution of known mineral occurrences in and around the project area. Erosion of kimberlites potentially results in diamonds being released in the present-day alluvium. The area in green is underlain by the Ecca Formation, containing coal seams.

Extensive exploration has taken place in the Welkom region since the drilling of the first successful borehole in 1933 on the farm Aandenk. Prospecting intensified and the first high values of gold were discovered in 1939. By 1940, sufficient work had been done to prove the existence of gold in the area and thirteen mining areas were later demarcated around, what would become the town of Welkom.

To date, major shafts, servicing the underground gold mining activities have been sunk and are close to the application area, for instance St. Helena 10 Shaft (1.3 km), Brand 5 Shaft (0.5 km) and Unisel Shaft (2.6 km), shown in Figure 5. The high-grade Basal and Leader reefs have been mined to as close as 200 metres from the application area in the northeast. In addition, exploration drilling took place from a double haulage system, 400 metres from the northwestern boundary of the application area (Figure 5).

Periodic chip sampling of the underground reefs resulted in an enormous pool of data of the captured gold and uranium values. This data, when digitised and analysed by geological software packages will lead to a great understanding of the reef characteristics and metal content, especially the underground chip data values in a buffer extending at least 2 kilometres from the application area's boundaries toward the north and northeast.



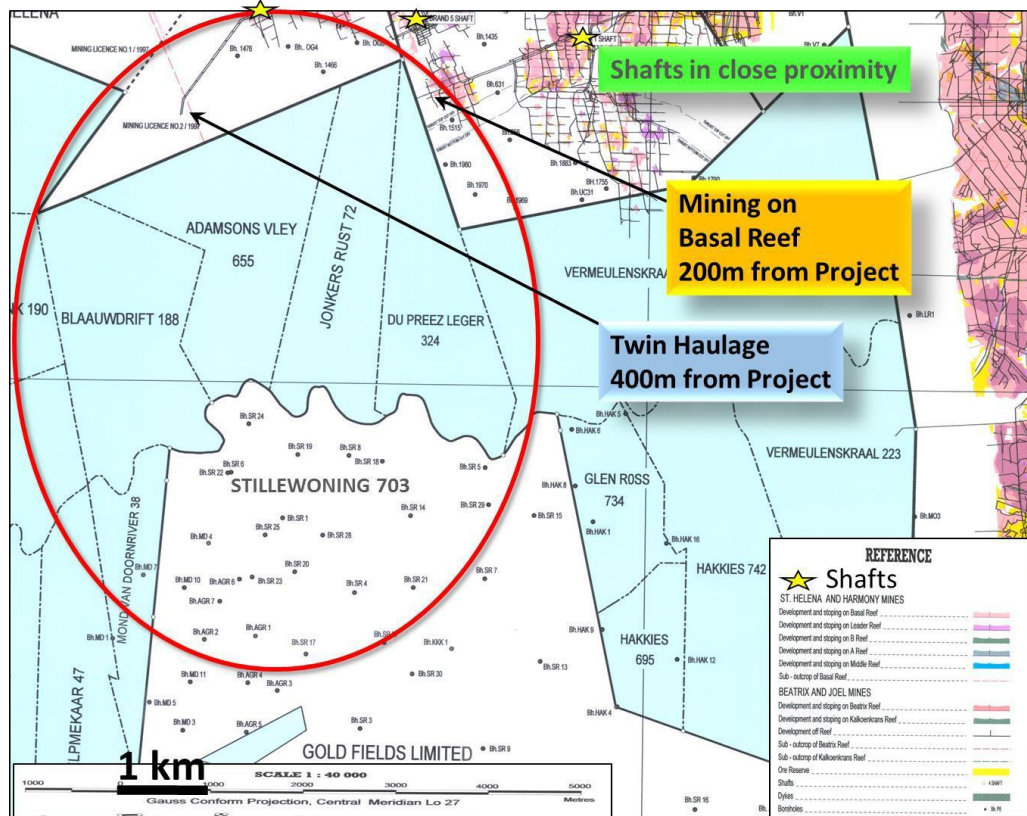


Figure 5: Favourable position of underground workings and shafts adjacent to the application area. Beatrix gold mine is situated directly south of the area (not shown on the map).

In addition to this enormous database, in excess of approximately 35 surface boreholes have been drilled in the project area, and an additional 28 boreholes in a 1.5 kilometre 'buffer zone' around the application area. The well-known gold- and uranium-bearing reefs of the Virginia goldfields have been intersected by the surface boreholes. The average depth of the boreholes is around 1 750 metres. At current costs, the total all-in exploration costs represented by these 63 boreholes will amount to more than R250 M at current rates and tariffs.

The borehole data, in combination with the underground chip sample data is a very powerful tool in determining the exploitable potential of the gold- and uranium-bearing reefs in the application area.

Apart from the extensive data described above, geophysical, remote sensing, seismic and other data are potentially available for the project area.

The vast sources of available data have been acquired from the present owners and utilised to model the various reefs in the project area. The average distance between the borehole reef intersections is approximately 600 m in the project area, enabling Sunshine to establish a code compliant resource without the need to execute more invasive exploration (like drilling from surface).



### 3. POLICY AND LEGISLATIVE CONTEXT

The EA Amendment application requires authorisation in terms of the following interlinked pieces of legislation:

1. The Mineral and Petroleum Resources Development Act (MPRDA, Act No. 28 of 2002)
2. The National Environmental Management Act (NEMA, Act No. 107 of 1998)

These pieces of core legislation stipulate the required studies, reports and legal processes to be conducted and the results thereof submitted to the relevant authorities for approval prior to commencement.

In addition to the above, there are various pieces of legislation which govern certain aspects of the prospecting activities and these are summarised in Table 5, together with the main legislative requirements mentioned above.

Table 5: Policy and legislative context.

Applicable Legislation And Guidelines	Reference Where Applied	How Does This Development Comply With And Respond To The Legislation And Policy Context
National Environmental Management Act (Act 107 of 1998)	This entire report is prepared as part of the Application for an Amended Environmental Authorisation under the NEMA	In terms of the NEMA, an Application for an Amended Environmental Authorisation subject to a Basic Assessment Process has been applied for
Minerals and Petroleum Resources Development Act (Act 28 of 2002)	This entire report is prepared as part of the Prospecting Right Amendment Application under the MPRDA	In terms of the Mineral and Petroleum Resources Development Act, a Prospecting Right Amendment Application has been applied for
National Environmental Management Waste Act (Act 26 of 2014)	Due to the nature of the proposed prospecting activities, a framework for the management of waste is not required for this Prospecting Right application	In terms of National Environmental Management Waste Act, no waste management License has been applied for
National Environmental Management Biodiversity Act (Act 10 of 2004)	Due to the nature of the proposed prospecting activities, a framework for the management of the environment is not required for this Prospecting Right application	In terms of the National Environmental Management Biodiversity Act, no framework for the management of alien and invasive species has been is required
National Water Act (Act 36 of 1998) Section 21	Due to the nature of the proposed prospecting activities no Section 21 water uses will be triggered, therefore there is no requirement to apply for Water Use authorisation in terms of the NWA	In terms of the National Water Act, no Water Use License has been applied for
National Heritage Resources Act (Act 25 of 1999)	Due to the nature of the proposed prospecting activities, a framework for a Heritage Management Plan is not required for this report	In terms of the National Heritage Resources Act, a specialist heritage impact study has not been undertaken in support of this Prospecting Right application due to the non-invasive nature of the prospecting activities.



## **3.1 ENVIRONMENTAL AUTHORISATION PROCESS**

### **3.1.1 Mineral and Petroleum Development Act**

In terms of the Mineral and Petroleum Resources Development Act, 2002 (Act 28 of 2002), an Amended Prospecting Right must be issued prior to the commencement of any prospecting activities. As per Section 79(4)(a) and (b) of the MPRDA, the Applicant is required to conduct a Basic Assessment and submit an EMPR for approval as well as to notify in writing and consult with I&AP's within 90 days of acceptance of the amendment application. The MPRDA also requires adherence with related legislation, chief amongst them is the National Environmental Management Act (Act No. 107 of 1998, NEMA) and the National Water Act (Act No. 36 of 1998, NWA).

Several amendments have been made to the MPRDA. These include, but are not limited to, the amendment of Section 102, concerning amendment of rights, permits, programmes and plans, to requiring the written permission of the Minister for any amendment or alteration; and the section 5A(c) requirement that landowners or land occupiers receive twenty-one (21) days' written notice prior to any activities taking place on their properties. One of the most recent amendments requires all mining related activities to follow the full NEMA process as per the 2014 EIA Regulations, which came into effect on 8<sup>th</sup> December 2014.

A Prospecting Right is exclusive, transferable, valid for 5 years, and renewable for a maximum of 3 years. Prospecting allows the holder of the right to conduct activities as per the Prospecting Works Programme to establish the presence of economically viable mineral resources. A Prospecting Right does not grant the holder the right to conduct any mining related activities.

### **3.1.2 National Environmental Management Act**

The main aim of the National Environmental Management Act, 1998 (Act 107 of 1998) (NEMA) is to provide for co-operative governance by establishing decision-making principles on matters affecting the environment. In terms of the NEMA Environmental Impact Assessment (EIA) regulations, the proponent is required to appoint an environmental assessment practitioner (EAP) to undertake the EIA as well as the public participation process. In South Africa, EIA became a legal requirement in 1997 with the promulgation of regulations under the Environmental Conservation Act (ECA). Subsequently, NEMA was passed in 1998. Section 24(2) of NEMA empowers the Minister and any MEC, with the concurrence of the Minister, to identify activities which must be considered, investigated, assessed and reported on to the competent authority responsible for granting the relevant environmental authorisation. On 21<sup>st</sup> April 2006 the Minister of Environmental Affairs and Tourism promulgated regulations in terms of Chapter 5 of the NEMA.

The objective of the Regulations is to establish the procedures that must be followed in the consideration, investigation, assessment and reporting of the activities that have been identified. The purpose of these procedures is to provide the competent authority with adequate information to make decisions which ensure that activities which may impact negatively on the environment to an unacceptable degree are not authorised, and that activities which are authorised are undertaken in such a manner that the environmental impacts are managed to acceptable levels.





The aim of the EIA process is to identify and assess the potential impacts associated with the proposed project and to develop measures through which potential negative biophysical and socio-economic impacts can be mitigated and positive benefits can be enhanced. The EIA will ensure that all issues are integrated into the lifecycle of the mining operation and its infrastructure. This will occur during the planning, construction, operation and decommissioning and site closure phases.

The Basic Assessment Report and the associated EMPR will indicate how the identified impacts will be avoided, mitigated and/or managed by setting environmental objectives and goals. The EMPR will further outline the implementation programme for the environmental objectives and goals. The EMPR is a legal requirement of the MPRDA and all mines, existing or new, are required to possess an approved EMPR prior to initiating any prospecting operations. The EMPR is legally binding and the proponent is required to meet the requirements specified in the document.

### **3.1.3 National Environmental Management: Waste Amendment Act**

On the 2<sup>nd</sup> June 2014 the National Environmental Management: Waste Amendment Act, 2014 (Act 26 of 2014) came into force. Waste is accordingly no longer governed by the MPRDA, but is subject to all the provisions of the National Environmental Management: Waste Act, 2008 (NEMWA). Section 16 of the NEMWA must also be considered which states as follows:

- “A holder of waste must, within the holder’s power, take all reasonable measures to:
  - a) avoid the generation of waste and where such generation cannot be avoided, to minimise the toxicity and amounts of waste that are generated
  - b) reduce, re-use, recycle and recover waste
  - c) where waste must be disposed of, ensure that the waste is treated and disposed of in an environmentally sound manner
  - d) manage the waste in such a manner that it does not endanger health or the environment or cause a nuisance through noise, odour, or visual impacts
  - e) prevent any employee or any person under his or her supervision from contravening the Act
  - f) prevent the waste from being used for unauthorised purposes.

Due to the non-invasive nature of the proposed prospecting activities, these general principles of responsible waste management are not incorporated into the requirements of the EMPR to be implemented for this project.

### **3.1.4 The National Environmental Management: Biodiversity Act**

The National Environmental Management: Biodiversity Act, 2002 (Act 10 of 2004) (NEMBA), “provides for: the management and conservation of South Africa’s biodiversity within the framework of the NEMA; the protection of species and ecosystems that warrant national protection; the sustainable use of indigenous biological resources; the fair and equitable sharing of benefits arising from bio-prospecting involving indigenous biological resources; the establishment and functions of a South African National Biodiversity Institute (SANBI); and for matters conducted therewith”.



- In terms of the Biodiversity Act, the applicant has a responsibility for: The conservation of endangered ecosystems and restriction of activities according to categorization of the area (not just by listed activity as specified in the EIA regulations)
  - Promote the application of appropriate environmental management tools in order to ensure integrated environmental management of activities thereby ensuring that all developments within the area are in line with ecological sustainable development and protection of biodiversity
  - Limit further loss of biodiversity and conserve endangered ecosystems.

Regulations published under the NEMBA also provide a list of protected species, according to the Act (GNR 151 dated 23<sup>rd</sup> February 2007, as amended in GNR 1187 dated 14<sup>th</sup> December 2007). Section 57 of NEMBA identifies restricted activities involving threatened or protected species. Restricted activities include the gathering, collecting, cutting, uprooting, damaging or destroy a listed species.

### **3.1.5 The National Environmental Management: Protected Areas Act**

The National Environmental Management: Protected Areas Act, 2003 (Act 57 of 2003) (NEMPAA) serves to: “provide for the protection and conservation of ecologically viable areas representative of South Africa’s biological biodiversity and its natural landscapes and seascape; for the establishment of a national register of all national, provincial and local protected areas; for the management of those areas in accordance with national norms and standards; for intergovernmental co-operation and public consultation in matters concerning protected areas; for the continued existence, governance and functions of South African National Parks; and for matters in connection therewith.

The objectives of this Act are to:

1. Provide, within the framework of the national legislation, including the National Environmental Management Act, for the declaration and management of protected areas
2. Provide for co-operation governance in the declaration and management of protected areas
3. Effect a national system of protected areas in South Africa as part of a strategy to manage and conserve its biodiversity
4. Provide for a diverse and representative network of protected areas on state land, private land, communal land and marine water
5. Promote sustainable utilisation of protected areas for the benefit of people, in a manner that would preserve the ecological character of such areas
6. Promote participation of local communities in the management of protected areas, when appropriate
7. Provide for the continued existence of South African National Parks.

### **3.1.6 National Water Act**

The National Water Act, 1998 (Act 36 of 1998) (NWA) makes provision for two types of application for water use licences, namely individual applications and compulsory applications. The NWA also provides that the responsible authority may require an assessment by the Applicant of the likely effect



of the proposed licence on the resource quality, and that such assessment be subject to the EIA regulations. A person may use water, if the use is:

1. Permissible as a continuation of an existing lawful water use (ELWU)
2. Permissible in terms of a general authorisation (GA)
3. Permissible under Schedule 1
4. Authorised by a licence.

The NWA defines 11 water uses. A water use may only be undertaken if authorised. Water users are required to register certain water uses that actually took place on the date of registration, irrespective of whether the use was lawful or not.

Section 21 of the National Water Act 1998 lists the following 11 water uses which can only be legally undertaken through the water use authorisation issued by the Department of Water and Sanitation (DWS):

1. Taking water from a water resource
2. Storing water
3. Impeding or diverting the flow of water in a watercourse
4. Engaging in a stream flow reduction activity contemplated in section 36
5. Engaging in a controlled activity identified as such in section 37(1) or declared under section 38(1)
6. Discharging waste or water containing waste into a water resource through a pipe, canal, sewer, sea outfall or other conduits
7. Disposing of waste in a manner which may detrimentally impact on a water resource
8. Disposing in any manner of water which contains waste from, or which has been heated in, any industrial or power generation process
9. Altering the bed, banks, course or characteristics of a watercourse
10. Removing, discharging or disposing of water found underground if it is necessary for the efficient continuation of an activity or for the safety of people
11. Using water for recreational purposes.

In terms of the National Water Act, no Water Use Licence has been applied for this project.

### **3.1.7 National Heritage Resources Act**

The National Heritage Resources Act, 1999 (Act 25 of 1999) (NHRA) stipulates that cultural heritage resources may not be disturbed without authorisation from the relevant heritage authority. Section 34(1) of the NHRA states that, "no person may alter or demolish any structure or part of a structure which is older than 60 years without a permit issued by the relevant provincial heritage resources authority..." The NHRA is utilized as the basis for the identification, evaluation and management of heritage resources and in the case of CRM those resources specifically impacted on by development as stipulated in Section 38 of NHRA, and those developments administered through NEMA, MPRDA and the DFA legislation. In the latter cases the feedback from the relevant heritage resources authority is required by the State and Provincial Departments managing these Acts before any authorisations are granted for development. The last few years have seen a significant change



towards the inclusion of heritage assessments as a major component of Environmental Impacts Processes required by NEMA and MPRDA. This change requires us to evaluate the Section of these Acts relevant to heritage (Fourie, 2008b):

*The NEMA 23(2)(b) states that an integrated environmental management plan should, "...identify, predict and evaluate the actual and potential impact on the environment, socio-economic conditions and cultural heritage".*

A study of subsections (23)(2)(d), (29)(1)(d), (32)(2)(d) and (34)(b) and their requirements reveals the compulsory inclusion of the identification of cultural resources, the evaluation of the impacts of the proposed activity on these resources, the identification of alternatives and the management procedures for such cultural resources for each of the documents noted in the Environmental Regulations. A further important aspect to be taken account of in the Regulations under NEMA is the Specialist Report requirements laid down in Section 33 (Fourie, 2008b).

MPRDA defines 'environment' as it is in the NEMA and therefore acknowledges cultural resources as part of the environment. Section 39(3)(b) of this Act specifically refers to the evaluation, assessment and identification of impacts on all heritage resources as identified in Section 3(2) of the National Heritage Resources Act that are to be impacted on by activities governed by the MPRDA. Section 40 of the same Act requires the consultation with any State Department administering any law that has relevance on such an application through Section 39 of the MPRDA. This implies the evaluation of Heritage Assessment Reports in Environmental Management Plans or Programmes by the relevant heritage authorities (Fourie, 2008b).

#### **4. NEED AND DESIRABILITY OF THE PROPOSED ACTIVITIES**

The mining industry of the Free State Province is of national and international importance. It contributes significantly to the GDP of South Africa. The Province produces a large part of South Africa's gold and other minerals general output. The mining value chain primarily constitutes exploration/prospecting, shaft set-up and mining. The Free State Provincial Spatial Development Framework (PSDF) identifies significant societal challenges in terms of employment and poverty. According to the PSDF these issues can be alleviated and addressed through long-term sustainable economic growth and development. Opportunities for potential growth include mining and mineral processing. The PSDF identifies the proposed land use for the immediate area as extensive agriculture with extractive industrial uses to some extent. Although this application relates to prospecting, if approved and quality minerals are found during these phases, it may lead to mining in the future which will in turn contribute to economic growth. This development is thus in line with the PSDF.

In addition to the above, the medium- to long term fundamentals for precious and base metals remain positive with supply deficits predicted in particular, due to a number of existing large gold mines reaching the end of their productive lives, continued growth in demand from the developing world and a lack of exploration for deposits hosting these metals over the past 30 years. The Welkom region is known to host world-class precious metal deposits and the prospecting application area is located in



the western part of the well-known part of the southern Free State Goldfield. Successful exploration may lead to the development of local mines and associated industries and be the catalyst for skills development and job creation.

The minerals relating to this application are gold, silver, uranium, PGM's, sulphur, sulphur (in pyrite), coal, pyrite and heavy minerals. If the application is granted, Sunshine will be enabled to determine if there are economically viable resources available in the area.

The proposed non-invasive prospecting activities described above are needed in order to determine the exact position, extent, grade and quality of the minerals applied for. These minerals are of significant value and the mining thereof has the potential to contribute considerably to the South African economy. The geological characteristics of the preferred location meet the prerequisites for concentration of these minerals. The non-invasive prospecting techniques will have no impacts on any locations.

Should prospecting prove successful and a resource quantified, it would indicate a potential viable economic activity in the form of mining. That is likely to contribute greatly to the socio-economic status quo in the form of increased income, employment and other benefits that would cascade through local, regional and national levels.

## **5. MOTIVATION FOR THE OVERALL PREFERRED DEVELOPMENT FOOTPRINT**

The application area was elected due to extensive experience and knowledge of the Witwatersrand gold reefs by Sunshine and a desktop study, applying gold ore deposit models and using regional geological maps, historical reports and borehole cores. The area under application is underlain by the Witwatersrand Basin and is known for its various gold- and uranium-bearing reefs. Apart from these two minerals, the reefs are known to host silver, base metals, sulphur (pyrite), REE's and PGM's. Coal is also present in the overlying Karoo Supergroup strata. In addition, some of the late-phase intrusions, like dykes and pipes, are known to host diamonds. These diamonds can be ~~still~~ in situ, or be present as dislodged, alluvial diamonds in watercourses. The applicant specialises in exploration/prospecting, developing of projects and mining. The applicant is also committed to utilising the best technologies currently available (thus no technology alternatives will be considered) and has designed the preliminary layout plan in such a manner that negative impacts are minimised and positive impacts are maximised.

There will be no development footprint due to the fact that only non-invasive prospecting will be undertaken. The geology is the primary driver in determining the location of prospecting and mining. Gold and uranium are present in the Central and West Rand Groups of the Witwatersrand Supergroup in the prospecting area. The geology of this area has been previously explored extensively; thus, historical data will be utilised to determine the potential resources without the need of invasive techniques. As such, no assessment of alternative development scenarios was conducted.



