

**Final Basic Assessment Report and Environmental  
Management Programme for the Environmental  
Authorisation for the Prospecting Application for  
Tungsten Ore on farms Klein Pella 40 and Pella Mission 39  
situated within the administrative district of  
Namaqualand, Northern Cape Province.**

**REFERENCE NO.: NC 30/5/1/2/2/ 13091 PR**

**August 2022**

Prepared for Envirostep Pty Ltd

47602 Carlswald, North Estate

Tamboitie street, Midrand

1685

Telephone no.: (073) 433-7453

Email: [shadi@envirostep.co.za](mailto:shadi@envirostep.co.za)

Prepared by Fecund Consultants Pty Ltd

345 Flower Street,

Capital Park, Gezina

0084

Telephone no.: 081 760 7362

Email: [info@fecundconsultants.com](mailto:info@fecundconsultants.com)

<b>Report Status</b>	Final
<b>Report No.:</b>	FC-2022-028
<b>Date</b>	August 2022
<b>Author</b>	TT Nelwamondo (Pr. Sci. Nat)
<b>Reviewer</b>	Nomusa Mapheka (Pr. Sci. Nat)

---

TT Nelwamondo (Pr. Sci. Nat)

---

Nomusa Mapheka (Pr.Sci. Nat)

## DECLARATION BY THE EAP

I, **Thabelo Teresa Nelwamondo**, declare that –

- I act as the independent environmental assessment practitioner in this application;
- I have expertise in conducting environmental impact assessments, including knowledge of the Act, Regulations and any guidelines that have relevance to the proposed activity;
- I will comply with the Act, Regulations and all other applicable legislation;
- I will perform the work relating to the application in an objective manner, even if this results in views and findings that are not favourable to the applicant;
- I will take into account, to the extent possible, the matters listed in Regulation 13 of the Regulations when preparing the application and any report relating to the application;
- I undertake to disclose to the applicant and the Competent Authority all material information in my possession that reasonably has or may have the potential of influencing - any decision to be taken with respect to the application by the Competent Authority; and - the objectivity of any report, plan or document to be prepared by myself for submission to the Competent Authority, unless access to that information is protected by law, in which case it will be indicated that such information exists and will be provided to the Competent Authority;
- I will perform all obligations as expected from an environmental assessment practitioner in terms of the Regulations; and
- I am aware of what constitutes an offence in terms of Regulation 48 and that a person convicted of an offence in terms of Regulation 48(1) is liable to the penalties as contemplated in Section 49B of the Act.



## 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).

**NAME OF APPLICANT:** Envirostep Pty Ltd

**TEL NO:** (073) 433-7453

**FAX NO:** 086 219 8717

**POSTAL ADDRESS:**

**PHYSICAL ADDRESS:** 47602 Carlswald North Estate, Tambotie Street, Midrand, 1685

**FILE REFERENCE NUMBER SAMRAD: REFERENCE NO.:** NC 30/5/1/2/2/ 13091 PR

**FILE REFERENCE NUMBER SAMRAD:** 13091 PR

Compiled in terms of Appendix 1, Appendix 4 of the Environmental Impact Assessment Regulations, 2014 (Government Notice No. R 983) (EIA Regulations, 2014 as Amended in 2017) and submitted as contemplated in Regulation 19 of Chapter 4 of the EIA Regulations, 2014 as amended

For

The application for an Environmental Authorization in terms of the National Environmental Management Act, 1998 (Act No. 107 of 1998), Environmental Impact Assessment Regulations 2017, Government Notice R326 - Government Notice R983 - Listing Notice 1 of 2014, as amended in 2017.

## **Important Notice**

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

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

In terms of section 16(3)(b) of the EIA Regulations, 2014, any report submitted as part of an application must be prepared in a format that may be determined by the Competent Authority and in terms of section 17 (1) (c) the competent Authority must check whether the application has considered 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.

## 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 focused on determining the geographical, physical, biological, social, economic, heritage, and cultural sensitivity of the sites and locations within sites and the risk of impact of the proposed activity and 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.

## ABBREVIATIONS

BAR	Basic Assessment Report
BID	Background Information Document
DEAT	Department of Environment, Agriculture and Tourism
DMR	Department of Mineral and Resources
DWS	Department of Water and Sanitation
EAP	Environmental Assessment Practitioner
EIA	Environmental Impact Assessment
EMP	Environmental Management Plan
EMPR	Environmental Management Programme
FBAR	Final Basic Assessment Report
GN	Government Notice
GNR	Government Notice Regulation
HIA	Heritage Impact Assessment
I&AP's	Interested and Affected Parties
LED	Local Economic Development
MAE	Mean Annual Evaporation
MAP	Mean annual Precipitation
MPRDA	Minerals and Petroleum Resources Development Act, 2002
NEMA	National Environmental Management Act, 1998
NDP	National Development Plan
PPP	Public Participation Process
PPE	Personal Protective Equipment
SAHRA	South African Heritage Resources Agency
SAHRIS	South African Heritage Resources Information System
SHE	Safety, Health and Environmental



## EXECUTIVE SUMMARY

Envirostep (Pty) Ltd has applied for an Environmental Authorisation for the proposed prospecting activities for Tungsten Ore on Farms Pella Mission 39 and Klein Pella, situated within Administrative District Namakwa in the Northern Cape Province.

The application has been lodged in terms of Regulation 16 of the National Environmental Management Act (Act 107 of 1998) (NEMA): Environmental Impact Assessment (EIA) Regulations, 2014 and Section 16 of the Mineral and Petroleum Resources Development Act, 2002 (Act 28 of 2002). In terms of the NEMA (Act 107 of 1998). EIA regulations of 2014 (amended April 2017), the proposed prospecting activity triggers Activity 20 and 22 of Listing Notice 1 GNR 327 and the applicant cannot proceed without an Environmental Authorisation.

Fecund Consultants (Pty) Ltd has been appointed by Envirostep (Pty) Ltd as an independent environmental assessment practitioner (EAP) to undertake the Environmental Impact Assessment for the proposed prospecting right project. The purpose of the study is to identify and assess all the possible impacts that may arise from the implementation of the proposed project and also to find the most effective way of enhancing environmental benefits and mitigating potential impacts to encourage sustainable development in the area.

The proposed prospecting activities will be undertaken over a period of five (5) years and the activities will be conducted in progressive phases which include Non-invasive and invasive methods. The Non-invasive method will include desktop studies and geological mapping, whereas Invasive methods will include drilling and sampling.

The potential risks and key issues identified were based on consultation with I&APs, internal process based on similar projects and the current state of the environment of the site. A description of the biophysical and social environment is included in the report, to ensure that all potential risks and issues are taken into consideration in all phases of the proposed project. A brief description of the potential aspects that will be impacted include the following:

- Air quality
- Fauna
- Flora

- Waste
- Ground water
- Geology
- Soils
- Socio-economic

This document Final Basic Assessment Report (DBAR) and the Environmental Management Programme (EMPr), was compiled in terms of the EIA Regulations of 2014 (amended, April 2017).

The findings and conclusions of this document (FBAR and EMPr), which concerns assessment of environmental impacts and a programme for management of the impacts for the proposed prospecting activities at the Project site, was compiled in terms of the EIA Regulations of 2014 for review by interested and affected parties including the competent authority. Based on the desktop study in respect of impact assessment, several recommendations are already made to mitigate significant negative impacts as well as to maximize positive impacts that will result from the proposed project.

Table of Contents

Objective of the basic assessment process.....7

EXECUTIVE SUMMARY .....9

1. Contact Person and correspondence address .....18

    1.1. Details of .....18

        1.1.1. Details of the EAP .....18

        1.1.2. Expertise of the EAP.....18

2. Location of the overall Activity. ....19

    2.1. Locality map.....19

3. Description of the scope of the proposed overall activity. ....21

4. LISTED AND SPECIFIED ACTIVITIES .....23

6. Policy and Legislative Context .....28

7. Need and desirability of the proposed activities.....30

8. Full description of the process followed to reach the proposed preferred alternatives within the site.....31

    8.1. Details of the development footprint alternatives considered.....31

        8.1.1. The property on which or location where it is proposed to undertake the activity;32

        8.1.2. The type of activity to be undertaken.....32

        8.1.3. The design or layout of the activity;.....33

        8.1.4. The technology to be used in the activity;.....33

        8.1.5. The operational aspects of the activity;.....33

        8.1.6. The option of not implementing the activity.....33

    8.2. Details of the Public Participation Process Followed .....34

        8.2.1. Identification of Interested and Affected Parties .....34

        8.2.2. Summary of issues raised by I&As .....37

    8.3. Concluding Remarks on Stakeholder Consultation.....59

9. The Environmental attributes associated with the alternatives. ....59

    9.1. Baseline Environment .....59

9.1.1.	Type of environment affected by the proposed activity.....	59
9.1.2.	Description of the current land uses.....	59
9.2.	Description of specific environmental features and infrastructure on the site. 59	
9.2.1.	Climate.....	59
9.2.2.	Topography .....	62
9.2.3.	Geology .....	62
	<i>Regional Geology</i> .....	62
	<i>Local Geology</i> .....	62
9.2.4.	Soil.....	65
9.2.5.	Surface Water .....	66
9.2.6.	Groundwater .....	68
9.2.7.	Flora.....	69
9.2.8.	FAUNA.....	74
9.2.9.	AIR QUALITY.....	74
9.2.10.	Noise.....	75
9.3.	Environmental and current land use map.....	75
10.	Impacts and risks identified including the nature, significance, consequence, extent, duration and probability of the impacts, including the degree to which these impacts .....	76
11.	Methodology used in determining and ranking the nature, significance, consequences, extent, duration and probability of potential environmental impacts and risks; 85	
11.1.	Criteria of assigning significance to potential impacts.....	85
11.2.	Impact Status .....	85
11.3.	Impact Extent .....	86
11.4.	Impact Duration .....	87
11.5.	Impact Probability.....	87
11.6.	Impact Intensity .....	88
11.7.	Impact Significance .....	89

12.	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.....	91
12.1.	Potential impacts on communities, individuals or competing land uses in close proximity .....	91
12.1.1.	Water quality and availability .....	92
12.1.2.	Influx of persons resulting in increased crime rates .....	92
12.1.3.	Visual Impact.....	92
12.2.	The possible mitigation measures that could be applied and the level of risk. 92	
12.2.1.	Measures to manage the potential impact on heritage resources .....	92
12.2.2.	Measures to manage the potential impacts on communities, individuals or competing land uses in close proximity.....	92
12.2.3.	Measures to manage the potential impact on Water quality and availability.....	94
12.2.4.	Motivation where no alternative sites were considered.....	95
12.2.5.	Statement motivating the alternative development location within the overall site.....	96
13.	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.....	96
13.1.	Assessment of each identified potentially significant impact and risk.....	98
13.2.	Summary of specialist reports.....	121
14.	ENVIRONMENTAL IMPACT STATEMENT.....	122
14.1.	Summary of the key findings of the environmental impact assessment; .....	122
14.2.	Final Site Map .....	122
14.3.	Summary of the positive and negative impacts and risks of the proposed activity and identified alternatives;.....	122
14.4.	Proposed impact management objectives and the impact management outcomes for inclusion in the EMPr;.....	123
14.5.	Aspects for inclusion as conditions of Authorisation.....	124

14.6.	Description of any assumptions, uncertainties and gaps in knowledge. ....	124
15.	Reasoned opinion as to whether the proposed activity should or should not be authorised.....	124
15.1.	Reasons why the activity should be authorized or not. ....	124
15.2.	Conditions that must be included in the authorisation.....	125
15.3.	Period for which the Environmental Authorisation is required. ....	125
16.	Undertaking .....	125
17.	Financial Provision .....	125
17.1.	Explain how the aforesaid amount was derived.....	126
17.1.1.	Method of Assessment.....	126
17.1.2.	Quantity Estimation.....	128
17.1.3.	Determination of Rates.....	128
17.1.4.	Financial Provision .....	131
17.1.5.	Confirm that this amount can be provided for from operating expenditure. 131	
18.	Specific information required by the Competent Authority .....	132
18.1.	Compliance with the provisions of sections 24(4)(a) and (b) read with section 24 (3) (a) and (7) of the National Environmental Management Act (Act 107 of 1998). The EIA report must include the:- .....	132
18.1.1.	Impact on the socio-economic conditions of any directly affected person. 132	
18.1.2.	Impact on any national estate referred to in section 3(2) of the National Heritage Resources Act.....	134
19.	Other matters required in terms of sections 24(4)(a) and (b) of the Act.....	134
1.	Environmental Management Programme.....	136
1.1.	Details of the EAP .....	136
1.2.	Description of the Aspects of the Activity.....	136
1.3.	Composite Map.....	136
1.4.	Description of Impact management objectives including management statements .....	136

1.4.1.	Determination of closure objectives. ....	136
1.4.2.	Volumes and rate of water use required for the operation. ....	137
1.4.3.	Has a water use licence has been applied for?.....	137
1.5.	Impacts to be mitigated in their respective phases .....	138
1.6.	Impact Management Outcomes .....	149
1.7.	Impact Management Actions .....	167
2.	Financial Provision .....	194
2.1.	Determination of the amount of Financial Provision. ....	194
2.1.1.	Describe the closure objectives and the extent to which they have been aligned to the baseline environment described under the Regulation under Regulation 22 (2) (d) as described in 2.4 herein. ....	194
2.1.2.	Confirm specifically that the environmental objectives in relation to closure have been consulted with landowner and interested and affected parties.....	195
2.1.3.	Provide a rehabilitation plan that describes and shows the scale and aerial extent of the main prospecting activities, including the anticipated prospecting area at the time of closure.....	195
2.1.4.	Explain why it can be confirmed that the rehabilitation plan is compatible with the closure objectives.....	197
2.1.5.	Calculate and state the quantum of the financial provision required to manage and rehabilitate the environment in accordance with the applicable guideline. ....	197
2.1.6.	Confirm that the financial provision will be provided as determined.....	198
3.	Mechanisms for monitoring compliance with and performance assessment against the environmental management programme and reporting thereon, including .....	199
3.1.	Indicate the frequency of the submission of the performance assessment/ environmental audit report.....	207
4.	Environmental Awareness Plan .....	207
4.1.	Manner in which the applicant intends to inform his or her employees of any environmental risk which may result from their work.....	207
4.2.	Manner in which risks will be dealt with in order to avoid pollution or the degradation of the environment.....	209

4.2.1.	Environmental Awareness Training Content – Induction Training:.....	209
4.2.2.	Development of procedures and checklists.....	210
4.2.3.	Emergency Preparedness and Response .....	210
4.2.4.	Incident Reporting Procedure.....	211
4.2.5.	Environmental and Social Audit Checklist .....	211
5.	Specific information required by the Competent Authority .....	211
6.	Undertaking .....	212
	APPENDIX A: MAPS.....	213
	APPENDIX B: CONSULTATION REPORT .....	214
	APPENDIX C: DETAILS OF THE EAP.....	215

### List of Figures

Figure 1:	Locality map for the proposed project. ....	20
Figure 2:	The 2011 Flooding of the Orange River Destroyed Hundreds of Hectares of Arable Land in Upington.....	61
Figure 3:	The 2011 Flooding of the Orange River Caused Significant Damage to Infrastructure and Blocked Transport Routes in Upington.....	61
Figure 4:	Stylised Stratigraphic Succession (after AA plc, June 2000) .....	64
Figure 5:	Orange River Catchment (Sourced from www.dwa.gov.za website, 2012) .....	67
Figure 6:	The National Vegetation Map (Mucina & Rutherford 2006) for the Area Around the Proposed Pella Water Board Pipeline and Associated Infrastructure .....	71
Figure 9:	Critical Biodiversity Areas Map for the Area Surrounding the Proposed Pella Water Board Pipeline and Associated Infrastructure .....	73
Figure 10:	Borehole capping (Source: Department of Mines and Petroleum, Guidelines for Environmentally Responsible Mineral Exploration & Prospecting in Western Australia, March 2012) .....	196

### List of Tables

Table 1:	Location of the overall Activity .....	19
Table 2:	Listed and specified activities .....	23
Table 3:	Policy and Legislative Context .....	28
Table 4:	Summary of issues raised by I&APs.....	37
Table 5:	Potential impacts associated with each activity. ....	76



Table 6: Status of Impact .....	85
Table 7: Duration of Impact .....	87
Table 8: Probability of impact.....	87
Table 9: Intensity of Impact .....	88
Table 10: Impact Magnitude and Significance Rating.....	89
Table 11: Identified potentially significant impacts and risk .....	98
Table 12: Summary of Specialist reports .....	121
Table 13: Impacts to be mitigated in their respective phases.....	138
Table 14: Impact Management Outcomes .....	149
Table 15: Impact Management Actions .....	167
Table 16: Mechanisms for monitoring compliance.....	199
Table 17: Environmental Training and Awareness Schedule.....	207

## PART A

### SCOPE OF ASSSMENT AND BASIC ASSESSMENT REPORT

## 1. Contact Person and correspondence address

### 1.1. Details of

#### 1.1.1. Details of the EAP

Name of The Practitioner: Thabelo Teresa Nelwamondo

Tel No.: 081 760 7362

Fax No. : 086 604 5465

e-mail address: info@fecundconsultants@gmail.com

#### 1.1.2. Expertise of the EAP.

*(a) The qualifications of the EAP*

BSc Hons in Environmental Management and Certificate in Environmental Compliance and Enforcement.

