



**mineral resources**

Department:  
Mineral Resources  
**REPUBLIC OF SOUTH AFRICA**

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

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

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# BASIC ASSESSMENT REPORT

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## 1.1 IMPORTANT NOTICE

In terms of the Mineral and Petroleum Resources Development Act (MPRDA), No. 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 (EIA) and an Environmental Management Programme (EMP) report in terms of the National Environmental Management Act (NEMA), No. 107 of 1998, it cannot be concluded that the said activities will not result in unacceptable pollution, ecological degradation or damage to the environment.

In terms of Regulation 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 Regulation 17(1)(c) the competent Authority must check whether the application has taken into account any minimum requirements applicable or instructions or guidance provided by the competent authority to the submission of applications.

It is therefore an instruction that the prescribed reports required in respect of applications for an environmental authorisation for listed activities triggered by an application for a right or a permit are submitted in the exact format of, and provide all the information required in terms of, this template.

Furthermore please be advised that failure to submit the information required in the format provided in this template will be regarded as a failure to meet the requirements of the Regulation and will lead to the Environmental Authorisation being refused.

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

## 1.2 OBJECTIVE OF THE BASIC ASSESSMENT PROCESS

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

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

2 PART A:  
SCOPE OF ASSESSMENT AND BASIC IMPACT  
ASSESSMENT REPORT

## 2.1 CONTACT PERSON AND CORRESPONDENCE ADDRESS

### 2.1.1 DETAILS OF

#### **2.1.1.1** Details of the EAP

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E-mail Address:	<a href="mailto:candis@prismems.co.za">candis@prismems.co.za</a>

#### **2.1.1.2** Expertise of the EAP

##### 2.1.1.2.1 The qualifications of the EAP

Candis Lubbe holds a BSc (Honours) in Ecology, Environment and Conservation, refer to Appendix A.1: CV of EAP and Company Profile.

##### 2.1.1.2.2 Summary of the EAP's Past Experience

Candis Lubbe has been involved in the compilation and/or management of ~16 Environmental Management Programmes and/or EMPlans for mining operations; undertaken ~29 Environmental Performance Assessment audits of mining operations and completed more than 22 environmental authorisation process including EIA's, waste licences and Section 24G. See Appendix A.1: CV of EAP and Company Profile.

### 2.1.2 LOCATION OF THE OVERALL ACTIVITY

Farm Name:	Portions 63 of the farm Elandsdrift 467 JQ Portions 64 of the farm Elandsdrift 467 JQ Portions 65 of the farm Elandsdrift 467 JQ Portions 69 of the farm Elandsdrift 467 JQ Portions 111 of the farm Elandsdrift 467 JQ
Application Area (Ha):	309 hectares
Magisterial District:	Magisterial District of Madibeng
Distance and Direction from Nearest Town:	28 km (equidistant) between Brits and Rustenburg
21 Digit Surveyor General Code for each Farm Portion:	TOJQ00000000046700111 TOJQ00000000046700063 TOJQ00000000046700064 TOJQ00000000046700065 TOJQ00000000046700069

### 2.1.3 LOCALITY MAP

The proposed prospecting right area for the Elandsdrift prospecting area is indicated in the figure below, covering an area of 309 hectares in extent, and is shown in relation to the major towns surrounding the proposed area.

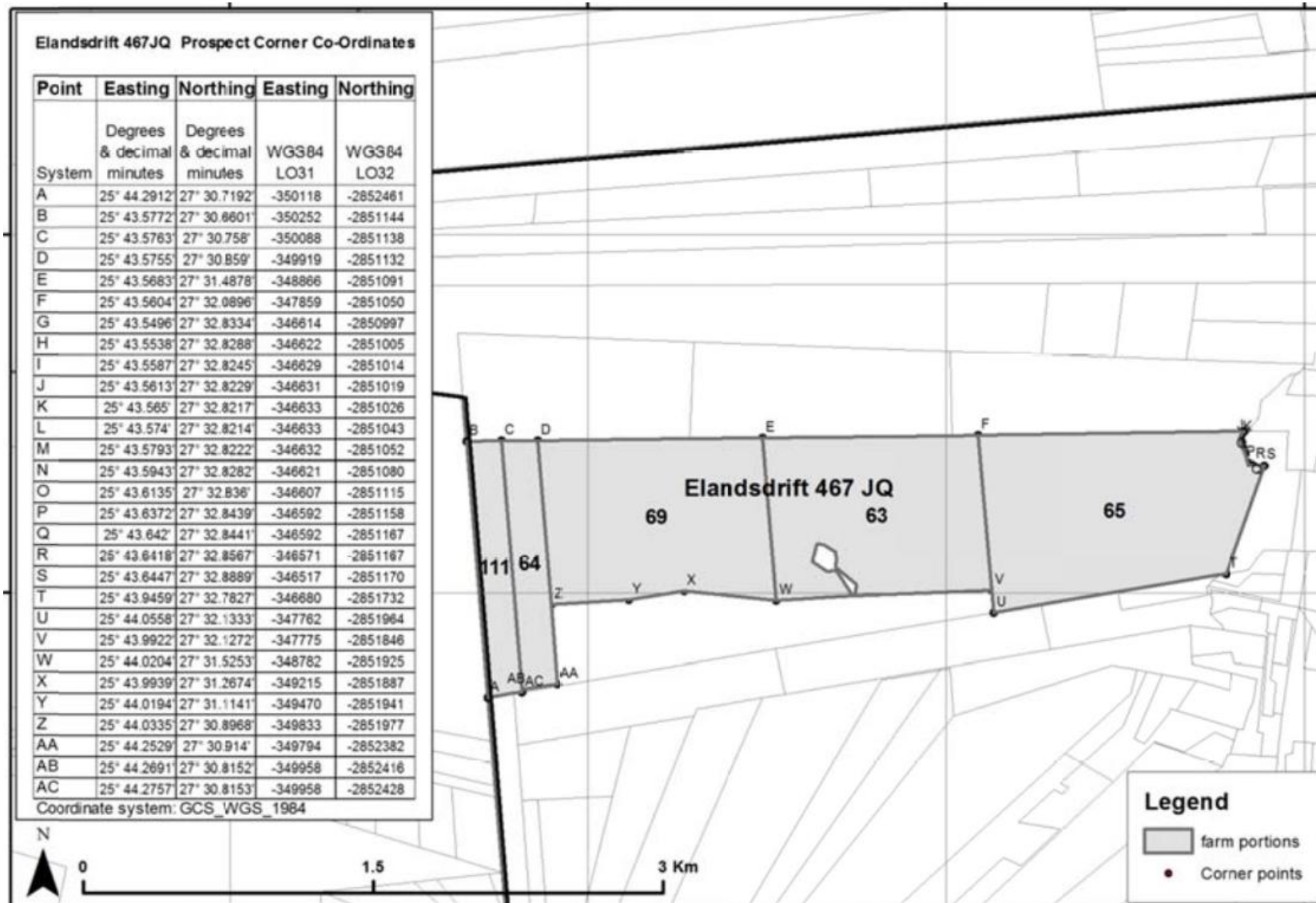


Figure 2.1: Regulation 2(2) Plan.

## 2.1.4 DESCRIPTION OF THE SCOPE OF THE PROPOSED OVERALL ACTIVITY

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

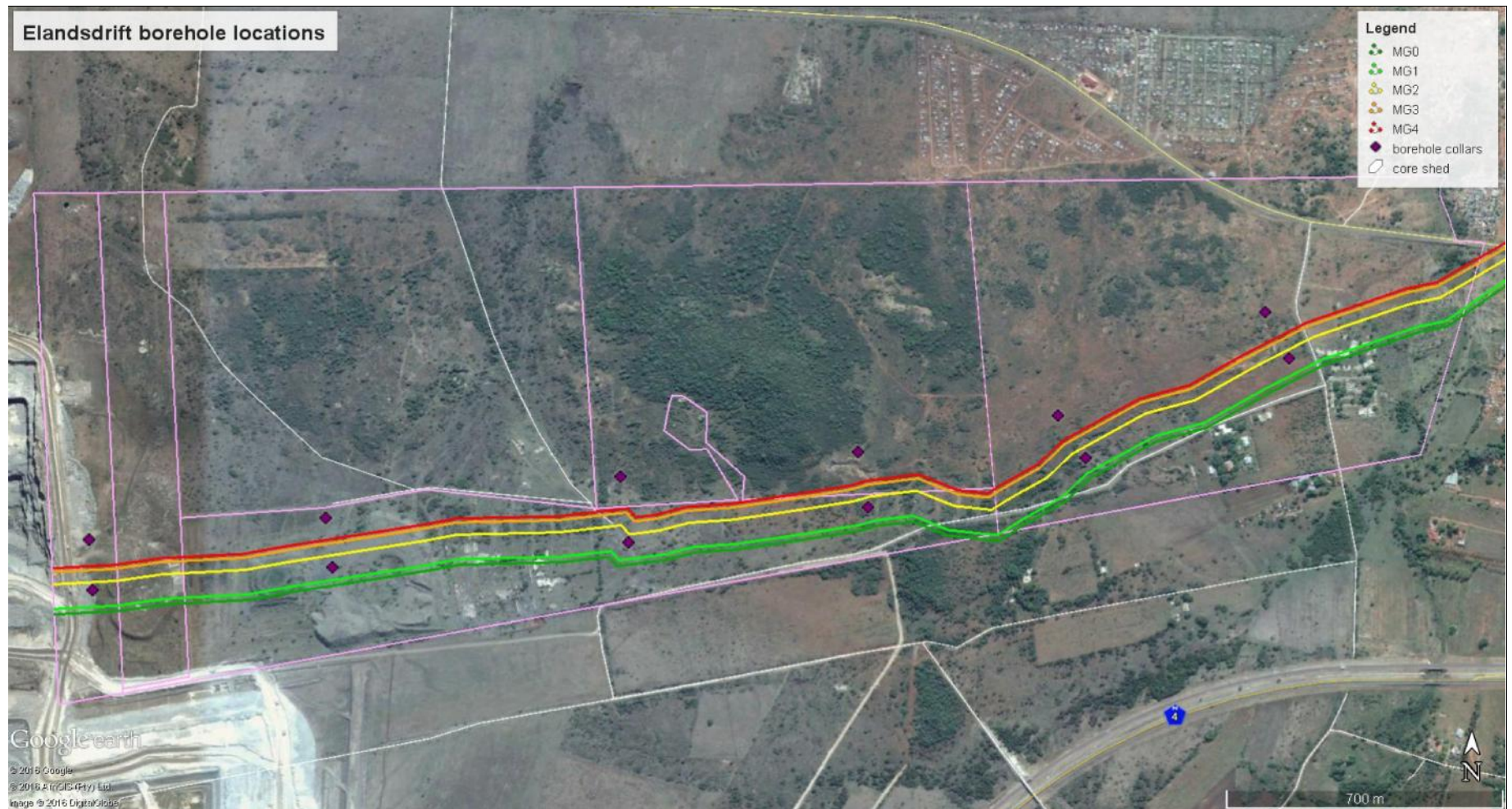


Figure 2.2: Layout plan indicating the prospecting area and proposed drill sites.



(i) Listed and specified activities

NAME OF ACTIVITY  (E.g. For prospecting – drill site, site camp, ablution facility, accommodation, equipment storage, sample storage, site office, access route etc.  E.g. For mining - excavations, blasting, stockpiles, discard dumps or dams, loading, hauling and transport, water supply dams and boreholes, accommodation, offices, ablution, stores, workshops, processing plant, storm water control, berms, roads, pipelines, power lines, conveyors, etc.)	AERIAL EXTENT OF THE ACTIVITY  (Ha or m <sup>2</sup> )	LISTED ACTIVITY  (Mark with an X where applicable or affected)	APPLICABLE LISTING NOTICE  (GNR 983, GNR 984 or GNR 985) / Not listed
Desktop Studies: <input type="checkbox"/> Design and monitoring of prospecting program <input type="checkbox"/> Layouts for drilling	N/A	N/A	Not listed
Prospecting: <input type="checkbox"/> Diamond and percussion drilling <input type="checkbox"/> Core chip logging and sampling <input type="checkbox"/> Drill site <input type="checkbox"/> Ablution facilities <input type="checkbox"/> Sampling storage area <input type="checkbox"/> Equipment storage area	Within 309 ha	20	GN R 983
Results and Analysis: <input type="checkbox"/> Modelling and resource estimation	N/A	N/A	Not listed
Mine Design and feasibility Study: <input type="checkbox"/> Mine design and feasibility study <input type="checkbox"/> Mining pre-application	N/A	N/A	Not listed

### **2.1.4.1 Description of the activities to be undertaken**

Both invasive and non-invasive activities are to be undertaken during prospecting. These activities are undertaken in phases according to be completed during a specified timeframe.