## **6. FULL DESCRIPTION OF THE PROCESS FOLLOWED TO REACH THE PROPOSED PREFERRED ALTERNATIVES WITHIN THE SITE**

### **6.1 DETAILS OF DEVELOPMENT FOOTPRINT ALTERNATIVES**

#### **6.1.1 Property**

The application area has been selected based predominantly on historical data available for the region, which indicates the potential for economically viable resources to occur. The surface geology of the prospecting area consists of rocks of the Karoo Supergroup. The Witwatersrand Supergroup which hosts gold is generally overlain by approximately 300 to 400 m of Karoo strata. At some places, Ventersdorp Supergroup overlies the underlying Witwatersrand rocks.

The Sand River is a prominent feature in the area, flowing from east to west. The river is characterised by a wide, shallow valley. Game farms, arable land and grazing is common. Due to the geological features (in terms of mineralisation) present within the proposed application area and the low sensitivity of the receiving socio-economic and biophysical environment, no property alternatives are suggested.

#### **6.1.2 Type of Activity**

Due to the nature of data collection and the extensive historical borehole and other datasets, invasive prospecting, such as drilling, is perceived to be unnecessary during prospecting. This is due to the availability of previously drilled boreholes, seismic and geophysical surveys within the project area, as well as underground mining, adjacent to it. Underground data of several reefs abutting the project could potentially be obtained, too. Sunshine will therefore fast-track the resource estimation process by utilising the historical data and information, instead of conducting invasive prospecting..

#### **6.1.3 Design or Layout**

No invasive activities are planned for this prospecting project. As such, there are no designs or layout alternatives to consider.

#### **6.1.4 Technology Alternatives**

The technologies listed in the Prospecting Work Programme have been proven effective in the determination of resource viability within the proposed prospecting area. The techniques employed in the non-invasive prospecting will include (i) desktop studies and acquisition of historical data, (ii) data inventory and capturing, (iii) data synthesis and database creation, (iv) generation of geological models, (v) geostatistical analyses, (vi) resource estimations and (vii) scoping and/or (pre-)feasibility studies, if required. These technologies have been selected due to their non-invasive nature and ability to provide information, at the level required, to determine and estimate potential gold and uranium resources. As such no further technological alternatives are considered.



### **6.1.5 Operational Aspects**

No invasive activities are planned for this prospecting project. As such, there are no operational aspect alternatives to consider.

### **6.1.6 Option of Not Implementing**

If the application is not granted, the potential to identify viable mineral resources could be lost. Mining activities are taking place, and have been taking place, abutting the application area and as such the proposed prospecting activities would represent a continuation of historical land use. Additionally, it allows for marginal land impacted by historical prospecting and mining activities to be re-introduced into the economy.

## **7. DETAILS OF THE PUBLIC PARTICIPATION PROCESS FOLLOWED**

### **7.1 Public Participation Methodology**

The Public Participation Process (PPP) is a requirement of several pieces of South African Legislation and aims to ensure that all relevant I&AP's are consulted, involved and their opinions are taken into account and a record included in the reports submitted to the Authorities. The process ensures that all stakeholders are provided this opportunity as part of a transparent process which allows for a robust and comprehensive environmental study.

A database and I&AP register was compiled. The list includes various stakeholders, authorities, landowners, land occupiers. Notification documents were distributed on the 26<sup>th</sup> March 2021. I&AP's have been provided a period of 30 days to register and comment on the proposed activity and application.

#### **7.1.1 Identification of I&AP's**

An initial I&AP list was compiled using the existing database of the project and updating contact information where required. The I&AP database contains the following categories of stakeholders:

1. National government
2. Provincial government
3. Local government
4. Agricultural sector
5. Organised business
6. Host and adjacent communities
7. Land claimants
8. Other organisations, clubs, communities, and unions
9. Various non-government organisations.

#### **7.1.2 List of Authorities Identified and Notified**

The following authorities have been identified and notified of the amendment application:





1. National Department of Mineral Resources and Energy
2. National Department of Agriculture, Forestry and Fisheries
3. National Department of Rural Development and Land Reform
4. South African National Roads Agency Ltd (SANRAL)
5. South African Heritage Resources Agency (SAHRA) – National
6. Free State Department of Mineral Resources
7. Free State Department of Agriculture, Rural Development, Land and Environmental Affairs
8. Free State Department of Cooperative Governance, Traditional Affairs and Human Settlements
9. Free State Department of Economic Development, Tourism and Environmental Affairs
10. Free State Department of Police, Roads and Transport
11. Free State Department of Human Settlements
12. Free State Department of Public Works
13. Free State Department of Water and Sanitation
14. Free State Tourism Authority
15. Matjhabeng Local Municipality
16. Lejweleputswa District Municipality
17. Eskom
18. Transnet.

### **7.1.3 List of Key Stakeholders Identified and Notified**

The following key stakeholders have been identified and notified of the amendment application:

1. The Council for Scientific and Industrial Research
2. Wildlife and Environment Society of South Africa (WESSA)
3. Agri South Africa
4. Free State Agriculture
5. Free State Heritage Resources Authority
6. South African National Parks (SANParks)
7. Federation for a Sustainable Development
8. Birdlife South Africa
9. Agricultural Research Council
10. Centre for Environmental Rights
11. Endangered Wildlife Trust.

### **7.1.4 List of Surface Rights/Landowners Identified and Notified**

The following surface right/landowners have been notified of the amendment application:

1. Bernard Wessels
2. Nicholas Johannes van Dyk
3. South African Government (the National Department of Rural Development and Land Reform is the custodian of state-owned land)





## **7.1.5 List of Adjacent Landowners Notified**

Notification to other adjacent landowners was hand delivered and sent via registered letters, fax and e-mail.

## **7.2 Notification of I&AP's**

This section provides details on the notification that was distributed as part of the BA process to date.

### **7.2.1 Initial notification**

The PPP commenced on the 26<sup>th</sup> March 2021 with an initial notification and call to register for the period ending on the 28<sup>th</sup> April 2021. Initial notification was given in the following manner:

#### **7.2.1.1 Registered Letters, Faxes and E-mails**

Notification letters, faxes and e-mails were distributed to all pre-identified I&AP's including affected and adjacent surface landowners, government organisations, NGO's, relevant municipalities, ward councillors and other organisations that might be affected. The notification letters included the following information:

1. List of anticipated activities to be authorised
2. Scale and extent of activities to be authorised
3. Sufficient detail of the intended operation (to enable I&AP's to assess/surmise what impact the activities will have on them or on the use of their land)
4. The purpose of the proposed project
5. Details of the affected properties (including a locality map)
6. Details of the MPRDA and NEMA Regulations that must be adhered to
7. Date by which any request to register as an I&AP must be forwarded through to Imbokodo
8. Contact details of the EAP.

In addition, a questionnaire was included in the registered letters, e-mails and facsimiles sent which requested the following information from I&AP's:

1. Information on any potential impacts from the proposed project
2. Suggestions on potential mitigation measures for their anticipated impacts
3. Information on current land uses and their location within the area
4. Information on the location of any environmental features of note within and in the vicinity of the study area
5. Details of the landowner and information (contact details) of lawful property occupiers, if any
6. Details of any other I&AP's that should be notified
7. Details on any land developments proposed in the near future
8. Any specific comments or concerns regarding the amendment application.

#### **7.2.1.2 Background Information Document (BID)**

A Background Information Document (BID) was prepared. The BID includes the following information:



1. Project name
2. Applicant name
3. Project location
4. Map of affected project area
5. Description of the application process
6. Information on document review
7. EAP contact person for the project.

### **7.2.1.3 Newspaper Advertisement**

A newspaper advertisement describing the proposed project and BA process was placed in a regional newspaper with adequate circulation in the area. The advertisement was placed in the Vista Newspaper, a free bilingual weekly newspaper, on the 26<sup>th</sup> March 2021. The newspaper advert included the following information:

1. Project name
2. Applicant name
3. Project location
4. Nature of the activity
5. EAP contact person for the project.

### **7.2.1.4 Site Notice Placement**

Five A2 correx site notices were placed along and within the perimeter of the proposed project area on the 26<sup>th</sup> March 2021. The on-site notices included the following information:

1. Project name
2. Applicant name
3. Project location
4. Map of proposed project area
5. Project description
6. Legislative requirements
7. EAP contact person for the project.

### **7.2.1.5 Poster Placement**

A3 posters were placed at local public gathering places. In Welkom, A3 posters were placed at a Checkers Supermarket, while in Virginia, A3 posters were placed at the Spar Supermarket. The notices and written notifications afforded all pre-identified I&AP's the opportunity to register for the project as well as to submit their issues/queries/concerns and indicate the contact details of any other potential I&AP's that should be contacted. The contact details of the EAP were clearly stated on the notification. Comments/concerns and queries were encouraged to be submitted in either of the following manners:

1. Electronically (fax, e-mail)
2. Telephonically



3. Written letters.

### 7.2.2 Availability of Draft BAR and EMPR Notification

The draft BAR and EMPR was made available for public review and comment for a period of 30 days, from the 26<sup>th</sup> March 2021 to the 28<sup>th</sup> April 2021. All pre-identified I&AP's were notified of the availability of the BAR and EMPR and where to locate it. I&AP's were also informed to provide comment either in writing or telephonically, to Imbokodo by no later than the 28<sup>th</sup> April 2021.

Notification regarding the availability of the draft BAR and EMPR was given in the following manner:

1. Registered letters, faxes and e-mails
2. Newspaper Advertisement
3. Site notices and posters.

Furthermore, the draft BAR and EMPR was uploaded online ([www.imbokodo.co.za/public-documents/](http://www.imbokodo.co.za/public-documents/)) for download.

### 7.2.3 Availability of Final BAR and EMPR Notification

The final BAR and EMPR will made available for public review and comment from the 30<sup>th</sup> April 2021. All registered ad pre-identified I&AP's will notified of the availability of report and where to locate it. I&AP's will also be informed to provide comment either in writing or telephonically, directly to the DMRE and to copy to Imbokodo. Table 6 details the opportunities provided for public participation.

Table 6: Opportunities provided for public participation.

Public Participation Phase			
Action	Description	Publication/Place	Date
Initial public notification (announcement of project) and Announcement for public review of draft BAR and EMPR	Newspaper advertisement	Newspaper	26 March 2021
	Notification of landowners and key I&AP's	I&APs were notified via advertisement, site notice, e-mail, fax, and/or post	26 March 2021
	Placement of site notices	A2 site notices within and around the site area (24 locations)	26 March 2021
	Placement of posters	A3 posters were placed at key public places within the site area	26 March 2021
Announcement for public review of final BAR and EMPR	Notification of landowners and key I&AP's	I&APs will be notified via e-mail, fax, and/or post	30 April 2021



### **1.1.1 Public Meeting/Open Day**

Due to the non-invasive nature of the prospecting activities, a public meeting was not deemed necessary during the BAR process.

## **1.2 Issues and responses**

The Public Participation Process was initiated on 26<sup>th</sup> March 2021. I&AP's are given until the 28<sup>th</sup> April 2021 to register for this project. The draft BAR and EMPR was made available from the 26<sup>th</sup> March 2021 until the 28<sup>th</sup> April 2021 and I&AP's were provided with the opportunity to comment on the draft BAR and EMPR. All comments or issues received from I&AP's have been included in this final report.

### **1.2.1 How Issues Raised Will be Addressed**

Comments raised will be addressed in a transparent manner and will be included in the final BAR and EMPR in the following manner:

1. Issues raised will be used quantitatively to calculate the significance of impacts both real and perceived
2. Issues raised will be used to provide further suggestions and recommendations with regard to technical management options for impacts

### **1.2.2 Summary of comments and concerns raised by I&AP's**

The Public Participation Process was initiated on the 26<sup>th</sup> March 2021. I&AP's are given a period of at least 30 days to register and comment on the application. All comments or issues received from I&AP's will be included in Table 7.



Table 7: Summary of issues raised by I&amp;AP's.

I&AP	Consulted	Date	Comment Received	Response Issued
<b>Key Stakeholders</b>				
<b>Landowner/s</b>				
Bernard Wessels	X		No comment received to date.	
Nicholas Johannes van Dyk	X		No comment received to date.	
National Department of Rural Development and Land Reform	X		No comment received to date.	
<b>Lawful Occupier/s</b>				
NA				
<b>Adjacent Landowners</b>				
NA				
<b>Local Municipality –Matjhabeng Local Municipality</b>				
Executive Mayor	X		No comment received to date.	
Municipal Manager	X		No comment received to date.	
Speaker	X		No comment received to date.	
Ward 9 Councillor	X		No comment received to date.	



I&AP	Consulted	Date	Comment Received	Response Issued
Ward 24 Councillor				
<b>District Municipality – Lejweleputswa District Municipality</b>				
Executive Mayor	X		No comment received to date.	
Municipal Manager	X		No comment received to date.	
Secretary	X		No comment received to date.	
<b>Communities</b>				
N/A	X		No comment received to date.	
<b>Traditional Leaders</b>				
N/A	X		No comment received to date.	
<b>Organs of State</b>				
National Department of Mineral Resources	X		No comment received to date.	
National Department of Agriculture, Forestry and Fisheries	X		No comment received to date.	
National Department of Rural Development and Land Reform	X		No comment received to date.	



I&AP	Consulted	Date	Comment Received	Response Issued
South African National Roads Agency Ltd (SANRAL)	X		No comment received to date.	
South African Heritage Resources Agency (SAHRA) – National	X		No comment received to date.	
Free State Department of Mineral Resources and Energy	X		No comment received to date.	
Free State Department of Agriculture, Rural Development, Land and Environmental Affairs	X		No comment received to date.	
Free State Department of Cooperative Governance, Traditional Affairs & Human Settlements	X		No comment received to date.	
Free State Department of Economic Development, Tourism and Environmental Affairs	X		No comment received to date.	
Free State Department of Police, Roads and	X		No comment received to date.	



I&AP	Consulted	Date	Comment Received	Response Issued
Transport				
Free State Department of Human Settlements	X		No comment received to date.	
Free State Department of Public Works	X		No comment received to date.	
Free State Department of Water and Sanitation	X		No comment received to date.	
Free State Tourism Authority	X		No comment received to date.	
Eskom - John Geeringh	X	March 29, 2021 8:44 AM	<p>Please find attached Eskom general requirements for works at or near Eskom infrastructure. Please send me a KMZ file of the affected properties and proposed development areas.</p> <p>Kind regards John Geeringh (Pr Sci Nat)(EAPASA) Senior Consultant Environmental Management Land and Rights Eskom Transmission Division Megawatt Park, D1Y42, Maxwell Drive, Sunninghill, Sandton. P O Box 1091, Johannesburg, 2000. Tel: 011 516 7233 Cell: 083 632 7663 Fax: 086 661 4064</p>	<p>Dear John,</p> <p>Thank you very much for the attachment. Eskom's general requirements for works at or near Eskom infrastructure are well noted.</p> <p>As requested, kindly find attached the KMZ file of the project area.</p> <p>Should you have any further questions in this regard, please do not hesitate to contact me.</p> <p>Keep well and enjoy your day.</p>





I&AP	Consulted	Date	Comment Received	Response Issued
			E-mail: john.geeringh@eskom.co.za	
Transnet	X		No comment received to date.	
<b>Other Affected Parties</b>				
Federation for a Sustainable Environment	X	March 26, 2021 6:04 PM	Noted with thanks.  Best Regards Mariette Liefferink CEO: FEDERATION FOR A SUSTAINABLE ENVIRONMENT TEL. (+27) 11 465 6910 (+27) 73 231 4893 Postnet Suite #113, Private Bag X153, Bryanston, 2021 E-MAIL: mariette@pea.org.za	
The Council for Scientific and Industrial Research	X		No comment received to date.	
Wildlife and Environment Society of South Africa (WESSA)	X		No comment received to date.	
Agri South Africa	X		No comment received to date.	



I&AP	Consulted	Date	Comment Received	Response Issued
Free State Agriculture	X			
Free State Heritage Resources Authority	X		No comment received to date.	
South African National Parks (SANParks)	X		No comment received to date.	
Birdlife South Africa	X		No comment received to date.	
Agricultural Research Council	X		No comment received to date.	
Centre for Environmental Rights	X		No comment received to date.	
Endangered Wildlife Trust (EWT) - Constant Hoogstad	X	March 29, 2021 10:22 AM	To whom it may concern In future please use eia@ewt.org.za Regards	Dear Constant, Thank you for your e-mail. The e-mail for EWT has been updated in the project database. Keep well and have a wonderful day.



## 2. THE ENVIRONMENTAL ATTRIBUTES ASSOCIATED WITH THE ALTERNATIVES

### 2.1 The Baseline Receiving Environment

This section describes the baseline receiving environment of the prospecting area. Information in this section is based on desktop studies by the EAP, input from the public through the I&AP questionnaire and a site visit undertaken in support of this application. As such, the descriptions below of environmental features represent a consolidation of relevant information to the application area.

#### 2.1.1 General Description of the Application Area

The application area is generally rugged and is defined by rivers that traverse it. The Sand River separates the farm Stille Woning 703 (south) from Jonkers Rust 72, Du Preez Leger 324 and Adamsons Vley 655 (north), and is a major natural land feature in the area. Doorn River cuts through Farm Stille Woning 703 from the south to north where it joins the Sand River. A major canal cuts through Jonkers Rust 72, Du Preez Leger 324 and Adamsons Vley 655, north of the Sand River. A wetland is found on Stille Woning 703. The rivers and gullies that define their valleys create a rugged landscape along the two major rivers and the smaller tributaries that define the affected landscape. Other than the rugged valleys, the area is generally flat and characterised by agricultural activities. Figure 6 presents a Google Earth aerial view of the application area.



Figure 6: Google Earth aerial view of the application area



## 2.1.2 Socio-Economic Context

The application area is located in the Free State Province, close to the town of Virginia. The application area can be found in Wards 9 and 24 of the Matjhabeng Local Municipality, which is part of the Lejweleputswa District Municipality (Figure 7).

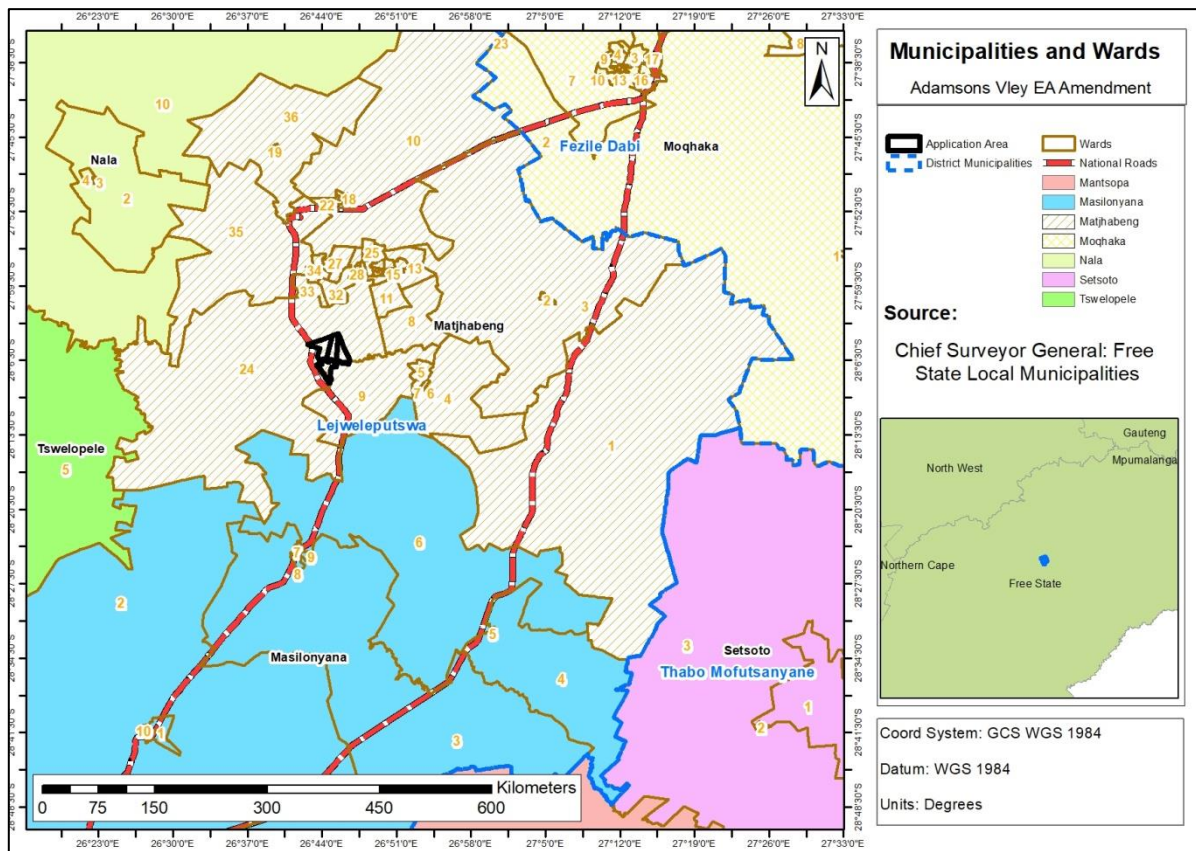


Figure 7: The affected local and district municipality (refer to Appendix D for an enlarged map).

The Matjhabeng Local Municipality incorporates the city of Welkom and the towns of Odendaalsrus, Virginia, Hennenman, Allanridge and Ventersburg. According to the 2016 census data, the Matjhabeng Local Municipality has a population of 429 113. Matjhabeng represents the hub of mining activity in the Free State Province. A large number of the surrounding population is employed by mining companies, such as Harmony Gold and Sibanye Gold.