*(b) Summary of the EAP's past experience.*

This report was prepared by Thabelo Teresa Nelwamondo (**Pr. Sci. Nat**), a registered Environmental Assessment Practitioner with over 8 years working experience in the field of Environmental Sciences and in the process of registering with **EAPASA**. She holds an Honours degree in Environmental Management and specialises in EIA (Environmental Impact Assessment) and related projects. She has been involved in a variety of different types of EIAs, construction project, mineral tenure and water related projects in South Africa. Thabelo Nelwamondo has also been involved in public participation programmes on several projects.

## 2. Location of the overall Activity.

Table 1: Location of the overall Activity

<b>Farm Name:</b>	Klein Pella 40 Pella Mission 39
<b>Application area (Ha)</b>	58 450 Ha
<b>Magisterial district:</b>	Namaqualand
<b>Distance and direction from nearest town</b>	32 km east of Pofadder town
<b>21-digit Surveyor General Code for each farm portion</b>	C05300000000004000001 C05300000000003900000 C05300000000003900002 C05300000000004000000

### 2.1. Locality map

The locality map of the proposed project is attached on Appendix A.

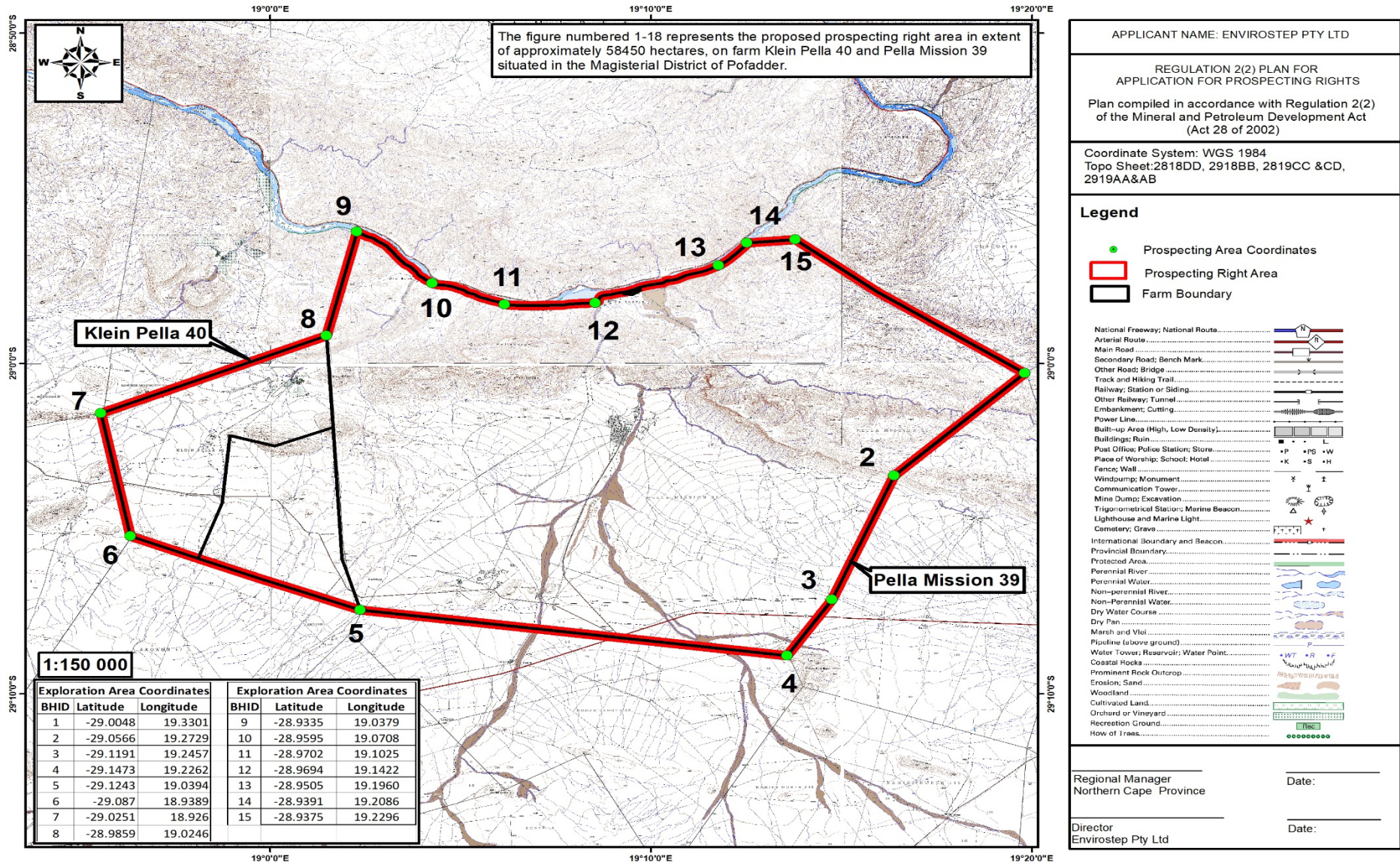


Figure 1: Locality map for the proposed project.

### **3. Description of the scope of the proposed overall activity.**

The detailed geology and Vanadium, Rutile, Copper ore and heavy metal's potential of the area is relatively unknown, and as such exploration work will commence from a very basic level. The Prospecting Work Programme will therefore be designed in phases, each phase conditional on the success of the previous phase and will include:

#### **Phase 1 – Desktop Study - Analysis of Existing Data.**

The exploration records of all previous work in the area will be re-examined, and the following studies will be carried out:

- Literature review
- Detailed aerial photograph and satellite image interpretation
- Regional airborne geophysics with main emphasis on magnetic and gravity
- Regional soil geochemistry interpretation
- Geological mapping will also be carried out.

These records will need to be captured into a GIS format for geological modelling and exploration scheduling analysis. This work will form an initial desktop and surface fieldwork study to be continued during the period that the prospecting right application is being assessed and, presumably, approved. A period of 12 months is estimated for this.

#### **Phase 2 – Follow Up Ground Geophysics, Soil Geochemistry and Trenching**

Once targets have been generated in the first phase there will be a need to follow up on these targets. A detailed and denser soil geochemistry exercise will need to be carried out. Coupled with this will be ground geophysics to sharpen the identified potential areas. Gravity magnetic and time domain EM will need to be done.

After soil geochemical and geophysical targets are generated a trenching or pitting exercise will be done on the anomalies to determine the sidewall properties, profiles and average grades and to do drill holes targeting. It is anticipated that phase will take approximately 12 months to complete.

#### **Phase 3 –Drilling and Resource Generation**

If the present application is approved and areas with possible targets for the minerals applied for, this identified prospective target will require further subsurface investigation.

Drilling (air core, or RAB or RC) of the prospective areas will commence to establish presence of mineralization. Geological borehole logging, down the hole logging and sampling will also be carried out.

Whole rock analysis of all the potential intersections will be carried out. For budgeting purposes, it is assumed that every meter of the initial holes analysis will be made.

It is anticipated that initially approximately 10 drill-holes will be drilled. Drill holes could vary in depth from 50 to 150m, with an average depth in the order of 150 meters. A reconnaissance will be done to determine distance of boreholes. A reconnaissance will be done to determine distance of boreholes.

The geological information generated will be used to model and estimate resource. The resources will at least be expected to be in the Indicated Category according to the appropriate reporting standard (SAMREC, JORC, or NI43 -101).

#### **Phase 4 – Resources drilling and Pre-feasibility Study**

The final phase of the prospecting programme would involve preparation of a prefeasibility study. This would include:

- Resource drilling
- Geological Modelling
- Initial conceptual Mine Planning.
- Planning the infrastructure requirements
- Environmental management planning
- Financial modelling
- Market analysis
- Analysis of transport logistics to markets
- Assessment of personal and training requirements
- Assessment of socio-economic factors

A feasibility study is multidisciplinary in nature and requires the highest levels of expertise available. Such studies are both costly and time consuming.

## 4. LISTED AND SPECIFIED ACTIVITIES

Table 2: Listed and specified activities

<b>NAME OF ACTIVITY (E.g. For prospecting - drill site, site camp, ablution facility, accommodation, equipment storage, sample storage, site office, access route etc...etc...etc</b>	<b>Aerial extent of the Activity Ha or m<sup>2</sup></b>	<b>LISTED ACTIVITY Mark with an X where applicable or affected.</b>	<b>APPLICABLE LISTING NOTICE (GNR 544, GNR 545 or GNR 546)</b>
Prospecting activities	Approximately 18.450 m <sup>2</sup>	X	GNR 983, LN 1, Activity 20
Drilling activities		X	GNR 983, LN 1, Activity 20
Soil sampling activities (A typical sampling site will be approximately 1 m <sup>2</sup> ). It is unlikely that more than 100 samples will be taken; however, this will be confirmed on site as part of the prospecting activities.		X	GNR 985, LN 3, Activity 12
Roads (roads will be temporary gravel roads, not exceeding 3.5 m in width)	Approximately 16 000 m <sup>2</sup>	-	
Temporary Camp site	Approximately 200 m <sup>2</sup>	-	
Site Clearance	Approximately 20 ha	X	GNR 983, LN 1, Activity 27
Sludge from drilling activities	Less than 100m <sup>2</sup>	-	
Hydrocarbon storage	Less than 30m <sup>2</sup>	-	
Removal of sensitive tree species (such as the type of tree). This activity is unlikely as the	There are no sensitive tree species on site.	-	

<p>prospecting activities can be planned around these areas to an extent).</p>			
--	--	--	--

**5. DESCRIPTION OF THE ACTIVITIES TO BE UNDERTAKEN**

The following section presents a detailed description of all the activities associated with the proposed Prospecting Application. Due to the nature of the Prospecting Works Programme, and the fact that the specific prospecting activities required are dependent on the preceding phase, assumptions are presented where required. These assumptions are based on similar projects undertaken by the Applicant and therefore be regarded as indicative of what will be under taken.

Access Roads

A number of existing roads and tracks already traverse the proposed prospecting site and these roads will be used during loam sampling, and drilling activities (All Phases).

During soil sampling activities, vehicle access will be gained to sampling site through the veld and the establishment of a track, to gain repeated access to a soil sample site will not be required. Once the drill site have been identified, temporary access roads may be established for repeated access to the drill site if the identified drill site cannot be accessed via existing roads and tracks.

Water Supply

During the geohydrological report, it was found that there are five (5) water boreholes located on the site. No water from boreholes will be used. Water will be out sourced for drilling purposes. It is anticipated that water brought onto the site, will be sourced from the Local Municipality.

Continuous water supply will be required during drilling, at an estimated rate of 500 litres per hour. On-site water storage tanks with a capacity of 15,000 for water supply to the drill, will be installed. Additional water requirements relates to the potable water supply for employees and workers. A temporary 260 litre on-site vertical water storage tank for drinking water and general use by persons will be provided at the drill site.



### Ablution

Ablution facilities at the drill site will involve the installation of drum or tank type portable toilets.

### Temporary Office Area

A temporary site office shaded area will be erected at the drill sites. No on-site electricity generation through the use of generators will be undertaken. Meals will be provided to the staff and workers as no heating and/ or cold storage facilities will be available. A shaded eating area will be provided.

### Accommodation

No accommodation for staff and workers will be provided on-site and all people will be accommodated in nearby towns (i.e. Heidelberg and Meyerton). Workers will be transported to and from the prospecting site on a daily basis. Night security staff will be employed once equipment has been established on site.

### Blasting

As per the Prospecting Works Programme does not allow for bulk sampling, no blasting will take place.

### Storage of Dangerous Goods

No fuel, oil and lubricants will be stored on site.

## **Detailed Prospecting Activities**

### Phase 1: Data acquisition and a Desktop study

A desktop study of all available data for the area will be undertaken to accumulate as much regional and historical data around the area as possible. This includes published geological reports, infrastructure mapping, and satellite imagery and existing geophysical information (if available) all iron ore (Vanadium, Copper, and Rutile) deposits will be targeted.

### Phase 2: Target Generation and Ground Truthing and Delineation

- Phase 2a: Magnetometer Surveys

Should the initial results of the desktop study be encouraging, further data will be generated through a ground magnetometer survey. Anomalies identified through the initial magnetic survey will be followed by more detailed anomaly- specific ground geophysics (magnetic and gravity), as well as grid loam (soil) sampling.

It is currently foreseen that the ground magnetics survey will be carried out on parallel lines spaced at 100m across the prospecting area using a magnetometer. A magnetometer is an instrument used to measure the strength and/ or direction of the earth's magnetic field in the direct vicinity of the instrument. Local magnetic intensity is directly affected by the magnetic properties of the underlying rock mass, so magnetic surveying can be used to detect and map out magnetically distinct geological entities.

A ground magnetic survey is usually carried out using two proton precession magnetometers. One is kept stationary at a "base- station" for the duration of the survey, and measures diurnal variation in the earth's magnetic field. The other magnetometer ("roving magnetometer") is moved over the area of interest usually on a pre- determined grid of parallel straight lines. The base station data is used to correct the survey data for diurnal variation in the earth's magnetic field. The corrected magnetic survey data is then processed and gridded to reveal changes in the magnetic field over the area surveyed caused by changes in the underlying rock mass.

Proton magnetometers are small, portable machines that are easily carried by one person. Magnetic surveying needs little or no bush clearing and is extremely low impact from an environmental perspective. As no significant environmental impacts are expected during this phase, rehabilitation will not be required.

- Phase 2b: Soil Sampling

Based on the outcomes of the magnetic survey, soil sampling will be undertaken for target areas. Soil samples will be taken to detect the presence of minerals being released into the soil layer by the weathering of the underlying rock.