#### NON-INVASIVE ACTIVITIES

- )] Comprises desktop studies, beginning with data acquisition. As much information as possible, related to the local geology and historical mining on the property, will be sourced (this includes published results). All such data will be compiled and researched by competent experienced staff that will complete an interim report on the results.
- )] Should the data indicate prospectivity over the property, a field visit will be undertaken to confirm any geological occurrence or evidence of previous mining as well as the state of any prior rehabilitation. Thereafter the area will be mapped in detail. From the combined results, a further report will be generated which will indicate and recommend a specific plan of action.
- )] The Pre-feasibility Study, including the relevant baseline non-invasive studies by external specialists on the environmental impact of a future mine, will be completed to prove the economic viability of the mine, based on the results of the previous phases.
- )] Third Party specialist studies for the completion of the definitive feasibility studies will be non-invasive.
- )] As the activities are non-invasive, there will be no impact on the environment. As such, no rehabilitation will be required and thus no environmental budget has been provided for these activities.

#### INVASIVE ACTIVITIES

The planned activities, i.e. drilling and assaying the samples, will take cognisance of the mineral types being prospected.

##### Drilling and Sampling

This phase will entail the fencing off an area of 10mX10m for each drill hole. The areas will be cleared and a temporary mobile office will be placed on site as well as a portable latrine. Access control will be via a locked gate with the required signage, ensuring only authorized personnel may enter. Security will be 24 hours and the area will be illuminated at night.

##### Sampling and Analysis

Samples from the boreholes will be taken to identify the mineral content. Sampling expenses include assay costs, mineralogical costs and other physical tests to determine the grades and ore characteristics essential to identify the suitability of the reserves for future mining. Sampling and analysis will be undertaken by an accredited professional laboratory (such as SGS Labs).

#### PRE-FEASIBILITY STUDIES

The data obtained in the previous phases, will be compiled and integrated, at each step, into a geological model utilising the most appropriate software. This will include, but is not limited to, DataMine and a suitable GIS programme. At the conclusion of each phase, the data and geological model will be interrogated and a decision will be taken as to what further action is required, the objective being a code-compliant resource. At this point, a decision will be taken whether to embark on a pre-feasibility study or not.

All of the information obtain through the prospecting activities will be evaluated by a geologist to obtain a geological resource. Economically viable resources will then be subjected to a pre-feasibility study followed by a definitive feasibility study.

The feasibility study will contain the following information:

- / Mine design based on actual exploration results
- / Alternatives examined (if any)
- / Preliminary siting, geotechnical and environmental studies complete
- / Bench scale metallurgical tests
- / Equipment factor cost estimate, written quotations
- / Basis for final feasibility developed.

The bankable feasibility document which will aim to indicate the feasibility of a future mine in the area. Should future mining be economically viable a mining permit will be applied for.

## 2.1.5 POLICY AND LEGISLATIVE CONTEXT

APPLICABLE LEGISLATION AND GUIDELINES USED TO COMPILE THE REPORT  (A description of the policy and legislative context within which the development is proposed including an identification of all legislation, policies, plans, guidelines, spatial tools, municipal development planning frameworks and instruments that are applicable to this activity and are to be considered in the assessment process)	REFERENCE WHERE APPLIED	HOW DOES THIS DEVELOPMENT COMPLY WITH AND RESPOND TO THE POLICY AND LEGISLATION CONTEXT?  (E.g. In terms of the National Water Act a Water Use License has/ has not been applied for.)
Mineral and Petroleum Resources Development Act, 2002 (Act No. 28 of 2002)	Section 16	Application for a prospecting right.
National Environmental Management Act, 1998 (Act No. 107 of 1998)	Section 24 Section 24D Section 24F	No person may commence an activity listed or specified unless the competent authority has granted an environmental authorisation for the activity.
Environmental Impact Assessment (EIA) Regulations, 2014, as amended (2017) <sup>1</sup>	Regulation 19 Regulation 39-44	Provides a description of the basic assessment and public participation processes to be followed.
Listing Notice 1 (Listed Activities)	Activity 20	This is the listed activity that is triggered and requires a basic assessment process to be followed.
Guideline on Need and Desirability	Chapter 4	Provides suggested considerations (questions to be engaged with when considering the need and desirability) required to meet the sustainability objectives.

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<sup>1</sup> The application for environmental authorisation was lodged on the 22<sup>nd</sup> February 2017 in terms of the EIA Regulations, 2014 (GN R 382 of 4 December 2014). However, an amendment of the EIA Regulations has since been published and come into effect as of the 7<sup>th</sup> April 2017. Therefore, the transitional arrangements have been considered. In addition, Activity 20 of Listing Notice 1 (GN R 983 of 4 December 2014) is equivalent to Activity 20 of the Amended Listing Notice 1 (GN R 327 of 7 April 2017).



## 2.1.6 NEED AND DESIRABILITY OF THE PROPOSED ACTIVITIES

According to the Need and Desirability Guidelines GN 891 of 20 October 2014 published in terms of the EIA Regulations, the following questions were considered:

### Securing ecological sustainable development and use of natural resources:

1. How will this development (and its separate elements/aspects) impact on the ecological integrity of the area, taking into account threatened ecosystems, critical biodiversity areas, conservation targets, ecological drivers, environmental management framework etc.?

The prospecting right area occurs immediately adjacent to an existing mine. Prospecting activities are extremely limited to minor small scale drilling, therefore the ecological integrity of the area will not be further impacted by the proposed prospecting activities.

2. How will this development disturb or enhance ecosystems and/or result in the loss or protection of biological diversity? What measures were explored to firstly avoid these negative impacts, and where these negative impacts could not be avoided altogether, what measures were explored to minimise and remedy (including offsetting) the impacts? What measures were explored to enhance positive impacts?

The prospecting right area occurs immediately adjacent to an existing mine. Prospecting activities are extremely limited to minor small scale drilling, therefore the ecological integrity of the area is insignificantly impacted by the proposed prospecting activities. Limited surface infrastructure is planned for the prospecting right area thus the potential ecological and biodiversity impacts are anticipated as low. However, mitigation measures to address any potential impacts have been included in the EMP.

3. How will this development pollute and/or degrade the biophysical environment? What measures were explored to firstly avoid these impacts, and where impacts could not be avoided altogether, what measures were explored to minimise and remedy (including offsetting) the impacts? What measures were explored to enhance positive impacts?

Potential impacts that may result in minor/limited pollution and/or ecological degradation include:

- ) Hydrocarbon spills from drilling and vehicles; and
- ) Clearance of vegetation.

However, these impacts are anticipated to be very low and will be managed through implementation of management measures specified in the EMP, such:

- ) Clean-up procedures for spills; and
- ) Environmental awareness.

4. What waste will be generated by this development? What measures were explored to firstly avoid waste, and where waste could not be avoided altogether, what measures were explored to minimise, reuse and/or recycle the waste? What measures have been explored to safely treat and/or dispose of unavoidable waste ?

The types of waste that may be generated include:

- )] Hazardous waste: hydrocarbon spills, empty oil containers and/or oily rags.
- )] Domestic (general waste): generated by the contractors (food waste and packaging).

All waste generated will be collected and stored at the drill sites in containers (approximately 210L drums) and disposed of at registered landfill site. All waste manifest documents will be retained as proof of safe disposal.

5. How will this development disturb or enhance landscapes and/or sites that constitute the nation's cultural heritage?

Currently it is unknown whether there are any heritage resources located on site, however the proposed activities are limited to twelve drilling sites (a minimal area of disturbance). However, a heritage survey must be undertaken prior to the implementation of prospecting activities and management measures must be included in the EMP.

6. How will this development use and/or impact on non-renewable natural resources

No non-renewable resources natural resources will be utilised for the prospecting activities.

7. How will this development use and/or impact on renewable natural resources and the ecosystem of which they are part?

Since no non-renewable resources natural resources will be utilised for the prospecting activities, no impact will be generated.

8. How were a risk-averse and cautious approach applied in terms of ecological impacts?

Any potential impacts that have been identified relating to the ecological integrity of the site will be managed through implementation of the EMP.

9. How will the ecological impacts resulting from this development impact on people's environmental right in terms following:
- a. Negative: ecological impacts are insignificant and thus do not impact on peoples environmental right.
  - b. Positive: there are no positive ecological impacts associated with this project.

10. Describe the linkages and dependencies between human wellbeing, livelihoods and ecosystem services applicable to the area in question and how the development's ecological impacts will result in socio-economic impacts (e.g. on livelihoods, loss of heritage site, opportunity costs, etc.)?

This is not applicable since limited and insignificant ecological impacts have been identified.

11. How will this development positively or negatively impact on ecological integrity objectives/targets/considerations of the area?

This is not applicable as the identified ecological impacts are insignificant for the proposed activities.

12. Considering the need to secure ecological integrity and a healthy biophysical environment, describe how the alternatives identified (in terms of all the different elements of the development and all the different impacts being

proposed), resulted in the selection of the "best practicable environmental option" in terms of ecological considerations?

No alternatives were considered, as the purpose of prospecting is to identify mineral reserves. No ecological impacts have been identified as the proposed prospecting activities are limited to twelve drill sites within the 300 hectare prospecting right area.

13. Describe the positive and negative cumulative ecological/biophysical impacts bearing in mind the size, scale, scope and nature of the project in relation to its location and existing and other planned developments in the area?

This is not applicable since the identified ecological impacts that have been identified are insignificant

Promoting justifiable economic and social development:

1. What is the socio-economic context of the area, based on, amongst other considerations such the IDP, spatial priorities and characteristics and LED strategies?

There area is considered a mining area as it is located immediately adjacent to an existing large scale mining operation (Tharisa Platinum Mine).

2. Considering the socio-economic context, what will the socio-economic impacts be of the development (and its separate elements/aspects), and specifically also on the socio-economic objectives of the area?

The proposed prospecting activities will not result in any significant socio-economic impacts.

3. How will this development address the specific physical, psychological, developmental, cultural and social needs and interests of the relevant communities?

During prospecting activities, there will be no change in the social needs and interests of the surrounding area. Only after the results of prospecting have been determined and a feasibility analysis for mining may this be assessed.

4. Will the development result in equitable (intra- and inter-generational) impact distribution, in the short- and longterm?

This is not applicable for prospecting activities as the results of prospecting will determine the potential for mining in the short and long term.

5. In terms of location, describe how the placement of the proposed development will:

- a. result in the creation of residential and employment opportunities in close proximity to or integrated with each other.
- b. reduce the need for transport of people and goods.
- c. result in access to public transport or enable non-motorised and pedestrian transport (e.g. will the development result in densification and the achievement of thresholds in terms public transport).
- d. compliment other uses in the area
- e. be in line with the planning for the area
- f. for urban related development, make use of underutilised land available with the urban edge
- g. optimise the use of existing resources and infrastructure
- h. opportunity costs in terms of bulk infrastructure expansions in non-priority areas (e.g. not aligned with the bulk infrastructure planning for the settlement that reflects the spatial reconstruction priorities of the settlement)
- i. discourage "urban sprawl" and contribute to compaction/densification
- j. contribute to the correction of the historically distorted spatial patterns of settlements and to the
- k. optimum use of existing infrastructure in excess of current needs,
- l. encourage environmentally sustainable land development practices and processes,
- m. take into account special locational factors that might favour the specific location (e.g. the location of a strategic mineral resource, access to the port, access to rail, etc.),
- n. the investment in the settlement or area in question will generate the highest socio-economic returns (i.e. an area with high economic potential),

- o. impact on the sense of history, sense of place and heritage of the area and the socio-cultural and cultural-historic characteristics and sensitivities of the area, and
- p. in terms of the nature, scale and location of the development promote or act as a catalyst to create a more integrated settlement?

In terms of the above, the proposed prospecting activities will not consider any of the above due to the objective of prospecting to identify mineral reserves and ascertain the feasibility of mining. There is no permanent development of any kind and no infrastructure to benefit the socio-economics of the surrounding area. Prospecting activities will be outsourced services to professional and established companies that are able to demonstrate appropriate expertise within their fields of experience.