## 2.1.3 Climate

The Free State experiences a continental climate, characterised by mild to hot summer temperatures in excess of 30°C and cold winter temperatures with severe frost during winter months. Areas in the east experience frequent snowfalls, especially on the higher ranges, whilst the west can be extremely hot in summer. Almost all precipitation falls in the summer months. Summers have a mean annual precipitation of 500 millimetres between November and March.

## 2.1.4 Topography

The topography of the application area comprises of undulating plains varying in altitude between 1 280 and 1 350 metres above sea level (masl).





### 2.1.5 Soils

The soil pattern in the area has a strong textural contrast. Plinthic horizons, soils with little development and some isolated rocky areas occur. Soils with a strong textural contrast are characterised as being strongly structured with marked clay accumulation and a reddish character. Soils with plinth horizons tend to be rich in iron. Other types are generally shallower and have little diversity. Soil depth is shown in Figure 8.

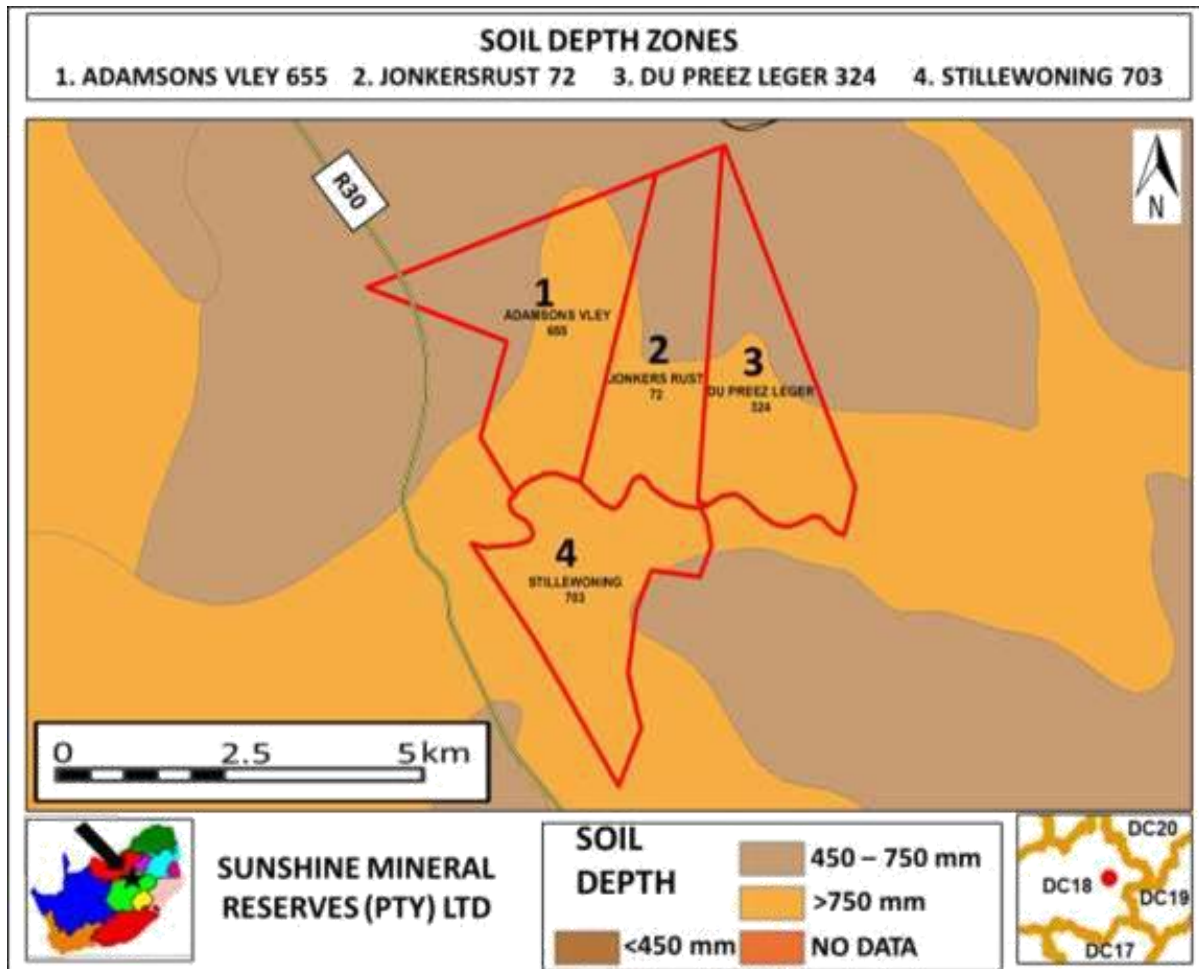


Figure 8: Soil depth on and around the farms relating to the application.

### 2.1.6 Land Use

The surrounding land use is characterised by dry land agriculture, natural vegetation, industrial, wetlands and mining (Figure 9). The predominant land uses within the application area are:

1. Cultivation
2. Natural land
3. Waterbodies.

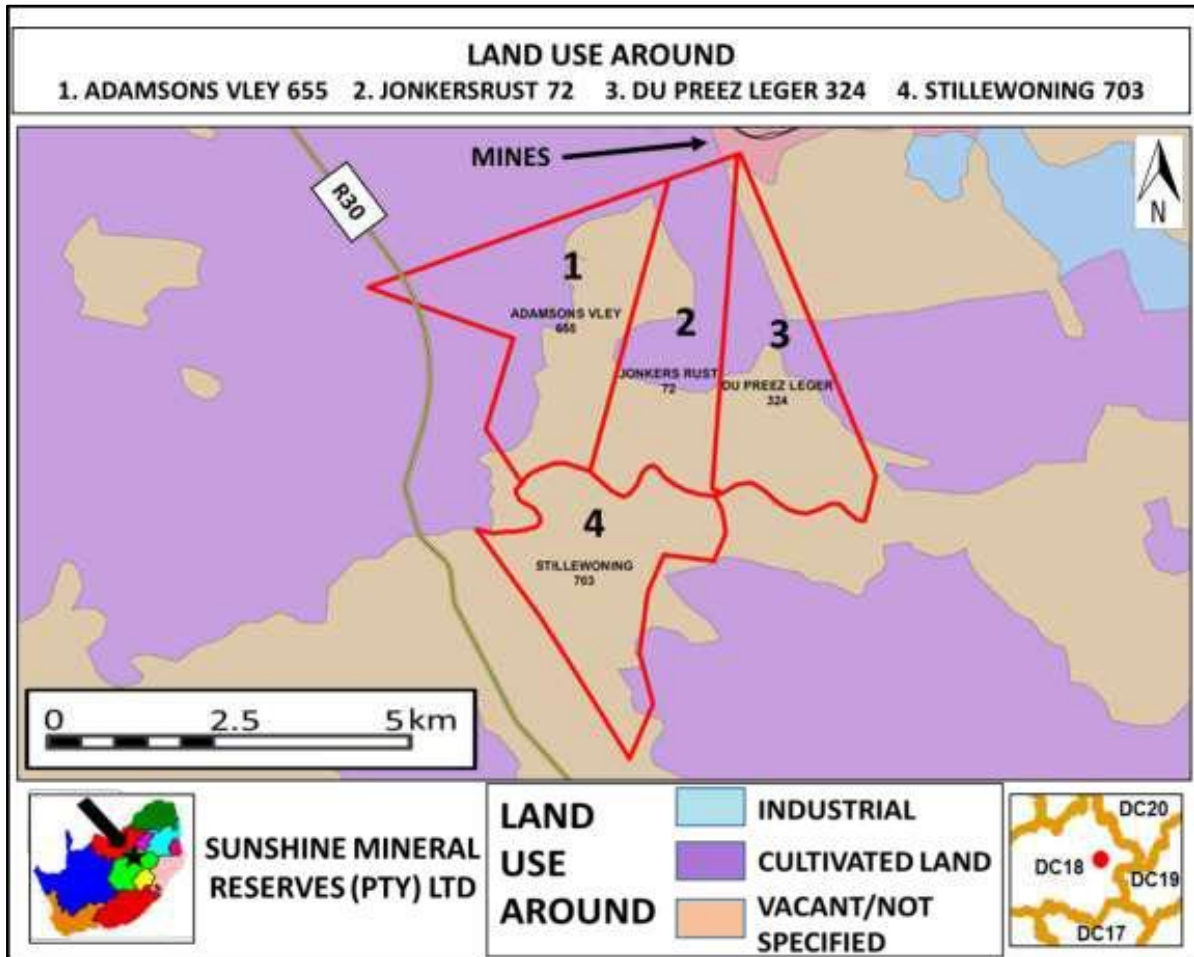


Figure 9: Current land uses.

### 2.1.6.1 Specific Environmental Features and Infrastructure On Site

Infrastructure on the four farms of the application area consists of mining, farm houses, farm buildings, farm roads and a primary school. The land is covered by grass, thicket and bushland in the lower-lying areas. This is being utilised for cattle grazing as well game farming. Figure 10 illustrates the environmental features and infrastructure.

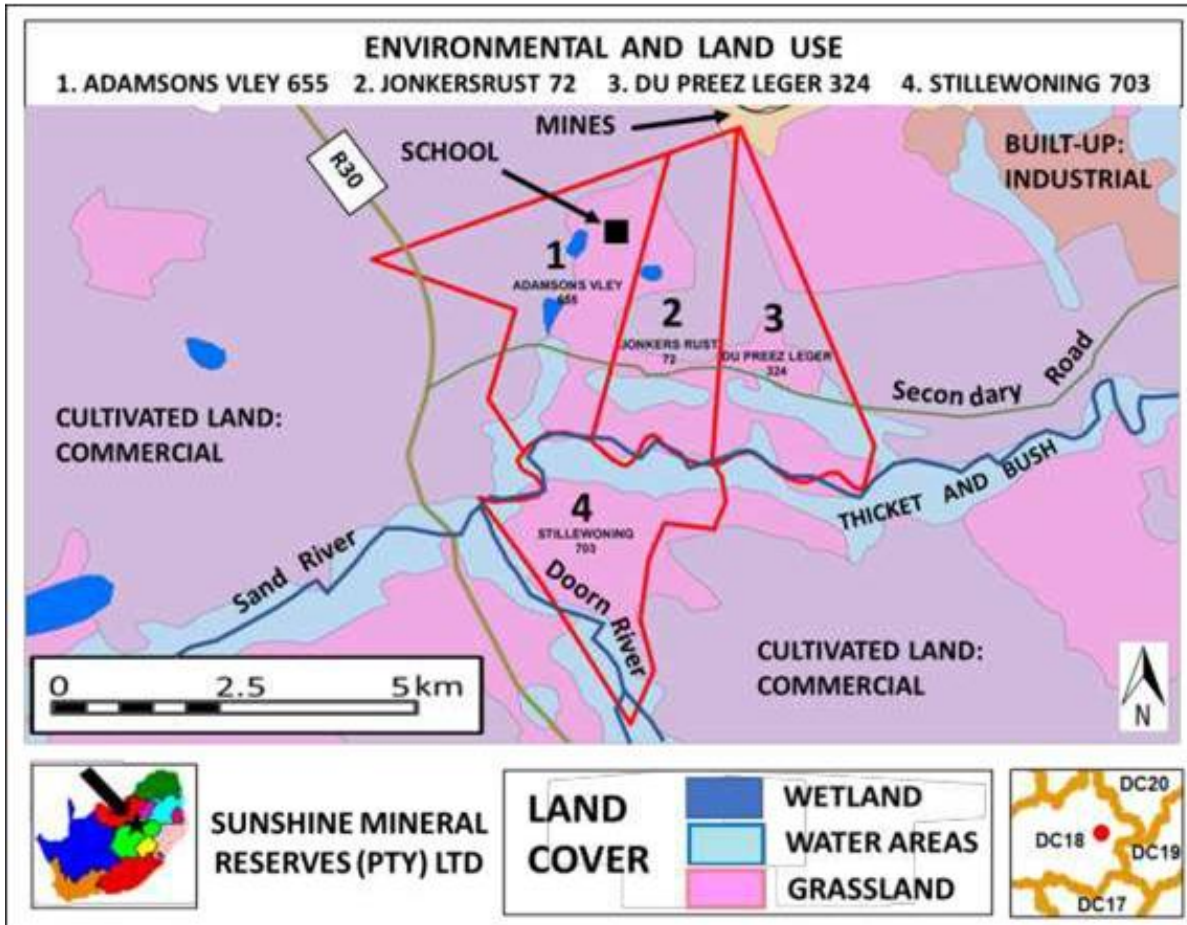


Figure 10: Land use on the four farms and surrounding areas.

### 2.1.7 Geology

The Free State Goldfield is typically overlain by 300 to 400 m of Karoo Supergroup strata, consisting predominantly of horizontally bedded sandstones and shales of the Ecca Group (Figure 11).

The surface geology of the prospecting area contains (i) thin Quaternary sediments, mostly recent sand and gravel in the river valleys, as well as (ii) the Karoo Dolerite Suite and (iii) the sedimentary rocks of the Karoo Supergroup. The Witwatersrand Supergroup which hosts gold is generally overlain Karoo Supergroup strata, which is predominantly consisting of horizontally bedded sandstones and shales of the Ecca Group. The Ecca Group contains coal which might be exploitable.

In addition to gold and uranium, the gold in the reefs of the Witwatersrand are known to contain approximately 10% silver, apart from a small quantity of base metals. Platinum Group Metals are known to be present in some reefs of the Witwatersrand Basin.

Alluvial diamonds are potentially present in the drainage channels of the current surface. The catchment area of the Sand River drains a large area known to host diamondiferous kimberlite.



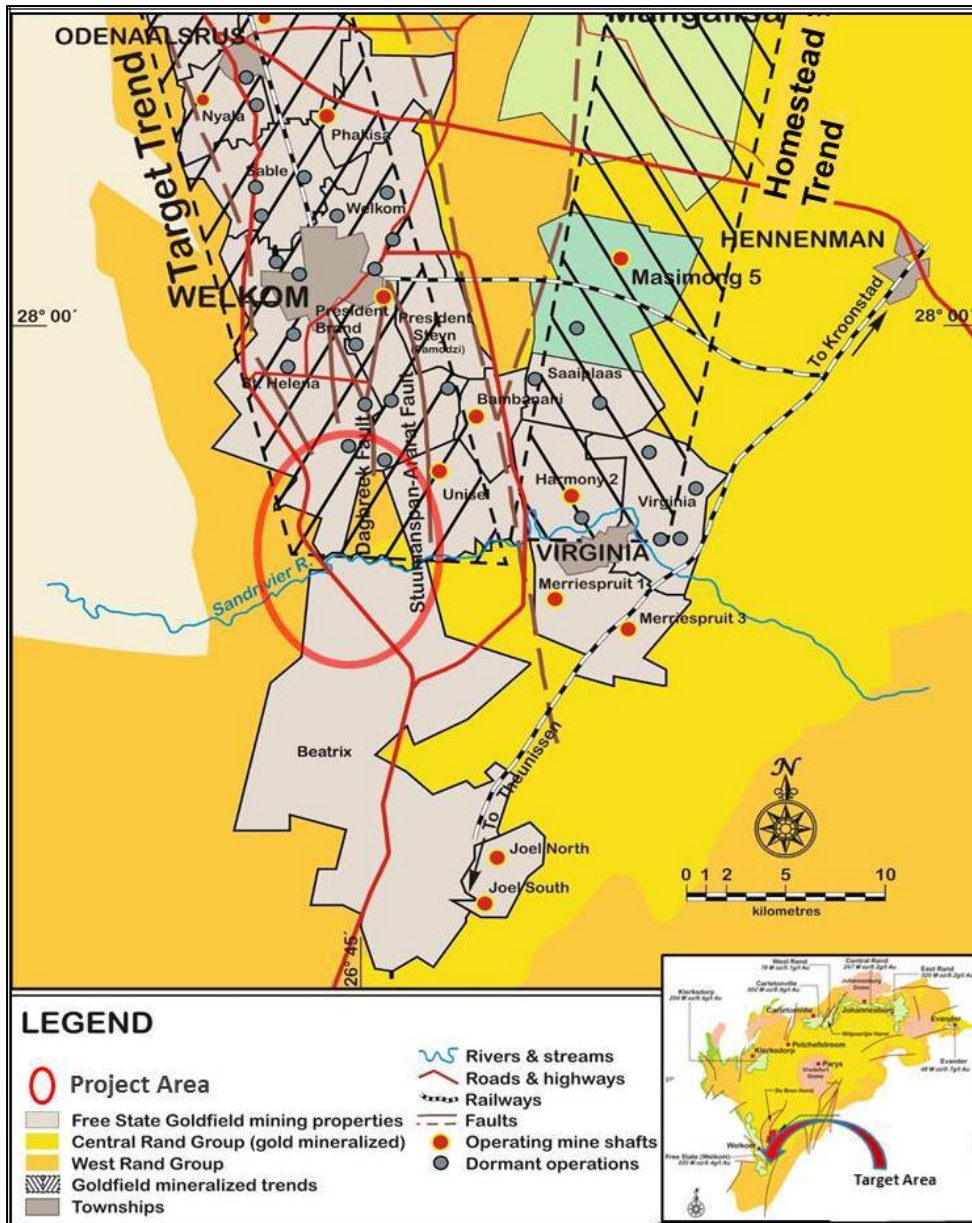


Figure 11: Geology of the application area

### 2.1.8 Surface Hydrology

The application area falls within the Vaal Water Management Area (WMA 5) (Figure 12), which includes rivers such as the Sand River, Doorn River and the Boschluisspruit (Figure 13).



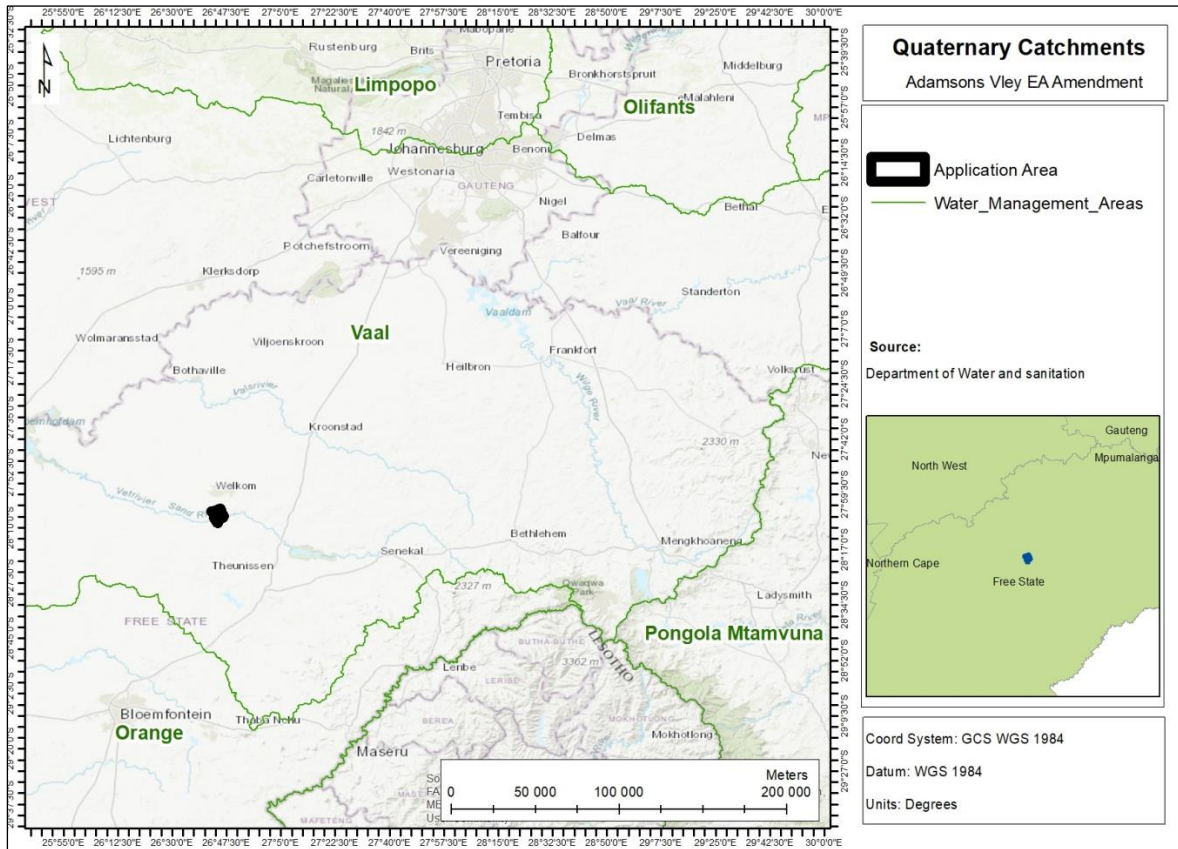


Figure 12: Water Management Areas of South Africa.