Soil samples of up to 200 litres (0.2 m<sup>3</sup> or 5-10k g) in volume will be taken in the top most soil layer (up to 20-30cm deep) and sieved on site to remove very fine (<4 25 micron) material. A typical sampling site will be approximately 1m<sup>2</sup>. Access to the sampling sites will be via existing gravel roads as far as practically possible each site will only be visited once. In arid environments the top most soil layer will be scraped off the surface as these

minerals are generally denser than the other soil minerals present and get concentrated by wind action.

A soil samples are excavated using simple shovel and bucket, so soil sampling is a low impact exploration method in terms of environmental disturbance. The distance between soil sample positions is determined on- site, generally in conjunction with a ground geophysical survey.

Minimal disturbance of vegetation and wildlife is envisaged. Each soil sampling site will be levelled after the sample was taken and due to small size of these sites, the re-vegetation of the sites will not be required as it is expected that natural vegetation will re-establish itself within a short period.

- Scout Drilling and Delineation Drilling

Targets generated during the sampling and geophysical surveys will be investigated on the ground and tested by initial Ore drilling. If any of the exploration targets give a positive result, a drilling program will be undertaken in order to delineate and give a preliminary assessment of the Copper ore, Vanadium ore, Rutile and Heavy minerals potential of the deposit identified. These will be analysed by electron microprobe for major and selected minor elements and the results will be interpreted to assess copper ore and heavy minerals potential.

Should delineation and initial evaluation of the deposit indicate a sufficient size and grade to warrant further evaluation, an appropriate bulk sampling program will be undertaken in order to establish grade and confirm its viability for mining.

## 6. Policy and Legislative Context

Table 3: Policy and Legislative Context

APPLICABLE LEGISLATION AND GUIDELINES USED TO COMPILE THE REPORT	REFERENCE WHERE APPLIED	HOW DOES THIS DEVELOPMENT COMPLY WITH AND RESPOND TO THE LEGISLATION AND POLICY CONTEXT.
National Environmental Management Act, 1998	This Basic Assessment Report & EMP	An application for Environmental Authorisation was submitted to the DMR Northern Cape. The application was accepted by the DMR on the 08 <sup>th</sup> June of 2022 (NC 30/5/1/2/2/ 13091 PR). The Department of Mineral Resources requested the submission of the BAR and EMP within the period of 90 days of the acceptance letter.
National Water Act, 1998		No application for Water Use License will be lodged due to the nature of the activity being applied for.
National Heritage Resources Act (Act No 25 of 1999)	All cultural and heritage resources should be protected if or when encountered	A permit may be required if identified cultural/heritage sites on the proposed site will be disturbed or destroyed because of the prospecting activities.
Conservation of Agricultural Resources Act, 1983	The overall Prospecting Activities	The project should promote the conservation of soil, water, and vegetation

<p>Section 34 of the Local Government: Municipal Systems Act, 2000 (ACT 32 of 2000)</p>	<p>The overall prospecting activities</p>	<p>Municipal System Act compels municipalities to draw up the IDP`s as a singular inclusive and strategic development plan. In terms of section 26 of the MSA, A municipality produces an IDP every five year.</p>
<p>Mineral and Petroleum Resources Development Act, 2002</p>	<p>Application for Prospecting in terms of Section 12 with Regulation 16 and 19 of EIA Regulations.</p>	<p>A Prospecting application has been submitted to the Department of Mineral Resources by the Applicant. The application was accepted by the Department of Mineral Resources-MP on the 08<sup>th</sup> June of 2022, (NC 30/5/1/2/2/ 13091 PR).</p>
<p>Mine Health and Safety Act ,1996 (No. 29 of 1996</p>	<p>The mine Health and Safety Act, 1996 (No, 29 of 1996) provides for the protection of the health and safety of employees and other persons at mines and, for that purpose- promote culture of health and safety</p>	<p>Applicant will be required to meet the requirements of the Mine Health and Safety Act during invasive and non-invasive prospecting phases.</p>
<p>Strategic Development Framework (SDF)</p>	<p>Alternatives</p>	<p>In terms with the SDF of the Khai- Ma Local municipality, various strategies and associated policies should be adopted to ensure effective spatial Development.</p>

National Development Plan 2030	The overall prospecting activities	The NDP aims to eliminate poverty and reduce inequality by 2030. According to the plan, South Africa can realize these goals by drawing on the energies of its people, growing an inclusive economy, building capabilities, enhancing the capacity of the state, and promoting leadership and partnership throughout society.
--------------------------------	------------------------------------	---

## 7. Need and desirability of the proposed activities.

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

The potential benefits of the proposed project are:

- Infrastructure development in the neighbouring town.
- Needed job creation and other local, provincial, and national socio-economic benefits.
- Local growth in the economy in the surrounding areas, and for local businesses
- Economic benefits for contractors and other suppliers of goods and services.

### 7.1. Motivation for the overall preferred site, activities, and technology alternative.

#### a. Preferred site

The proposed prospecting area is targeted as historically several iron ore occurrences are known in the area. There are also various metals within the exploration area. The site therefore regarded as preferred site and alternative site is not considered.

## **b. Technological and Site Activity Alternatives**

Geophysical surveys, trenching and drilling are the only major methods used in exploring for deposits of this type and for resource definition and evaluation. The technology to be used cannot be replaced by any other methods thus these are the preferred activities

Due to the nature of the proposed prospecting activities future land use alternatives will not be compromised. Once a viable reserve has been confirmed a comprehensive social and environmental impact assessment will be required (in accordance with the legislation), during which time alternative land use to mining would be investigated.

In terms of the technologies proposed, these have been chosen based on the long-term success of the company in terms of their prospecting history. The prospecting activities proposed in the Prospecting Works Programme is dependent on the preceding phase as previously discussed, therefore no alternatives are indicated, but rather a phased approach of trusted prospecting techniques.

The location of intrusive drilling activities will be determined during Phase 1 of the Prospecting Works Programme. There will not be any infrastructures during exploration activities, only temporary mobile infrastructures will be erected.

## **8. Full description of the process followed to reach the proposed preferred alternatives within the site.**

### **8.1. Details of the development footprint alternatives considered.**

With reference to the site plan provided as Appendix 1 and the location of the individual activities on site, provide details of the alternatives considered with respect to:

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

### **8.1.1. The property on which or location where it is proposed to undertake the activity.**

No location alternative has been considered. The applicant's property or location is being guided by the presence of higher probability of Tungsten ore deposits thus not any location or property is suitable for the proposed activity.

### **8.1.2. The type of activity to be undertaken.**

#### Description of planned Non-invasive Activities

Desktop studies to be undertaken over the area would include studying of all available geological maps/plans, aerial photographs, topography maps and any other related geological information about this area. Upon completion of the desktop study, field geological mapping of the area will be conducted, and Geomorphological Studies and Geophysical Survey will be conducted to map out the occurrence of Tungsten ore in the paleo streams.

#### Description of planned Invasive Activities

This Prospecting Work Program is designed to establish the extent of the area of the Tungsten ore deposit, and all available geological information will be utilized to better predict occurrence of Tungsten ore and the economic viability of the Project.

Borehole planning will involve drilling program design and implementation procedures to ensure that drilling is conducted as safe and economic as possible.

This phase will include cooperation between the drilling contractor, services contractors, geologists, and other technical specialists. The planning process will also ensure that the health and safety of all working on the drilling sites and the environment are protected. It is envisaged that 200 core boreholes will be drilled at an average depth of 100m, the location for proposed borehole will be determined by the results from the Non – Invasive techniques of prospecting.

Reverse circulation percussion drilling will be conducted to delineate the deposit, holes are set up similarly to conventional holes, and the most important element of RC drilling is the sample. The goal is to capture as much as possible from the hole, preferably through the inner tube. High inside samples circulation is achieved by having the appropriate



clearance between the bit shroud and the hole wall. This should forge a seal, thereby forcing the samples inside.

- *Sample Analysis*

The borehole information will be logged on site and captured in the Microsoft Excel while the database is being compiled using the Rockworks software. The 3-D geological model will be created and analysed by the Data mine 3-D modelling package. All samples collected throughout drilling will be submitted to a SANAS-accredited laboratory for comprehensive analyses and metallurgical recovery tests aimed at determining Ore quality.

### **8.1.3. The design or layout of the activity.**

Since exploration is temporary in nature limited permanent structures will be constructed. Negotiations and agreements will be made with the farm owners to use any existing infrastructure like accommodation for the explorers, access roads and other things like workshops.

Various designs and layouts for the prospecting operations have been considered and the layout has been altered to avoid potentially high impacted sensitivity areas.

The infrastructure/ processing area will be in existing disturbed areas to ensure that less land will be lost and outside sensitive areas.

### **8.1.4. The technology to be used in the activity.**

The RC drilling technique is the only major method used in exploring for placer deposits of this type and for resource definition and evaluation. The technology to be used cannot be replaced by any other methods thus these are the preferred activities.

### **8.1.5. The operational aspects of the activity.**

The first course of action is to find the paleochannels and depth of basal strata through drilling and record the results of each borehole. The RC drilling is the preferred method at this stage of the project based on the effectiveness on this type of strata.

### **8.1.6. The option of not implementing the activity.**

The 'no-go' alternative is the option of not undertaking prospecting activities on the project site. The no-go option assumes the site remains in its current state. Drilling is required to investigate the potential and feasibility of the minerals on site. There is no potential for any future investment in a mine without the confirmation of the mineral resources availability which can only be obtained from drilling activities. Should the

prospecting right not be granted, effectively the minerals being applied for will not benefit the local community. The socio-economic benefit and most notably the future employment and potential of mine development will be lost if the prospecting activities are not implemented to determine the feasibility of any deposits that may occur within the area.

The mining sector forms part of the backbone of the South African economy. Tungsten Ore prospecting can give rise to the local economy and add to the scientific body of knowledge of the area. The jobs that were to be created during prospecting phase will also be missed; these employment opportunities would be reduced, causing an economic burden on the government as people dependant on social grants would not be reduced. The state of the natural environment will remain the same, amongst other things the following will be beneficial:

- There will be no geological and soil disturbance which may lead to ground water contamination.
- No excessive generation of wastes from the proposed activities.
- No compaction of pathways affecting the growth pattern of grasses and movement of micro animals.
- No disturbance of wildlife in the surrounding game farms will occur; and
- The biodiversity will not be altered as there will be no removal of plants and induced noise from prospecting activities.

## **8.2. Details of the Public Participation Process Followed**

### **8.2.1. Identification of Interested and Affected Parties**

Settlements were identified using the 1:50 000 topographical map, aerial imagery Title deed searches and through consultation. No communities are situated on the said properties. All the affected properties belong to private farmers and some portions are state owned land.

Other I&APs identified, include Organs of State, who have jurisdiction over, or might have an interest in the proposed protecting activities, adjacent and other landowners, non-governmental organisations, and other organisations and/ private persons.

Adjacent and non-adjacent landowners were identified through the review of property databases and deed searches, natural person (s) contact databases, and expanded through queries and recommendations made by identified stakeholders and general internet-based searches.

*a. Methodology of Notification:*

- Cadastral search and Deeds search to identify farm portions
- Adverts and Site Notices to notify stakeholder
- Distribution of BIDs with comments sheet requesting the recommendation of any other stakeholders
- Site Visit to consult with stakeholder
- Community or Communities Identified and whether these parties are the landowner.

*b. Land Claims*

The request for a Land Claim Letter was e-mailed to from the Northern Cape Department of Rural Development and Land Reform on the 01 August 2022. The department's response has not been completed to this date.

*c. Traditional Authorities*

No Traditional Authority was identified.

*d. Municipalities*

The project is located within the Administrative Magisterial District of Namaqua, under the jurisdiction of the Khai Ma Local Municipality. Both municipalities were informed in person, BID and Site Notices were hand delivered.

*Landowners and Notification Methodology*

Pella Mission 39 and Klein Mission 40 are owned Khai Ma Local Municipality. BIDs were given to the Director of Environmental Department (Mr. Edward Vries) of Khai Ma Local Municipality on the 12<sup>th</sup> of July 2022. Site Notices were also placed at the Municipality and the local library.

e. *Meeting*

Meetings regarding the proposed project were held with the ward councillor of Ward 5 in Pella and Mr Edward Vries of the Khai Ma Local Municipality. Both the ward councillor and the mayor did not attend the meeting and never gave any apologies thereof. Proof of communication has been attached to the Public Participation Report.

f. *Adverts were place in the:*

- Die Platterlander, 01<sup>st</sup> of July 2022, pg. 2
- BID and Registration Sheet with a Locality map was circulated on the 12<sup>th</sup> of July 2022.
- A site visit was conducted on 12<sup>th</sup> of July 2022.
- All Government department where informed of the said application in person and via e-mail.
- A3 Site Notices were placed at the site boundary and Khai Ma Local Municipality and the local library as well as Pella Library.
- A draft copy of this BAR and EMP will be circulated to all I&APs registered on the project database for a period of 30 days to allow I&APs the opportunity to comment on the findings of the EMP from the 02<sup>nd</sup> of August 2022.

g. *Issues and Response Register*

All comments received by Stakeholders are included in the table below.

## 8.2.2. Summary of issues raised by I&As

Table 4: Summary of issues raised by I&As

Interested and Affected Parties		Date	Issues raised	EAPs response to issues as mandated by the applicant	Section and paragraph reference in this report where the issues and or response were incorporated.
List the names of persons consulted in this column, and Mark with an X where those who must be consulted were in fact consulted.		Comments Received			
<b><u>AFFECTED PARTIES</u></b>					
<b>Landowner/s</b>	<b>X</b>				
Khai Ma Local Municipality		12/07/2022	The municipality welcomes the project, but the occupants of certain portions are difficult when coming to projects like this.	Noted, we'll with the councillors to engage with them regarding this project.	
<b>Municipality</b>	<b>X</b>				
Khai Ma Local Municipality (Edward Vries)		12/07/2022	The municipality welcomes the project and would like to be update of the progress	Noted	

Namakwa District Municipality		02/08/2022	No comment received yet		
<b>Organs of state (Responsible for infrastructure that may be affected Roads Department, Eskom, Telkom, DWA e</b>					
DARDLE- Bryn Fischer		14/04/2022	Comments not conclusive		
DWS-	X		No comment received yet		
SAHRA- Nokukhanya Khumalo	X		No comment received yet		
<b>Communities</b>	x				
James Mauuers (Ward 5 councillor) Pella		12/07/2022	Our community is not easy to deal with regarding project such as this but will convey the message to them and revert with their response.	Noted, thank you	
Waterboer Pella (Ward 3 councillor-Pella)		02/08/2022	No comment received		
<b>Dept. Land Affairs</b>					
Sam Pheko	X	02/08/2022	No comment received yet.		
<b>Traditional Leaders</b>					

No Traditional Leaders identified within the site area					
<b>I&amp;A Parties</b>					
Kerry Purnell Project Manager Northern Cape land Project Wilderness Foundation Africa kerry@wfa.africa	X	01/08/2022	<p>Wilderness Foundation Africa (WFA), through its Northern Cape Land Project, is focused on the continued and improved protection of ecosystems at a landscape level. With the support of the Leslie Hill Succulent Karoo Trust and WWF South Africa, WFA assists both National and Provincial conservation bodies with the implementation of the National Protected Area Expansion Strategy (NPAES) in the Northern Cape. To ensure the continued persistence of ecosystems and that national conservation targets in the Northern Cape will be achieved, it is essential that impacts on sensitive and highly localized habitats are minimized or avoided altogether.</p> <p>The following key pieces of legislation, policy and guidelines provide the point of departure for Wilderness Foundation Africa's comments:</p>	Noted, your comments have been taken into consideration. Once the study is complete, it will be circulated to all I&As.	