#### 2.1.7 MOTIVATION FOR THE OVERALL PREFERRED SITE, ACTIVITIES AND TECHNOLOGY ALTERNATIVE

No alternatives were considered, as the purpose of prospecting is to identify mineral reserves and feasibility for mining. Results of prospecting will determine the feasibility for mining and resultant area.

#### 2.1.8 FULL DESCRIPTION OF THE PROCESS FOLLOWED TO REACH THE PREFERRED ALTERNATIVES WITHIN THE SITE

No alternatives were considered, as the purpose of prospecting is to identify mineral reserves and feasibility for mining. Results of prospecting will determine the feasibility for mining and resultant area.

##### (i) Details of the development footprint alternatives considered

- (a) The property on which or location where it is proposed to undertake the activity

For prospecting activities an extensive list of properties was included in order to ascertain the mineral reserves. No alternatives may be provided with reference to alternative properties.

- (b) The type of activity to be undertaken

The type of prospecting activities required include drilling and sampling, no other feasible alternative methods are available.

- (c) The design or layout of the activity

Drill sites have been identified according to the location of likely mineral reserves and is based on the underlying geology. The central core storage area will be located on an existing old ore pad. No other surface infrastructure is planned within the surface of the proposed prospecting right boundary. Therefore alternative designs and layouts are not required for the proposed prospecting activities.

- (d) The technology to be used in the activity

Not applicable. No alternative technology is available for the proposed prospecting activities as drilling is the available and applicable method for prospecting activities.

- (e) The operational aspects of the activity

Not applicable. The operational aspects include sampling and drilling activities which must be conducted as stipulated in the prospecting works programme.

(f) The option of not implementing the activity

In the event that prospecting activities do not occur, no mining may be undertaken within the area without a valid mining right or permit.

(ii) Details of the public participation process followed

The following public participation process has been undertaken to date:

1. Identification of all interested and affected parties (I&APs).
2. Assessment of most practical method of notification of the I&AP's.
3. The following methods of notification were employed:
  - a. Newspaper Advertisement:  
Newspaper advertisement: Rustenburg Herald (published 26 April 2017)
  - b. Site Notices: Strategically placed at the following locations:  
2 x adjacent high density areas  
2 x Site Boundary
  - c. Background Information Documents (BIDs): Containing registration and comment sheet distributed via hand delivery:  
50 x BIDs distributed to various high density surrounding areas
  - d. Written Notifications: were emailed to all I&AP's and organs of state where email addresses were attainable.
4. The Draft Basic Assessment Report was provided and made available for comment via:

) Dropbox link

) Hard Copies and CDs were distributed to the following organs of state:

- Department of Mineral Resources (DMR) – Competent Authority
- Department of Water Affairs (DWS)
- Department of Agriculture, Forestry and Fisheries
- Department of Rural, Environment and Agricultural Development (READ)
- Department of Rural Development and Land Reform
- North West Heritage Resources Agency (PHRA)
- Bojanala District Municipality
- Madibeng Local Municipality

Please note that the comment period to review the Draft BAR is being undertaken between 25<sup>th</sup> April to 26<sup>th</sup> May 2017 (30 days).

(iii) Summary of issues raised by I&APs

NO.	NAME	AFFILIATION	FORM	DATE	COMMENT	RESPONSE
Please note that the comment period to review the Draft BAR is currently being undertaken between <u>25<sup>th</sup> April to 26<sup>th</sup> May 2017</u> (30 days). Therefore any issues, comments and feedback will be included in the Final BAR.						

Table 1: Identified Interested and Affected Parties (I &AP's).

<p style="text-align: center;"><b>INTERESTED AND AFFECTED PARTY DATABASE</b></p> <p style="text-align: center;"><b>APPLICATION FOR ENVIRONMENTAL AUTHORISATION - PROSPECTING RIGHT</b></p> <p style="text-align: center;"><b>PRISM REFERENCE NUMBER: 21704</b></p> <p style="text-align: center;"><b>NW 30/5/1/1/3/2/12061 PR</b></p>								
ID	21 Digit Code	Property Name	Organisation /Company Name	Contact person	Capacity	Address	Tel	Email
<b>Adjacent Land Owners and Property Owner</b>								
1	T0JQ00000000046700111	Portion 111 of the farm Elandsdrift 467 JQ	THARISA MINERALS PTY LTD			3 Eato, Road Eland House Bryanston, 2021 South Africa	011 707 4460	
2	T0JQ00000000046700064	Portion 64 of the farm Elandsdrift 467 JQ	THARISA MINERALS PTY LTD					
3	T0JQ00000000046700063	Portion 63 of the farm Elandsdrift 467 JQ	HEILA MAGDALENA BARNARD EIENDOMME CC					
4	T0JQ00000000046700065	Portion 65 of the farm Elandsdrift 467 JQ	WOLLIES PROP PTY LTD					
5	T0JQ00000000046700069	Portion 69 of the farm Elandsdrift 467 JQ	SAMANCOR CHROME LTD					
6	T0JQ00000000034200257	Portion 257 of Farm Kafferskraal 342 JQ	THARISA MINERALS PTY LTD					



7	T0JQ00000000034200135	Portion 135 of Farm Kafferskraal 342 JQ	THARISA MINERALS PTY LTD					
8	T0JQ00000000034200285	Portion 285 of Farm Kafferskraal 342 JQ	THARISA MINERALS PTY LTD					
9	T0JQ00000000034200283	Portion 283 of Farm Kafferskraal 342 JQ	THARISA MINERALS PTY LTD					
10	T0JQ00000000034200313	Portion 313 of Farm Kafferskraal 342 JQ	NO INFORMATION AVAILABLE					
11	T0JQ00000000034200152	Portion 152 of Farm Kafferskraal 342 JQ	THARISA MINERALS PTY LTD					
12	T0JQ00000000034200138	Portion 138 of Farm Kafferskraal 342 JQ	THARISA MINERALS PTY LTD					
13	T0JQ00000000034200096	Portion 96 of Farm Kafferskraal 342 JQ	THARISA MINERALS PTY LTD					
14	T0JQ00000000034200183	Portion 183 of Farm Kafferskraal 342 JQ	THARISA MINERALS PTY LTD					
15	T0JQ00000000034200218	Portion 218 of Farm Kafferskraal 342 JQ	THARISA MINERALS PTY LTD					
16	T0JQ00000000046700227	Portion 227 of the farm	NO INFORMATION					

		Elandsdrift 467 JQ	N AVAILABLE					
17	T0JQ00000000046700090	Portion 90 of the farm Elandsdrift 467 JQ	THARISA MINERALS PTY LTD					
18	T0JQ00000000046700089	Portion 89 of the farm Elandsdrift 467 JQ	THARISA MINERALS PTY LTD					
19	T0JQ00000000046700140	Portion 140 of the farm Elandsdrift 467 JQ	SAMANCOR CHROME LTD					
20	T0JQ00000000046700088	Portion 88 of the farm Elandsdrift 467 JQ	BOUWER ADRIAAN WILLEM- TRUSTEES					
21	T0JQ00000000046700087	Portion 87 of the farm Elandsdrift 467 JQ	ADLEM JOSEPH					
22	T0JQ00000000046700086	Portion 86 of the farm Elandsdrift 467 JQ	BOSHOFF PETRUS IGNATIUS LOURENS AND BOSHOFF AMANDA					
23	T0JQ00000000046700085	Portion 85 of the farm Elandsdrift 467 JQ	STEWART ANNA DEBORA					
24	T0JQ00000000046700134	Portion 134 of the farm Elandsdrift 467 JQ	KUHNE ANNA ELIZABETH					

25	T0JQ00000000046700034	Portion 34 of the farm Elandsdrift 467 JQ	LOCAL MUNICIPALITY OF MADIBENG					
26	T0JQ00000000046700001	Portion 01 of the farm Elandsdrift 467 JQ	LOCAL MUNICIPALITY OF MADIBENG					
27	T0JQ00000000046700076	Portion 76 of the farm Elandsdrift 467 JQ	THARISA MINERALS PTY LTD					
28	T0JQ00000000046700075	Portion 75 of the farm Elandsdrift 467 JQ	THARISA MINERALS PTY LTD					
<b>Community Organisations</b>								
29	N/A	N/A	Agri North West	Mr W.P. Auret			018 632 2987	<a href="mailto:nwlu@isdnet.co.za">nwlu@isdnet.co.za</a>
<b>Ward Councillor</b>								
32	N/A	N/A	Ellen Dikang	Ward Councillor - Ward 27			071 144 9091	<a href="mailto:ellendikgang23@gmail.com">ellendikgang23@gmail.com</a>
<b>Authorities</b>								
33	N/A	N/A	Department of Mineral Resources	Matodzi Ramboho	Case Officer	Vaal University of Technology Building, c/o Voortrekker & Margaretha Prinsloo Streets, KLERKSDORP, 2570	018 487 4300	<a href="mailto:Matodzi.Ramboho@dmr.gov.za">Matodzi.Ramboho@dmr.gov.za</a>
34	N/A	N/A	Department of Agriculture, Forestry and Fisheries - North West	Mr Mahlaba	Chief Director: Agriculture	Agricenter Building Corner Dr James Moroko and Stadium	018 365 1007/ 018 389 5026 /018 389 5157	<a href="mailto:malakiam@nwpg.gov.za">malakiam@nwpg.gov.za</a>

			Policy and Planning			Road Mmabatho, 2735		
35	N/A	N/A	National Department of Agriculture, Forestry and Fisheries - Policy, Planning and Monitoring and Evaluation	Joe Kgobokoe	DDG: Policy, Planning and Monitoring and Evaluation	Room 230, Harvest House 30 Hamilton Street Arcadia Pretoria 0002	012 319 6120	<a href="mailto:MokutuleK@daff.gov.za">MokutuleK@daff.gov.za</a>
36	N/A	N/A	Department of Rural, Environmental and Agricultural Development (READ)	Ouma Skosana		Agricenter Building Corner Dr James Moroko and Stadium Road Mmabatho, 2735	018 389 5959/5156	<a href="mailto:oskosana@nwpg.gov.za">oskosana@nwpg.gov.za</a>
37	N/A	N/A	Department of Water and Sanitation	Rens Botha	Chief Engineer: Water Resources Management - Limpopo-North West Proto CMA	Cnr Dr. James Moroka Drive and Sekame Road Mega City Complex Unit 99 Sekame Street MMABATHO 2735	012 392 1308/082 808 9560	<a href="mailto:bothar@dws.gov.za">bothar@dws.gov.za</a>

38	N/A	N/A	Provincial Heritage Resources Agency (PHRA) - North West	Mosiane Mothlabane		1st Floor Gaabomotho Building 760 Dr. James Moroka Drive Private Bag X90 Mmabatho 2735	018 388 2826	<a href="mailto:mosianem@nwpg.gov.za">mosianem@nwpg.gov.za</a>
39	N/A	N/A	Department of Rural Development and Land Reform	Bonginkosi Zulu	Acting DDG: Land Redistribution and Development	184 Jeff Maseloma Street Pretoria, 0001	012 312 9840/ 012 312 8472	<a href="mailto:Bonginkosi.Zului@drdlr.gov.za">Bonginkosi.Zului@drdlr.gov.za</a>
40	N/A	N/A	Department of Rural Development and Land Reform	Adv. Vela Mngwengwe	CD: Property Management and Advisory Services	184 Jeff Masemola Pretoria,0001	012 312 9862 / 012 312 8237	<a href="mailto:Vela.Mngwengwe@drdlr.gov.za">Vela.Mngwengwe@drdlr.gov.za</a>
41	N/A	N/A	Department of Rural Development and Land Reform	Dr Nozizwe Makgalemele	DDG: Spatial Planning and Land Use Management	Room 801 Capital Towers Pretoria, Gauteng, 0001	012 312 9834/ 012 312 9851	<a href="mailto:Nozizwe.Makgalemele@drdlr.gov.za">Nozizwe.Makgalemele@drdlr.gov.za</a>
42	N/A	N/A	Department of Rural Development and Land Reform	Mr Lengane Bogatsu	Chief Director: Land Restitution Support (North West)		018 392 3080	<a href="mailto:lengane.bogatsu@drdlr.gov.za">lengane.bogatsu@drdlr.gov.za</a>
43	N/A	N/A	Bojanala District Municipality	Tshepo Lenke	Municipal Manager	Cnr Beyers Naude and Fatima Bhayat Drive, RUSTENBURG	014 590 4502	<a href="mailto:gtlenke@gmail.com">gtlenke@gmail.com</a> ;
44			Bojanala District Municipality	Tsholofelo Dikgole	Secretary to the Municipal Manager	Cnr Beyers Naude and Fatima Bhayat	014 590 4502	<a href="mailto:tsholofelod@bojanala.gov.za">tsholofelod@bojanala.gov.za</a>

						Drive, RUSTENBURG		
45	N/A	N/A	Madibeng Local Municipality	Isaac Lekgetho	Municipal Manager	Van Velden Street, Brits, 0250, South Africa	012 318 9100	<a href="mailto:isaaclekgetho@madibeng.gov.za">isaaclekgetho@madibeng.gov.za</a> ; <a href="mailto:munman@madibeng.gov.za">munman@madibeng.gov.za</a>

(iv) The environmental attributes associated with the alternatives

This section describes the biophysical and socio-economic environment that may be affected and the known baseline conditions, which may be affected by the proposed prospecting activities.