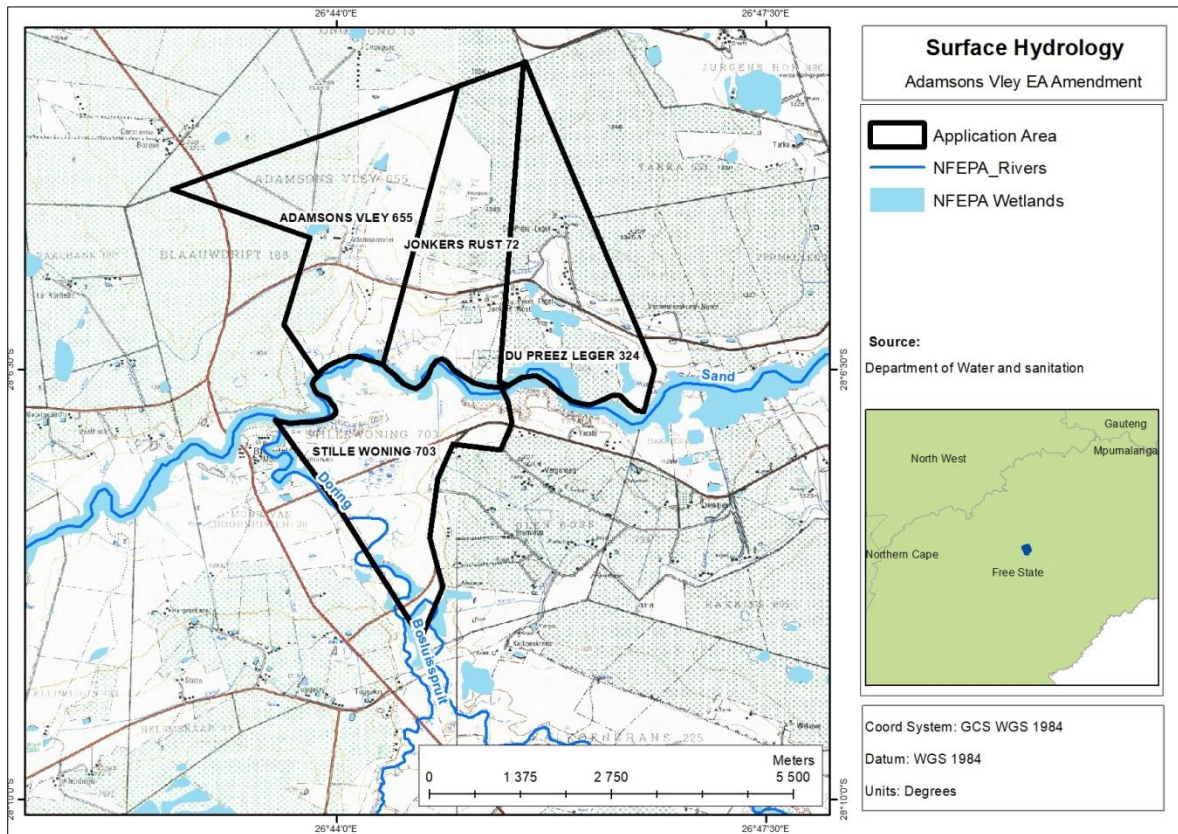


Figure 13: Surface hydrology of the application area.

The Vaal Water Management comprises of 12 tertiary catchment areas and the application area is situated in the DC18 quaternary catchment area (Figure 14). According to the South African Mine Water Atlas (SAMWA, 2018), this catchment is of moderate ecological sensitivity.

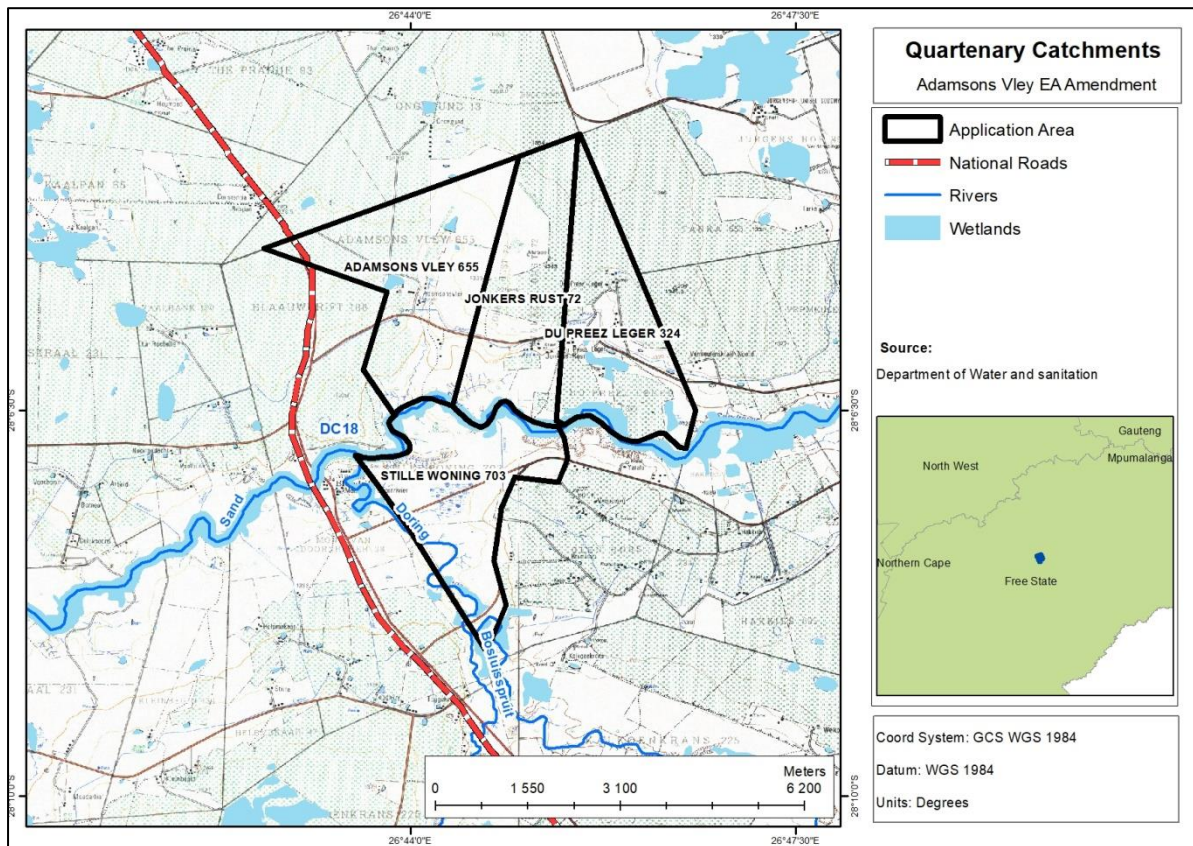


Figure 14: Quaternary catchment area of the application.

### Freshwater Ecosystem Priority Area (NFEPA) Status

In an attempt to better conserve aquatic ecosystems, South Africa has recently categorised its river systems according to set ecological criteria (i.e. ecosystem representation, water yield, connectivity, unique features, and threatened taxa) to identify Freshwater Ecosystem Priority Areas (FEPAs) (Driver et al., 2011). The FEPAs are intended to be conservation support tools and envisioned to guide the effective implementation of measures to achieve the National Environment Management: Biodiversity Act, 2005 (Act 10 of 2004) (NEM:BA) biodiversity goals (Nel et al. 2011).

According to Driver et al. (2011), the rivers present in the application area are in a largely modified condition (class D) (Figure 15). The modified river conditions are due to impacts from agricultural activities and urban development.



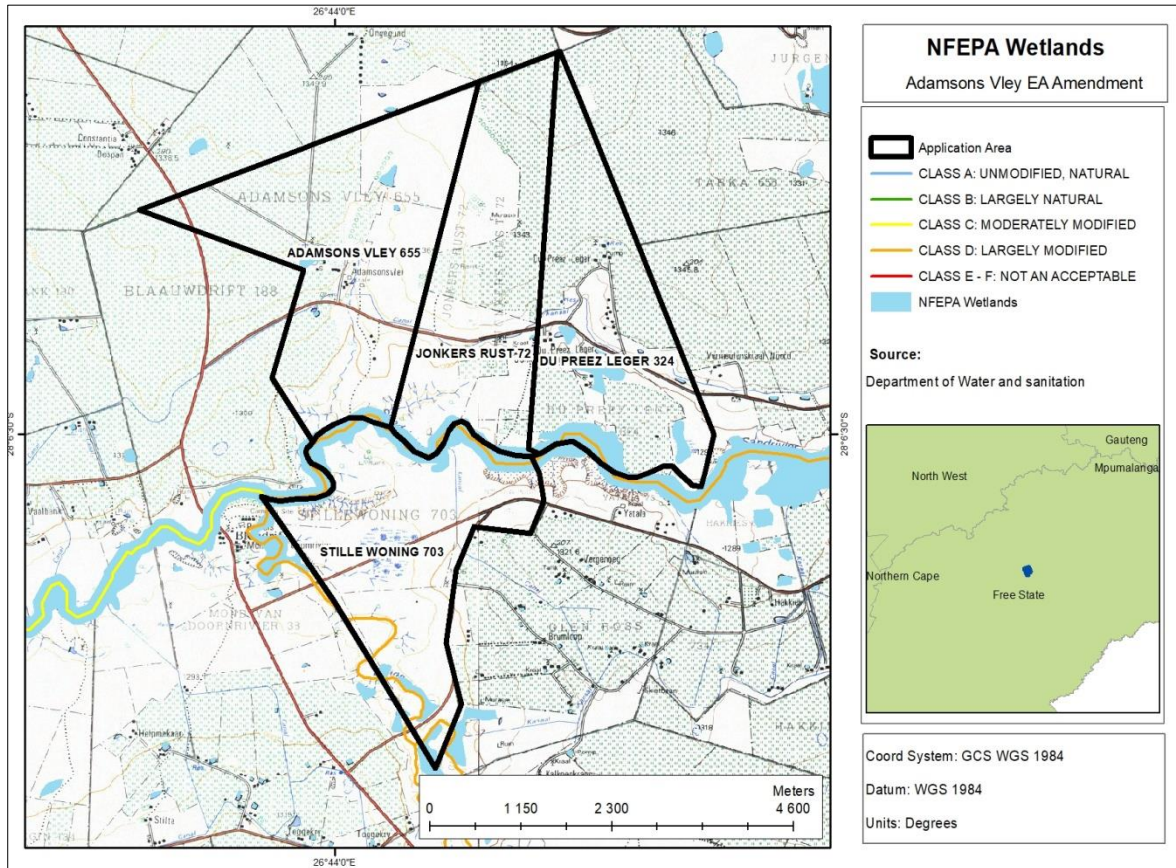


Figure 15: NFEPA wetlands present in the application area.

### 2.1.9 Fauna

The application area is disturbed by land uses such as cultivation. A desktop search for expected species and identified species as well as the identification of any Red Data or Species of Conservation Concern (SCC) present or potentially occurring in the area was conducted. Emphasis was placed on the probability of occurrence of species of provincial, national and international conservation importance. Table 8 summarises the diversity of fauna that is expected to occur in the application area.

Table 8: Animals groups considered for this study along with the total species possibly occurring in or near the application area and how many of these species are SCC.

Animal Group	Total Species	Species of Conservation Concern
Avifauna	266	22
Mammals	73	10
Reptiles	28	2
Amphibians	20	1

### 2.1.9.1 Avifauna

Based on the South African Bird Atlas Project, Version 2 (SABAP2) database, 266 bird species are expected to occur in the vicinity of the application area. Of the expected bird species, 22 species are listed as SCC either on a regional scale or international scale. The SCC includes the following:

- Four species that are listed as Endangered (EN) on a regional basis
- Six species that are listed as Vulnerable (VU) on a regional basis
- Twelve species that are listed as Near Threatened (NT) on a regional basis.

### 2.1.9.2 Important Bird Areas

Important Bird Areas (IBAs) are the sites of international significance for the conservation of the world's birds and other conservation significant species as identified by BirdLife International. These sites are also all Key Biodiversity Areas; sites that contribute significantly to the global persistence of biodiversity (BirdLife, 2017).

According to BirdLife International (2017), the selection of Important Bird and Biodiversity Areas (IBAs) is achieved through the application of quantitative ornithological criteria, grounded in up-to-date knowledge of the sizes and trends of bird populations. The criteria ensure that the sites selected as IBAs have true significance for the international conservation of bird populations and provide a common currency that all IBAs adhere to, thus creating consistency among, and enabling comparability between, sites at national, continental and global levels.

No IBAs occur within the proximity of the proposed application area. The nearest IBA to the application area is the HJ Joel Private Nature Reserve, which is situated approximately 20 km south-east of the application area (Figure 16).

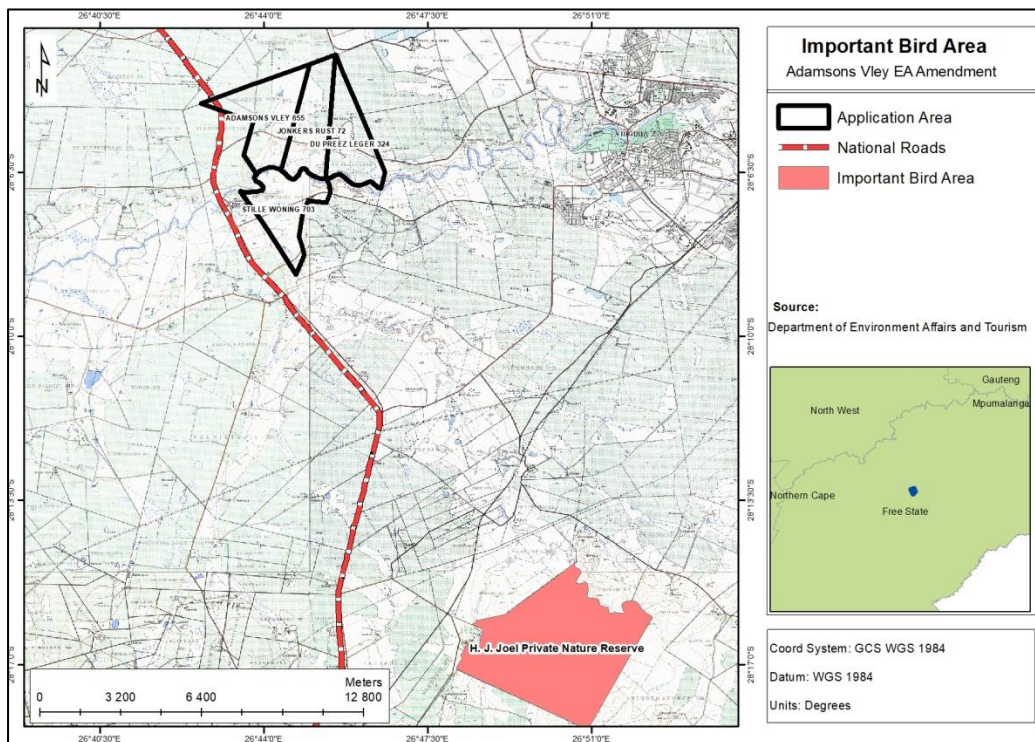


Figure 16: Nearest IBA to the project area.



### 2.1.9.3 Mammals

The International Union for Conservation of Nature (IUCN) Red List Spatial Data (IUCN, 2017) lists 73 mammal species that could be expected to occur within the vicinity of the application area. Of these species, 8 are medium to large conservation dependant species, such as *Ceratotherium simum* (Southern White Rhinoceros) and *Equus quagga* (Plains Zebra) that, in South Africa, are generally restricted to protected areas such as game reserves. These species are not expected to occur in the project area and are removed from the expected SCC list. Of the remaining 65 small to medium sized mammal species, 10 are listed as being of conservation concern on a regional or global basis. The list of potential species includes:

- One that is listed as Endangered (EN) on a regional basis
- Four that are listed as Vulnerable (VU) on a regional basis
- Five that are listed as Near Threatened (NT) on a regional scale.

### 2.1.9.4 Reptiles

Based on the IUCN Red List Spatial Data (IUCN, 2017) and the ReptileMAP database provided by the Animal Demography Unit (ADU, 2017) 28 reptile species are expected to occur in the application area. Two reptile species of conservation concern are expected to be present in the application area, namely *Smaug giganteus* (Sungazer or 'Ouvolk') and *Chamaesaura aenea* (Coppery Grass Lizard). *Smaug giganteus* (Sungazer or 'Ouvolk') is categorised as Vulnerable on both a regional and an international scale, and is endemic to South Africa. *Chamaesaura aenea* (Coppery Grass Lizard) is categorised as near threatened on both an international and a regional scale.

### 2.1.9.5 Amphibians

Based on the IUCN Red List Spatial Data (IUCN, 2017) and the AmphibianMAP database provided by the Animal Demography Unit (ADU, 2017) 20 amphibian species are expected to occur in the application area. One amphibian species of conservation concern could be present in the application area, namely the Giant Bull Frog (*Pyxicephalus adspersus*). The Giant Bull Frog is listed as near threatened on a regional scale.

### 2.1.10 Vegetation

The overall application area is situated within the grassland biome which is centrally located in southern Africa, and adjoins all except the desert, fynbos and succulent Karoo biomes (Mucina and Rutherford, 2006). The grassland biome comprises many different vegetation types. According to Mucina and Rutherford (2006), the application area is situated across two vegetation types, namely (i) Highveld Alluvial Vegetation (AZa 5) and (ii) Vaal Vet Sandy Grassland (Gh10) (Figure 17).



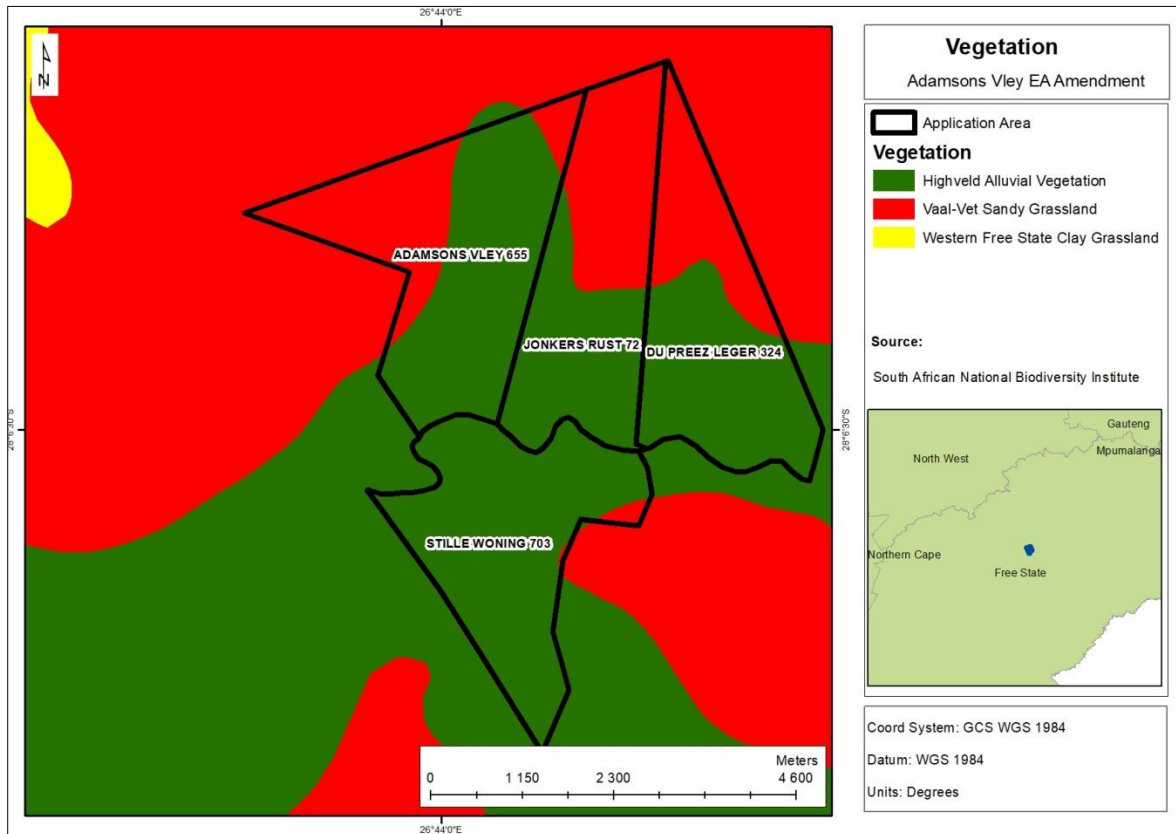


Figure 17: Vegetation of the application area.

The vegetation types are discussed in more detail below.

### 2.1.10.1 Highveld Alluvial Vegetation (AZa 5)

According to Mucina and Rutherford (2006), the Highveld Alluvial Vegetation can be found Mpumalanga, Gauteng, the Free State and the North West provinces as well as Lesotho and Swaziland. The vegetation type can be found at an altitude of 1000 - 1500 masl. The Highveld Alluvial Vegetation supports riparian thickets which are mostly dominated by *Acacia karoo*. These areas are accompanied by seasonally flooded grasslands and disturbed herblands which are often dominated by alien plants.

Important taxa include:

- Riparian Thickets
  - Small Trees: *Acacia karoo* (d), *Salix mucronata subsp. mucronata* (d), *S. mucronata subsp. woodii* (d, within subescarpment grasslands of KwaZulu - Natal), *Ziziphus macronata* (d), *Celtis africana*, *Rhus lancea*.
  - Tall Shrubs: *Gymnosporia buxifolia* (d) *Rhus pyroides* (d) *Diospyros lycioides*, *Ehretia rigida*, *Grewia flava*.
  - Low Shrubs: *Asparagus larycinus* (d), *A suaveolens* (d).
  - Woody Climber: *Clematis brachiata*.
  - Succulent Shrub: *Lycium hirtum* (d).
  - Graminoids: *Setaria verticillata* (d), *Panicum maximum*.