			<ul style="list-style-type: none"> <li>• Constitution of the Republic of South Africa Act, 1996 (Act No. 108 of 1996), and the requirement for 'ecologically sustainable development'.</li> <li>• National Environmental Management Act, 1998 (Act No. 107 of 1998) (as revised): in particular, the national environmental management principles related to the need to avoid, and if avoidance is not altogether possible, to minimize and remedy impacts on biodiversity, and to apply a risk-averse and cautious approach.</li> <li>• NEMA EIA Regulations.</li> <li>• The Minerals and Petroleum Resources Development Act, 2002 (Act No. 28 of 2002) and its regulations, particularly those that reflect on environmental impacts.</li> </ul> <p>The Department of Environmental Affairs / Department of Mineral Resources / Chamber of Mines, and Mining and Biodiversity Forum's Mining and Biodiversity Guideline 2013</p>		
--	--	--	--	--	--



			<p>(hereinafter referred to as the MBG), which requires:</p> <ul style="list-style-type: none"> <li>o Apply the law.</li> <li>o Use the best available biodiversity information</li> <li>o Engage stakeholders thoroughly.</li> <li>o Use best practice environmental impact assessment (EIA) to identify, assess and</li> </ul> <p>evaluate impacts on biodiversity.</p> <ul style="list-style-type: none"> <li>o Apply the mitigation hierarchy in planning any mining-related activities; and to develop robust environmental management programme (EMP).</li> <li>o Ensure effective implementation of the EMP, including adaptive management</li> </ul> <p>Wilderness Foundation Africa, as an Interested and Affected Party hereby wishes to object to the Prospecting Rights application (DMR Ref: NC 30/5/1/1/2/13091 PR) based on (but not limited to) the following:</p>		
--	--	--	--	--	--

			<p><b>1. Prospecting application falls within CBA's 1 and CBA's 2</b></p> <p>Both properties for which the prospecting application was submitted fall within Critical Biodiversity Areas (CBA's). Most of the area falls within a CBA 2 while the remainder within a CBA 1 and Ecological Support Areas (ESA's). These areas are essential to meet biodiversity targets for ecosystems, species, and ecological processes, and are considered as "no-go" for any developments. They furthermore guide decision-making about where best to locate development and inform land-use planning, environmental assessment and authorizations, and natural resource management.</p> <p>Any damage caused by prospecting and subsequent mining activities in the proposed area will cause irreplaceable loss and should be completely avoided.</p>		
--	--	--	--	--	--

			<p><b>2. The area targeted for prospecting is a National Protected Area expansion priority for South Africa</b></p> <p>The properties targeted for the Prospecting Application are a National Protected Area expansion priority for South Africa. The National Protected Area Expansion Strategy (NPAES) was specifically developed with the aim of improved ecosystem representation and ecological sustainability through effective and strategic protected area expansion. Both Klein Pella 40 and Pella Mission 39, fall within the Bushmanland Primary Focus Area (NPAES, 2017). Should this application thus be approved it will directly influence and obstruct the protected area expansion targets adopted and implemented by the Department of Forestry, Fisheries and Environment (DFFE) and the Northern Cape Department of Agriculture, Environmental Affairs, Rural Development and Land Reform (DAERL).</p> <p>WFA would furthermore also like to bring to the attention of the EAP and</p>		
--	--	--	--	--	--

			<p>Proponent that the property Klein Pella RE/40 was recently presented at the Northern Cape Protected Area Expansion Review Committee, where it was approved for Nature Reserve status. The process to officially declare the property as a private Nature Reserve is now underway.</p> <p><b>3. The proposed prospecting will impact on unprotected and poorly protected vegetation types</b></p> <p>According to the latest SANBI Vegetation Map (2018) there are five vegetation types which occur within the proposed prospecting area. According to the 2018 National Biodiversity Assessment report, four of the five vegetation units are classified as "Not Protected" and one as "Poorly Protected". Any prospecting or development activities on the proposed properties will impact on the national conservation targets for these poorly and unprotected vegetation types as well as the highly specialized and endemic plant species associated with them.</p>		
--	--	--	--	--	--

			<p>Wilderness Foundation Africa requests that a full Botanical and Ecological assessment is carried out to form part of the Draft Basic Assessment Report which will be provided to all I &amp; AP.</p> <p><b>CONCLUSION</b></p> <p>In view of the concerns and conclusions provided above, WFA is of the opinion that Environmental Authorization for proposed prospecting activities should not be given due to the sensitive ecological nature and strategic conservation importance of Klein Pella 40 and Pella Mission 39.</p> <p>We duly request concise and detailed responses to the concerns we raised. WFA is willing to engage in open discussions with you to have our concerns adequately understood. WFA respectfully requests being adequately informed about any other developments in your application that may affect our position as an Interested and Affected Party. WFA may attend the Regional Mining Development and Environmental</p>		
--	--	--	--	--	--

			<p>Committee (RMDEC) meeting to make a presentation on the application. WFA reserve the right to comment further on the application should any new information become available to us that we consider to be of importance in our opposition to this application.</p> <p>Wilderness Foundation Africa would like to restate its strong objection to the Prospecting Right Application. Any attempt to proceed with this Prospecting Right Application will be strongly challenged by Wilderness Foundation Africa in partnership with other stakeholders involved in Protected Area Expansion and conservation in the area.</p>		
<p>Zelda van Dyk Chief Compliance Officer  Karsten Boedery Pty Ltd</p>	X	02/08/2022	<p>As per your public notice, Karsten Boedery (Pty) Ltd (herein after "The Karsten Group" or "TKG"), the owners of Portion 0 of Farm 40, Namaqualand, hereby confirm our registration as an Interested and Affected Party (I&amp;AP).</p>	<p>Noted, Envirostep will respond accordingly.</p>	

			<p>The following key pieces of legislation, policy and guidelines provide the point of departure for Wilderness Foundation Africa's comments:</p> <ul style="list-style-type: none"> <li>• Constitution of the Republic of South Africa Act, 1996 (Act No. 108 of 1996), and the requirement for 'ecologically sustainable development'.</li> <li>• National Environmental Management Act, 1998 (Act No. 107 of 1998) (as revised): in particular, the national environmental management principles related to the need to avoid, and if avoidance is not altogether possible, to minimize and remedy impacts on biodiversity, and to apply a risk-averse and cautious approach.</li> <li>• NEMA EIA Regulations.</li> </ul>		
--	--	--	--	--	--

			<ul style="list-style-type: none"> <li>• The Minerals and Petroleum Resources Development Act, 2002 (Act No. 28 of 2002) and its regulations, particularly those that reflect on environmental impacts.</li> <li>• The Department of Environmental Affairs / Department of Mineral Resources / Chamber of Mines, and Mining and Biodiversity Forum's Mining and Biodiversity Guideline 2013 (hereinafter referred to as the MBG), which requires:             <ul style="list-style-type: none"> <li>○ Apply the law.</li> <li>○ Use the best available biodiversity information</li> <li>○ Engage stakeholders thoroughly.</li> <li>○ Use best practice environmental impact assessment (EIA) to identify, assess and evaluate impacts on biodiversity.</li> </ul> </li> </ul>		
--	--	--	---	--	--



			<ul style="list-style-type: none"> <li>○ Apply the mitigation hierarchy in planning any mining-related activities; and to develop robust environmental management programme (EMP).</li> <li>○ Ensure effective implementation of the EMP, including adaptive management</li> </ul> <p>The Karsten Group, as an Interested and Affected Party hereby wishes to object to the Prospecting Rights application</p> <p>(DMR Ref: NC 30/5/1/1/2/13091 PR) based on (but not limited to) the following:</p> <p>Agricultural contribution to Provincial GDP and job creation</p> <p>The proposed prospecting area is part of an existing world-class agricultural production unit making a significant positive regional socio-economic</p>		
--	--	--	---	--	--

			<p>impact through long-term sustainable job creation.</p> <p>Any activity that threatens to disturb the surface and/or ground water resources of this area poses a significant risk to our agricultural activities by jeopardizing the drinking water resources of our staff accommodation.</p> <p>Any mining activity is associated with significant dust generation and the mining sector in South Africa has not yet come up with effective means of dust suppression. Dust can have a significant negative impact on fruit production as it reduces the quality of the final product due to dust residue and its effect on the colouring of the grape berries. Similarly, it has a significant impact on the quantity of export quality produce (Table Grapes and Dates), as it sticks to the waxy</p>		
--	--	--	--	--	--

			<p>layer of the fruit and reduces the effectiveness of agro-chemicals used in pest and fungus control resulting in lower yields of class one fruit.</p> <p>Aesthetic impacts on existing tourism business</p> <p>TKG has an established tourism business on Klein Pella which is an important revenue stream for the business that helps to offset key costs of farming in such a remote location. Portion 0 of Farm 40 plays a key part in the farm's eco-tourism business and any mining and/or development thereon would have a negative aesthetic impact and permanently destroy the 'sense of place' for guests arriving on the farm. Furthermore, any activity that threatens to disturb the surface and/or ground water resources of this area poses a</p>		
--	--	--	---	--	--

			<p>significant risk to our tourism business by jeopardizing the drinking water resources of our tourism accommodation.</p> <p>Prospecting application falls within CBA's 1 and CBA's 2</p> <p>Both properties for which the prospecting application was submitted fall within Critical Biodiversity Areas (CBA's). Most of the area falls within a CBA 2 while the remainder within a CBA 1 and Ecological Support Areas (ESA's). These areas are essential to meet biodiversity targets for ecosystems, species, and ecological processes, and are considered as "no-go" for any developments. They furthermore guide decision-making about where best to locate development and inform land-use planning,</p>		
--	--	--	---	--	--

			<p>environmental assessment and authorizations, and natural resource management.</p> <p>Any damage caused by prospecting and subsequent mining activities in the proposed area will cause irreplaceable loss and should be completely avoided.</p> <p>The area targeted for prospecting is a National Protected Area expansion priority for South Africa</p> <p>The properties targeted for the Prospecting Application are a National Protected Area expansion priority for South Africa. The National Protected Area Expansion Strategy (NPAES) was specifically developed with the aim of improved ecosystem representation and ecological sustainability through effective and strategic protected area expansion.</p>		
--	--	--	--	--	--

			<p>Both Klein Pella 40 and Pella Mission 39, fall within the Bushmanland Primary Focus Area (NPAES, 2017). Should this application thus be approved it will directly influence and obstruct the protected area expansion targets adopted and implemented by the Department of Forestry, Fisheries and Environment (DFFE) and the Northern Cape Department of Agriculture, Environmental Affairs, Rural Development and Land Reform (DAERL).</p> <p>TKG would furthermore also like to bring to the attention of the EAP and Proponent that the property Klein Pella RE/40 was recently presented at the Northern Cape Protected Area Expansion Review Committee, where it was approved for Nature Reserve status. The process to officially declare the property as a private Nature</p>		
--	--	--	--	--	--

			<p>Reserve is now underway. The formal declaration of the property is a key strategic component of both our tourism and agricultural business as it demonstrates our commitment to sustainable development principles to foreign markets that buy our produce.</p> <p>The proposed prospecting will impact on unprotected and poorly protected vegetation types</p> <p>According to the latest SANBI Vegetation Map (2018) there are five vegetation types which occur within the proposed prospecting area. According to the 2018 National Biodiversity Assessment report, four of the five vegetation units are classified as "Not Protected" and one as "Poorly Protected". Any prospecting or development activities on the proposed properties will impact on the</p>		
--	--	--	--	--	--

			<p>national conservation targets for these poorly and unprotected vegetation types as well as the highly specialized and endemic plant species associated with them.</p> <p>TKG requests that a full Botanical and Ecological assessment is carried out to form part of the Draft Basic Assessment Report which will be provided to all I &amp; AP.</p> <p>CONCLUSION</p> <p>In view of the concerns and conclusions provided above, TKG is of the opinion that Environmental Authorization for proposed prospecting activities should not be given due to the sensitive ecological nature and strategic conservation importance of Klein Pella 40 and Pella Mission 39.</p>		
--	--	--	--	--	--



			<p>We duly request concise and detailed responses to the concerns we raised. The Karsten Group is willing to engage in open discussions with you to have our concerns adequately understood. TKG respectfully requests being adequately informed about any other developments in your application that may affect our position as an Interested and Affected Party. TKG reserve the right to comment further on the application should any new information become available to us that we consider to be of importance in our opposition to this application.</p> <p>The Karsten Group would like to restate its strong objection to the Prospecting Right Application. Any attempt to proceed with this Prospecting Right Application on our property will be strongly challenged by our company in partnership with</p>		
--	--	--	---	--	--

---

			other regional, Provincial and National stakeholders involved in our agricultural contributions towards the Provincial GDP, as well as our vision for the long-term biodiversity conservation land use and tourism businesses on the non-agricultural portions of our properties.		
--	--	--	---	--	--

### **8.3. Concluding Remarks on Stakeholder Consultation**

The consultation commenced four weeks after the acceptance of the application and therefore the findings in this section should be considered preliminary and will be updated once the final report is available. The consultation report will be submitted to the DMR (Competent Authority) together with the BAR and EMPr.

## **9. The Environmental attributes associated with the alternatives.**

### **9.1. Baseline Environment**

#### **9.1.1. Type of environment affected by the proposed activity.**

The biophysical environment is described with specific reference to climate, geology, soils, vegetation and landscape features, climate, and general biodiversity.

#### **9.1.2. Description of the current land uses.**

Based on the information gathered during the desktop study and site visit, farms under application falls within Critical Biodiversity Areas 1 and 2. The proposed area is a National Protected Area expansion priority for South Africa. This was confirmed during a site investigation and stakeholder investigation process conducted on the 25<sup>th</sup> of April 2022.

### **9.2. Description of specific environmental features and infrastructure on the site.**

#### **9.2.1. Climate**

**Precipitations:** The proposed Project area is located in the Northern Cape Province of South Africa, a characteristically dry region, comprising a portion of the Kalahari Desert. The greater study region falls within both the Bushmanland and Namaqualand areas, which experience summer and winter rainfall respectively. As a result, the proposed Project area experiences both summer and winter rainfall.

Rainfall patterns for the nearby towns of Aggeneys and Pella (the closest towns to the proposed Project area) are similar, with Springbok (and to a lesser extent Pofadder) receiving relatively higher volumes of monthly average rainfall. Aggeneys receives an average of 98 mm of rainfall per annum, while Pella and Pofadder receive an average of 77 and 117 mm of rainfall per annum, respectively.

The Gamsberg region receives greater than 75 percent of its annual rainfall between January and June ( $\pm$  68 mm), with the months of January, February and April receiving the majority of this rainfall. Whereby Aggeneys has experienced its highest mean monthly rainfall during April (approximately 24 mm), over a period from 1986 to 2012. In contrast, its lowest mean monthly rainfall has been experienced during May and June, over the same period. In general, annual precipitation in the region is highly variable.

Despite relatively little annual rainfall, flooding of the Orange River (approximately 45 km north-east of the project site) occurs as a result of extreme precipitation inland. In terms of other extreme precipitation events, snow has also been recorded four times (since 1920) within the greater study region, including in Springbok in 1953, 1988 and 1994 and in Upington in 1983. In addition to this, severe hail has been recorded twice since 1920, once in Augrabies in 1991, and once in Upington in 2002.