(a) Local Climate

Climate can influence the potential for environmental impacts and related mine design. Specific issues include:

- J Rainfall could influence erosion, evaporation, vegetation growth, rehabilitation planning, dust suppression, and surface water management planning;
- J Temperature could influence air dispersion through impacts on atmospheric stability and mixing layers, vegetation growth, and evaporation which could influence rehabilitation planning; and
- J Wind could influence erosion, the dispersion of potential atmospheric pollutants, and rehabilitation planning.

**Temperature:** The monthly distribution of average daily maximum temperatures shows that the average midday temperatures range from 19.9°C in June to 28.8°C in January. The province is the coldest during July when the mercury drops to 2.7°C on average during the night (source: South African Weather Bureau, 2010).

**Rainfall:** North-West normally receives about 481mm of rain per year, with most rainfall occurring during summer. It receives the lowest rainfall (0mm) in June and the highest (95mm) in January. Buffelspoort station is the closest station to the mine and has the longest rainfall record (83 years). From this station, it was recorded that the highest rainfall was 630mm in 1989 while the lowest of 429mm was recorded in 1985. From this station, it was also concluded that the majority of the rainfall occurs in the summer months of October to March at which time approximately 90% of the annual rainfall occurs.

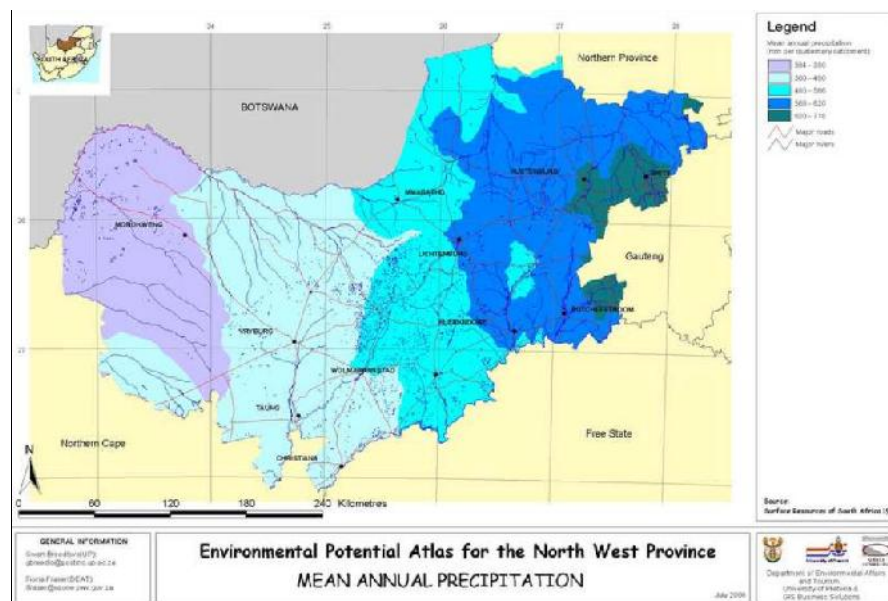


Figure 2.3: Mean Annual Precipitation Map showing high precipitation in North West Province (Source: Envass, EIA-REP-050-12\_13, 2014).

**Wind and Evaporation:** The prevailing wind direction for Elandsdrift node is a north western wind flow. During winter-months (July - August), the enhanced influence of westerly wave disturbances is evident in the increase frequency of south westerly winds. An increase in the frequency of north easterly winds during spring months, and the continued prevalence of north westerly and northerly airflow, reflects the combined influence of anti-cyclonic subsidence and easterly wave systems.

The dominant day time winds are from the north-east and north-west. The dominant night time wind is from the south and south east. On average, the south and south easterly winds occur approximately 25% of the time and are associated with low wind speeds between 1 and 2m/s. On average, the winds from the north-east, north-west and south-west occur less frequently but are associated with higher speeds that are greater than 5m/s. On average, calm conditions are experienced approximately 14% of the time.

#### (b) Topography

The natural topography of a study site will determine the following factors:

- )] Surface water run-off (including groundwater)
- )] Depth of soils and the potential for soil erosion, dependent on the slope of the study area;
- )] Aesthetic appearance of the area; and
- )] Climatic factors such as wind speeds and direction (which might be influenced by the topography of an area).

Changes in the topography caused by the mining activities could therefore alter all of the above-mentioned aspects of the environment. Project-related activities have the potential to alter the topography of the site through the establishment of both temporary and permanent infrastructure.

The topography in and around the Mine is gently undulating. The elevation ranges from 1,140m in the south-west to approximately 1,320m in the north. Immediately north of the mine are a number of gabbro-norite hills. South of the mine area is the Magaliesberg Mountain range. Peaks in this part of the Magaliesberg rise to approximately 1400 metres above mean sea level (mamsl).

#### (c) **Geology**

Elandsdrift is situated in the Bushveld Igneous Complex (see Figure 5). The Bushveld complex is an intrusive igneous body, extending about 400 km from east to west and about 350 km from north to south. It comprises a series of ultramafic-mafic layers and a suite of associated granitoid rocks.

The ultramafic-mafic rocks of the Bushveld Igneous Complex are known as the Rustenburg Layered Suite. The stratigraphy of the Rustenburg suite is summarised as follows:

- )] Upper zone consisting of norites, gabbros and diorites, magnetite seams
- )] Main zone consisting of norites and gabbros.
- )] Critical zone consisting of pyroxenites, norites and anorthosites. It is within this layer that the platinum group metals are found
- )] Lower Zone consisting of pyroxenites and harzburgites, chromitite seams
- )] Marginal zone consisting of pyroxenites and norites.

There are four main limbs to the complex, namely the Northern Limb, the Eastern Limb, the Southern Limb and the Western Limb. Elandsdrift is located on the Western limb of the Bushveld Complex in the Marikana section. The Marikana section is separated from



the Brits section to the east by Wolhulterstrop and the Rustenburg section to the west by the Spruitfontein upfold.

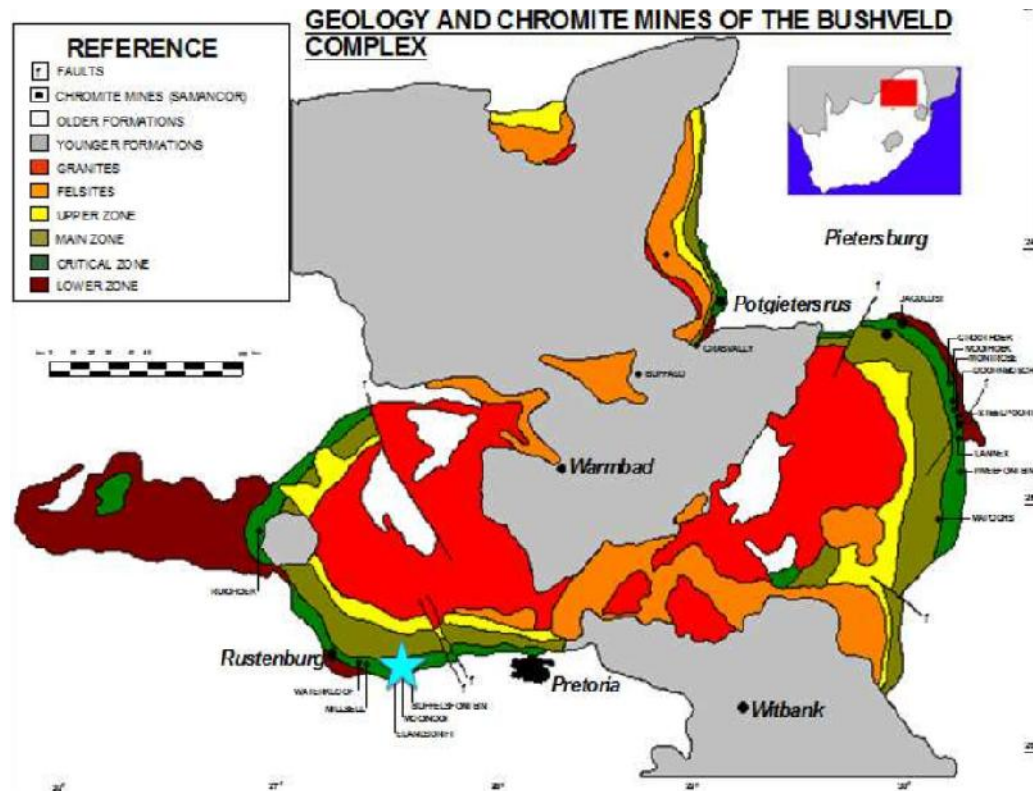


Figure 2.4: Main Geological features of the Bushveld Complex (Source: Envass, EIA-REP-050-12\_13, 2014)

(d) Soils and land use

- Soils
- Land Use

The soils that occur on the proposed development are as follow:

- ] Arcadia (Ar): It has a Vertic A Horizon over unconsolidated material over saprolite. The soil varies from 40-90cm in depth. It has a low to medium potential agricultural production capacity.
- ] Glenrosa (Gs): It has an Orthic A Horizon over a hard Lithocutanic B Horizon. The soils vary from 20-40cm in depth.
- ] There are large boulders on the surface. It is marginal for agricultural production.
- ] Mispah (Ms): It has a thin Orthic A Horizon solid rock. The soils vary from 10-30cm in depth. There are large boulders on the surface. It is marginal for agricultural production.
- ] Oakleaf (Oa): It has an Orthic A Horizon over a Neocutanic B Horizon. The soil varies in depth from 75-100cm. They are highly erodible and therefore low to medium potential soils. This area is also disturbed and some mining of sand took place. It is marginal for agricultural production.

The present land use is a very small portion of old crop lands (sunflower) presently laying fallow and the majority of land is seriously encroached with thorn bush making it inaccessible even for cattle.

Table 2-2: Soil physical properties for the different soil forms.

Properties	Soil 1	Soil 2	Soil 3	Soil 4
Soil Form	Arcadia	Glenrosa	Mispah	Oakleaf
Sub Dominant Soil		Mispah	Glenrosa	Hutton
Soil Family	1200	1211	1100	1110
Soil Depth	40-80cm	20-40cm	0-20cm	80-100cm
Effective Rooting Depth	40cm	20cm	20cm	60cm
Infiltration Rate	Low < 5mm/h	Moderate 5-10mm/h	Low <5mm/h	Moderate 5-10mm/h
Consistency	Hard	Friable	Friable	Friable
Structure	Strong Blocky	Apedal	Apedal	Loose
Texture	Cl	Sa Cl Lm	Lm Sa	Lm Sa
Drainage	Slow	Moderate	Fast	Fast
Gravel/Rocks A Horizon	20%	40%	80%	10%-
Gravel/Rocks B1 Horizon	30%	80%	100%	30%
Gravel/Rocks B2 Horizon	-	-	-	-
Wetness	W1	-	-	-
Compactability	Low	Low	Low	High
Erodability	High	Very High	Very High	Very High
Potential Nematode Infestation	Low	Low	Low	High
Irrigation Classification	5	5	5	4
Land Capabaility (Ag)	4	4	8	4
Land Capability (Mining)	Grazing/Arable	Grazing	Wilderness	Arable

The area is dominated by agricultural and mining activities. Agriculture and mining are the key economic activities in the municipal boundaries of the Bojanala District Municipality. There are also various mining and industrial operations that are located around the proposed Elandsrft prospecting area.