- Herb: *Pollichia campestris*.
- Reed Beds
  - Megagraminoid: *Phragmites australis* (d).
- Flooded Grasslands and Herblands
  - Low Shrubs: *Gomphocarpus fruticosus* (d), *Felicia muricata*.
  - Succulent Shrub: *Salsola rabieana*
  - Graminoids: *Agrostis lachnantha* (d), *Andropogon eucomus* (d), *Chloris virgata* (d), *Cynodon dactylon* (d), *Eriogonum plana* (d), *Hemarthria altissima* (d), *Imperata cylindrica* (d), *Ischaemum fasciculatum* (d), *Miscanthus junceus* (d), *Paspalum distichum* (d), *Andropogon appendiculatus*, *Brachiaria morlothii*, *Cyperus denudatus*, *C. longus*, *Echinochloa holubii*, *Eragrostis obtusa*, *E. porosa*, *Fimbristylis ferruginea*, *Panicum coloratum*, *Pycreus mundii*, *Sporobolus africanus*, *S. fimbriatus*, *Themeda triandra*, *Urochloa panicoides*.
  - Herbs: *Persicaria lapathifolia* (d), *Alternanthera sessilis*, *Barleria macrostegia*, *Corchorus asplenifolius*, *Equisetum ramosissimum*, *Galium capense*, *Hibiscus pusillus*, *Lobelia angolensis*, *Nidorella resedifolia*, *Persicaria amphibia*, *P. hystricula*, *Pseudognaphalium oligandrum*, *Pulicaria scabra*, *Rorippa fluviatilis* var. *fluviatilis*, *Senecio inornatus*, *Stachyshyssopoides*, *Vahlia capensis*.
  - Geophytic Herbs: *Vrinum bulbispermum*, *Haplocarpha lyata*.
- Open Water
  - Aquatic Herb: *Myriophyllum spicatum*.

The Highveld Alluvial Vegetation is considered least threatened. Nearly 10% has been statutorily conserved in the Barberspan. These conserved areas are; Bloemhof Dam, Christiana, Faan Meintjies, Sandveld, Schoonspruit, Soetdoring, and Wolwespruit Nature Reserves. A loss in the vegetation type is generally associated with cultivation and the building of dams. This Alluvial vegetation is prone to infestation by a number of weeds, obviously encouraged by the high nutrient status of soils and ample water supply. Woody species often dominate either riverine thickets or grasslands or form rural communities in disturbed habitats. The undergrowth of the alluvial riparian thickets and the accompanying grasslands suffer from heavy overgrazing in many places.

#### **2.1.10.2 Vaal-Vet Sandy Grassland (Gh 10)**

Vaal-Vet Sandy Grassland is found in the North West and Free State Provinces at an altitude of 1 260 – 1 360 mamsl. It occurs south of Lichtenburg and Ventersdorp and stretches southwards towards Klerksdorp, Leeudoringstad, Bothaville and to the north towards Brandfort.

The landscape is plains-dominated with irregular, undulating plains with mainly low-tussock grasslands with an abundant karroid element. A characteristic feature of this vegetation unit is the dominance of *Themeda triandra*.





Important taxa include:

- Graminoids: *Antheophora pubescens* (d), *Aristida congesta*, *Chloris virgata* (d), *Cymbopogon caesius* (d), *Cynodon dactylon* (d), *Digitaria argyrograpta*, *Elionurus muticus*, *Eragrostis chloromelas* (d), *E. lehmanniana* (d), *E. plana* (d), *E. tichophora* (d), *Heteropogon contortus* (d), *Panicum gilvum* (d), *Setaria Sphacelata* (d), *Themeda triandra* (d), *Targus berteronianus* (d), *Brachiaria serrata*, *Cymbopogon pospischilii*, *Digitaria eriantha*, *Eragrostis curvula*, *E. obtusa*, *E. superba*, *Panicum coloratum*, *Pogonarthria squarrosa*, *Trichoneura grandiglumis*, *Triraphis andropogonoides*.
- Herbs: *Stachys spathulata* (d), *Barleria macrostegia*, *Berkheya onopordifolia* var. *onopordifolia*, *Chamaesyce inaequilatera*, *Geigeria aspera* var. *aspera*, *Helichrysum caespititium*, *Hermannia depressa*, *Hibiscus pusillus*, *Monsonia burkeana*, *Rhynchosia adenodes*, *Selago densiflora*, *Vernonia oligocephala*.
- Geophytic Herbs: *Bulbine narcissifolia*, *Ledebouria marginata*.
- Succulent Herbs: *Tripteris aghillana* var. *integrifolia*

### 2.1.11 Sensitivity and Conservation Status of Local Ecosystems

There are features on site that need to be taken into account in order to evaluate sensitivity of the site and its surroundings. These include the following:

4. Wetland areas: There are a variety of wetland habitat on site, including rivers, streams and pans (Figure 18). The wetlands are protected according to the National Water Act (Act 36 of 1998) and also constitute important ecological areas in terms of hydrological process and as refugia for species
5. Natural vegetation: The Vaal-Vet Sandy Grassland, which is listed as Endangered in the scientific literature and according to the National List of Ecosystems that are Threatened and need protected (GN10002 of 2011), published under the NEMA: Biodiversity Act (Act 10 of 2004) (Figure 19).

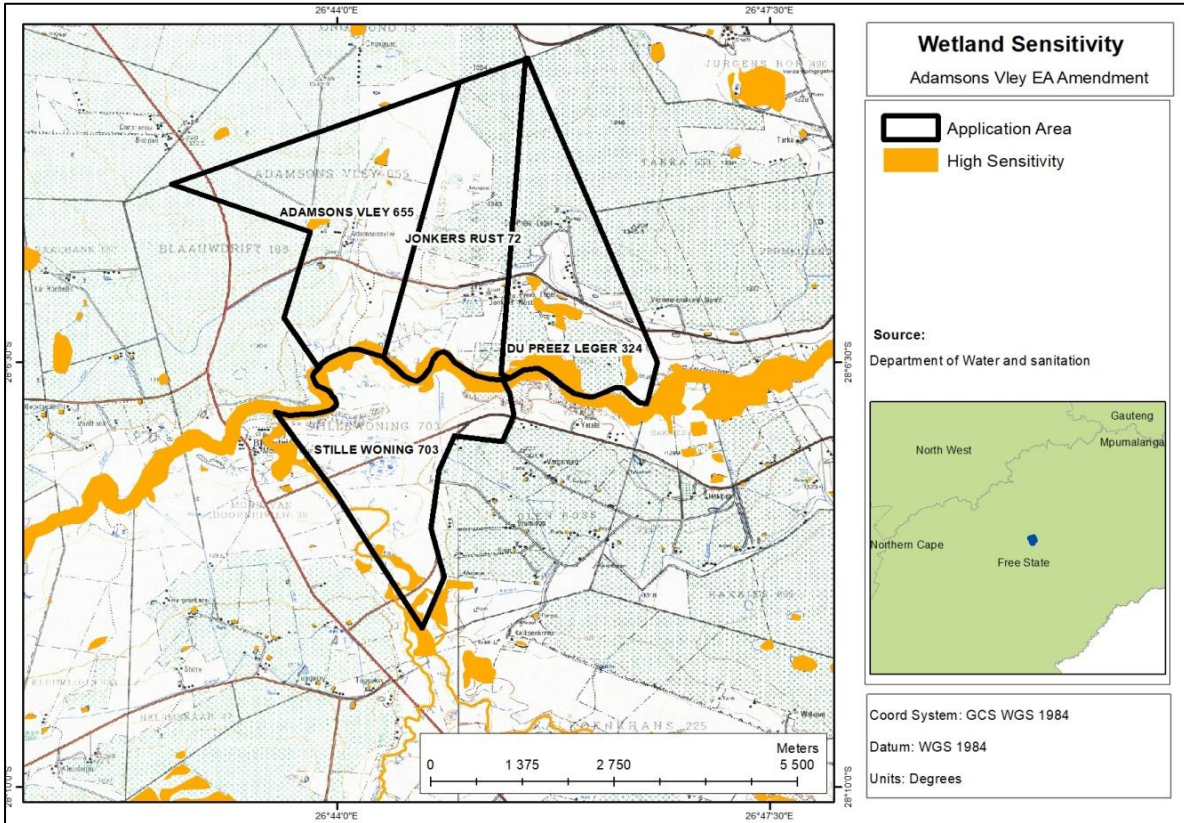


Figure 18: Wetland sensitivity of the application area and surrounding areas.

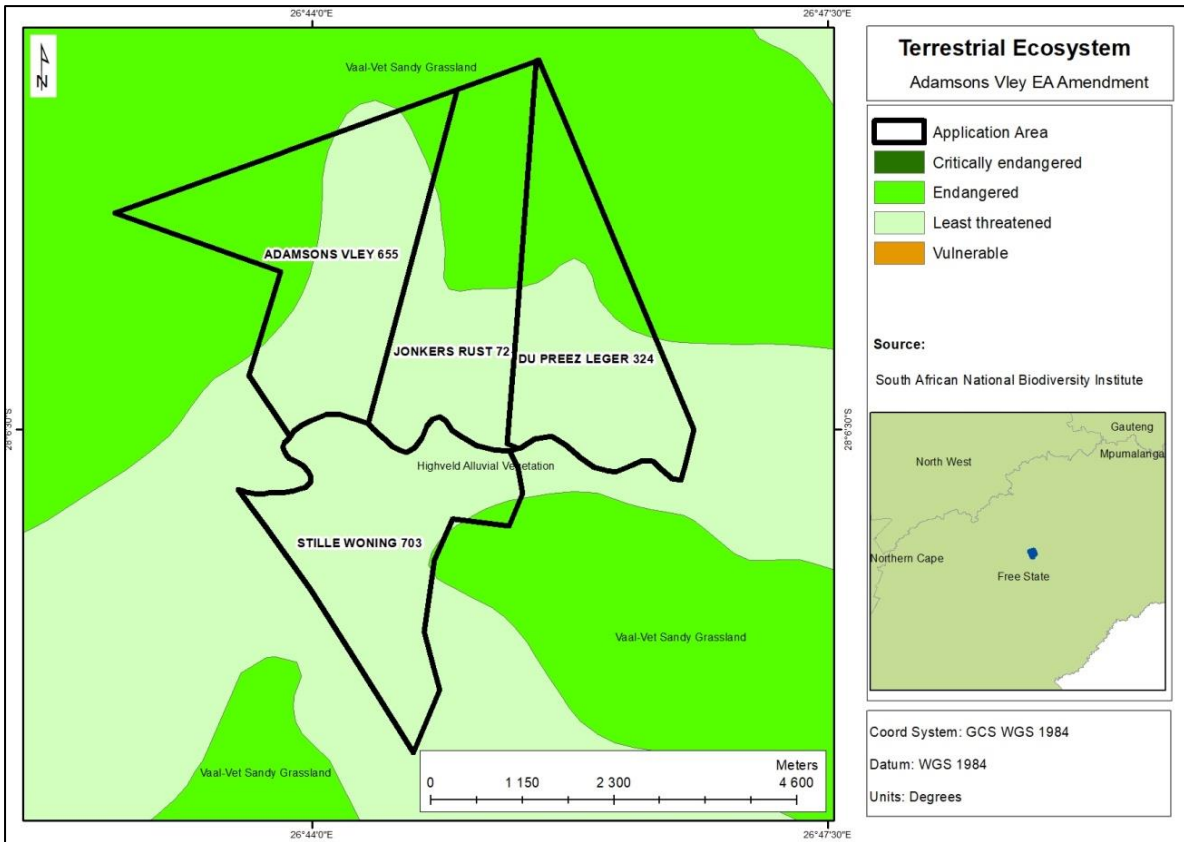


Figure 19: Ecosystem conservation status of the application area.



These areas of grassland have high conservation value. However, according to the National Biodiversity Assessment (2011), the Terrestrial Ecosystem Protection Level for this application area is Hardly Protected (Figure 20).

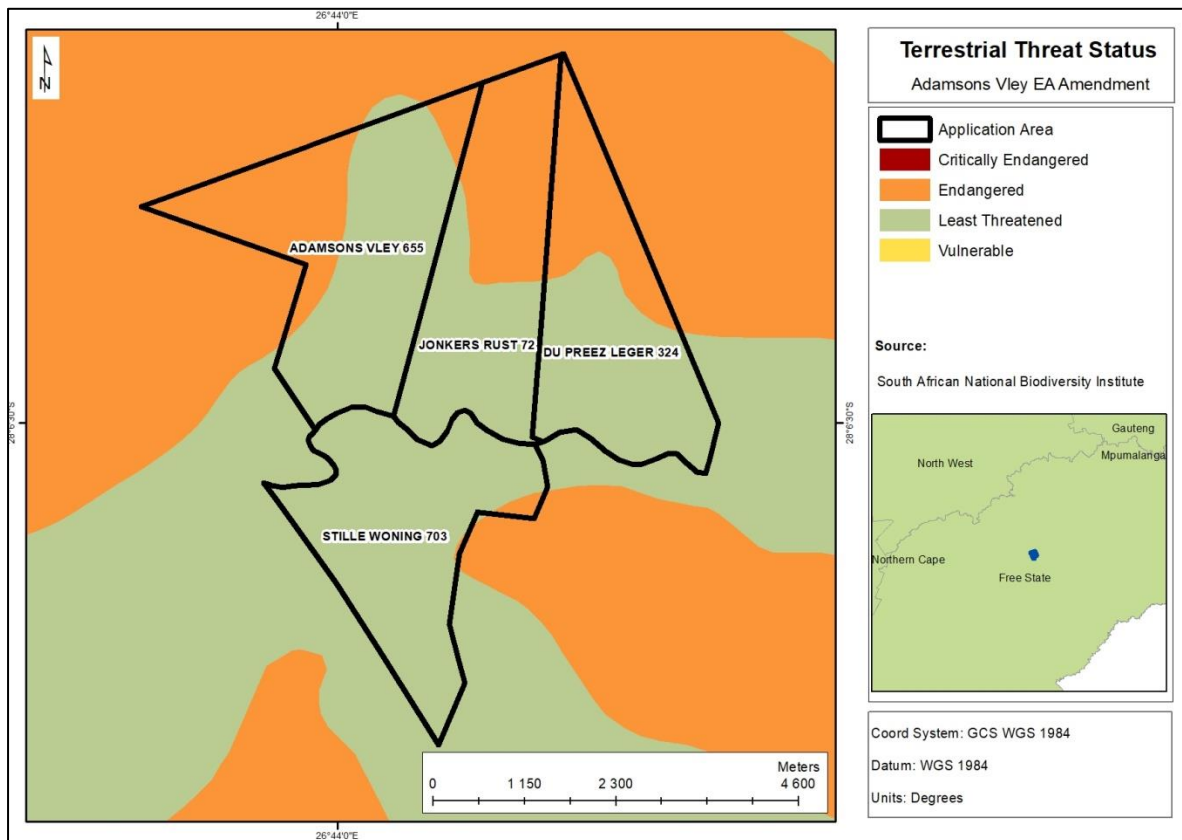


Figure 20: Conservation status of ecosystems in the application area.

### 2.1.12 Critical Biodiversity

Sensitive environmental features on site have been mapped and are presented in Figure 21. Sections within the application area are identified as Critical Biodiversity Areas 1 (CBA 1), Ecologically Sensitive Areas 1 and 2 (ESAs 1 and 2), Degraded and Other according to the Free State Biodiversity Sector Plan. The plan is a compilation of sensitive ecological elements considered to be a high priority in terms of protection and conservation.

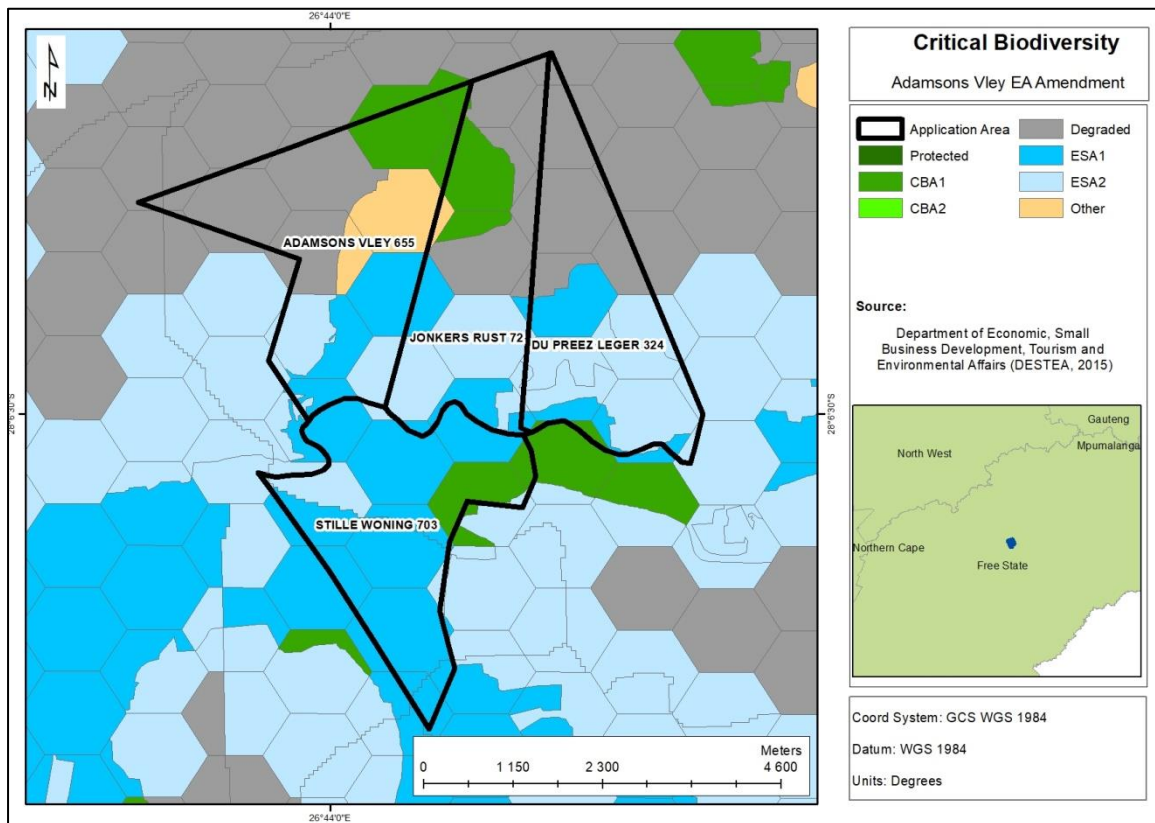


Figure 21: Ecological sensitive areas.

Table 9 summarises the conservation categories present within and around the application area.

Table 9: Summary of conservation categories.

Category	Sub-category	Description
<b>Protected Areas</b>		Areas that are managed mainly for biodiversity conservation and contribute to meeting biodiversity targets for those biodiversity features that fall within their boundaries
<b>CBA</b>	CBA 1	Areas that are 80-100% irreplaceable for meeting biodiversity conservation targets: or Critical Linkages; or Critically Endangered
	CBA 2	Areas that are optimally located as part of the most efficient solution to meet biodiversity targets
<b>ESA</b>	ESA: Local Corridor	Fine scale connectivity pathways that contribute to resilience and connectivity between climate change focal areas
<b>Natural Areas</b>		Natural areas which are not identified as CBAs or ESAs but which provide a range of ecosystem services from their ecological infrastructure
<b>Degraded</b>		Areas that could have potentially experienced a loss of important biodiversity features and/or their supporting ecosystems
<b>Other</b>		Areas in good or fair ecological condition that fall outside the protected area network and have not been identified as CBAs or ESA's

Proposed prospecting activities will be undertaken off-site, thus resulting in no impact on ecological sensitivity areas within the site.





### 2.1.13 Protected Areas

Formally protected areas refer to areas protected either by national or provincial legislation. Based on the SANBI (2010) Protected Areas Map and the National Protected Areas Expansion Strategy (NPAES), the application area does not overlap with, nor will it impact upon, any formally protected areas.

The nearest protect area to the application area is the HJ Joel Private Nature Reserve, which is situated approximately 20 km south-east of the application area (Figure 22).