**Flooding:** Analysis of extreme weather events in the Northern Cape between 1920 and 2011 indicates that severe flooding has been experienced in Upington, Kakamas, Augrabies and Springbok on a fairly regular basis (approximately more than 2.6 times per decade) (1). Of the 50 flooding events that have occurred in the Northern Cape, since 1920, 40 percent of them have occurred in towns situated along the Orange River. Flooding is a rare occurrence in towns further away from the river; however one incident was recorded in Springbok in 1994.

Flooding of the Orange River occurs in this area when there has been significant rainfall inland and the river struggles to contain the flow within its huge catchment (approximately 1 million km<sup>2</sup>). The most recent severe event occurred in January 2011. In this case, the river inundated the flood plain and resulted in the devastation of arable land and the evacuation of families from the Upington, Kakamas and Augrabies towns (see *Figure below*).



Figure 2: The 2011 Flooding of the Orange River Destroyed Hundreds of Hectares of Arable Land in Upington



Figure 3: The 2011 Flooding of the Orange River Caused Significant Damage to Infrastructure and Blocked Transport Routes in Upington

It should be noted that it is possible that not all extreme weather events are captured within the SAWS CAELUM Report as it depends on a SAWS representative experiencing and reporting the event. It is, however, the best available source of data on such events from SAWS. Additionally, although an extreme event, snow for example, was recorded in one town it is likely that the event was also experienced in other, smaller towns within the region in which the proposed Project is situated, but that the event was not recorded in the other towns given their size.

### **9.2.2. Topography**

The local topography is characterised with undulating plains, containing low growing shrubby vegetation and grasses. The surrounding plains are approximately 750 – 900 meters above mean sea level (mamsl), with the highest areas of the Gamsberg inselberg varying between 1100 – 1150 mamsl. The Gamsberg inselberg is approximately 7.2 km east – west and approximately 4.6 km north – south. Erosion along the top of the inselberg has resulted in the creation of a basin within the feature, which subsequently varies between 60 – 70 m below the rim of the inselberg.

### **9.2.3. Geology**

#### ***Regional Geology***

The Gamsberg zinc deposit is developed in a medium to high grade metamorphic volcano-sedimentary succession belonging to the Aggeneys Sub-Group of the Bushmanland Group. This Group is bordered to the east by the Hartbees River Thrust, to the north by the Groothoek Thrust and Wortel Belt, and it is overlain Karoo-age rocks to the south. Together these Groups occur within the Namaqualand Metamorphic Complex, which as mentioned above, consists of Precambrian metamorphic rocks and intrusive formed or metamorphosed during the Namaqua Orogeny.

The Bushmanland Group is composed of basement granitic rocks (1 700 to 2 050 Ma), supra-crustal sequences of sedimentary and volcanic origin (1 200, 1 600 and 1 900 Ma) and intrusive charoite to granitic rocks (950, 1 030 to 1 060, and 1 200 Ma).

#### ***Local Geology***

*Figure below* presents a stylised stratigraphic succession for the proposed Project area, with specific detail of the Gamsberg North ore body that is targeted in this Project.

The succession at Gamsberg comprises of basal quartz-feldspathic gneiss overlain progressively upwards by sillimanite-bearing pyelitic schist and metaquartzites of up to 450 m thickness; the Gams Iron Formation (GIF) of 0 to 80 m thickness; and Koeris Formation rocks consisting of quartz-muscovite schist, lenses of conglomerate and amphibolite to a thickness of 400 to 500 m. *Table 5.2* presents key characteristics of the various lithologies that would report as hanging wall, ore zone or footwall material.

Note that the latest phase of structural deformation of the local basin resulted in upturning and buckling, to produce a steep-limbed anticlinal structure on the north side of the inselberg.

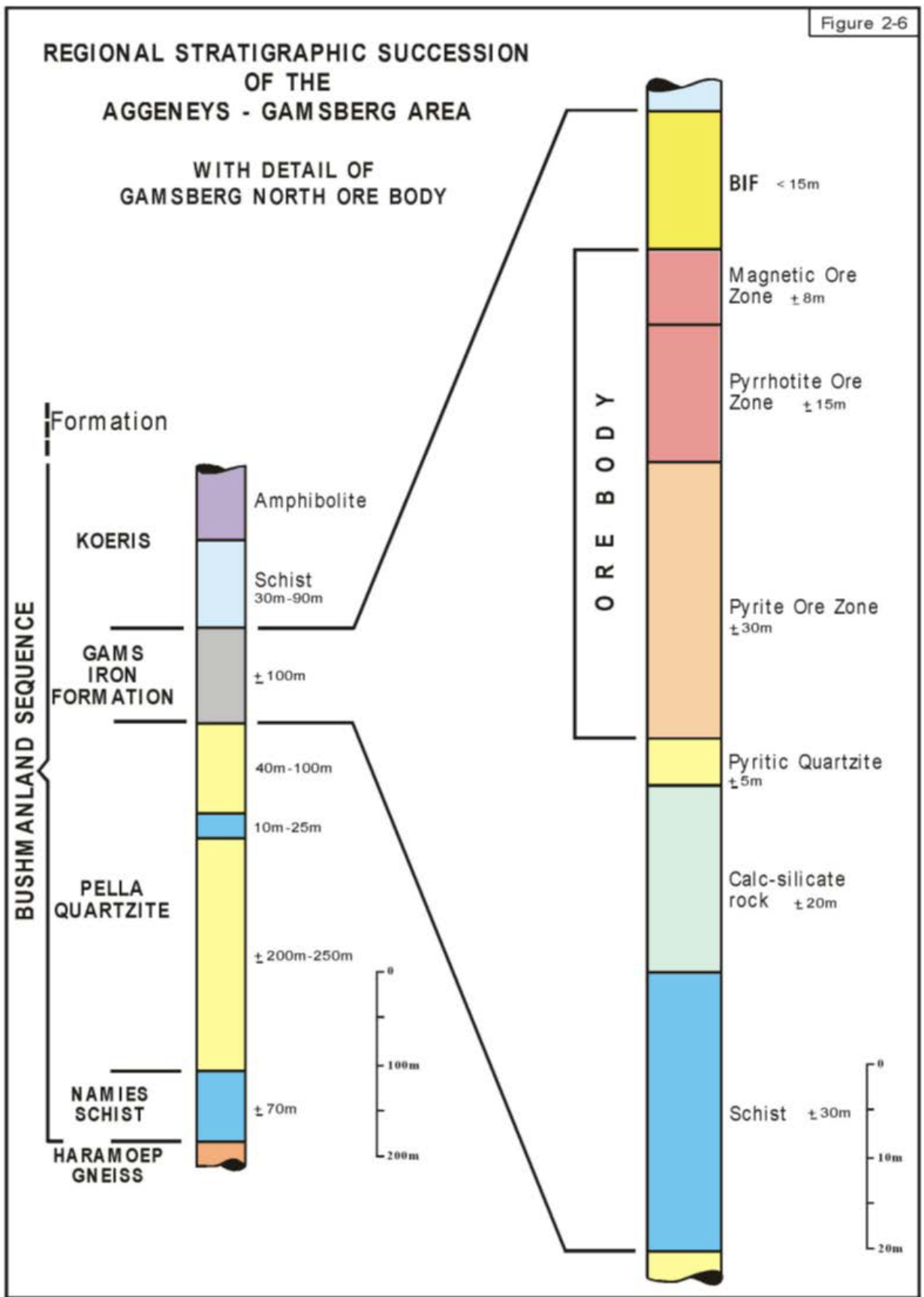


Figure 4: Stylised Stratigraphic Succession (after AA plc, June 2000)



#### **9.2.4. Soil**

##### ***Soil Forms***

The Project area is characterised by an extensive peneplain. The soils present in the peneplain are predominantly shallow and stony. However, soils found within the inselberg are characterised with boulder and stony scree slope soils (SRK Consulting, 2010). The scarps and crest of the inselberg are characterised with bare rocks, while the Gamsberg Basin itself is characterised with shallow gravelly soils.

The soils present on the peneplain are generally characterised with reddish sandy topsoil that is shallow in nature. However, a 10cm thick red sandy surface layer is present along the northern section of the proposed site. The western and southern part of the proposed site is characterised with deeper red soils, varying in depth from 30 cm to 60 cm. Along the south western portion of the proposed site, deeper red soils occur.

It should be noted that the Gamsberg inselberg has been managed as a grazing-free site. In doing, the level of land degradation is limited for this inselbergs in contrast to the surrounding farm lands, which have experienced varying degrees of degradation as a result of overgrazing.

The Project area (which comprises of 4 properties) are already zoned for mining, with the exception of Gams 60, Portion 4 which is zoned for farming. However, it must be noted that Black Mountain Mining has an existing surface right to mine Gams 60, Portion 4 and therefore no grazing is currently undertaken on this property.

##### ***Agricultural Potential***

The dry climate is unsuitable for crop production, and livestock farming is the dominant form of land use in the region. The Project area has an existing mining right, and thus the grazing potential of the site has not been investigated. Furthermore, grazing activities have been prevented on the Gamsberg inselberg, which has indirectly contributed to the conservation of the existing biodiversity on-site.

## **9.2.5. Surface Water**

### ***Catchment Area Characteristics***

Situated in the Orange River basin, the mine is located at the watershed between two quaternary catchments, being D81G and D82C. The latter is an endoreic catchment, meaning that it is an interior drainage basin that does not drain to the sea. The Gamsberg inselberg is situated within quaternary catchment D81G, which drains in a northerly direction towards the Orange River some 35km away. A third quaternary catchment, D82A was identified in the 2010 baseline report, but being remote from any anticipated mine infrastructure, is not further considered in this report.

The baseline surface water assessment identified 11 sub-catchments totalling roughly 750 km. These are sub-catchments 4 and 9a. Table 5.3 compares the baseline catchment nomenclature with that adopted for this report. Other baseline sub-catchments that are unaffected by proposed mining infrastructure are not further considered in this report.

For the baseline assessment, no ineffective areas were identified. Runoff was therefore deemed to be generated by the entire sub-catchment and calculated accordingly. The full development scenario, however, introduced ineffective areas that had a significant impact on peak flows and volumes. Figure 5.13 below illustrates the on-site watercourses, baseline sub-catchments and associated 1:100 year flood lines.



Figure 5: Orange River Catchment (Sourced from [www.dwa.gov.za](http://www.dwa.gov.za) website, 2012)

### Site Specific Water Resources

The Project area falls within three quaternary catchment areas, namely, D82C, D82A and D81G. During the hydrology and surface water analysis undertaken by SRK Consulting (2010), the Project area and associated infrastructure is expected to impact on 10 local water catchment areas in the three quaternary catchments.

Based on the previous investigations, the area for each catchment ranges from 0.97 km<sup>2</sup> to 272 km<sup>2</sup>. The MAR for each of these catchments were based on area weighting WR2005 data (SRK Consulting, 2010). The area weighted MAR for each of these catchment areas varied from 300 m<sup>3</sup> to 84 000 m<sup>3</sup>. However, due to the limited rainfall

experienced in the region, most of the water courses identified are ephemeral in nature. Notwithstanding, the small catchment area identified on top of the inselberg does contain a spring, and therefore can experience seasonal to perennial flows. A map reflecting the main watercourses within the mining license, together with associated 1:100 year flood lines are presented below:

### **9.2.6. Groundwater**

#### ***Description of Hydrogeology***

As part of the baseline study, a hydro-census analysis was undertaken by SRK Consulting in 2010 of the Gamsberg region to obtain information related to groundwater. Approximately 41 water sources (including boreholes, wells and springs) were identified, however, only 27 of those were operational with the required equipment.

The baseline study confirmed that no regional aquifers have developed in the Namaqualand Metamorphic Complex. Furthermore, due to thinly developed soils, primary weathered zone aquifers are infrequent and localised.

Groundwater is mainly found within secondary fractured-rock aquifers and tends to be found along fractures within hydraulically isolated rocks of low permeability, which are commonly found in the surrounding areas. According to the baseline report, the transmissivity of the fractured aquifers is considered to be low (SRK Consulting, 2010).

The geology in the Gamsberg area is mainly comprised of dense metamorphic rocks which are characterised with low permeability, and as such, the movement of groundwater in the area is largely influenced by secondary structural features. Features such as shears, thrust faults and fractures will impact on the movement of groundwater. Interconnected features would facilitate a greater movement of groundwater across the region, while unconnected features will limit groundwater flows to the individual faults or fractures. The structural features identified are largely oriented in a north to northwest direction of the proposed Gamsberg site, with a few features present to the east to west and southeast directions.

#### ***Current Groundwater Use***

Groundwater resources in the Namakwa District are more abundant than surface water features. Groundwater serves as a key water source, especially for livestock farmers in the Project area.

Based on estimated projections, a total of ~75 000 m<sup>3</sup>/a of groundwater is abstracted, primarily for livestock watering and domestic use. This was calculated based on the hydro-census analysis undertaken in 2010 by SRK Consulting for the various boreholes, wells and springs. The boreholes present in the region are expected to yield between 0.1 and 0.5 ℓ/s, which are likely to experience seasonal variations based on rainfall patterns.

### **Groundwater Quality**

Groundwater sampling and analysis was undertaken in 2010 by SRK Consulting. The Electrical Conductivity (EC) and pH levels were measures at locations within and around the Gamsberg inselberg. The EC levels in the water sampled in the Gamsberg inselberg appears to be lower than those sampled from sites adjacent to and surrounding the inselberg. This implies that the Gamsberg inselberg has a higher recharge rate. The pH values of the water sampled varied between 6.15 and 8.45, with a mean of 7.45.

Fluoride concentrations in groundwater samples ranged between 0.2 and 4.2 mg/ℓ, with a mean value of 2.07 mg/ℓ. Majority of the samples tested exceeded the Class two water quality parameters, and is thus considered not suitable for drinking purposes in terms of SANS 241 of 2006. The elevated Fluoride concentrations were limited to samples taken from sources surrounding the Gamsberg inselberg, and could potentially be attributed to evaporation rates, mineralogy of the rock or holding time of groundwater.

### **9.2.7. Flora**

#### ***The Gamsberg Inselberg in a Regional Context***

The Gamsberg inselberg sits within what is termed the Bushmanland Inselberg Region (BIR), which includes all the large, quartzite-capped inselbergs located in the northern Bushmanland plains in South Africa. The BIR is said to cover a total area of about 6 300 km<sup>2</sup> (Desmet, 2010). The BIR extends through the boundary between summer and winter rainfall systems in Southern Africa. Based on this location, the vegetation found on the plains and along the warmer north-facing slopes is characteristic of the Nama Karoo Biome whereas that of cooler higher-elevation plains and south-facing slopes is characteristic of the Succulent Karoo Biome. The overlap of these biomes makes these inselbergs a unique feature, thus forming the fundamental difference of these inselbergs as compared to other inselbergs found elsewhere in the Nama Karoo. Due to erratic

rainfall experienced during different seasons, summer and winter rainfall flora can co-exist in this region, and thus contributing to its unique value.

The vegetation found on these inselbergs forms a distinct centre of plant endemism located within the larger Eastern Gariep Centre of Endemism (Desmet, 2010), which includes the Orange River valley between Vioolsdrif and Pofadder/Onseepkans. As there are a number of species identified that is considered to be endemic to the Bushmanland inselbergs and the BIR itself, the region has been termed "Bushmanland Inselberg Centre of Endemism".