#### (e) Biodiversity

Biodiversity forms one of the most crucial environmental considerations of a development and it is used to formulate decisions pertaining to activities with significant environmental impacts. The inclusion of biodiversity in decision making has been aimed to bridge a gap between economic development and land destruction, thus mitigating the environmental effects these developments may pose while still maintaining a functioning biodiversity. Therefore, as part of the EIA guidelines it is important to assess the potential impact of these proposed activities as they can impact directly or indirectly on the receiving environment. In general, biodiversity represents the variety of species within a specified ecosystem and can thus be used to assess the ecosystem health. According to the Gauteng Conservation Plan v33\_1110 the proposed site falls within a Important and Ecological supported area.

Vegetation: The North West Province has wide array of species, ecosystem and habitats. This is largely due to the diverse nature if the Provinces landscapes and variation in climate.

The Province falls within the Savannah-Grassland Biome with its associated Marikana Thornveld vegetation unit.

The vegetation point of interest in the study area is the Mambakop. The Mambakop is a rocky hill next to Elansdrift. This is the highest and larger rocky hill outcrop with the crest that stands at 1230m and 30m above the flat area of its base following the 1200m contour line. The Mambakop does not intersect the site but it is situated closer to the north boundary of the study site (i.e. it is in close proximity to the site). The area where the proposed site is situated is not pristine. On the proposed site the following vegetation units were observed: -

- ] Combretum-Berchemia outcrop;
- ] An Acacia-Dichrostachys Thornveld;
- ] Mixed alien and Indigenous vegetation;
- ] Dichrostachys-Heteropogon conturtus veld;
- ] Patches of cultivated fields; and
- ] Small section of drainage vegetation.

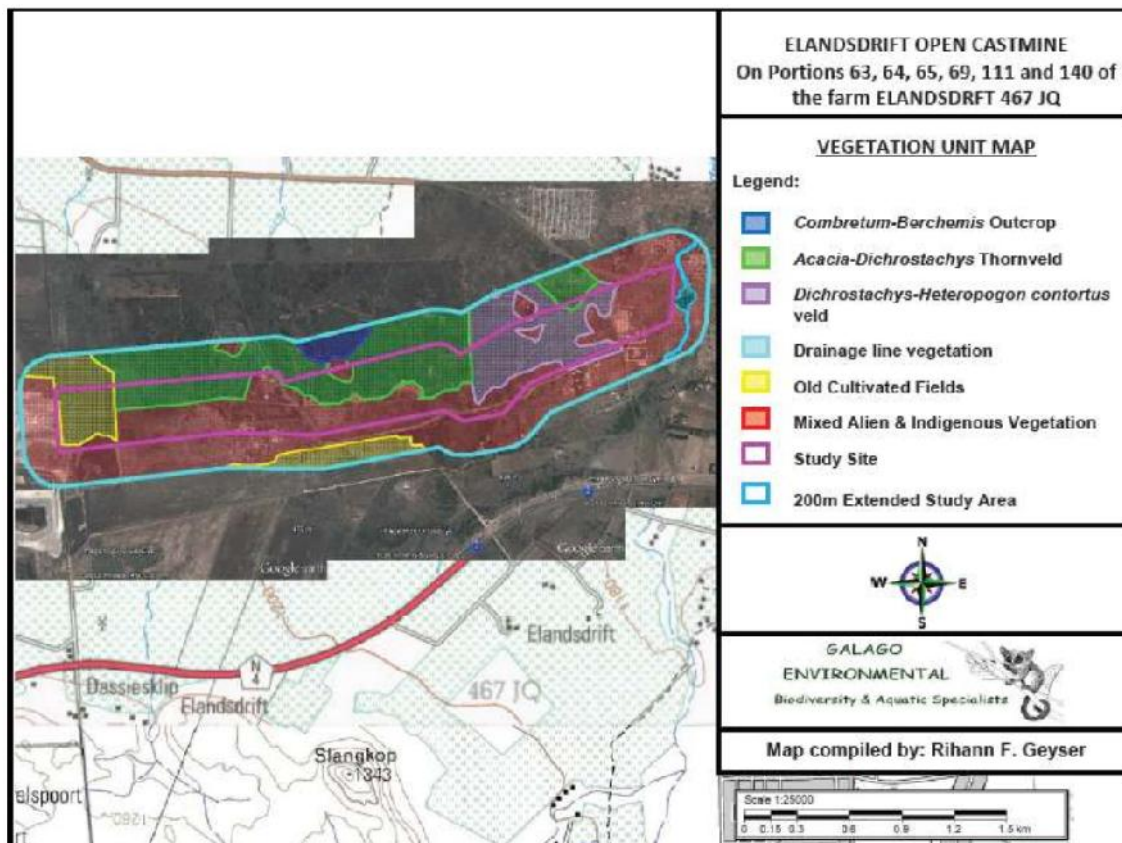


Figure 2.5: Vegetation study units identified on the study site (Source: Envass, EIA-REP-050-12\_13, 2014).

**Fauna:** The proposed site is generally disturbed with moderate micro-habitat diversity, apart from the Mambakop where the micro-habitat diversity is high. Except for the Common Duiker (*Sylvicapra grimmia*) that was randomly seen in the area; no fauna were found on the site. However, there is slight chance of Eastern Rock Elephant Shrew (*Elephantus myurus*) and Jameson's red rock rabbit (*Pronolagus randensis*) occurring at the site.

The Mambakop may still accommodate moderate mammal diversity on a medium scale. Therefore, it is considered of medium sensitivity and it is likely that the proposed project will significantly impact it or its connectivity. No threatened animals or those of conservation concern were observed at the study site. The Mambakop may still accommodate moderate mammal diversity.

**Avifauna:** Avifauna assessment of grid 2527DA quarter degree square (QDS) and pentad 2540\_2730 for South African Birds Atlas Phase 2 (SABAP2) shows that there are birds of Critical and Near Threatened status likely to occur in the area. However, specialist study shows that only Lanner Falco (*Falco biarmicus*), a near threatened bird species may visit the study area but it is unlikely to use it on a permanent basis. The proposed activity will not have a negative effect on Red data species of listed avifauna due to lack of suitable breeding, foraging and roosting habitat. The entire area is disturbed by past and present mining and agricultural activities.

#### (f) Hydrology

Surface water resources include drainage lines and paths of preferential flow of stormwater runoff. Project related activities have the potential to alter the drainage of surface water through the establishment of both temporary and permanent infrastructure and/or result in the contamination of the surface water resources through seepage and/or spillage of potentially polluting materials, non-mineralised waste (general) and hazardous and mineralised wastes.

The surface waters in the Province are in the form of rivers, dams, pans, wetlands and dolomitic eyes fed by aquifers. No wetlands occur in the vicinity of the proposed site. The main rivers are the Crocodile, Groot Marico, Hex, Elands, Vaal, Mooi, Harts and Molopo rivers.

The Elandsdrift mining node is situated within the Maretlwana subcatchment. There is an Elandsdriftspruit River that flows north into the Maretlwana River. The Maretlwana River continues to flow north where it meets the Gwatlhe River which subsequently flows into Crocodile River.

#### (g) Geohydrology

Groundwater is a valuable resource and is defined as water which is located beneath the ground surface in rock pore spaces and in the fractures of lithologic formations. The Province has a large reservoir of subterranean water in the form of fractured aquifers and dolomitic compartments. However, recharge to this precious resource is considered to be one of the lowest in South Africa with an average of less than 10 mm per year in the western region of the Province. The North West Province relies heavily on groundwater resources to meet its needs. Sources of pollution of groundwater resources include mining and industrial activities, agriculture and domestic use. Main groundwater water quality issues in the Province include high levels of dissolved mineral such as nitrates and fluoride concentrations in certain areas, due to both natural and human-induced factors. The Rustenburg Layered Suite rocks typically act as secondary aquifers (intergranular and fractured rock aquifers). However, the multi-layered weathering system present on these rocks could prove to have up to two aquifer systems present in the form of a shallow,

saprolitic aquifer with a weathered, intergranular soft rock base associated with the contact of fresh bedrock and the weathering zone; and a fractured bedrock aquifer. These aquifer systems are discussed below: Shallow, saprolitic aquifer The main source of recharge into the shallow aquifer is rainfall that infiltrates the aquifer through the unsaturated (vadose) zone. Vertical movement of water is faster than lateral movement in this system as water moves predominantly under the influence of gravity. This aquifer may contain transported, coarse, anorthositic sediment or turf clay sediment when underlain by norite. The hydraulic conductivity of this aquifer ranges between  $10^{-8}$  and  $10^{-2} \text{m.day}^{-1}$  and porosity ranges between 0.4 and 0.7 for turf clay sediments. The hydraulic conductivity of the coarse, anorthositic sediment can reach up to 20m/day with porosities ranging between values of 0.25 to 0.5. Fractured, bedrock aquifer Groundwater movement is predominantly associated with secondary structures in this aquifer (fractures, faults, dykes, etc.). The average water level depth in the area ranges between 5 and 40 (mbgl) Metres Below Ground Level. Borehole yields in the Rustenburg Layered Suite fractured aquifers are generally low and can be expected to be between 0.1 and 2 l/s with regional flow resembling flow in the porous medium (i.e. obeying Darcy's law). These formations contain limited quantities of water resources due to the poor storage capacity of the igneous rock. Groundwater quality in the area is also expected to be intermediate to poor with EC values ranging from 4.4 to 120mS/m and possibly elevated Ca, Mg, Cl, and SO<sub>4</sub> as well as carbonate alkalinity concentrations. Both the porosity and the hydraulic conductivity of the Rustenburg Layered Suite fractured aquifers are known to be low. The commonly expected values of porosity and permeability for igneous rock types, similar to those present in the Rustenburg Layered Suite, are 0.05 (porosity) and  $10^{-5} \text{m.d}^{-1}$  (hydraulic conductivity) respectively. Movement of groundwater in this aquifer will be preferential in secondary structures such as joints, faults and fractures.

#### (h) Noise

As previously stated, the site is occupied by various landuses, ranging from mining to agricultural. As a result the noise impact to the area is low due to the activities sparsely located within the landscape. It should also be noted that a large part of the western side of the study area is surrounded by mining and mining related activities which contributes to high levels of noise pollution.

#### (i) Heritage Resources

Cultural Resources are all non-physical and physical man-made occurrences, as well as natural occurrences associated with human activity. These include all sites, structure and artefacts of importance, either individually or in groups, in the history, architecture and archaeology of human (cultural) development. Graves and cemeteries are also included in Cultural resources.

Archaeological and cultural features background regarding the different phases of human history involves: -

Stone Age: The Stone Age is the period in human history when lithic material was mainly used to produce tools (Coertze & Coertze 1996: 293). In South Africa the Stone Age can be divided in three periods. It is however important to note that dates are relative and only provide a broad framework for interpretation. The division for the Stone Age according to Korsman & Meyer (1999: 93-94) is as follows:

- > Early Stone Age (ESA) 2 million – 150 000 years ago
- > Middle Stone Age (MSA) 150 000 – 30 000 years ago
- > Late Stone Age (LSA) 40 000 years ago – 1850 - A.D

The closest known Stone Age site in the vicinity of the surveyed area is a rock art site to the northeast. Rock engravings are found to the south and east of Rustenburg. These date back to the Late Stone Age (Bergh 1999). The environment is such that it does not



provide much natural shelter such as caves and therefore it is possible that Stone Age people did not settle here for long periods of time. They would have however been lured to the area due to an abundance of wild life as the natural vegetation would have provided ample grazing and there are plenty natural water sources. One may therefore find small sites or occasional stone tools.