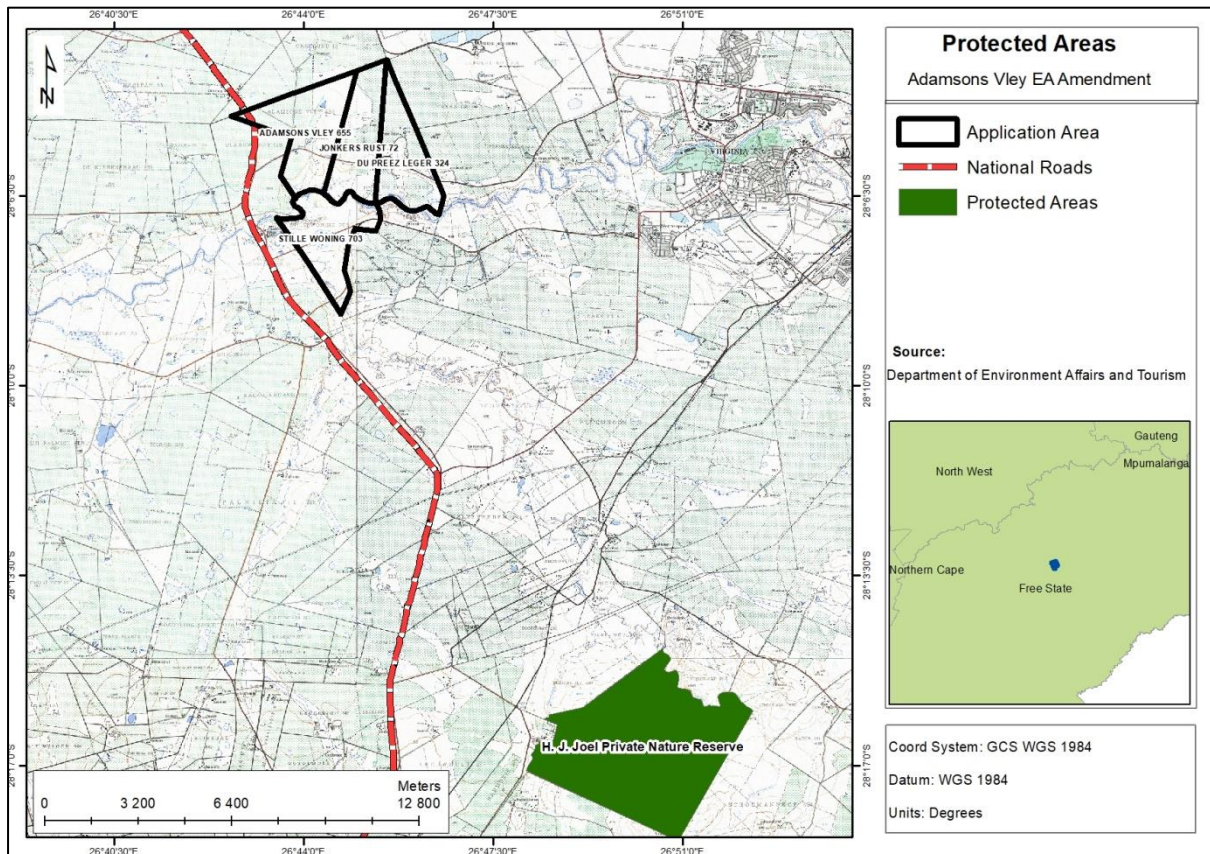


Figure 22: Nearest protected area to the application.

### 2.1.14 Heritage

A Heritage Impact Assessment was undertaken over the application area in 2018. The study was conducted on a desktop level and a field survey was undertaken in order to identify archaeological sites, burial grounds and built environment features within the area.

According to the literature review, archaeology is divided into three periods, namely the Stone Age, the Iron Age and the Historical Period. It is during these periods that diverse groups of people settled on the southern African landscape.

The Stone Age is divided into three periods, namely the Early Stone Age (ESA) (2 million to 250 000 years ago), the Middle Stone Age (MSA) (250 000 – 22 000 years ago) and the Later Stone Age (LSA) (25 000 to 200 years ago). The ESA comprises the Oldowan stone tool complex (2 and 1.7-1.5 million years ago), and the Acheulean stone tool complex (1.7-1.5 million years ago and 250-200



thousand years ago) (Klein, 2000; Mitchell, 2002). The transition from Early to Middle Stone Age includes a change in technology from large stone tools to smaller blades and flakes. In the Free State Province, MSA and LSA sites are mainly located near river drainages such as Doring Spruit, north of Kroonstad and the Vals River, as well as the Sand River to the south of Ventersburg (Rossouw, 2012a; Kruger, 2018).

The Iron Age is typically referred to as the period during which the first Bantu speakers migrated south from western Africa (Coplan, 2000). According to Huffman (2007), the Iron Age can be divided into the Early Iron Age (EIA) (AD 200 – 900), the Middle Iron Age (MIA) (AD 900 – 1 300) and the Late Iron Age (LIA) (AD 1 300 – 1 840). The Iron Age is characterised by farming communities who domesticated animals, produced various ceramic vessels, smelted iron for weapons and manufactured tools. Several Iron Age stone wall settlements have been found in the Kroonstad region.

The Historical Period dates from AD 1 600 and it is generally the period related to colonial settlement in South Africa. During the Anglo-Boer war, several battles took place in and around the Kroonstad region. Following disputes with the British, the Dutch-speaking Voortrekkers migrated north into the interior of southern Africa from the Cape Colony in 1836 in search of creating a homeland, independent of British rule. This migration of approximately 12 000 – 140 000 Voortrekkers is referred to as the Great Trek. During 1815 to 1840 Mzilikazi, a Zulu who departed from Shaka Zulu, migrated with his followers north and invaded the interior of South Africa. This led to a series of battles and wars between the Zulus, Voortrekkers and Sotho-Tswana communities in the Orange Free State and southern Transvaal (Gutteridge, 2008). The Voortrekkers, who were assisted by the Sotho-Tswana and Griqua groups, defeated Mzilikazi's Matabele. Following this dispute, the region between the Orange and Vaal Rivers was proclaimed as British Possession by Sir Harry Smith in 1848 (Scott-Keltie and Epstein, 1925).

### **History of Welkom**

Welkom is considered to be South Africa's youngest city and is the second largest town in the Free State. It was proclaimed by William Backhouse, a city planning consultant for Anglo-American, in 1947. The city was founded for the rich gold and uranium deposits discovered in the area (Erasmus B, 2004).

Notable sites in the area include:

6. The Aandenk Monument – celebrating the discovery of gold in the area An Afrikaans language monument
  - The Joanne Pim Monument
  - A second world war monument
  - A Voortrekker Memorial A dog monument
7. The MOTH memorial
  - The Gold Museum – offers a complete history of the discovery of Gold in the area
  - The Welkom Museum – offers a complete history of Welkom
8. A Local Apartheid Memorial



- The Sand River Convention Memorial – located on the banks of the Sand River. This is where the independence Zuid-Afrikaansche Republiek (Transvaal) was recognised by the British Empire in 1852 (Ross, 1999).

#### 2.1.14.1 Culture/Heritage Resources

No physical survey took place as part of this study. The study relied on published records and HIAs conducted in the Free State province and for location of communities within the project footprint was based on Google Earth Spotting. Furthermore, the following technological tools and platforms were deemed important for documenting and recording located and/or identified sites:

1. DELL aided with Garmin Basecamp Software, Google Earth – to plot the propose development area
2. Quantum GIS Wroclaw (1.7.4) was used to communities spotted in the proposed development area against the proposed mine development infrastructures.

#### Cadastral Search

Previous studies conducted over the application area indicate that a number of built environment and landscape features have been recorded. Ruins have been recorded on Farm Stille Woning 703. Over 20 built environment features north of the Sand River on Farms Jonkers Rust 72 and Du Preez Leger 324 have been recorded in form of homesteads and kraals. These features are located north and south of the canal that cuts across the two farms. On Farms Adamsons Vley 655 over 12 built environment features have been recorded and they are mostly homesteads.

The cadastral database shows that there are over 32 built environment features located in the four affected farms. Based on experience and knowledge gained on similar projects most of the farming community homestead and kraals contain burial grounds and graves and the likelihood of finding such is high.

#### Google Earth Search

Google Earth search of the affected area yielded the following results:

1. **Adamsons Vley 655:** Located within this farm's boundaries is a water catchment area of an unknown stream. Close to it various buildings can be seen as well as some open veld and agricultural land. On the southern part of the farm, which extends all the way to the Sand River as its southern boundary, is part of the Sand River floodplain, and also within it is some agriculture land. Findings here can be historical homesteads as well as some artefacts that might be found in the runoff of the catchment area.
2. **Jonkers Rust 72:** This farm is quite similar to Adamsons Vley 655, but with the exception of the catchment area. However, many trees found in square formations can indicate the presence of historical homesteads
3. **Du Preez Leger 324:** This farm is also quite similar to the previously described properties. However, within the Sand River floodplain some agricultural land can be identified, but they do look to be in disuse, due to many trees and scrubs that can be identified on it. These could be remnants of an historical farmstead that may have been located nearby.





4. **Stille Woning 703:** This farm is located on the southern banks of the Sand River and the Doorn River is located on the western boundary. Very little human interference can be detected apart from a building located on the north-eastern boundary of the property

Similarly, to cadastral search, the Google Earth spotting of the affected farms show areas with a possibility of yielding historical burial grounds and grave (i.e., cemeteries or graveyards). Some of these may not necessarily be in homesteads but also along floodplains of the Sand River. Trekboers have been known to bury their dead on floodplain due to the ease of which graves can be dug in the sandy soil.

**2.1.15 Palaeontology**

According to the palaeosensitivity map developed by the South African Heritage Resources Agency (SAHRA), the application area is situated in areas classified as very high, moderate to low sensitivity (Figure 23). Notice of the proposed Prospecting Right Application has been uploaded onto the South African Heritage Resources Agency (SAHRA) website, South African Heritage Information System (SAHRIS).

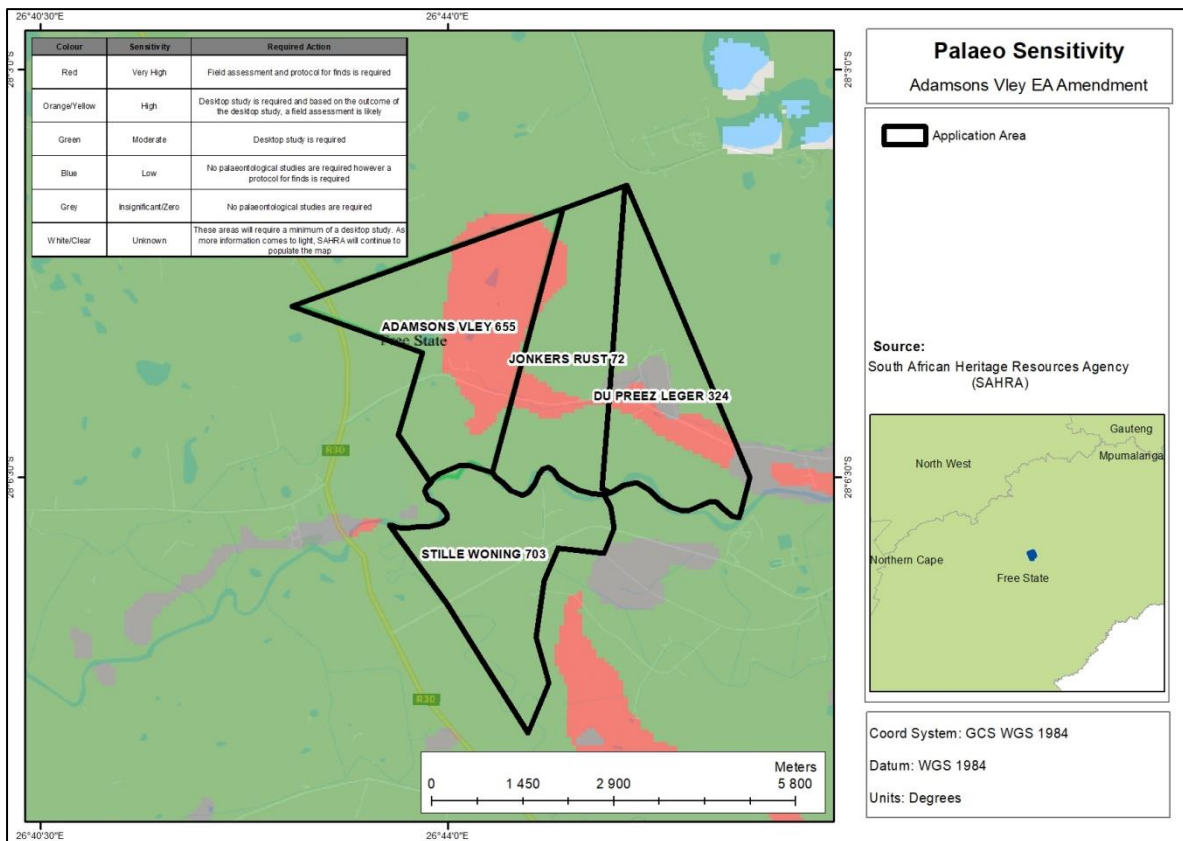


Figure 23: Palaeosensitivity of the application area.

**2.1.16 Biodiversity and Mining**

The Mining and Biodiversity Guidelines (2013) were developed by the Department of Mineral Resources, the Chamber of Mines, the South African National Biodiversity Institute and the South African Mining and Biodiversity Forum, with the intention to find a balance between economic growth



and environmental sustainability. The Guideline is envisioned as a tool to “foster a strong relationship between biodiversity and mining” which will eventually translate into best practice within the mining sector. In identifying biodiversity priority areas which have different levels of risk against mining, the Guideline categorises biodiversity priority areas into four categories of biodiversity priority areas in relation to their importance from a biodiversity and ecosystem service point of view as well as the implications for mining in these areas:

1. Legally protected areas, where mining is prohibited.
2. Areas of highest biodiversity importance, which are at the highest risk for mining.
3. Areas of high biodiversity importance, which are at a high risk for mining.
4. Areas of moderate biodiversity importance, which are at a moderate risk for mining.

According to the guidelines, the proposed site largely falls within areas that are not classified as risk to mining (Figure 24).

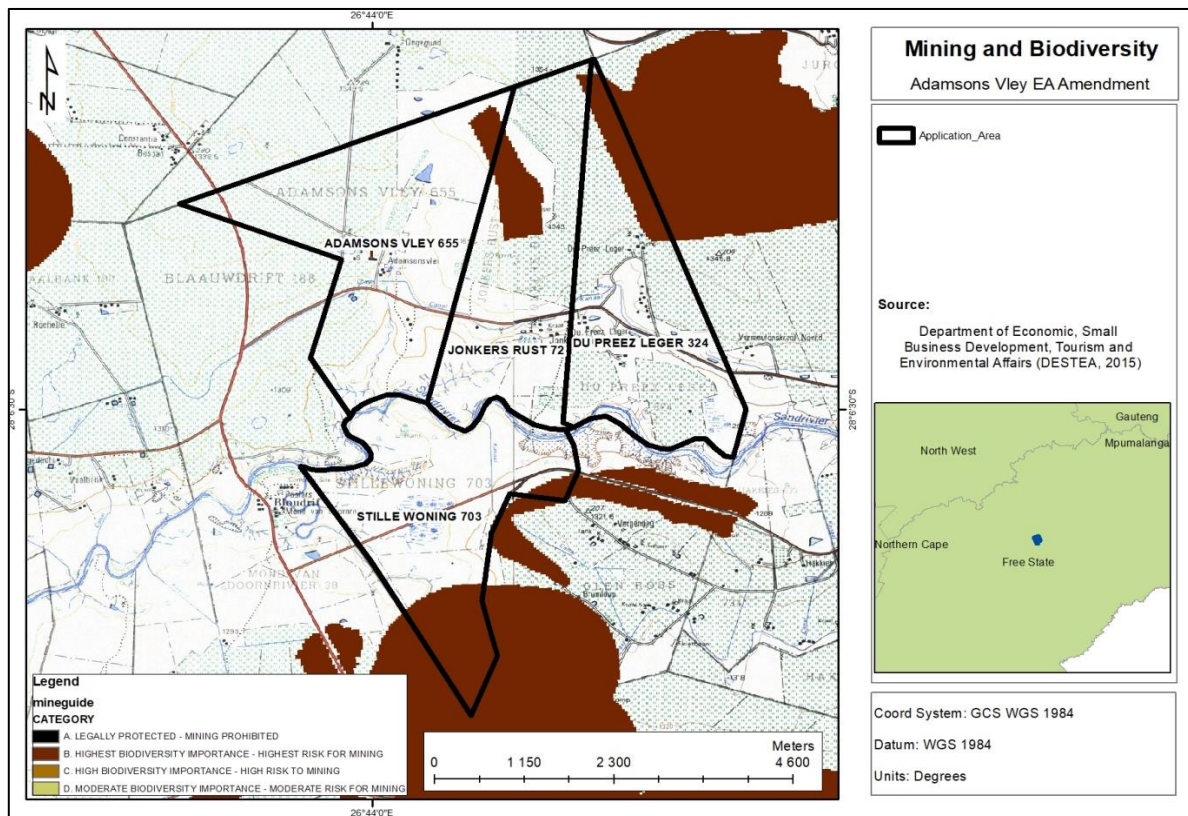


Figure 24: Mining and biodiversity guidelines in relation to the application area.

## 2.1.17 Environmental Aspects Which May Require Protection and/or Remediation

Due to the non-invasive nature of the proposed prospecting activities, there are no features on site that may require protection and/or remediation. Should Sunshine determine a need to conduct invasive prospecting within the tenement area, there would be features on site which require appropriate protection and/or remediation. A Section 102 amendment process, which would include an update to the EMPR, would take place and the necessary mitigation measures would be implemented.



### 3. IMPACTS AND RISKS IDENTIFIED

Impacts and risks were identified based on the proposed prospecting activities to take place on site. As such, Table 10 lists the potential impacts related to each of the significant activities related to the prospecting operation.

Table 10: List of potential impacts per activity.

Aspect	Potential Impacts
<b>Planning and Preparation</b>	
Social	Perceptions and expectations
<b>Operation: Field Mapping</b>	
Social	Safety and security risks to landowners and lawful occupiers
	Interference with existing land-uses
	Sense of place
	Perceptions and expectations
Economic	Discovery of Economically Viable Mineral Resources

Each of the identified risks and impacts for these phases was assessed using the assessment methodology described in Section 9.1. The assessment criteria include the nature, extent, duration, magnitude/intensity, reversibility, probability, public response, cumulative impact and irreplaceable loss of resources. The full scoring of each impact is provided in the impact assessment table provided in Appendix E.

A summary of the impacts and their significance before and after mitigation is provided in Section 9.2 of this report.

In order to calculate the significance of an impact, probability, duration, extent and magnitude will be used. The pre and post mitigation scores will provide an indication of the extent to which an impact can be mitigated.

#### 3.1 THE IMPACT ASSESSMENT METHODOLOGY

The subsections below present the approach to assessing the identified potential environmental impact with the aim of determining the relevant environmental significance.

##### 3.1.1 Method of Assessing Impacts

The impact assessment methodology is guided by the requirements of the NEMA EIA Regulations (2014). The broad approach to the significance rating methodology is to determine the environmental risk (ER) by considering the consequence (C) of each impact (comprising Nature, Extent, Duration, Magnitude, and Reversibility) and relate this to the probability/likelihood (P) of the impact occurring.



This determines the environmental risk. In addition, other factors, including cumulative impacts, public concern, and potential for irreplaceable loss of resources, are used to determine a prioritisation factor (PF) which is applied to the ER to determine the overall significance (S).

### 3.1.2 Determination of Environmental Risk

The significance (S) of an impact is determined by applying a prioritisation factor (PF) to the environmental risk (ER).

The environmental risk is dependent on the consequence (C) of the particular impact and the probability (P) of the impact occurring. Consequence is determined through the consideration of the Nature (N), Extent (E), Duration (D), Magnitude (M), and reversibility (R) applicable to the specific impact.

For the purpose of this methodology the consequence of the impact is represented by:

$$C = \frac{(E+D+M+R) \times N}{4}$$

Each individual aspect in the determination of the consequence is represented by a rating scale as defined in Table 11.

Table 11: Criteria for determination of impact consequence.

Aspect	Score	Definition
Nature	- 1	Likely to result in a negative/ detrimental impact
	+1	Likely to result in a positive/ beneficial impact
Extent	1	Activity (i.e. limited to the area applicable to the specific activity)
	2	Site (i.e. within the development property boundary),
	3	Local (i.e. the area within 5 km of the site),
	4	Regional (i.e. extends between 5 and 50 km from the site)
	5	Provincial / National (i.e. extends beyond 50 km from the site)
Duration	1	Immediate (<1 year)
	2	Short term (1-5 years)
	3	Medium term (6-15 years)
	4	Long term (the impact will cease after the operational life span of the project),
	5	Permanent (no mitigation measure of natural process will reduce the impact after construction).
Magnitude/ Intensity	1	Minor (where the impact affects the environment in such a way that natural, cultural and social functions and processes are not affected)
	2	Low (where the impact affects the environment in such a way that natural, cultural and social functions and processes are slightly affected)



Aspect	Score	Definition
	3	Moderate (where the affected environment is altered but natural, cultural and social functions and processes continue albeit in a modified way)
	4	High (where natural, cultural or social functions or processes are altered to the extent that it will temporarily cease) or
	5	Very high / don't know (where natural, cultural or social functions or processes are altered to the extent that it will permanently cease)
Reversibility	1	Impact is reversible without any time and cost
	2	Impact is reversible without incurring significant time and cost
	3	Impact is reversible only by incurring significant time and cost
	4	Impact is reversible only by incurring prohibitively high time and cost
	5	Irreversible Impact

Once the C has been determined the ER is determined in accordance with the standard risk assessment relationship by multiplying the C and the P. Probability is rated/scored as per Table 12. Table 13 indicates the determination of environmental risk.

Table 12: Probability scoring.

Probability	1	Improbable (the possibility of the impact materialising is very low as a result of design, historic experience, or implementation of adequate corrective actions; <25%),
	2	Low probability (there is a possibility that the impact will occur; >25% and <50%)
	3	Medium probability (the impact may occur; >50% and <75%)
	4	High probability (it is most likely that the impact will occur- > 75% probability), or
	5	Definite (the impact will occur)

The result is a qualitative representation of relative ER associated with the impact. ER is therefore calculated as follows:

$$ER = C \times P$$

Table 13: Determination of environmental risk.

Consequence	5	5	10	15	20	25
	4	4	8	12	16	20
	3	3	6	9	12	15
	2	2	4	6	8	10
	1	1	2	3	4	5
		1	2	3	4	5
<b>Probability</b>						





The outcome of the environmental risk assessment will result in a range of scores, ranging from 1 through to 25. These ER scores are then grouped into respective classes as described in Table 14.

Table 14: Significance classes.