A regional investigation undertaken by Dr Phillip Desmet (2000), confirmed that the Gamsberg inselberg is considered to be the most regionally important inselberg in the BIR in terms of its biodiversity and composition. This was based on multiple criteria with which to compare and rank sites with other inselbergs. The Gamsberg inselberg has the highest number of plant species of other inselbergs surveyed, which are representative of the entire regional flora. The plant diversity is unique at a local, regional and global perspective, especially in light of the diversity of species, habitats, presence of rare species and size of specific plant populations.

### **Regional Botanical Analysis**

The national vegetation map (Mucina & Rutherford 2006) for the Study Area is depicted below in *Figure 5.17*. The area is remarkably heterogeneous for an arid area, with eight different vegetation types present within the broader Study Area. The vegetation diversity reflects the topographic and edaphic diversity of the area, with the Orange River valley with flanking mountain ranges, the open plains of the Bushmanland Plateau and the inselbergs breaking the monotony of the plains. Added to this is a diversity of substrates which include sandy plains, gravel, quartz and calcrete plains, rocky slopes and outcrops and drainage lines. In addition to this, the majority of vegetation types have not been heavily impacted by transformation and are still more than 95% intact (refer to *Table 5.8* below). According to the National List of Threatened Ecosystems, only Lower Gariep Alluvial Vegetation is listed as Endangered on account of the large amount of transformation this unit has experienced owing to intensive agriculture in the area.

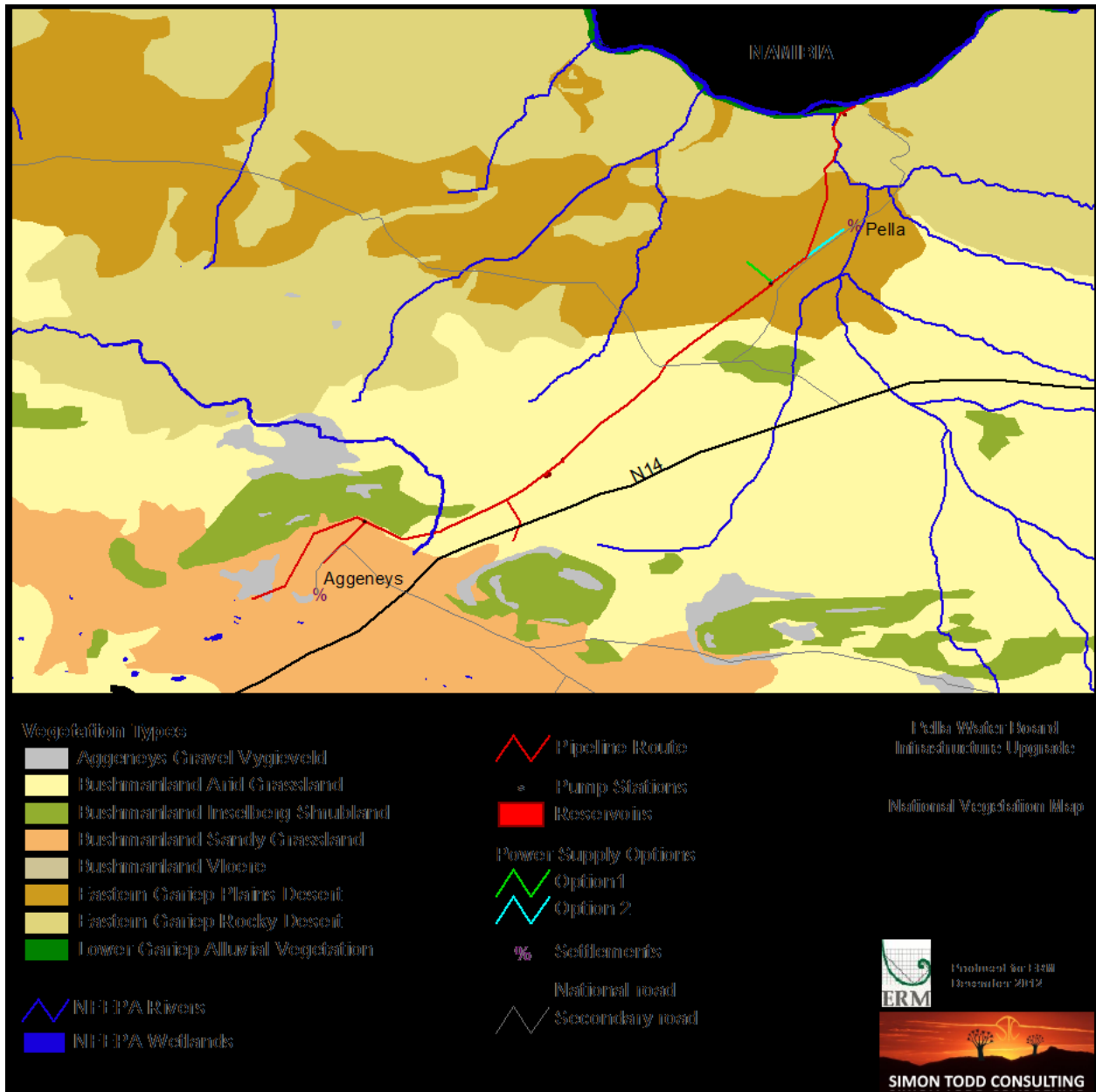


Figure 6: The National Vegetation Map (Mucina & Rutherford 2006) for the Area Around the Proposed Pella Water Board Pipeline and Associated Infrastructure

The Bushmanland Sandy Grassland vegetation type is comprised of a single habitat unit called the Plains Sandy mobile dunes (Table 5.6). This habitat type covers a total area of 18.5 hectares, which equates to less than 1% of the regional extent of this vegetation type. The Bushmanland Sandy Grassland is generally found from the south of Aggeneys to the north of Pofadder, along large sand dunes present on the region. The vegetation is characterised as sparse to dense, with loose sandy grassland on dune ridges with a wealth drought-resistant shrubs and trees. Although no endemic flora species are listed for this vegetation unit, it is not very well known suggesting that there may be such species

present. This vegetation unit is however the habitat of the Red Lark *Calendulauda burra* which is an endemic species that is listed as *Vulnerable*.



Figure 7: Example of Bushmanland Arid Grassland Vegetation Type



Figure 8: Plains Quartz Gravel Patch at northern eastern base of Gamsberg Inselberg

### **Critical Biodiversity Areas and Broad-Scale Processes**

The Gamsberg site lies within the planning domain of the Namakwa Biodiversity Sector Plan (Desmet & Marsh, 2008). This biodiversity assessment identifies Critical Biodiversity Areas (CBAs) which represent biodiversity priority areas which should be maintained in a natural to near natural state. The CBA maps indicate the most efficient selection and



classification of land portions requiring safeguarding in order to maintain ecosystem functioning and meet national biodiversity objectives. As can be seen from the CBA map for the area, depicted in the figure below, the CBAs in the area are complex and reflect the landscape diversity in the area as well as the abundance of specific habitats of conservation significance. Various broad-scale Ecological Support Areas are present and intended to promote the maintenance of the broad-scale connectivity of the landscape. This includes parts of the pipeline route near Pella, after it emerges from the canyon as well as a large proportion of the pipeline between the Horseshoe and Kokerboom reservoirs.

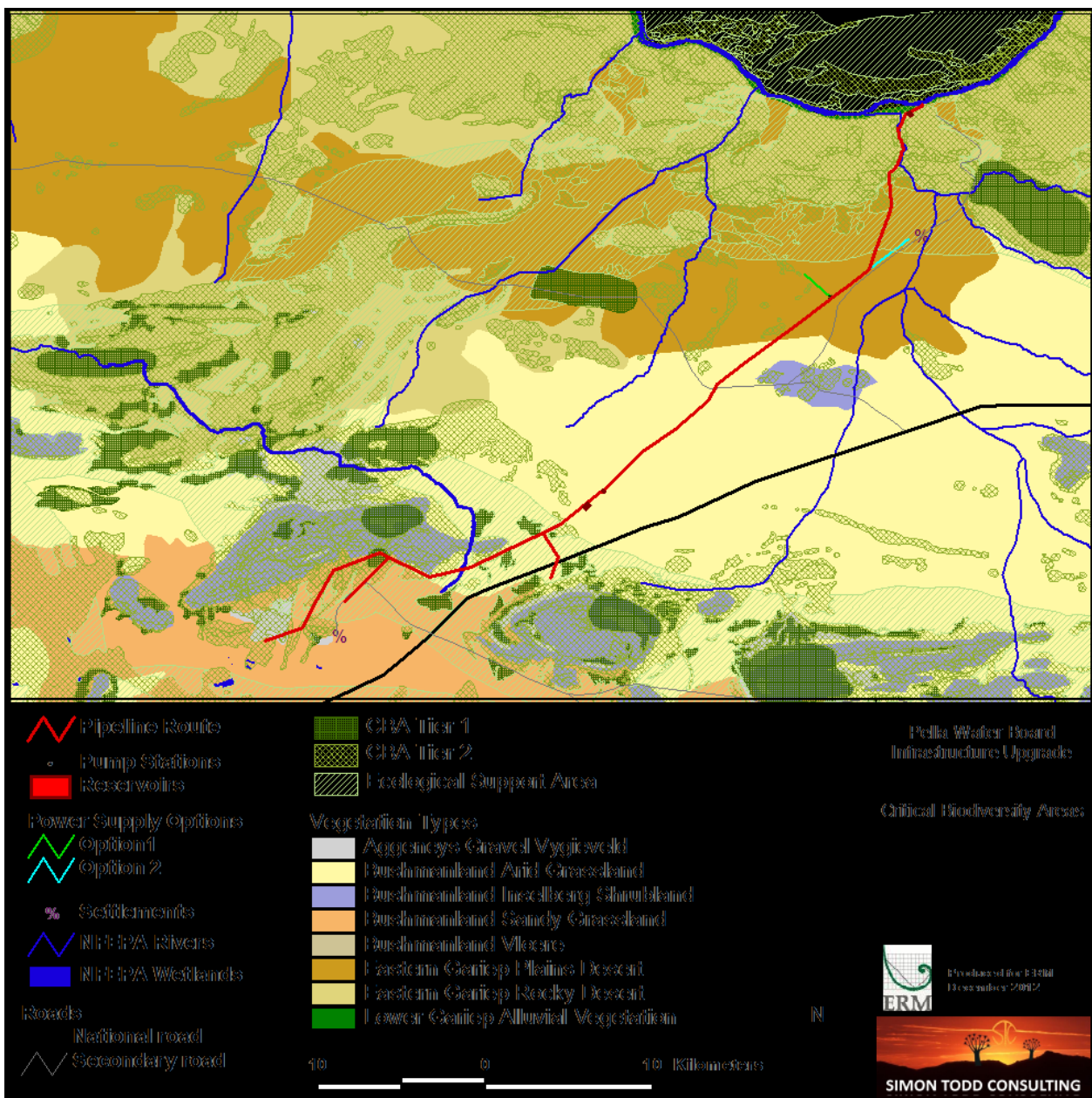


Figure 9: Critical Biodiversity Areas Map for the Area Surrounding the Proposed Pella Water Board Pipeline and Associated Infrastructure

### **9.2.8. FAUNA**

Faunal baseline studies were undertaken to update the existing faunal assessment previously undertaken during the initial EIA process (2000). Recent baseline studies have been undertaken by GroundTruth (2013) within the Gamsberg concession and by Simon Todd Consulting (2013) for the greater area. The findings of these investigations are presented below.

#### ***Terrestrial Invertebrates***

Based on the field work and observations undertaken, it was confirmed that no Red Listed invertebrate species were identified in the Gamsberg region (Groundtruth, 2010). This was said to unlikely change through further investigations as most of the Red List invertebrates in South Africa are butterfly's, none of which are expected to occur in the Gamsberg region.

A total of 13 ant species were identified during the baseline study in 2010, which was undertaken during the dry season. It is speculated that this number of ant species could increase dramatically should a survey be undertaken during the wet season. Two ant species potentially endemic to the Northern Cape and Southern Namibia were identified during field observations (Groundtruth, 2013), which are as follows:

- i. The pale *Messor* species; and
- ii. A *Camponotus fulvopilosus*-group species.

The *Camponotus* species is distinct from the Karoo form of *C. fulvopilosus* commonly occurring in the region. The pale *Messor* species could not be identified using available keys, and currently remains as undescribed.

### **9.2.9. AIR QUALITY**

The dominant form of farming currently undertaken in the region is livestock farming. Due to climatic conditions, crop farming is prevalent along the Orange River. The activity of ploughing is generally limited to small plots of land, and not part of larger commercial farming activities. Due to the scale of farming in the region, agricultural activities are seen as a minor contributor to particulate matter (ie PM10 and Total Suspended Particles) concentrations in the region.

Mining activities are likely to significantly contribute to air emissions in the region. Mining activities are generally associated with the release of sulphur dioxide (SO<sub>2</sub>), nitrogen oxides (NO<sub>x</sub>), carbon monoxide (CO) and carbon dioxide (CO<sub>2</sub>). In addition, fugitive dust emissions such as PM<sub>2.5</sub>, PM<sub>10</sub> and Total Suspended Particles are also characteristic of mining activities such as materials handling, blasting, drilling, haul vehicles, stockpiling and waste management. Taking cognisance of the existing mining operations within Aggeneys, the existing Black Mountain Mine is likely to contribute to the ambient air concentration levels in the region.

Air quality monitoring was undertaken from June to October of 2009 to determine the current ambient air quality concentrations related to PM<sub>10</sub>, SO<sub>2</sub> and NO<sub>2</sub> (SRK Consulting, 2010).

#### **9.2.10. Noise**

The Gamsberg inselberg is located in an area that is sparsely populated, with limited sensitive noise receptors in the immediate area. Sensitive receptors in the area include the town of Aggeneys, adjacent land owners and road users (N14 and Loop 10 gravel road). The proposed Gamsberg zinc mine will result in the generation of noise through the use of diesel equipment, crushing, concentrating and activity of mining (ie blasting and drilling).

Recognising the potential noise sources, the existing ambient noise levels in the area were identified. The N14 National Road and Loop 10 gravel road has been identified as major sources of noise, due to levels of traffic experienced in the area. Furthermore, the town of Aggeneys is characterised with community related activities and thus contributes to the existing ambient noise levels. However, as Aggeneys is approximately 14 km south west of the proposed mine, the town results in minimal noise emissions, relative to the Project area.

### **9.3. Environmental and current land use map.**

Attached to Appendix A

## **10. Impacts and risks identified including the nature, significance, consequence, extent, duration and probability of the impacts, including the degree to which these impacts**

The following table illustrates the potential impacts associated with each activity.