**Iron Age:** The Iron Age is the name given to the period of human history when metal was mainly used to produce metal artefacts (Coertze & Coertze 1996). In South Africa it can be divided in two separate phases according to Van der Ryst & Meyer (1999), namely:

- > Early Iron Age (EIA) 200 – 1000 A.D
- > Late Iron Age (LIA) 1000 – 1850 A.D

Huffman (2007) however indicates that a Middle Iron Age should be included. His dates, which now seem to be widely accepted in archaeological circles, are:

- > Early Iron Age (EIA) 250 – 900 A.D
- > Middle Iron Age (MIA) 900 – 1300 A.D
- > Late Iron Age (LIA) 1300 – 1840 A.D

Many Late Iron Age sites have been identified in the area around the towns of Rustenburg, Koster and Groot Marico as well as in the Waterberg Mountains. This includes the surveyed area (Bergh 1999). During earlier times the area was inhabited by Tswana groups, namely the Fokeng and Hurutshe. In the 19th century and even today, the area is inhabited by other Tswana groups, namely the Kwena, Tlokwa, Phiring, Taung and the Fokeng (Bergh 1999). During the Difaquane these people moved further to the north and south, but they returned later on (Bergh 1999).

Iron Age sites were indeed found during the survey. It therefore is clear from the above mentioned that these people utilized and inhabited this area.

**Historical Age:** The historical age started with the first recorded oral histories in the area. It includes the moving into the area of people that were able to read and write. This era is sometimes called the Colonial era or the recent past.

Due to factors such as population growth and a decrease in mortality rates, more people inhabited the country during the recent historical past. Therefore and because less time has passed, much more cultural heritage resources from this era have been left on the landscape. It is important to note that all cultural resources older than 60 years are potentially regarded as part of the heritage and that detailed studies are needed in order to determine whether these indeed have cultural significance. Factors to be considered include aesthetic, scientific, cultural and religious value of such resources.

Early travellers have moved through this part of the Northwest Province. This included Coenraad de Buys in 1821 and 1825, David Hume in 1825, Robert Scoon and William McLuckie in 1827 and 1829 and Dr. Robert Moffat and Reverend James Archbell in 1829 (Bergh 1999). Hume again moved through this area in 1830 followed by the expedition of Dr. Andrew Smith in 1835 (Bergh 1999). Hume also moved through the area with Scoon in 1835. In 1836 William Cornwallis Harris visited the area. The well-known explorer Dr. David Livingstone passed through this area in 1847 (Bergh 1999).

In 1837 the Voortrekkers also moved through the Swartruggens area (Bergh 1999). During this year a Voortrekker commando moved out against Mzilikazi and was engaged in a battle with his impi to the north of Swartruggens. The area surveyed was inhabited by white settlers as early as 1839 (Bergh 1999).

The greater Magaliesberg area saw much action during the Anglo-Boer War (1899-1902). British troops reached Rustenburg on 14 June 1900. Three battles were fought here during

the War, being the one at Buffelspoort on 3 December 1900, the one at Nooitgedacht on 13 December 1900 and the one at Vlakfontein on 29 May 1901 (Bergh 1999). The British also erected blockhouses in the area.

The significance of the sites, structures and artefacts is determined by means of their historical, social, aesthetic, technological and scientific value in relation to their uniqueness, condition of preservation and research potential. The various aspects are not mutually exclusive, and the evaluation of any site is done with reference to any number of these aspects. Cultural significance is site-specific and relates to the content and context of the site. Sites regarded as having low cultural significance have already been recorded in full and require no further mitigation. Sites with medium cultural significance may or may not require mitigation depending on other factors such as the significance of impact on the site. Sites with a high cultural significance require further mitigation.

During the survey one site of cultural heritage significance was located in the area to be developed. It was a grave yard belonging to the Historical Age. However, there is always a possibility that more sites may become known later and that those need to be dealt with in accordance with the legislation. Chances therefore are good to find sites associated with part of the human history. This might also include graves.

#### (j) Demographics

The socio-economic environment in the province can be summarised as follows:

**Population:** The North West Province (NWP) has a population of approximately 3.2 million residents (Community Survey, 2007; Quantec, 2010), with an average household size of 3.6.

**Economic Activity:** Provincially it was estimated that, in 2009, the most dominant sector contributing to the North West Province's economy was the mining industry. This was demonstrated by 25% of the economically active population being employed in this industry. The sectors with the smallest contributions to the province's Gross Geographic Product (GGP) were electricity and water, as well as the transportation industry.

**Unemployment:** It was estimated that the unemployment rate of the NWP in 2009 was 26% (presenting a similar profile to South Africa as a whole –with an unemployment rate of 25% in the same year).

**Education:** Ten percent (10%) of the working age population has had no formal education. Furthermore, only 18% of the total population in the province obtained a grade 12/matric education.

**Basic services:** The majority of the population's households have access to piped water, with only eight percent (8%) using alternate water sources (for example, boreholes, water vendors, wells, tankers, dams, rivers, streams). Approximately 46% of households with toilet facilities utilise pit or bucket latrines. Eight percent (8%) have no toilet facilities. In terms of households' dominant energy source, 86% use electricity as the primary means for lighting. Refuse removal services are provided to most households, with a small percentage of the population (an estimated nine percent (9%)) not having any refuse disposal facilities.

**Housing:** Within the NWP, it is estimated that 22% of the population reside in informal dwellings (with 15% of the population living in informal settlements and seven percent (7%) in backyards).

**Municipal Level:** Samancor Elandsdrift falls within The Madibeng Local Municipality's Ward 36 falls within the Bojanala District Municipality. The Ward occupies 3 839 km<sup>2</sup> with the population of 477 381 as in 2011 dominated by Blacks (89%), Whites (8.9%),

Coloureds and then Asian/Indians. The most spoken language is Tswana (43.5%). The Elandsdrift site is situated within this Ward and occupies an area of 0.08km<sup>2</sup> with 255 000 population. The most spoken language is Tswana followed by Zulu, Xhosa, Pedi, Sotho, Afrikaans and English. Below, is key statistics of the Municipality for 2011 (source: STATISTIC SOUTH AFRICA). The socio-economic environment in the municipality can be summarised as follows:

**Table 3: Population.**

Total population	477,381
Young	25,7%
Working Age	69,2%
Elderly	5,1%
Population Density	124 persons/km <sup>2</sup>

**Table 4: Employment Statistics.**

Unemployment Rate	30,4%
Youth Unemployment Rate	38,2%

**Table 5: Education Levels.**

No Schooling Aged 20+	7,8%
Higher Education Aged 20+	7,7%
Matric Aged 20+	27,3%

**Table 6: Dwellings and Access to Services.**

Number of Households	160,724
Average Household Size	2,9
Female Headed Households	30,3%
Formal Dwellings	59,2%
Housing Owned/Paying Off	54,1%
Flush Toilet connected to Sewerage	27,2%
Weekly Refuse Removal	25,7%
Piped Water Inside Dwelling	22,2%
Electricity for Lighting	81%

The population growth and urbanization information indicates that in future greater pressure on environmental resources such as open space and water can be expected in the Madibeng Local Municipality. Timeous planning is required to provide adequate infrastructure, especially in informal settlements where lack of infrastructure leads to water, soil and air pollution. Based on the findings of this report, the Elandsdrift Opencast Mine poses no fatal flaws to the socio-economic environment in the study area of the proposed project. This is based on the condition that recommended mitigating factors that were identified and discussed in this document, are implemented.



(v) Impacts and risks identified including the nature, significance, consequence, extent, duration and probability of the impacts, including the degree to which these impacts

	IMPACTS				CONSEQUENCE					PROBABILITY		WOM		CONFIDENCE		IMPLEMENTATION OF MANAGEMENT MEASURES	MITIGATION EFFICIENCY		WM	DEGREE REVERSABILITY & LOSS OF RESOURCE				
	Type	Description	Cumulative	Nature	Extent (A)		Duration (B)		Intensity (C)		Probability (P)		SIG.							SIG.	Loss of Resources		Reversibility	
CONSTRUCTION PHASE																								
Establish Central Storage Shed	Direct	Loss of biodiversity	Yes	Negative	Site	1	Incidental	1	Low	1	Possible	10	Low	30	High	100	No management measures required	Very Low	20%	Low	No Loss	0	Reversible	100
	Direct	Loss of habitat	Yes	Negative	Site	1	Short-term	2	Low	1	Likely	15	Low	60	High	100	No management measures required	Very Low	20%	Low	No Loss	0	Reversible	100
OPERATIONAL PHASE																								
Drill Collar Sites	Direct	Loss of biodiversity	None	Negative	Site	1	Short-term	2	Low	1	Possible	10	Low	40	Medium	50	No management measures required	Low	40%	Low	No Loss	0	Reversible	100
	Indirect	Loss of habitat	None	Negative	Site	1	Short-term	2	Low	1	Possible	10	Low	40	High	100	No management measures required	Very Low	20%	Low	No Loss	0	Reversible	100
	Direct	Contamination from Sumps	None	Negative	Site	1	Short-term	2	Low	1	Possible	10	Low	40	Medium	50	Maintain a spill kit within the prospecting area to utilise when needed	Low	40%	Low	No Loss	0	Reversible	100
	Direct	Dust emissions	None	Negative	Site	1	Short-term	2	Low	1	Possible	10	Low	40	Medium	50	Implement dust suppression measures by watering of roads	Low	40%	Low	No Loss	0	Reversible	100
	Indirect	Emissions from vehicles and equipment (CO2, NOx, SOx, VOCs etc.)	None	Negative	Site	1	Short-term	2	Low	1	Possible	10	Low	40	Medium	50	Ensure all vehicles and/or equipment used within the construction phase are serviced according to the appropriate maintenance plan	Low	40%	Low	No Loss	0	Reversible	100
Sampling and Analysis	Not Applicable	None	None	None	None	0	None	0	None	0	None	0	None	0	None	0	No management measures required	None	0%	None	No Loss	0	Reversible	100
Pre- / Feasibility Study	Not Applicable	None	None	None	None	0	None	0	None	0	None	0	None	0	None	0	No management measures required		0%	None	No Loss	0	Reversible	100
Incidents, accidents and potential emergency	Indirect	Pollution incidents	Yes	Negative	Local	5	Short-term	2	Low	1	Possible	10	Low	80	Medium	50	Implement environmental awareness plan	Medium	60%	Low	No Loss	0	Reversible	100
	Indirect	Health and safety	No	Negative	Neighbouring	2	Long-term	8	Medium	5	Possible	10	Low	150	Medium	50	Implement environmental awareness plan	Very Low	20%	Low	No Loss	0	Reversible	100
Socio-Economic	Indirect	Safety and security	Yes	Negative	Neighbouring	2	Long-term	8	Medium	5	Likely	15	Low-Medium	225	High	100	Engage in permanent 24 hour security to control access at the camp	Low	40%	Low	No Loss	0	Reversible	100

- (vi) Methodology used in determining and ranking the nature, significance, consequences, extent, duration and probability of potential environmental impacts and risks

The standard methodology used in the environmental impact assessment to determine the significance rating of the potential impacts are outlined in this section.

(a) Significance

The significance of an impact is defined as the combination of the consequence of the impact occurring and the probability that the impact will occur. The nature and type of impact may be direct or indirect and may also be positive or negative, refer to Table 2-7 below for the specific definitions.

Table 2-7: Nature and type of impact.

IMPACT	Nature and Type of Impact:		
	Direct	Impacts that are caused directly by the activity and generally occur at the same time and place as the activity	✓/✗
	Indirect	Indirect or induced changes that may occur as a result of the activity. These include all impacts that do not manifest immediately when the activity is undertaken or which occur at a different place as a result of the activity	✓/✗
	Cumulative	Those impacts associated with the activity which add to, or interact synergistically with existing impacts of past or existing activities, and include direct or indirect impacts which accumulate over time and space	✓/✗
	Positive	Impacts affect the environment in such a way that natural, cultural and / or social functions and processes will benefit significantly, and includes neutral impacts (those that are not considered to be negative)	✓
	Negative	Impacts affect the environment in such a way that natural, cultural and/or social functions and processes will be comprised	✗

Table 2-8 presents the defined criteria used to determine the consequence of the impact occurring which incorporates the extent, duration and intensity (severity) of the impact.

Table 2-8: Consequence of the Impact occurring.