Environmental Risk Score	
Value	Description
< 10	Low (i.e. where this impact is unlikely to be a significant environmental risk)
≥ 10 and < 20	Medium (i.e. where the impact could have a significant environmental risk)
≥ 20	High (i.e. where the impact will have a significant environmental risk)

The impact ER will be determined for each impact without relevant management and mitigation measures (pre-mitigation), as well as post implementation of relevant management and mitigation measures (post-mitigation). This allows for a prediction in the degree to which the impact can be managed/ mitigated.

### 3.1.3 Impact Prioritisation

In accordance with the requirements of Appendix 3(j) of the NEMA 2014 EIA Regulations (GNR 982, as amended), and further to the assessment criteria presented in the Section above it is necessary to assess:

1. Each potentially significant impact in terms of: cumulative impacts
2. The degree to which the impact may cause irreplaceable loss of resources

In addition, it is important that the public opinion and sentiment regarding a prospective development and consequent potential impacts is considered in the decision-making process.

In an effort to ensure that these factors are considered, an impact prioritisation factor (PF) will be applied to each impact ER (post-mitigation). This prioritisation factor does not aim to detract from the risk ratings but rather to focus the attention of the decision-making authority on the higher priority/significance issues and impacts (Table 15). The PF will be applied to the ER score based on the assumption that relevant suggested management/ mitigation impacts are implemented.

Table 15: Criteria for the determination of prioritisation.

<b>Public Response (PR)</b>	Low (1)	Issue not raised in public response.
	Medium (2)	Issue has received a meaningful and justifiable public response.
	High (3)	Issue has received an intense meaningful and justifiable public response
<b>Cumulative Impact (CI)</b>	Low (1)	Considering the potential incremental, interactive, sequential, and synergistic cumulative impacts, it is unlikely that the impact will result in spatial and temporal cumulative change
	Medium (2)	Considering the potential incremental, interactive, sequential, and synergistic cumulative impacts, it is probable that the impact will result in spatial and temporal cumulative change
	High (3)	Considering the potential incremental, interactive, sequential,



		and synergistic cumulative impacts, it is highly probable/definite that the impact will result in spatial and temporal cumulative change
<b>Irreplaceable loss of Resources (LR)</b>	Low (1)	Where the impact is unlikely to result in irreplaceable loss of resources
	Medium (2)	Where the impact may result in the irreplaceable loss (cannot be replaced or substituted) of resources but the value (services and/or functions) of these resources is limited
	High (3)	Where the impact may result in the irreplaceable loss of resources of high value (services and/or functions)

The value for the final impact priority is represented as a single consolidated priority, determined as the sum of each individual criterion. The impact priority is therefore determined as follows:

$$\text{Priority} = \text{PR} + \text{CI} + \text{LR}$$

The result is a priority score which ranges from 3 to 9 and a consequent PF ranging from 1 to 2 (Table 16).

Table 16: Determination of prioritisation factor.

Priority	Ranking	Prioritisation Factor
3	Low	1
4	Medium	1.17
5	Medium	1.33
6	Medium	1.5
7	Medium	1.67
8	Medium	1.83
9	High	2

In order to determine the final impact significance, the PF is multiplied by the ER of the post mitigation scoring. The ultimate aim of the PF is to be able to increase the post mitigation environmental risk rating by a full ranking class, if all the priority attributes are high (i.e. if a medium environmental risk impact is identified after the conventional impact rating, but there is significant cumulative impact potential, significant public response, and significant potential for irreplaceable loss of resources, then the net result would be to upscale the impact to a high significance (Table 17).

Table 17: Environmental significance rating.

<b>Environmental Significance Rating</b>	
Value	Description
< -10	Low negative (i.e. where this impact would not have a direct influence on the decision to develop in the area)
≥ -10 and < -20	Medium negative (i.e. where the impact could influence the decision to develop in the area).





Environmental Significance Rating	
$\geq -20$	High negative (i.e. where the impact must have an influence on the decision process to develop in the area)
0	No impact
$< 10$	Low positive (i.e. where this impact would not have a direct influence on the decision to develop in the area)
$\geq 10 < 20$	Medium positive (i.e. where the impact could influence the decision to develop in the area)
$\geq 20$	High positive (i.e. where the impact must have an influence on the decision process to develop in the area)

### 3.2 ASSESSMENT AND EVALUATION OF POTENTIAL PROJECT IMPACTS

The proposed prospecting activities to be undertaken are non-invasive and as such there is only one alternative worth assessing which is the initial layout and activities proposed. There will therefore be no physical disturbance to the application area and/or interference with landowners or communities.

It should be noted that this report has been made available to I&AP's for review and comment and their comments and concerns will be addressed in the final report to be submitted to the DMRE for adjudication. Furthermore, it should be noted that the impact scores themselves will include the results of the public response and comment. The results of the public consultation will be used to update the impact scores upon completion of the public review period.

Please refer to Section 9.1 for the Methodology used in determining and ranking the nature, significance, consequence, extent, duration and probability of potential environmental impacts and risks.

The following potential impacts were identified during the Basic Assessment and are for the prospecting layout as well as activities proposed. Please refer to Appendix F for the full impact scoring calculations.

#### 3.2.1 Socio-Economic Perceptions and Expectations of the Community

The notification of the proposed project is likely to create great interest, particularly in the potential for employment and perceived safety and security risks. However, due to the non-invasive activities for this project, no unskilled labour is required and no site access is required. As such, perceptions and expectations must be managed through on-going, open and transparent communication with affected stakeholders, communities and landowners.

##### 3.2.1.1 Significance of Impact

The above impact will be negative but site specific. With mitigation, the impact can be controlled but not prevented and will remain low to moderate in significance.



Impact	Pre-Mitigation Score	Post-Mitigation Score	Final Significance
Socio-economic perceptions and expectations of the community	-11.00	-9.00	-9.00

### 3.2.1.2 Possible Mitigation Measures:

Potential mitigation measures that can be applied to reduce the impact of the socio-economic perceptions and expectations include:

3. Adhere to an open and transparent communication procedure with stakeholders at all times
4. Ensure that accurate and regular information is communicated to I&AP's
5. Ensure that information is communicated in a manner which is understandable and accessible to I&AP's
6. Enhance project benefits and minimise negative impacts through intensive consultation with stakeholders.

### 3.2.2 Safety and security risks to landowners and lawful occupiers

Required access and use of land for field mapping is a risk to the safety and security of landowners and lawful occupiers due to property access and use by unfamiliar people in the area.

#### 3.2.2.1 Significance of Impact

The above impact will be negative but site specific. With mitigation, the impact can be controlled but not prevented and will remain low in significance.

Impact	Pre-Mitigation Score	Post-Mitigation Score	Final Significance
Safety and security risks to landowners and lawful occupiers	-3.00	-1.25	-1.25

#### 3.2.2.2 Possible Mitigation Measures:

Potential mitigation measures that can be applied to reduce the impact of the safety and security risks to landowners and lawful occupiers include:

1. Ensure non-invasive prospecting activities are consistent with occupational health and safety requirements.
2. Prior to accessing any portion of land, the Applicant must enter into formal written agreements with the affected landowner. This formal agreement should additionally stipulate landowners special conditions which would form a legally binding agreement.
3. All homestead gates must be closed immediately upon entry/exit.
4. Vehicles used must be in a roadworthy condition and their loads secured. Speed limits must be adhered to and all local, provincial and national regulations with regards to road safety and transport



### 3.2.3 Interference With Existing Land Use

During the operation phase, the Applicant and the contractors will require access to the site in order to confirm where the activities will take place and where machinery will be placed. This may interfere with current land-uses.

#### 3.2.3.1 Significance of Impact

The above impact will be negative but site specific. With mitigation, the impact can be controlled but not prevented and will remain low in significance.

Impact	Pre-Mitigation Score	Post-Mitigation Score	Final Significance
Interference with existing land uses	-2.50	-2.00	-2.00

#### 3.2.3.2 Possible Mitigation Measures:

A potential mitigation measure that can be applied to reduce the impact of interference with existing land uses includes:

1. The Applicant must enter into formal written agreements with the affected landowners and provide compensation for any loss of revenue due to the prospecting activities.

### 3.2.4 Sense Of Place

The proposed prospecting project may impact on the established sense of place of the property. The character of the area will not change due to the absence of invasive prospecting activities.

Impact	Pre-Mitigation Score	Post-Mitigation Score	Final Significance
Sense of place	-2.50	-1.00	-1.00

#### 3.2.4.1 Possible Mitigation Measure:

A potential mitigation measure that can be applied to reduce the impact of sense of place includes:

1. The Applicant must enter into formal written agreements with the affected landowners and provide compensation for any loss of revenue due to the prospecting activities.

### 3.2.5 Job creation

Prospecting operations have the potential to positively influence by contributing directly towards employment (albeit short) on a local scale.

Impact	Pre-Mitigation Score	Post-Mitigation Score	Final Significance
Job Creation	+9.00	+12.00	+14.00



### 3.2.5.1 Significance of Impact

This impact will be positive in nature and of short-term duration as employment positions will be limited to Geologists only and will be lost once the operational activities cease.

### 3.2.5.2 Possible Mitigation Measure:

1. Maximise employment opportunities, skills development and training.

### 3.2.6 Discovery of Economically Viable Mineral Resources

Should prospecting prove successful and a resource quantified, it would indicate a potential viable economic activity in the form of mining. Mining will contribute greatly for local economic stimulation through direct employment, future business opportunities, royalties and tax revenues.

Impact	Pre-Mitigation Score	Post-Mitigation Score	Final Significance
Discovery of Economically Viable Mineral Resources	+13.00	+18.75	+21.88

### 3.2.6.1 Significance of Impact

This impact will be positive in nature in the long term.

### 3.2.6.2 Possible Mitigation Measures:

1. Maximise through optimisation of economic growth opportunities.

## 4. MOTIVATION WHERE NO ALTERNATIVE SITES WERE CONSIDERED

There will be no development footprint due to the fact that only non-invasive prospecting will be undertaken. The geology is the primary driver in determining the location of prospecting and mining. Gold and uranium are present in the Central and West Rand Groups of the Witwatersrand Supergroup in the prospecting area. In addition to gold and uranium, the gold in the reefs of the Witwatersrand are known to contain approximately 10% silver, apart from a small quantity of base metals. Platinum Group Metals are known to be present in some reefs of the Witwatersrand Basin. Alluvial diamonds are potentially present in the drainage channels of the current surface. The catchment area of the Sand River drains a large area known to host diamondiferous kimberlite. The application area is also known to host coal seams, which are present in the Eccca Formation of the Karoo Supergroup. The geology of this area has been previously explored extensively; thus, historical data can be used to determine the potential resources without the need of invasive prospecting techniques. As such, no assessment of alternative development scenarios was conducted.



## **5. STATEMENT MOTIVATING THE ALTERNATIVE DEVELOPMENT LOCATION WITHIN THE OVERALL SITE**

As discussed above, the proposed application area has been selected due to the geology of the site, which indicates the potential for economically viable minerals to occur. The site layout was determined based on the location of existing mining areas and the extensive exploration work previously conducted in the area. No alternative development location within the overall site has been identified as viable or is considered in this report.

## **6. FULL DESCRIPTION OF THE PROCESS UNDERTAKEN TO IDENTIFY, ASSESS AND RANK THE IMPACTS AND RISKS THE ACTIVITY WILL IMPOSE ON THE PREFERRED SITE (IN RESPECT OF THE FINAL SITE LAYOUT PLAN) THROUGH THE LIFE OF THE ACTIVITY**

The impact assessment process may be summarised as follows:

1. Identification of proposed prospecting activities including their nature and duration
2. Screening of activities likely to result in impacts or risks
3. Utilisation of the above-mentioned methodology to assess and score preliminary impacts and risks identified
4. Inclusion of I&AP comment regarding impact identification and assessment
5. Finalisation of impact identification and scoring.

## **7. IMPACT ASSESSMENT OF EACH IDENTIFIED POTENTIALLY SIGNIFICANT IMPACT AND RISK**

Refer to Appendix F for a summary of the full scoring for each of the assessed impacts.

## **8. SUMMARY OF SPECIALIST REPORTS**

Owing to the limited scope and short duration of the proposed project which will include non-invasive activities only, specialist studies were not undertaken. Only desktop baseline assessments were undertaken, namely:

1. General description of the application area
2. Socio-economic
3. Biodiversity (fauna and flora)
4. Surface hydrology



5. Heritage
6. Palaeontology.

The summary of the key findings is detailed below.

### **General Description of the Application area**

The application area is defined by the Sand River that traverses the four farms. The area is generally flat and it is characterised by agricultural activities. The topography of the application area varies in altitude between 1 280 and 1 350 metres above mean sea level. The area is characterised by mild to hot summer temperatures in excess of 30°C and cold winter temperatures with frost.

### **Socio-Economic**

The application area can be found in Wards 9 and 24 of the Matjhabeng Local Municipality, which is part of the Lejweleputswa District Municipality. According to the 2016 census data, the Matjhabeng Local Municipality has a population of 429 113. Matjhabeng represents the hub of mining activity in the Free State Province. A large number of the surrounding population is employed by mining companies, such as Harmony Gold and Sibanye Gold.

### **Flora**

The application area falls within two vegetation types according. These two vegetation types are Highveld Alluvial Vegetation and Vaal-Vet Sandy grassland.

The Highveld Alluvial Vegetation is considered least threatened. Nearly 10 % has been statutorily conserved in conserved areas and Nature Reserves. This vegetation is prone to infestation by a number of weeds, obviously encouraged by the high nutrient status of soils and ample water supply. Woody species often dominate either riverine thickets or grasslands or form rural communities in disturbed habitats. The undergrowth of the alluvial riparian thickets and the accompanying grasslands suffer from heavy overgrazing in many places.

The Vaal-Vet Sandy Grassland is considered Endangered. Only 0.3 % of this vegetation type is statutorily conserved around dams and Nature Reserves. A loss in the vegetation type is generally associated with transformed land for cultivation, for commercial crops and grazing for cattle and sheep.

No threatened or protected floral species were identified.

### **Fauna**

A desktop search for protected or threatened fauna species was conducted using a quarter degree search (2726BC) on the South African National Biodiversity Institute (SANBI) Integrated Biodiversity Information System (SIBIS) Database. There are no faunal species of concern that fall within the study area according to the SIBIS search. An alternative search for sensitive species for the study area was undertaken through the Animal Demography Unit – Virtual Museum (VM). The VM database contains information on species ranges and catalogues data regarding where and when a species was seen. No threatened or protected faunal species were identified via the VM database.





### **Surface Water**

The application area falls within the Vaal Water Management Area. The Vaal Water Management Areas comprises 12 tertiary catchment areas, and the application area is specifically situated in the DC 18 quaternary catchment. The Sand River traverses the area. Eighteen wetlands and the Sand River area are present within the area proposed for non-invasive on foot field mapping, however all activities will be moved away from the wetlands and main rivers. The current assessment finds that a 20 m buffer zone should be recognised from the edge of the wetlands and riparian areas. The proposed activities will not have any impact on the water resources because they are all non-invasive.

### **Heritage**

Previous studies conducted over the application area indicate that a number of built environment and landscape features have been recorded. Ruins have been recorded on Farm Stille Woning 703. Over 20 built environment features north of the Sand River on Farms Jonkers Rust 72 and Du Preez Leger 324 have been recorded in form of homesteads and kraals. These features are located north and south of the canal that cuts across the two farms. On Farms Adamsons Vley 655 over 12 built environment features have been recorded and they are mostly homesteads.

The cadastral database shows that there are over 32 built environment features located in the four affected farms. Based on experience and knowledge gained on similar projects most of the farming community homestead and kraals contain burial grounds and graves and the likelihood of finding such is high.

### **Palaeontology**

According to the palaeosensitivity map developed by the South African Heritage Resources Agency (SAHRA), the application area is situated in areas classified as very high, moderate to low sensitivity.

## **9. ENVIRONMENTAL IMPACT STATEMENT**

This Basic Assessment was undertaken in order to identify all of the potential impacts associated with each phase of prospecting. Each of the identified risks and impacts were assessed following the impact methodology described in the body of this report. The assessment criteria include nature, extent, duration, magnitude/intensity, reversibility, probability, public response, cumulative impact, and irreplaceable loss of resources.

Based on the impact assessment conducted by the Environmental Assessment Practitioner, the environmental impacts associated with the proposed prospecting activities are expected to be localised and of low significance.

The following negative impacts were identified and assessed in the Basic Assessment Report:

1. Safety and security risks to landowners and lawful occupiers
2. Interference with land-use



3. Sense of place
4. Perceptions and expectations

In terms of positive impacts, the following key benefits have been identified:

- Job creation during prospecting operations.
- Discovery of economically viable mineral resources.



## 10. FINAL SITE MAP

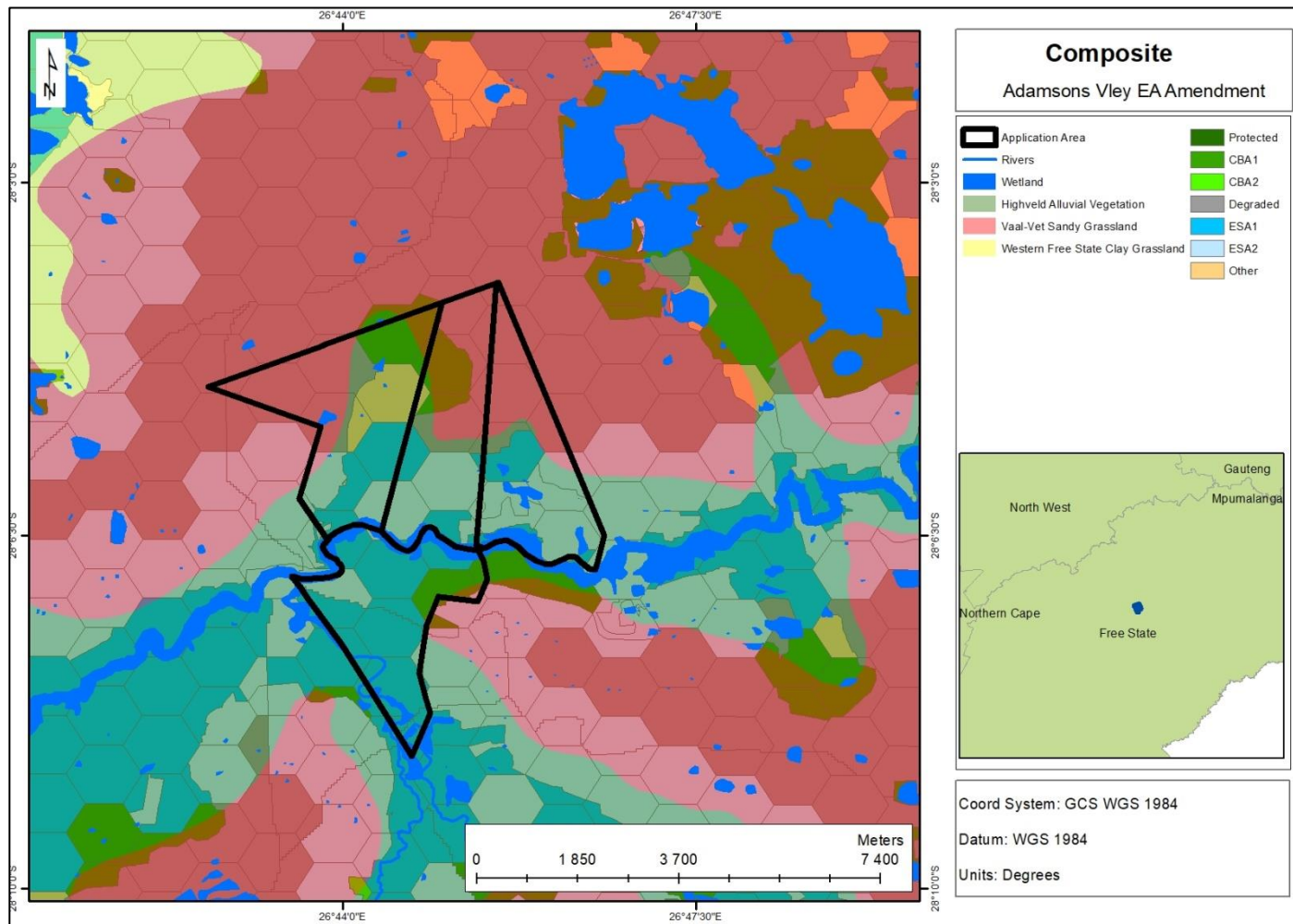


Figure 25: Composite map of the application area.



## **11. SUMMARY OF POSITIVE AND NEGATIVE IMPLICATIONS AND RISKS**

The positive implications of the proposed project are (i) job creation (albeit short-term and (ii) the discovery of economically viable mineral resources.

Due to the non-invasive nature of the proposed prospecting activities, the negative implications and risks of the project are minimal and as such the positive outcomes for the project would far outweigh the negative. The negative impacts are (i) safety and security risks to landowners and lawful occupiers, (ii) interference with land-use, (iii) sense of place and (iv) perceptions and expectations. The EMPR has identified appropriate mechanisms for avoidance and mitigation of this negative impact.

## **12. PROPOSED IMPACT MANAGEMENT OBJECTIVES AND OUTCOMES**

The management objective is to minimise the impact of the proposed project in terms of the socio-economic perceptions and expectations of I&AP's. The outcome to be achieved is to lessen the impact through the following measures:

2. Adhere to an open and transparent communication procedure with stakeholders at all times
3. Ensure that accurate and regular information is communicated to I&AP's
4. Ensure that information is communicated in a manner which is understandable and accessible to I&AP's
5. Enhance project benefits and minimise negative impacts through intensive consultation with stakeholders
6. Assemble adequate, accurate, appropriate and relevant socio-economic information relating to the context of the operation.