*Table 5: Potential impacts associated with each activity.*

Phase		Activities	Potential Impacts	Reversible	Irreplaceable Damage	Can impact be avoided
<b>Phase 1: Data Acquisition and Desktop Study</b>						
Phase 1: Data Acquisition	N/A	Data collection and assessment (desktop only)	None identified.	N/A	N/A	N/A
Phase 1: Desktop Study	N/A	Data Assessment	None identified.	N/A	N/A	N/A
<b>Phase 2: Target Generation and Ground Truthing</b>						
Phase 2: Airborne geophysics survey	N/A	Site fly-over (flying height of approximately 25m over a period of approximately 1 week)	Noise impacts resulting from site flyovers affecting cattle and game farm animals. Nuisance noise impacts on communities and landowners and other persons.	Yes	No	No
Phase 2: Ground geophysics survey	N/A	Ground survey	Poor access control resulting in impacts on cattle movement, breeding and grazing practices.	Yes	No	Yes

Phase		Activities	Potential Impacts	Reversible	Irreplaceable Damage	Can impact be avoided
Phase 2: Soil Sampling	Construction Phase	No construction or site establishment activities will be undertaken.	No anticipated impacts.	N/A	N/A	N/A
	Operation Phase	Site access	<ul style="list-style-type: none"> <li>• Destruction and/ or disturbance of on-site fauna and flora.</li> <li>• Poor access control resulting in impacts on cattle movement, breeding, and grazing practices.</li> <li>• Vehicle traffic noise impact affecting cattle and/ or wildlife.</li> <li>• Poor housekeeping could result littering and associated impacts this will have on the aesthetics of the area, contamination of river</li> </ul>	<p>Partial</p> <p>Yes</p> <p>Yes</p> <p>Yes</p>	<p>No</p> <p>No</p> <p>No</p> <p>No</p>	<p>Yes</p> <p>Yes</p> <p>Yes</p> <p>Yes</p>

Phase		Activities	Potential Impacts	Reversible	Irreplaceable Damage	Can impact be avoided
			<p>systems in the rainy season and the potential health hazard to cattle.</p> <ul style="list-style-type: none"> <li>Activities within the riverbed could result in the disturbance to the natural geomorphology.</li> <li>Activities within the riverbed could result in safety hazards during rainy periods.</li> </ul>	<p>Partial</p> <p>No</p>	<p>Potential</p> <p>No</p>	<p>Yes</p> <p>Yes</p>
		Soil Sampling	Soil disturbances from soil sampling resulting in soil 30 kg of soil per sample?	Yes	No	No
	Decommissioning Phase	No decommission will be required	No anticipated impacts	N/A	N/A	N/A

Phase	Activities	Potential Impacts	Reversible	Irreplaceable Damage	Can impact be avoided	
<b>Phase 3: Scout Drilling and Delineation Drilling</b>						
	Construction Phase	Site Access	Destruction and/ or disturbance of on-site fauna and flora.	Partial	No	Yes
			Soil compaction resulting from repeated use of access roads to drill sites.	Yes	No	No
			Vehicle traffic noise impact affecting cattle and/ or horses.	Yes	No	No
			Poor access control resulting in impacts on cattle movement, breeding, and grazing practices.	Yes	No	Yes
			Potential destruction of heritage resources.	No	Yes	Yes



Phase		Activities	Potential Impacts	Reversible	Irreplaceable Damage	Can impact be avoided
		Site establishment activities including: (a) Vegetation clearing of drill pad area. (b) Topsoil stripping and stockpiling. (c) Drill pad compaction (d) Excavation and lining of drill water sump. (e) Erection of temporary site office shaded area, potable ablution facilities and water storage tanks and core bay. (f) Erection of fuel storage tank. (g) Erection of safety barrier.	Destruction and/ or disturbance of on-site fauna and flora.	Partial	No	Yes
			Soil disturbance and compaction and topsoil stockpiling resulting in soil erosion.	Yes	Partial	No
			Dust emission resulting from site clearing, soil stripping and construction activities (including vehicle entrained dust)	Yes	No	Yes
			Visual impact affecting visual character and "sense of place"	Yes	No	Partial
			Influx of persons (job seekers) to site because of increased activity resulting in increased	Yes	No	Partial

Phase		Activities	Potential Impacts	Reversible	Irreplaceable Damage	Can impact be avoided
		(h) Waste generation and management.	incidents of the theft and opportunistic crime.			
Operational Phase		Exploration drilling and core sample collection and storage including:	Water and soil pollution resulting from disposal of drill fluids.	Yes	Partial	Yes
		(a) Scout and delineation drilling.	Continued soil erosion from topsoil stockpile and compaction from drill pad platform.	Yes	No	Yes
		(b) Drilling maintenance and re-fuelling.	Potential water and soil pollution resulting from hydrocarbon spills and drill maintenance activities.	Yes	Partial	Yes
		(c) Core sample collection and storage.	Dust emissions from drilling and general site activities (including vehicle entrained dust).	Yes	No	Yes
		(d) Drill fluid collection, storage, and evaporation.				
		(e) Waste generation and management.				

Phase		Activities	Potential Impacts	Reversible	Irreplaceable Damage	Can impact be avoided
			Visual impact affecting visual character and "sense of place"	Yes	No	Partial
			Vehicle traffic and drill noise impact affecting wildlife game farm animals.	Yes	No	Partial
			Poor access control resulting in impacts on cattle movement, breeding, and grazing practices.	No	No	Yes
			Influx of persons (job seekers) to site because of increased activity resulting in increased incidents of theft and opportunistic crime.	Yes	No	Partial
			Impact on the pans and associated ecosystem in the area.	No	Yes	Yes

Phase		Activities	Potential Impacts	Reversible	Irreplaceable Damage	Can impact be avoided
	Decommissioning phase	Removal of temporary infrastructure including:	Dust emissions from decommissioning activities (including vehicle entrained dust).	Yes	No	Yes
		(a) Removal of temporary site office shaded area, potable ablution facilities, water storage tanks and core bay	Poor access control resulting in impacts on cattle movement, breeding, and grazing practices.	No	No	Yes
		(b) Boreholes capping	Potential water and soil pollution from hydrocarbon spills.	Yes	Partial	Yes
		Drill pad rehabilitation including:	Soil erosion resulting from the re-spreading of topsoil before vegetation is re-established.	Yes	No	Yes
		(a) Ripping of drill pad and access road.				
		(b) Re-spreading of stockpiled topsoil.				
		(c) Re-vegetation				

## 11. Methodology used in determining and ranking the nature, significance, consequences, extent, duration and probability of potential environmental impacts and risks.

### 11.1. Criteria of assigning significance to potential impacts

The evaluation of impacts is conducted in terms of the criteria detailed in Table 6 to Table 11. The various environmental impacts and benefits of this project are discussed in terms of impact status, extent, duration, probability, and intensity. Impact significance is regarded as the sum of the impact extent, duration, probability and intensity and a numerical rating system has been applied to evaluate impact significance; therefore an impact magnitude and significance rating is applied to rate each identified impact in terms of its overall magnitude and significance (Table 12).

In order to adequately assess and evaluate the impacts and benefits associated with the project it was necessary to develop a methodology that would scientifically achieve this and to reduce the subjectivity involved in making such evaluations. To enable informed decision- making it is necessary to assess all legal requirements and clearly defined criteria in order to accurately determine the significance of the predicted impact or benefit on the surrounding natural and social environment.

### 11.2. Impact Status

The nature or status of the impact is determined by the conditions of the environment prior to construction and operation. A discussion on the nature of the impact will include a description of what causes the effect, what will be affected and how it will be affected. The nature of the impact can be described as negative, positive or neutral.

Table 6: Status of Impact

Rating	Description	Quantitative Rating
Positive	A benefit to the receiving environment	P

Rating	Description	Quantitative Rating
Neutral	No cost or benefit to the receiving environment	-
Negative	A cost to the receiving environment	N

### 11.3. Impact Extent

The extent of an impact is considered as to whether impacts are either limited in extent or if it affects a wide area or group of people. Impact extent can be site specific (within the boundaries of the development area), local, regional or national and/or international.

Table 7: *Extent of impact*

Rating	Description	Quantitative Rating
Low	Site specific: occurs within the site boundary	1
Medium	Local: Extends beyond the site boundary; Affects the immediate surrounding environment (i.e. up to 5km from the project site boundary)	2
High	Regional: Extends far beyond the site boundary; widespread effect (i.e. 5km and more from the project site boundary)	3
Very High	National: Extends far beyond the site boundary; widespread effects.	4

## 11.4. Impact Duration

The duration of the impact refers to the time scale of the impact or benefit.

Table 7: Duration of Impact

Rating	Description	Quantitative Rating
Low	Short term: Quickly reversible; less than the project lifespan; 0-5 years.	1
Medium	Medium term: Reversible over time; Approximate lifespan of the project; 5-17 years.	2
High	Long term: Permanent; Extends beyond the decommissioning phase; >17 years	3

## 11.5. Impact Probability

The probability of the impact describes the likelihood of the impact actually occurring.

Table 8: Probability of impact

Rating	Description	Quantitative Rating
Improbable	Possibility of the impact materialising is negligible; Chance of occurrence <10%.	1
Probable	Possibility that the impact will materialise is likely; Chance of occurrence 10 – 49.9%.	2
Highly Probable	It is expected that the impact will occur; Chance of occurrence 50– 90%.	3
Definite	Impact will occur regardless of any prevention measures; Chance of occurrence >90%.	4

Definite and Cumulative	Impact will occur regardless of any prevention measures; Chance of occurrence >90% and is likely to result in cumulative impacts	5
-------------------------	--	---

## 11.6. Impact Intensity

The intensity of the impact is determined to quantify the magnitude of the impacts and benefits associated with the proposed project.

Table 9: Intensity of Impact

Rating	Description	Quantitative Rating
Maximum Benefit	Where natural, cultural and/or social functions or processes are positively affected resulting in the maximum possible and permanent benefit.	+5
Significant Benefit	Where natural, cultural and/ or social functions or processes are altered to the extent that it will result in temporary but significant benefit.	+4
Beneficial	Where the affected environment is altered but natural, cultural and/ or social functions or processes continue, albeit in a modified, beneficial way.	+3
Minor Benefit	Where the impact affects the environment in such a way that natural, cultural and/ or social functions or processes are only marginally benefited.	+2
Negligible Benefit	Where the impact affects the environment in such a way that natural, cultural and/ or social functions or processes are negligibly benefited.	+1
Neutral	Where the impact affects the environment in such a way that natural, cultural and/ or social functions or processes are not affected.	0
Negligible	Where the impact affects the environment in such a way that natural, cultural and/ or social functions or processes are negligibly affected.	-1



Rating	Description	Quantitative Rating
Minor	Where the impact affects the environment in such a way that natural, cultural and/ or social functions or processes are only marginally affected.	-2
Average	Where the affected environment is altered but natural, cultural and/ or social functions or processes continue, albeit in a modified way.	-3
Severe	Where natural, cultural and/ or social functions or processes are altered to the extent that it will temporarily cease.	-4
Very Severe	Where natural, cultural and/ or social functions or processes are altered to the extent that it will permanently cease.	-5

## 11.7. Impact Significance

The impact magnitude and significance rating is utilised to rate each identified impact in terms of its overall magnitude and significance.

Table 10: Impact Magnitude and Significance Rating

Impact	Rating	Description	Quantitative Rating
7	High	Of the highest positive order possible within the bounds of impacts that could occur.	+12- 16
	Medium	Impact is real, but not substantial in relation to other impacts that might take effect within the bounds of those that could occur. Other means of achieving this benefit are approximately equal in time, cost and effort.	+6- 11

Impact	Rating	Description	Quantitative Rating
	Low	Impacts is of a low order and therefore likely to have a limited effect. Alternative means of achieving this benefit are likely to be easier, cheaper, more effective and less time-consuming.	+1- 5
<b>No Impact</b>	No Impact	Zero impact	0
<b>Negat ive</b>	Low	Impact is of a low order and therefore likely to have little real effect. In the case of adverse impacts, mitigation is either easily achieved or little will be required, or both. Social, cultural, and economic activities of communities can continue unchanged.	-1- 5
	Medium	Impact is real, but not substantial in relation to other impacts that might take effect within the bounds of those that could occur. In the case of adverse impacts, mitigation is both feasible and fairly possible. Social cultural and economic activities of communities are changed but can be continued (albeit in a different form). Modification of the project design or alternative action may be required.	-6- 11
	High	Of the highest order possible within the bounds of impacts that could occur. In the case of adverse impacts, there is no possible mitigation that could offset the impact, or mitigation is difficult, expensive, time-consuming or a combination of these. Social,	-12- 16

Impact	Rating	Description	Quantitative Rating
		cultural and economic activities of communities are disrupted to such an extent that these come to a halt.	

## 12. 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.

### 12.1. Potential impacts on communities, individuals or competing land uses in close proximity

The following impacts are regarded as community impacts:

- Potential water and soil pollution resulting from hydrocarbon spills and soil erosion;
- Noise due to the undertaking of the site fly-overs;
- Poor access control resulting in impacts on cattle movement, breeding and grazing practices;
- Influx of persons (job seekers) to site as a result of increased activity and the possible resultant increase in opportunistic crime; and
- Visual Impact

Prospecting will be undertaken by specialist sub- contractors and it is not anticipated that employment opportunities for local and/ or regional communities will result from the prospecting activities.

### **12.1.1. Water quality and availability**

There is Orange river on the northern part of the site. The same river is used by mines closed by (Black mountain mine) of which their pipes passed through the properties under application.

### **12.1.2. Influx of persons resulting in increased crime rates**

The potential impacts of an increase in crime rates associated with an influx of unemployed persons travelling to mine sites seeking employment may occur.

### **12.1.3. Visual Impact**

The general characteristics of the site and that of the surrounding area are regarded to be that of "wilderness" and prospecting activities may result in localised visual impacts.

## **12.2. The possible mitigation measures that could be applied and the level of risk.**

The section below provides a summary of the key management measures associated with the impacts identified in the previous section. The detailed rating and management plan is presented in Section 11, of this report.

### **12.2.1. Measures to manage the potential impact on heritage resources**

No Heritage Impact Assessment study has been conducted. No graveyards were identified during the site visit and no prospecting will take place anywhere close to the graveyards. Should any graves be discovered during prospecting activities, all work will be stopped and an Archaeologist and Palaeontologist will be consulted.

### **12.2.2. Measures to manage the potential impacts on communities, individuals or competing land uses in close proximity**

*a. Pollution Prevention*

- Mitigation and management measures must be implemented to prevent environmental pollution which may impact on environmental resources utilized by communities, landowners and other stakeholders. These mitigation and management measures are discussed in the following section.

*b. Noise due to the under taking of the site fly-overs and prospecting activities;*

- Directly affected, adjacent landowners and game farms in proximity to the site will be informed of the planned dates of the airborne geophysics survey and a grievance mechanism will be made available. Mitigation alternatives are limited to timing of the flyovers which may affect aspects such as hunting activities on game farms.
- Farms owners will be consulted and informed of any low fly overs which may affect people or any animals being held in restricted holding pens, with a view to prevent possible injury or damage as a result of animals being start led by the noise.
- Site activities will be conducted during day time hours 07h00– 17h30 to avoid night time noise disturbances and night time collisions with fauna.

*c. Poor access control resulting in impacts on cattle movement, breeding and grazing practices;*

- Access control procedures must be agreed on with farm owners and all staff trained on these procedures.

*d. Influx of persons (job seekers) to site as a result of increased activity and the possible resultant increase in opportunistic crime;*

- Casual labour will not be recruited at the site to eliminate the incentive for persons travelling to site seeking employment.
- The landowner (all private and state land owners) will be notified of unauthorised persons encountered on site.
- If deemed necessary, the South African Police Service will be informed of unauthorised persons encountered on site.

e. *Visual Impact*

- Based on visual observation, wet dust suppression will be undertaken to manage dust emissions from vehicle movement and other construction activities as and when needed. Depending on the need and quantity of water used for wet suppression, a suitable, low environmental impact chemical suppression alternative must be considered in order to conserve water resources.
- The portable ablution facilities, vertical water tanks and any other infrastructure should be acquired with a consideration for colour. Natural earth, green and mat black options which will blend in with the surrounding area must be favoured.
- A waste management system will be implemented and sufficient waste bins will be provided for on- site. A fine system will be implemented to further prohibit littering and poor housekeeping practices.