CONSEQUENCE	Extent of Impact:		
	Site	Impact is limited to the site and immediate surroundings, within the study site boundary or property (immobile impacts)	1
	Neighbouring	Impact extends across the site boundary to adjacent properties (mobile impacts)	2
	Local	Impact occurs within a 5km radius of the site	5

	Regional	Impact occurs within a provincial boundary	<b>8</b>
	National	Impact occurs across one or more provincial boundaries	<b>10</b>
	Duration of Impact:		
	Incidental	The impact will cease almost immediately (within weeks) if the activity is stopped, or may occur during isolated or sporadic incidences	<b>1</b>
	Short-term	The impact is limited to the construction phase, or the impact will cease within 1 - 2 years if the activity is stopped	<b>2</b>
	Medium-term	The impact will cease within 5 years if the activity is stopped	<b>5</b>
	Long-term	The impact will cease after the operational life of the activity, either by natural processes or by human intervention	<b>8</b>
	Permanent	Where mitigation either by natural process or by human intervention will not occur in such a way or in such a time span that the impact can be considered transient	<b>10</b>
	Intensity or Severity of Impact:		
	Low	Impacts affect the environment in such a way that natural, cultural and/or social functions and processes are not affected	<b>1</b>
	Low-Medium	Impacts affect the environment in such a way that natural, cultural and/or social functions and processes are modified insignificantly	<b>2</b>
	Medium	Impacts affect the environment in such a way that natural, cultural and/or social functions and processes are altered	<b>5</b>
	Medium-High	Impacts affect the environment in such a way that natural, cultural and / or social functions and processes are severely altered	<b>8</b>
	High	Impacts affect the environment in such a way that natural, cultural and / or social functions and processes will permanently cease	<b>10</b>

The probability of the impact occurring is the likelihood of the impacts actually occurring, and is determined based on the classification provided in Table 2-9.

Table 2-9: Probability and confidence of impact prediction.

PROBABILITY	Probability of Potential Impact Occurrence:		
	Improbable	The possibility of the impact materialising is very low either because of design or historic experience	5
	Possible	The possibility of the impact materialising is low either because of design or historic experience	10
	Likely	There is a possibility that the impact will occur	15
	Highly Likely	There is a distinct possibility that the impact will occur	25
	Definite	The impact will occur regardless of any prevention measures	30

The significance of the impact is determined by considering the consequence and probability without taking into account any mitigation or management measures and is then ranked according to the ratings listed in Table 2-10. The level of confidence associated with the impact prediction is also considered as low, medium or high (Table 2-11).

Table 2-10: Significance rating of the impact.

SIGNIFICANCE	Significance Ratings:		
	Low	Neither environmental nor social and cultural receptors will be adversely affected by the impact. Management measures are usually not provided for low impacts	1-180
	Low-Medium	Management measures are usually encouraged to ensure that the impacts remain of Low-Medium significance. Management measures may be proposed to ensure that the significance ranking remains low-medium	181-360
	Medium	Natural, cultural and/or social functions and processes are altered by the activities, and management measures must be provided to reduce the significance rating	361-540
	Medium-High	Natural, cultural and/or social functions and processes are altered significantly by the activities, although management measures may still be feasible	541-720
	High	Natural, cultural, and/or social functions and processes are adversely affected by the activities. The precautionary approach will be adopted for all high significant impacts and all possible measures must be taken to reduce the impact	721-900

Table 2-11: Level of confidence of the impact prediction.

CONFIDENCE	Level of Confidence in the Impact Prediction:		
	Low	Less than 40% sure of impact prediction due to gaps in specialist knowledge and/or availability of information	10
	Medium	Between 40 and 70% sure of impact prediction due to limited specialist knowledge and/or availability of information	50
	High	Greater than 70% sure of impact prediction due to outcome of specialist knowledge and/or availability of information	100

Once significance rating has been determined for each impact, management and mitigation measures must be determined for all impacts that have a significance ranking of Medium and higher in order to attempt to reduce the level of significance that the impact may reflect.

The EIA Regulations, 2014 specifically require a description is provided of the degree to which these impacts:

- ) can be reversed;
- ) may cause irreplaceable loss of resources; and
- ) can be avoided, managed or mitigated.

Based on the proposed mitigation measures the EAP will determined a mitigation efficiency (Table 2-12) whereby the initial significance is re-evaluated and ranked again to effect a significance that incorporates the mitigation based on its effectiveness. The overall significance is then re-ranked and a final significance rating is determined.

Table 2-12: Mitigation efficiency.

MITIGATION EFFICIENCY	Mitigation Efficiency		
	None	Not applicable	0%
	Very Low	Where the significance rating stays the same, but where mitigation will reduce the intensity of the impact. Positive impacts will remain the same	20%
	Low	Where the significance rating reduces by one level, after mitigation	40%
	Medium	Where the significance rating reduces by two levels, after mitigation	60%
	High	Where the significance rating reduces by three levels, after mitigation	80%
	Very High	Where the significance rating reduces by more than three levels, after mitigation	100%

The reversibility is directly proportional the "Loss of Resource" where no loss of resource is experienced, the impact is completely reversible; where a substantial "Loss of resource"

is experienced there is a medium degree of reversibility; and an irreversible impact relates to a complete loss of resources, i.e. irreplaceable (Table 2-13).

Table 2-13: Degree of reversibility and loss of resources.

DEGREE REVERSABILITY & LOSS OF RESOURCES	Loss of Resources:		
	No Loss	No loss of social, cultural and/or ecological resource(s) are experienced. Positive impacts will not experience resource loss	0
	Partial	The activity results in an insignificant or partial loss of social, cultural and/or ecological resource(s)	30
	Substantial	The activity results in a significant loss of social, cultural and/or ecological resource(s)	60
	Irreplaceable	The activity results in the complete and irreplaceable social, cultural and/or ecological loss of resource(s)	80
	Reversibility:		
	Irreversible	Impacts on natural, cultural and/or social functions and processes are irreversible to the pre-impacted state in such a way that the application of resources will not cause any degree of reversibility	20
	Medium Degree	Impacts on natural, cultural and/or social functions and processes are partially reversible to the pre-impacted state if less than 50% resources are applied	40
	High Degree	Impacts on natural, cultural and/or social functions and processes are partially reversible to the pre-impacted state if more than 50% resources are applied	70
	Reversible	Impacts on natural, cultural and/or social functions and processes are fully reversible to the pre-impacted state if adequate resources are applied	100

(b) Cumulative Impacts

It is important to assess the natural environment using a systems approach that will consider the cumulative impact of various actions. Cumulative impact refers to the impact on the environment, which results from the incremental impact of the actions when added to other past, present and reasonably foreseeable future actions regardless of what agencies or persons undertake such actions. Cumulative impacts can result from individually minor, but collectively significant actions or activities taking place over a period of time. Cumulative effects can take place frequently and over a period of time that the effects cannot be assimilated by the environment.

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

Not applicable, no alternatives were considered regarding the layout due to prospecting activities occurring underground and no surface infrastructure to be located within the prospecting right area (other than the shaft).

- (viii) The possible mitigation measures that could be applied and the level of risk

All issues raised by the I&AP's are contained in the Comments and Response Report. However no risks pertaining to the I&AP's require mitigation. The responses to the raised issues must be considered.

- (ix) Motivation where no alternative sites were considered

This is a prospecting right application where an extensive area has been applied for, no alternative sites exist.

- (x) Statement motivating the alternative development location within the overall site.

The final site layout is not subject to any alternatives.

## 2.1.9 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

As mentioned above, this is a prospecting right application where an extensive area has been applied for, no alternative sites exist.

Since the activities are limited, the identification of the impacts and risks of the proposed prospecting site was identified and assessed by the EAP through evaluation of the Prospecting Works Programme (PWP).

In addition, the Draft Basic Assessment Report is currently out for comment in order to obtain feedback and comments from and I&AP regarding the identification of impacts and risks.

## 2.1.10 ASSESSMENT OF EACH IDENTIFIED POTENTIALLY SIGNIFICANT IMPACT AND RISK

ACTIVITY	POTENTIAL IMPACT	ASPECTS AFFECTED	PHASE In which impact is anticipated	SIGNIFICANCE If not mitigated	MITIGATION TYPE	SIGNIFICANCE If mitigated
Establish Central Storage Shed	Loss of biodiversity	Land / Ecology	Construction	Low	None required	Low
	Loss of habitat	Land / Ecology	Construction	Low	None required	Low
Drill Collar Sites	Loss of biodiversity	Air	Operation	Low	None required	Low
	Loss of habitat	Land / Ecology	Operation	Low	None required	Low
	Contamination from Sumps	Water	Operation	Low	Maintain spill kit within the prospecting area to utilise when needed	Low
	Dust Emissions	Air	Operation	Low	Implement dust suppression by watering	Low
	Emissions from Vehicles	Air	Operation	Low	Maintenance of vehicles and equipment	Low
Sampling and Analysis	None	None	Operation	None	None required	None
Pre-feasibility Study	None	None	Operation	None	None required	None
Incidents, accidents & potential emergency situations	Pollution incidents	Soil	Operation	Low	None required	Low
	Health and safety	Social	Operation	Low	None required	Low
Socio-Economic	Safety and security	Social	Operation	Low-Medium	Engage in permanent 24 hour security to control access at the camp	Low

The supporting impact assessment conducted by the EAP must be attached as Appendix A.4: Impact Assessment.



## 2.1.11 SUMMARY OF SPECIALIST REPORTS

LIST OF STUDIES UNDERTAKEN	RECOMMENDATIONS OF SPECIALIST REPORTS	SPECIALIST RECOMMENDATIONS THAT HAVE BEEN INCLUDED IN THE EIA REPORT (Mark with an X where applicable)	REFERENCE TO APPLICABLE SECTION OF REPORT WHERE SPECIALIST RECOMMENDATIONS HAVE BEEN INCLUDED.
Not applicable	None required		

Attach copies of Specialist Reports as appendices – Not Applicable, no specialist studies are required as prospecting is limited to drilling of 12 1x1m sites.

#### 2.1.12 ENVIRONMENTAL IMPACT STATEMENT

- (i) Summary of the key findings of the environmental impact assessment

The main impacts associated with the proposed prospecting activities include:

- )] Clearance of vegetation (loss of biodiversity/habitat) for drill sites
- )] Dust emissions
- )] Contamination of water/soil from sump
- )] Safety and security issues (theft of equipment on site)

- (ii) Final site map

Final site Map is attached under Appendix A.5\_ Final Site Map.

- (iii) Summary of the positive and negative impacts and risks of the proposed activity and identified alternatives

Positive impacts: Economic benefit (feasibility leads to mining)

Negative impacts: clearance of vegetation, contamination from drilling, safety and security within the area

#### 2.1.13 PROPOSED IMPACT MANAGEMENT OBJECTIVES AND THE IMPACT MANAGEMENT OUTCOMES FOR INCLUSION IN THE EMPR

Clearance of vegetation: restrict drill sites to the fenced off (1x1m) area

Contamination from drilling: line sump and maintain spill kits on site for use during spills and leaks

Safety and security: Utilise 24 hour security access to the site.

#### 2.1.14 ASPECTS FOR INCLUSION AS CONDITIONS OF AUTHORISATION

In the event that the prospecting right application is accepted and an environmental authorisation is granted:

- Appoint a specialist to conduct a Heritage Resource Survey and an Ecological Habitat Assessment.

#### 2.1.15 DESCRIPTION OF ANY ASSUMPTIONS, UNCERTAINTIES AND GAPS IN KNOWLEDGE

The following specialist studies have not been undertaken:

- Heritage Resource Survey; and
- Ecological Habitat Assessment

This is as a result of the prospecting right application not being accepted and extremely limited drilling will be undertaken limiting an extremely small area in relation to the prospecting right area. Twelve drill sites of 1 x 1 m will be drilled within 309 hectares.

#### 2.1.16 REASONED OPINION AS TO WHETHER THE PROPOSED ACTIVITY SHOULD OR SHOULD NOT BE AUTHORISED

- (i) Reasons why the activity should be authorized or not

The proposed prospecting activities pose no risk to the surrounding area from an environmental and socio-economic perspective.

(ii) Conditions that must be included in the authorisation

Underground stability is unknown, however this must be investigated prior to drilling upon granting of prospecting authorisation.

2.1.17 PERIOD FOR WHICH THE ENVIRONMENTAL AUTHORISATION IS REQUIRED

The environmental authorisation must remain valid for the duration of the prospecting right which may not exceed a period of five years.

2.1.18 UNDERTAKING

As the EAP managing the application, I confirm that the undertaking required to meet the requirements of this section is provided at the end of the EMP and is applicable to both the Basic Assessment Report and the Environmental Management Programme report.

2.1.19 FINANCIAL PROVISION

The amount of R 16900.00 is required manage and rehabilitate the environment in respect of rehabilitation.