## **13. ASPECTS FOR INCLUSION AS CONDITIONS OF AUTHORISATION**

1. The approval of the project is for prospecting only. The approval excludes any mining activities
2. Stakeholder engagement will continue throughout the prospecting activities to ensure the community and landowners are kept informed and allowed to raise issues. These issues will then be addressed through a grievance mechanism
3. The applicant should adhere to the conditions of the EA and EMPR for this project.



## **14. DESCRIPTION OF ANY ASSUMPTIONS, UNCERTAINTIES AND GAPS IN KNOWLEDGE**

The following assumptions, uncertainties and gaps in knowledge are applicable to this BAR:

1. The baseline environment was compiled through desktop studies and previous specialist reports undertaken around the vicinity of the application area. The baseline environment is subject to change based on the results of the public participation process. The possibility exists that the baseline data is out-dated or incomplete. Furthermore, the description of the baseline environment has been further informed by the results of the public participation process
2. The faunal searches are based on incomplete datasets and are not conclusive. As such there is still the chance that threatened or protected species can occur on site and this can only be confirmed with a more detailed study
3. There will be no invasive work undertaken for the project. This report only considers non-invasive prospecting activities and as such is not adequate to mitigate any invasive activities. Should the Applicant determine at a later stage that invasive work is required, this will not require an amendment of the PWP and EMPR. Furthermore, the revised EMPR may require specialist studies depending on the planned activities
4. In interpreting the NFEPA data, it must always be remembered that the NFEPA database is incomplete. The NFEPA Implementation Manual, Driver et al. (2011) states “not all wetlands have been mapped and there are substantial gaps”. Furthermore, “rivers and wetlands that are not FEPA’s... still require a biodiversity assessment because knowledge of special ecological features or species of special concern is incomplete.”

## **15. REASONED OPINION AS TO WHETHER THE PROPOSED ACTIVITY SHOULD OR SHOULD NOT BE AUTHORISED**

Should prospecting prove successful and a resource quantified, it would indicate a potential viable economic activity in the form of mining. Mining will contribute greatly to the socio-economic status quo in the form of increased income, employment and other benefits that would cascade through the local, regional and national levels.

Due to the nature of the proposed prospecting activities, potential impacts are expected to be minimal. The potential impacts that have been identified will have a low significance if prospecting impacts are mitigated correctly. The EMPR aims to present management measures that will eliminate, offset or reduce adverse environmental impacts, as well as to provide the framework for environmental monitoring.

Based on the various impact assessments as well as the mitigation measures put forward during the course of this report, it is the opinion of the EAP that this activity should be authorised with conditions attached.





## **16. PERIOD FOR WHICH THE ENVIRONMENTAL AUTHORISATION IS REQUIRED**

The Amended Environmental Authorisation is required for the same duration as the associated Amended Prospecting Right.

## **17. UNDERTAKING**

It is confirmed that the undertaking required to meet the requirements of this section is provided at the end of the EMPR and is applicable to both the BAR and the EMPR.

## **18. FINANCIAL PROVISION**

The Regulations pertaining to the Financial Provision for Prospecting, Prospecting, Mining or Production Operations promulgated under section 44(aE), (aF), (aG), (aH) read with sections 24(5)(b)(ix), 24(5)(d), 24N, 24P and 24R of the National Environmental Management Act, 1998 (Act No.107 of 1998) (20 November 2015) have been considered and this is anticipated to result in an increase in the rehabilitation costs estimated using above mentioned quantum.

The detailed amount that is required to both manage and rehabilitate the environment in respect of rehabilitation is reflected in the quantum of financial provision in Section 36 (Part B) of this report. As the quantum indicates that an amount of R0.00 is required for Financial Provision, the DMRE can recommend an appropriate amount.

## **19. SPECIFIC INFORMATION REQUIRED BY THE COMPETENT AUTHORITY**

No additional information has been requested from the Competent Authority.

## **20. COMPLIANCE WITH THE PROVISIONS OF SECTIONS 24(4)(A) AND (B) READ WITH SECTION 24(3)(A) AND (7) OF THE NATIONAL ENVIRONMENTAL MANAGEMENT ACT (ACT 107 OF 1998) THE BAR REPORT MUST INCLUDE THE:**



## **20.1 IMPACT ON THE SOCIO-ECONOMIC CONDITIONS OF ANY DIRECTLY AFFECTED PERSON**

The proposed project may create interest, particularly in the potential for employment and concerns over damage to natural resources. As such, perceptions and expectations must be managed through on-going, open and transparent communication with affected stakeholders, communities and landowners.

The consultation process will allow directly affected parties to raise their concerns. Further to this, it must be noted that I&AP's, including directly affected parties such as landowners, have the opportunity to review and comment on this report. The results of the public consultation have been included in the final report submitted to the department for adjudication.

## **20.2 IMPACT ON ANY NATIONAL ESTATE REFERRED TO IN SECTION 3(2) OF THE NATIONAL HERITAGE RESOURCES ACT**

Notice of the proposed Prospecting Right Application has been uploaded onto the SAHRA website, SAHRIS. No invasive work will be conducted on the prospecting area. Therefore, no national estates will be affected.

## **21. OTHER MATTERS REQUIRED IN TERMS OF SECTIONS 24(4)(A) AND (B) OF THE ACT**

There are no other matters required in terms of Section 24(4)(A) and (B) of the Act.



## **PART B:**

# **ENVIRONMENTAL MANAGEMENT PROGRAMME**

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## **22. INTRODUCTION**

### **22.1 DETAILS OF THE EAP**

The details and expertise of the EAP are detailed in Sections 1.4 and 1.5 above as required.

### **22.2 DESCRIPTION OF THE ASPECTS OF THE ACTIVITY**

A description of the aspects of the activity covered by the EMPR below is included in Section 2 above.

## **23. DESCRIPTION OF IMPACT MANAGEMENT OBJECTIVES INCLUDING MANAGEMENT STATEMENTS**

### **23.1 DETERMINATION OF CLOSURE OBJECTIVES**

The vision and consequent objective and targets for rehabilitation, decommissioning and closure, aim to reflect the local environmental and socio-economic context of the project and to represent both the corporate requirements and the stakeholder expectations.

As no invasive prospecting activities will be undertaken on the project area, no environmental impacts which could result in any environmental risk, will exist. A risk assessment will be undertaken to serve as evidence that rehabilitation is not required on site.

### **23.2 VOLUMES AND RATE OF WATER USE REQUIRED FOR THE OPERATION**

Due to the non-invasive nature of the prospecting activities, no water use will be required.

### **23.3 HAS A WATER USE LICENCE BEEN APPLIED FOR?**

Due to the non-invasive nature of the prospecting activities, no water will be required. As such, there is no requirement to apply for a Water Use License.



## 23.4 IMPACTS TO BE MITIGATED IN THEIR RESPECTIVE PHASES

Table 18: Impacts to be mitigated.

Activities	Phase	Size and scale of disturbance	Mitigation measures	Compliance with standards	Time period for implementation
<ul style="list-style-type: none"><li>• Desktop studies and acquisition of historical data</li><li>• Data inventory and capturing</li><li>• Data synthesis and database creation</li><li>• Generation of geological models</li><li>• Resource estimations</li><li>• Scoping and/or (pre-)feasibility studies, if required</li></ul>	All phases	No direct physical disturbance	<ul style="list-style-type: none"><li>• Ensure non-invasive prospecting activities are consistent with occupational health and safety requirements</li><li>• Prior to accessing any portion of land, the Applicant must enter into formal written agreements with the affected landowner. This formal agreement should additionally stipulate the landowner's special conditions which would form a legally binding agreement</li><li>• All homestead gates must be closed immediately upon entry/exit</li><li>• All vehicles using public roads must be in a roadworthy condition and their loads secured. Speed limits must be adhered to and all local, provincial and national regulations with regards to road safety and transport</li></ul>	Shall adhere to South African legislation pertaining to social issues, including the Constitution and NEMA principles as published in the Public Participation Guideline, 2010	Throughout prospecting



## 23.5 IMPACTS MANAGEMENT ACTIONS AND OUTCOMES

Table 19: Impact management actions and outcomes.

Activities	Potential impact	Mitigation type	Compliance with standards	Time period for implementation
<ul style="list-style-type: none"><li>• Desktop studies and acquisition of historical data</li><li>• Data inventory and capturing</li><li>• Data synthesis and database creation</li><li>• Generation of geological models</li><li>• Resource estimations</li><li>• Scoping and/or (pre-)feasibility studies, if required</li></ul>	<ul style="list-style-type: none"><li>• Perceptions and expectations</li></ul>	<ul style="list-style-type: none"><li>• Ensure non-invasive prospecting activities are consistent with occupational health and safety requirements</li><li>• Prior to accessing any portion of land, the Applicant must enter into formal written agreements with the affected landowner. This formal agreement should additionally stipulate the landowner's special conditions which would form a legally binding agreement</li><li>• All homestead gates must be closed immediately upon entry/exit</li><li>• All vehicles using public roads must be in a roadworthy condition and their loads secured. Speed limits must be adhered to and all local, provincial and national regulations with regards to road safety and transport</li></ul>	Shall adhere to South African legislation pertaining to social issues, including the Constitution and NEMA principles as published in the Public Participation Guideline, 2010	Throughout prospecting





## 24. FINANCIAL PROVISION

The requirement for final rehabilitation, decommissioning and closure stems primarily from the legislative requirements of the MPRDA and NEMA. On 20<sup>th</sup> of November 2015 the Minister promulgated the Financial Provisioning Regulations under the NEMA. The Regulations aim to regulate the determination of financial provision as contemplated in the NEMA for the costs associated with the undertaking of management, rehabilitation and remediation of environmental impacts from prospecting, prospecting, mining or production operations through the lifespan of such operations and latent or residual environmental impacts that may become known in the future. These regulations provide for, inter alia:

- Determination of financial provision: An Applicant or holder of a right or permit must determine and make financial provision to guarantee the availability of sufficient funds to undertake rehabilitation and remediation of the adverse environmental impacts of prospecting, prospecting, mining or production operations, as contemplated in the Act and to the satisfaction of the Minister responsible for mineral resources
- Scope of the financial provision: Rehabilitation and remediation; decommissioning and closure activities at the end of operations; and remediation and management of latent or residual impacts
- Regulation 6: Method for determining financial provision – An applicant must determine the financial provision through a detailed itemisation of all activities and costs, calculated based on the actual costs of implementation of the measures required for:
  - Annual rehabilitation – annual rehabilitation plan
  - Final rehabilitation, decommission and closure at end of life of operations – rehabilitation, decommissioning and closure plan
  - Remediation of latent defects
- Regulation 10: An applicant must-
  - ensure that a determination is made of the financial provision and the plans contemplated in regulation 6 are submitted as part of the information submitted for consideration by the Minister responsible for mineral resources of an application for environmental authorisation, the associated environmental management programme and the associated right or permit in terms of the Mineral and Petroleum Resources Development Act, 2002
  - Provide proof of payment or arrangements to provide the financial provision prior to commencing with any prospecting, prospecting, mining or production operations
- Regulation 11: Requires annual review, assessment and adjustment of the financial provision. The review of the adequacy of the financial provision including the proof of payment must be independently audited (annually) and included in the audit of the EMPR as required by the EIA Regulations



Appendix 4 of the Financial Provisioning Regulations provides the minimum content of a Final Rehabilitation, Decommissioning and Closure Plan. The detailed amount that is required to both manage and rehabilitate the environment in respect of rehabilitation is reflected in the quantum of financial provision in Section 36 of this report.

The DMRE currently holds a Financial Provision to the amount of ZAR 32 787.86 to cater for rehabilitation and management of residual and latent environmental impacts for this project. Due to the non-invasive prospecting activities that are planned on site during the tenure of this tenement, no additional amount has been calculated for this amendment application. It is deemed that the ZAR 32 787.86 that has already been paid is sufficient. This amount is reviewed on an annual basis and it will be adjusted during the annual Financial Provision Quantum Review period.

## **25. DESCRIBE THE CLOSURE OBJECTIVES AND THE EXTENT TO WHICH THEY HAVE BEEN ALIGNED TO THE BASELINE ENVIRONMENT DESCRIBED UNDER THE REGULATION**

As no invasive prospecting activities will be undertaken on the project area, no environmental impacts which could result in any environmental risk will exist. A risk assessment will be undertaken to serve as evidence that rehabilitation is not required on site.

## **26. CONFIRM SPECIFICALLY THAT THE ENVIRONMENTAL OBJECTIVES IN RELATION TO CLOSURE HAVE BEEN CONSULTED WITH LANDOWNER AND INTERESTED AND AFFECTED PARTIES**

The Public Participation Process (PPP) is a requirement of several pieces of the South African legislation and aims to ensure that all relevant I&AP's are consulted, involved and their opinions are taken into account and a record included in the reports submitted to Authorities. The process ensures that all stakeholders are provided this opportunity as part of a transparent process which allows for a robust and comprehensive environmental study. The PPP which forms part of this application needs to be managed sensitively and according to best practises in order to ensure and promote:

1. Compliance with national legislation
2. Establish and manage relationships with key stakeholder groups
3. Encourage involvement and participation in the environmental study and authorisation/ approval process.

As such, the purpose of the PPP and stakeholder engagement process is to:

1. Introduce the proposed project



2. Explain the environmental authorisations required
3. Explain the environmental studies already completed and yet to be undertaken (where applicable)
4. Determine and record issues, concerns, suggestions and objections to the project
5. Provide opportunity for input and gathering of local knowledge
6. Establish and formalise lines of communication between the I&APs and the project team
7. Identify all significant issues for the project
8. Identify possible mitigation measures or environmental management plans to minimise and/or prevent negative environmental impacts and maximise and/or promote positive environmental impacts associated with the project.

Landowners and I&AP's have been consulted and provided an opportunity to comment on this Basic Assessment Report, EMPR including all decommissioning, closure and rehabilitation plans. As no invasive prospecting activities will be undertaken on the project area, no environmental impacts which could result in any environmental risk, will exist. A risk assessment will be undertaken to serve as evidence that rehabilitation is not required on site.

## **27. REHABILITATION PLAN**

### **27.1 INTEGRATED REHABILITATION AND CLOSURE PLAN**

The main aim in developing a rehabilitation plan is to mitigate the impacts caused by the prospecting activities and to restore land back to a satisfactory standard. As no invasive prospecting work shall be undertaken, a rehabilitation plan is not required. However, provision must be made to monitor any unforeseen impact that may arise as a result of the proposed prospecting activities and incorporated into post closure monitoring and management.

## **28. EXPLAIN WHY IT CAN BE CONFIRMED THAT THE REHABILITATION PLAN IS COMPATIBLE WITH THE CLOSURE OBJECTIVES**

As no invasive prospecting activities will be undertaken on the project area, no environmental impacts which could result in any environmental risk will exist. No closure objectives and a rehabilitation plan are required.



**29. CALCULATE AND STATE THE QUANTUM OF THE FINANCIAL PROVISION REQUIRED TO MANAGE AND REHABILITATE THE ENVIRONMENT IN ACCORDANCE WITH THE APPLICABLE GUIDELINE**

Table 19 details the quantum for Financial Provision.



Table 20: Quantum for Financial Provision.

<b>CALCULATION OF THE QUANTUM (2019 RATES)</b>							
<b>PR Holder:</b>		Sunshine Mineral Reserves (Pty) Ltd			<b>Reference:</b>		FS 10445 PR
<b>Evaluator:</b>		Imbokodo Environmental and Geological Services (Pty) Ltd			<b>Date:</b>		Mar-20
No.	Description	Unit	A	B	C	D	E=A*B*C*D
			Quantity	Master Rate	Multiplication factor	Weighting factor 1	Amount (Rands)
1	Dismantling of processing plant and related structures (including overland conveyors and powerlines)	m3	0	15.42	1	1	0.00
2 (A)	Demolition of steel buildings and structures	m2	0	212.89	1	1	0.00
2(B)	Demolition of reinforced concrete buildings and structures	m2	0	313.75	1	1	0.00
3	Rehabilitation of access roads	m2	0	38.08	1	1	0.00
4 (A)	Demolition and rehabilitation of electrified railway lines	m	0	369.75	1	1	0.00
4 (A)	Demolition and rehabilitation of non-electrified railway lines	m	0	201.69	1	1	0.00
5	Demolition of housing and/or administration facilities	m2	0	427.11	1	1	0.00
6	Opencast rehabilitation including final voids and ramps	ha	0	223,198.93	1	1	0.00
7	Sealing of shafts adits and inclines	m3	0	114.29	1	1	0.00
8 (A)	Rehabilitation of overburden and spoils	ha	0	148,799.27	1	1	0.00
8 (B)	Rehabilitation of processing waste deposits and evaporation ponds (non-polluting potential)	ha		185,326.81	1	1	0.00
8 (C)	Rehabilitation of processing waste deposits and evaporation ponds (polluting potential)	ha	0	538,276.91	1	1	0.00
9	Rehabilitation of subsided areas	ha	0	124,596.98	1	1	0.00
10	General surface rehabilitation	ha	0.2	117,874.12	1	1	23,574.82
11	River diversions	ha	0	117,874.12	1	1	0.00
12	Fencing	m	0	134.45	1	1	0.00
13	Water management	ha	0	44,819.06	1	1	0.00
14	2 to 3 years of maintenance and aftercare	ha	0	15,686.67	1	1	0.00
15 (A)	Specialist study	Sum	0	0.00		1	0.00
15 (B)	Specialist study	Sum	0	0.00		1	0.00
<b>Sub Total 1</b>							<b>23,574.82</b>



1	Preliminary and General (12%)	2,828.98	<b>Weighting Factor 2</b>	2,828.98
			1	
2	Contingencies (10%)	2,357.48		2,357.48
			<b>Sub Total 2</b>	<b>28,761.28</b>
			<b>VAT (15%)</b>	<b>4,026.58</b>
			<b>Grand Total</b>	<b>32,787.86</b>
			<b>Amount Due</b>	<b>0.00</b>





### **30. CONFIRM THAT THE FINANCIAL PROVISION WILL BE PROVIDED AS DETERMINED**

According to Regulation 8 pertaining to the financial provision for prospecting, exploration, mining or production operations (GN 1147), an applicant or holder of a right or permit must make financial provision by one or a combination of the following:

- Financial guarantee from a bank registered in terms of the Banks Act, 1990 (Act 94 of 1990) or from a financial institution registered by the Financial Services Board as an insurer or underwriter
- Deposit into an account administered by the Minister responsible for mineral resources or
- Contribution to a trust fund established in terms of applicable legislation.

Mr Charles Watts of Sunshine has committed to finance the prospecting costs.

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### 31. MECHANISMS FOR MONITORING COMPLIANCE

Table 21: Mechanisms for monitoring compliance.

Source Activity	Impacts Requiring Monitoring Programmes	Functional Requirements For Monitoring	Roles And Responsibilities	Monitoring And Reporting Frequency And Time Periods For Implementation
<ul style="list-style-type: none"><li>• Desktop studies and acquisition of historical data</li><li>• Data inventory and capturing</li><li>• Data synthesis and database creation</li><li>• Generation of geological models</li><li>• Resource estimations</li><li>• Scoping and/or (pre-) feasibility studies, and updating thereof, if required</li></ul>	None	None	None	None



## **32. INDICATE THE FREQUENCY OF THE SUBMISSION OF THE PERFORMANCE ASSESSMENT/ ENVIRONMENTAL AUDIT REPORT**

The result of environmental monitoring and compliance to the approved EMPR will be undertaken every second year and submitted to the DMRE in the form of an environmental performance assessment. Included in the report will be the following relevant information:

7. The period when the performance assessment was conducted
8. The scope of the assessment
9. The procedures used for conducting the assessment
10. Interpreted information gained from monitoring the EMPR
11. Evaluation criteria used during the assessment
12. Results of the assessment are to be discussed and mention must be made of any gaps in the EMPR and how it can be rectified
13. Yearly updated layout plans.

Any emergency or unforeseen impacts will be reported immediately to the DMRE and other relevant government departments.

## **33. ENVIRONMENTAL AWARENESS PLAN AND TRAINING**

As no invasive work will be undertaken for the project, there is no requirement for environmental awareness and training.

### **33.1 MANNER IN WHICH RISKS WILL BE DEALT WITH TO AVOID POLLUTION OR DEGRADATION**

As no invasive work will be undertaken for the project, there is no requirement for environmental awareness and training.

## **34. SPECIFIC INFORMATION REQUIRED BY THE COMPETENT AUTHORITY**

No additional information was requested or is deemed necessary.



## 35. UNDERTAKING

### The EAP herewith confirms:

- (a) The correctness of the information provided in the reports
- (b) The inclusion of comments and inputs from stakeholders and I&APs
- (c) The inclusion of inputs and recommendations from the specialist reports, where relevant
- (d) That the information provided by the EAP to the I&AP's and any responses by the EAP to comments or inputs made by the I&AP's are correctly reflected herein



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Signature of the Environmental Assessment Practitioner

Imbokodo Services (Pty) Ltd

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Name of company

30 April 2021

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Date

### The Applicant herewith confirms:

- (a) The person whose name is stated below is the person authorised to act as representative of the Applicant in terms of the resolution submitted with the application
- (b) The applicant undertakes to execute the Environmental Management Programme as proposed

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Name and Signature of the applicant / Name and Signature on behalf of the applicant

Sunshine Mineral Reserves (Pty) Ltd

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Name of company

30 April 2021

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Date



## 36. REFERENCES

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- BirdLife (2017) Important Bird Areas Factsheet: Chelmsford Dam Nature Reserve. Available at <http://www.birdlife.org>.
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