(i) Explain how the aforesaid amount was derived

The sealing of twelve drill sites (0.25hectares) was provided for including rehabilitation of the surface area around the drill site (1x1m). The quantum was used to calculate the financial provision required for rehabilitation, however the master rates was changed to the actual estimated cost for closure.

No.	Description	Unit	A	B	C	D	E=A*B*C*D
			Quantity	Master Rate	Multiplication factor	Weighting factor 1	Amount (Rands)
7	Sealing of shafts adits and inclines	m3	0.25	15000	1	1	3750
10	General surface rehabilitation	ha	0,25	52600	1	1	13150

(ii) Confirm that this amount can be provided for from operating expenditure

The amount, is anticipated to be an operating cost and is provided for as such in the Prospecting Work Programme.

2.1.20 SPECIFIC INFORMATION REQUIRED BY THE COMPETENT AUTHORITY

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

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

This is not applicable for prospecting activities.

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

Not applicable.

2.1.21 OTHER MATTERS REQUIRED IN TERMS OF SECTION 24(4)(A) AND (B) OF THE ACT

Not applicable.

3 PART B:  
ENVIRONMENTAL MANAGEMENT PROGRAMME  
REPORT

1. DRAFT ENVIRONMENTAL MANAGEMENT PROGRAMME

3.1.1 DETAILS OF THE EAP

Name of the Practitioner:	Candis Lubbe
Tel No.:	011 475 0210 / 011 958 0811
Fax No.:	086 601 4800 / 011 958 0811
E-mail Address:	<a href="mailto:candis@prismems.co.za">candis@prismems.co.za</a>

The requirement for the provision of the details and expertise of the EAP are already included in PART A.

3.1.2 DESCRIPTION OF THE ASPECTS OF THE ACTIVITY

The requirement to describe the aspects of the activity that are covered by the draft environmental management programme is already included in PART A.

3.1.3 COMPOSITE MAP

The Composite map is attached under Appendix B.1\_ Environmental Sensitivity Map

3.1.4 DESCRIPTION OF IMPACT MANAGEMENT OBJECTIVES INCLUDING  
MANAGEMENT STATEMENTS

(i) Determination of closure objectives

Objective at closure: to safely close the incline shafts and rehabilitate the area surrounding the drill sites.

(ii) Volumes and rate of water use required for the operation

Volume of water required for prospecting is limited to drilling and is less than 5000L for entire drilling programme.

(iii) Has a water use licence been applied for?

No, the water use required for drilling remains below the threshold required for general authorisations.

(iv) Impacts to be mitigated in their respective phases

(Measures to rehabilitate the environment affected by the undertaking of any listed activity).

ACTIVITIES	PHASE	SIZE AND SCALE OF DISTURBANCE	MITIGATION MEASURES	COMPLIANCE WITH STANDARDS	TIME PERIOD FOR IMPLEMENTATION
<p>(E.g. For prospecting – drill site, site camp, ablution facility, accommodation, equipment storage, sample storage, site office, access route etc.</p> <p>E.g. For mining - excavations, blasting, stockpiles, discard dumps or dams, Loading, hauling and transport, Water supply dams and boreholes, accommodation, offices, ablution, stores, workshops, processing plant, storm water control, berms, roads, pipelines, power lines, conveyors, etc.).</p>	<p>(Of operation in which activity will take place.</p> <p>State: Planning and design, Pre-construction, Construction, Operational, Rehabilitation, Closure, Post closure).</p>	<p>(Volumes, tonnages and hectares or m<sup>2</sup>).</p>	<p>(Describe how each of the recommendations in herein will remedy the cause of pollution or degradation and migration of pollutants).</p>	<p>(A description of how each of the recommendations herein will comply with any prescribed environmental management standards or practices that have been identified by Competent Authorities).</p>	<p>(Describe the time period when the measures in the environmental management programme must be implemented. Measures must be implemented when required.</p> <p>With regard to Rehabilitation specifically this must take place at the earliest opportunity. With regard to Rehabilitation, therefore state either: - upon cessation of the individual activity or upon the cessation of mining, bulk sampling or alluvial diamond prospecting as the case may be.</p>
Establish Central Storage Shed	Construction	2500m <sup>2</sup> (50 x 50 m <sup>2</sup> )	N/A	N/A	2 weeks
Diamond and Percussion Drilling: Drill Collar Sites	Operation	6000m <sup>2</sup> (12 x 10 x 50 m <sup>2</sup> )	Limit all drilling to the designated fenced off area	N/A	2 – 3 months
Sampling and analysis	Operation	N/A	N/A	N/A	Prospecting Right
Pre-feasibility study	Operation	N/A	N/A	N/A	Prospecting Right

### 3.1.5 IMPACT MANAGEMENT OUTCOMES

(A description of impact management outcomes, identifying the standard of impact management required for the aspects contemplated in paragraph (b):

ACTIVITY  (Whether listed or not listed. E.g. Excavations, blasting, stockpiles, discard dumps or dams, Loading, hauling and transport, Water supply dams and boreholes, accommodation, offices, ablution, stores, workshops, processing plant, storm water control, berms, roads, pipelines, power lines, conveyors, etc.).	POTENTIAL IMPACT  (E.g. dust, noise, drainage surface disturbance, fly rock, surface water contamination, groundwater contamination, air pollution etc.).	ASPECTS AFFECTED	PHASE  (In which impact is anticipated E.g. Construction, commissioning, operational, decommissioning, closure, post-closure).	MITIGATION TYPE  (Modify, remedy, control, or stop through E.g. noise control measures, storm-water control, dust control, rehabilitation, design measures, blasting controls, avoidance, relocation, alternative activity etc. E.g. Modify through alternative method, control through noise control, control through management and monitoring, remedy through rehabilitation).	STANDARD TO BE ACHIEVED  (Impact avoided, noise levels, dust levels, rehabilitation standards, end use objectives etc.).
Establish Central Storage Shed	Vegetation Clearance	N/A	Construction	Limit activities to fenced/designated areas	EMP
Diamond and Percussion Drilling: Drill Collar Sites	Oil Spills	Soil / Water	Operation	Maintain a spill kit at the shaft area to utilise when needed	Soil Quality Contaminated Land
Sampling and analysis	N/A	N/A	Operation	N/A	N/A
Pre-feasibility study	N/A	N/A	Operation	N/A	N/A

### 3.1.6 IMPACT MANAGEMENT ACTIONS

ACTIVITY  (Whether listed or not listed. E.g. excavations, blasting, stockpiles, discard dumps or dams, Loading, hauling and transport, Water supply dams and boreholes, accommodation, offices, ablution, stores, workshops, processing plant, storm water control, berms, roads, pipelines, power lines, conveyors, etc.)	POTENTIAL IMPACT  (E.g. dust, noise, drainage surface disturbance, fly rock, surface water contamination, groundwater contamination, air pollution etc.)	MITIGATION TYPE  (Modify, remedy, control, or stop)  Through;  E.g. noise control measures, storm-water control, dust control, rehabilitation, design measures, blasting controls, avoidance, relocation, alternative activity etc.  E.g. Modify through alternative method, control through noise control, control through management and monitoring, remedy through rehabilitation	TIME PERIOD FOR IMPLEMENTATION  (Describe the time period when the measures in the environmental management programme must be implemented Measures must be implemented when required.  With regard to Rehabilitation specifically this must take place at the earliest opportunity. With regard to Rehabilitation, therefore state either: -  Upon cessation of the individual activity or Upon the cessation of mining, bulk sampling or alluvial diamond prospecting as the case may be.)	COMPLIANCE WITH STANDARDS  (A description of how each of the recommendations in <del>2-11-6 read with 2-12 and 2-15-2</del> herein will comply with any prescribed environmental management standards or practices that have been identified by Competent Authorities.)
Establish Central Storage Shed	Vegetation Clearance	Limit activities to fenced/designated areas	Continuous (Construction Phase)	EMP
Diamond and Percussion Drilling: Drill Collar Sites	Oil Spills	Maintain a spill kit at the shaft area to utilise when needed	Continuous (Operation Phase)	Environmental Performance Assessment Audit
Sampling and analysis	N/A	N/A	N/A	N/A
Pre-feasibility study	N/A	N/A	N/A	N/A



### 3.1.9 FINANCIAL PROVISION

#### (1) Determination of the amount of Financial Provision

- (c) Describe the closure objectives and the extent to which they have been aligned to the baseline environment described under the Regulation.

Closure objective is to cap and close the drill sites and rehabilitate the area surrounding the drill sites, so that the site represents a natural state.

- (d) Confirm specifically that the environmental objectives in relation to closure have been consulted with landowner and interested and affected parties

This information has been provided to the landowners and I&AP's during this comment period 25 April to 26 May 2017.

- (e) Provide a rehabilitation plan that describes and shows the scale and aerial extent of the main mining activities, including the anticipated mining area at the time of closure

Refer to Appendix A.2, the layout map.

- (f) Explain why it can be confirmed that the rehabilitation plan is compatible with the closure objectives

The rehabilitation plan includes closure of the drill sites and the closure objective is to cap/seal the drilled sites and rehabilitate to a natural state.

- (g) Calculate and state the quantum of the financial provision required to manage and rehabilitate the environment in accordance with the applicable guideline

The amount of R 16900.00 is required manage and rehabilitate the environment in respect of rehabilitation.

- (h) Confirm that the financial provision will be provided as determined.

The amount, is anticipated to be an operating cost and is provided for as such in the Prospecting Work Programme.

Mechanisms for monitoring compliance with and performance assessment against the environmental management programme and reporting thereon, including:

- (i) Monitoring of Impact Management Actions
- (j) Monitoring and reporting frequency
- (k) Responsible persons
- (l) Time period for implementing impact management actions
- (m) Mechanism for monitoring compliance

SOURCE ACTIVITY	IMPACTS REQUIRING MONITORING PROGRAMMES	FUNCTIONAL REQUIREMENTS FOR MONITORING	ROLES AND RESPONSIBILITIES (FOR THE EXECUTION OF THE MONITORING PROGRAMMES)	MONITORING AND REPORTING FREQUENCY AND TIME PERIODS FOR IMPLEMENTING IMPACT MANAGEMENT ACTIONS
N/A	N/A	N/A	N/A	N/A

### 3.1.12 INDICATE THE FREQUENCY OF THE SUBMISSION OF THE PERFORMANCE ASSESSMENT / ENVIRONMENTAL AUDIT REPORT

A Performance Assessment and/or Environmental Audit Report will be undertaken and submitted annually.

### 3.1.13 ENVIRONMENTAL AWARENESS PLAN

- (1) Manner in which the applicant intends to inform his or her employees of any environmental risk which may result from their work

- J Toolbox talks will be conducted daily to discuss health, safety and environmental topics prior to drilling and sampling activities.
- J A schedule of potential topics to be discussed must be drawn up for the proposed activities prior to commencement of prospecting.
- J An attendance register must be signed by all employees and records of this must be retained in a file for review during any audit/site inspection.

- (2) Manner in which risks will be dealt with in order to avoid pollution or the degradation of the environment

Internal site assessments will be conducted weekly to ensure that no pollution incidents are evident.

### 3.1.14 SPECIFIC INFORMATION REQUIRED BY THE COMPETENT AUTHORITY

The financial provision must be reviewed and updated annually according to the legal requirements specified in MPRDA Regulations.

## 2. 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 Interested and Affected Parties and any Responses by the EAP to Comments or Inputs made by Interested and Affected Parties are Correctly Reflected herein ☒



Signature of the environmental assessment practitioner:

Prism Environmental Management Services

Name of company:

24 April 2017

Date:

-END-

#### 4 APPENDICES FOR PART A

4.1 APPENDIX A.1: CV OF EAP AND COMPANY PROFILE

4.2 APPENDIX A.2: LIST OF PROPERTIES

4.3 APPENDIX A.3: SITE LAYOUT PLAN

4.4 APPENDIX A.4: IMPACT ASSESSMENT

4.5 APPENDIX A.5: FINAL SITE MAP

4.6 APPENDIX A.6: SOCIO-ECONOMIC ASSESSMENT

Not Applicable

4.7 APPENDIX A.7: HERITAGE ASSESSMENT

Not Applicable

4.8 APPENDIX A.8: MOTIVATION

Not Applicable

#### 5 APPENDICES FOR PART B

5.1 APPENDIX B.1: ENVIRONMENTAL SENSITIVITY MAP