Prospecting will be undertaken by specialist sub- contractors and it is not anticipated that employment opportunities for local and/ or regional communities will result from the prospecting activities.

**12.2.3. Measures to manage the potential impact on Water quality and availability**

a. *Potential water and soil pollution impacts resulting from hydrocarbon spills and soil erosion will be mitigated and managed as follows;*

- Existing tracks and roads must be used as far as is practicable to minimize the potential for soil erosion. In instances where access to drill sites are to be established, and if required, raised blade clearing will be undertaken with a view to maintain vegetation cover to limit soil erosion potential .
- Soil disturbances are to be limited as far as is practicable to minimize the potential for soil erosion.
- When establishing the drill pad, topsoil including the remaining vegetation, will be stripped and stockpiled up- slope of the pad. The stock pile will be shaped to divert stormwater around the drill pad to minimise soil erosion of the pad. Stockpiled topsoil will be used during rehabilitation efforts.

- Where practicable topsoil will be stripped to a depth of 10cm. Topsoil will be stockpiled to a maximum height of 1.5 m with a side slope of not more than 1:3.
- Mechanical erosion control methods will be implemented if required. This may include the use of geotextiles to stabilise slopes.
- To reduce the potential for water pollution during the drilling activities, a sump will be constructed with a sufficient capacity to receive drill fluids and allow for evaporation.
- The sump will be constructed to divert storm water away and/ or around the sump to avoid clean stormwater inflow.
- Oils and lubricant will be stored within secondary containment structures.
- Where practicable, vehicle maintenance will be undertaken off-site.
- In the event that vehicle maintenance is undertaken on-site (i.e. such as break down maintenance), drip trays and/ or UPVC sheets will be used to prevent spills and leaks onto the soil.
- A waste management system will be implemented and sufficient waste bins will be provided for onsite. A fine system will be implemented to further prohibit littering and poor housekeeping practices.
- Waste separation will be undertaken at source and separate receptacles will be provided (i.e. general waste, recyclables and hazardous waste).
- Receptacles will be closed (i.e. fitted with a lockable lid) to eliminate the possibility of access by animals overnight.
- Wastes will be removed and disposed of at an appropriately licensed landfill (facility disposal licenses will be verified) and recyclables will be taken to a licensed recycling facility.
- Drill holes must be temporarily plugged immediately after drilling is completed and remain plugged until they are permanently plugged below ground to eliminate the risk posed to fauna by open drill holes.
- Drill holes must be permanently capped as soon as is practicable.

#### **12.2.4. Motivation where no alternative sites were considered.**

Based on the history of Ore availability in the area, there is possibility to encounter Tungsten Ore on the properties subject to this Application.

The site is therefore regarded as the preferred site and alternative sites are not considered.

#### **12.2.5. Statement motivating the alternative development location within the overall site.**

As it is clear from the information provided, each of the phases is dependent on the results of the preceding phase. The location and extent of extraction and hauling has determined based on information derived from the geophysics surveys.

### **13. 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.**

In order to identify the potential impacts associated with the proposed prospecting activities the following steps were undertaken:

The stakeholder consultation process was undertaken in a manner to be interactive, providing landowners and identified stakeholders with the opportunity to provide input in to the project. This is a key focus, as the local residences have capabilities of providing site specific information, which may not be available in desktop research material. Stakeholders are requested (as part of the BID) to provide their views on the project and any potential concerns which they may have. All comments and concerns will be captured and formulated into the impact assessment.

A detailed desktop investigation was undertaken to determine the environmental setting in which the project is located. Based on the desktop investigations various resources were used to determine the significance and sensitivity of the various environmental considerations. The desktop investigation involved the use of:



- South African National Biodiversity Institute (SANBI) Biodiversity Geographic Database LUDS system;
- Geographic Information System base maps;
- Department of Water Affairs information documents such as the (ISP and Groundwater Vulnerability Reports);
- Municipal Integrated Development Plan;
- Municipal Strategic Development Framework; etc.

A site visit was undertaken on the 12<sup>th</sup> of July 2022. This site visit was utilized to ensure that the information gathered as part of the desktop investigation reflects the current status of the land.

The rating of the identified impacts was undertaken in a quantitative manner as provided from Impact Ratings. The ratings are undertaken in a manner to calculate the significance of each of the impacts. The EAP also assesses the outcomes of the calculation to determine whether the outcome reflects the perceived and actual views. The identification of management measures are done based on the significance of the impacts and measures that have been considered appropriate and successful, specifically as Best Practical and Economical Options.

### 13.1. Assessment of each identified potentially significant impact and risk

Table 11: Identified potentially significant impacts and risk

Name of Activity	Potential Impact	Aspects Affected	Phase	Significance	Mitigation Type	Significance
<b>Phase 1: Data Acquisition and Desktop Study</b>						
Data Collection and assessment (desktop only)	None identified	N/A	Planning	N/A	No mitigation proposed.	N/A
Data Assessment	None identified	N/A	Planning	N/A	No mitigation proposed	N/A
<b>Phase 2: Target Generation and Ground Truthing</b>						
Site fly-over	Noise impacts resulting from site flyovers affecting cattle and other animals	Noise generation	Planning	7	Directly affected, adjacent landowners and game farms in proximity to the site will be informed of the planned dates of the airborne geophysics survey and a grievance mechanism will be made available. Mitigation alternatives are limited to timing of the flyovers which may affect aspects such as hunting activities	7

Name of Activity	Potential Impact	Aspects Affected	Phase	Significance	Mitigation Type	Significance
					on animals found on site and in proximity areas.  Farm owners must be consulted and informed of any low fly overs which may affect cattle being held in restricted holding pens, which may result in injury or damage.	
	Nuisance noise impacts on communities and landowners and other persons.	Noise generation	Planning	7	No mitigation proposed.	7
Ground surveys	Poor access control resulting in impacts on cattle and horses' movement, breeding and grazing practices.	Loss of cattle and horses	Planning	10	Access control procedures must be agreed on with farm owners and all staff trained on these procedures.	8

Name of Activity	Potential Impact	Aspects Affected	Phase	Significance	Mitigation Type	Significance
No construction or site establishment activities will be undertaken.	No anticipated impacts	N/A	N/A	N/A	No mitigation proposed.	N/A
Soil sampling (30 kg of soil per sample)	Destruction and/ or disturbance of on-site fauna and flora.	Loss of fauna	Operational Phase	6	<p>Use existing track and roads in all instances as far as practicable.</p> <p>As part of the soil sampling programme, no tracks will be cleared for once-off access to sampling sites.</p> <p>Avoid significant vegetation such as trees and large shrubs if driving through the veld is required to access an identified sampling site.</p> <p>Site activities will be conducted during daytime hours 07h00- 17h30 to avoid night noise disturbances and nighttime collisions with fauna.</p>	5

Name of Activity	Potential Impact	Aspects Affected	Phase	Significance	Mitigation Type	Significance
					Vehicle speed will be reduced, particularly in highly vegetated areas to avoid deaths by vehicle impacts.	
	Poor access control resulting in impacts on cattle movement, breeding, and grazing practices.	Noise generation	Operational Phase	10	Access control procedures must be agreed on with farm owners and all staff trained on these procedures.	8
	Vehicle traffic noise impact affecting cattle and horses or even wildlife from neighbouring farms.	Loss of cattle and/or nuisance creation.	Operational Phase	6	Site activities will be conducted during daytime hours 07h00- 17h30 to avoid night-time noise disturbances and night-time collisions with fauna.	4
	Poor housekeeping could result in littering and the associated impacts this will have on the area, contamination	Loss of aesthetic value, loss of water resources	Operational Phase	13	A waste management system will be implemented, and sufficient waste bins will be provided for on site. A fine system will be implemented to further prohibit	6

Name of Activity	Potential Impact	Aspects Affected	Phase	Significance	Mitigation Type	Significance
	<p>of river systems in the rainy season and the potential health hazard to cattle and other animals.</p>	<p>, loss of fauna and flora.</p>			<p>littering and poor housekeeping practices.</p> <p>Waste separation will be undertaken at source and separate receptacles will be provided (i.e., general waste, recyclables, and hazardous waste).</p> <p>Receptacles will be closed (i.e., fitted with a lockable lid) to eliminate the possibility of access by animals overnight.</p> <p>Wastes will be removed and disposed of at an appropriately licensed landfill (facility disposal licenses will be verified) and recyclables will be taken to a licensed recycling facility.</p>	

Name of Activity	Potential Impact	Aspects Affected	Phase	Significance	Mitigation Type	Significance
	Activities within the riverbed could result in the disturbance to the natural geomorphology.	Loss of fauna and flora, altering the riverbed.	Operational Phase	12	Only sampling may be undertaken in the riverbed. No other activities (drilling, roads, etc.) may be undertaken.	4
	Activities within the riverbed could result in safety hazards during rainy periods.	Loss and. Or damage to life.	Operational Phase	15	No sampling within the riverbed will be permitted during rainy periods.  A first aid station and emergency must be available on site.	7
	Soil disturbance from soil sampling resulting in soil structure destruction, compaction, and erosion.	Loss of soil resources	Operational Phase	6	Soil disturbances are to be limited as far as is practicable.	5
No decommissioning activities will be required.	No anticipated impacts.	N/A	Decommissioning Phase	N/A	No mitigation proposed.	N/A

Name of Activity	Potential Impact	Aspects Affected	Phase	Significance	Mitigation Type	Significance
<b>Phase 3: Scout Drilling and Delineation Drilling</b>						
Site Access	Destruction and/ or disturbance of on-site fauna and flora.	Loss of fauna and flora	Operational Phase	10	<p>Map indicating the location of the drilling sites must be submitted to the relevant landowners, as well as to the DMR and DWS. Upon agreement of the location of the activities can the applicant proceed.</p> <p>Use existing track and roads in all instances as far as is practicable.</p> <p>Where track clearing is necessary, raised blade clearing will be conducted to minimise disturbance and aid rehabilitation efforts and significant vegetation such trees and large shrubs will be avoided.</p>	6



Name of Activity	Potential Impact	Aspects Affected	Phase	Significance	Mitigation Type	Significance
					<p>Site activities will be conducted during daytime hours 07h00- 17h30 to avoid night-time noise disturbances and night-time collisions with fauna.</p> <p>Vehicle speed will be reduced, particularly in highly vegetated areas is one way to avoid deaths by vehicle impacts.</p>	
	Soil compaction resulting from repeated use of access roads to drill sites.	Loss of soil resources	Construction Phase	8	<p>Where track clearing is necessary, raised blade clearing be conducted to minimise disturbance and aid rehabilitation efforts.</p> <p>As part of rehabilitation, all compacted roads and drill pads will be ripped and re-vegetated.</p>	5

Name of Activity	Potential Impact	Aspects Affected	Phase	Significance	Mitigation Type	Significance
	Vehicle traffic noise impact affecting cattle, horses, and other animals on site.	Loss of fauna	Construction Phase	6	Site activities will be conducted during daytime hours 07h00- 17h30 to avoid night-time noise disturbance.	4
	Poor access control resulting in impacts on cattle and horses' movement, breeding, and grazing practices.	Loss of fauna	Construction Phase	10	Access control procedures must be agreed on with farm owners and staff trained.	8
	Potential destruction of heritage resources	No heritage/cultural resources on site	Construction Phase	N/A	No mitigation proposed.	N/A
Site establishment activities including: (a) Vegetation clearing of drill pad area. (b) Topsoil stripping and stockpiling	Destruction and/ or disturbance of fauna and flora	Loss of fauna and flora	Construction Phase	10	The removal of vegetation within the drill pad area will be minimized.  If practicable, raised blade clearing be conducted for the entire drill pad to minimise	7

Name of Activity	Potential Impact	Aspects Affected	Phase	Significance	Mitigation Type	Significance
<p>(c) Drill pad compaction.</p> <p>(d) Excavation and lining of drill water sump.</p> <p>(e) Erection of temporary site office shaded area, potable ablution facilities and water storage tanks and core bad.</p> <p>(f) Erection of fuel storage tank</p>					<p>disturbance and aid rehabilitation efforts.</p> <p>The design of the drill fluid sump must incorporate effective fauna egress to avoid entrapment.</p> <p>A fire emergency procedure will be developed to contain and minimise the destruction of flora and faunal habitat which may result from fire.</p>	
<p>(g) Erection of safety barrier.</p> <p>(h) Waste generation and management.</p>	<p>Soil disturbance and topsoil stockpiling resulting in soil compaction and erosion.</p>	<p>Loss of soil resources</p>	<p>Construction Phase</p>	<p>11</p>	<p>If the drill pad is cleared of all vegetation, lower blade clearing will be undertaken prior to the stripping of topsoil.</p> <p>Topsoil including the remaining vegetation, will be stripped, and stockpiled up-slope of the pad. The</p>	

Name of Activity	Potential Impact	Aspects Affected	Phase	Significance	Mitigation Type	Significance
					<p>stockpile will be shaped to divert stormwater around the drill pad to minimise soil erosion of the pad.</p> <p>Where practicable topsoil will be stripped to a depth of 10 cm.</p> <p>Vegetation removed through lower blade clearing will be mixed with topsoil to increase organic content and to preserve the seed bank to aid rehabilitation efforts.</p> <p>Topsoil will be stockpiled to a maximum height of 1.5m with a side slope of not more than 1:3.</p> <p>Mechanical erosion control methods will be implemented if</p>	

Name of Activity	Potential Impact	Aspects Affected	Phase	Significance	Mitigation Type	Significance
	Dust emission resulting from site clearing, soil stripping and construction activities (including vehicle entrained dust)	Dust emissions	Construction Phase	10	<p>required. This may include the use of geo tiles to stabilise slopes.</p> <p>Based on visual observation, wet dust suppression will be undertaken to manage dust emissions from vehicle movement and other construction activities as and when deemed.</p> <p>Depending on the need and quantity of water used for wet suppression, a suitable, low environmental impact chemical suppression alternative must be considered to conserve water resources.</p>	6
	Visual impact affecting character and "sense of place".	Loss in aesthetics	Construction Phase	6	The shaded office area, portable ablution facilities, vertical water tanks and any other infrastructure should be acquired with a	5

Name of Activity	Potential Impact	Aspects Affected	Phase	Significance	Mitigation Type	Significance
					consideration for colour. Natural earth, green and mat black options which will blend in with the surrounding area must be favoured	
	Influx of persons (job seekers) to site because of increased activity resulting in increased incidents of theft and opportunistic crime.	Increase in petty crimes	Construction Phase	8	<p>Casual labour will not be recruited at the site to eliminate the incentive for persons travelling to site seeking employment.</p> <p>The landowner (all private and state landowners) will be notified of unauthorised persons encountered on site.</p> <p>If deemed necessary, the South African Police Services (SAPS) will be informed of unauthorised persons encountered on site.</p>	7

Name of Activity	Potential Impact	Aspects Affected	Phase	Significance	Mitigation Type	Significance
Exploration drilling and core sample collection and storage including: (a) Scout and delineation drilling (b) Drill maintenance and re-fuelling. (c) Core sample collection and storage. (d) Waste generation and management.	Water and soil pollution resulting from disposal of drill fluids.	Loss of water resources, loss of soil resources	Operational Phase	12	A sump will be constructed with a sufficient capacity to receive drill fluids and allow for evaporation.  The sump will be constructed to divert stormwater away and/ or around the sump to avoid clean stormwater inflow.	5
	Continued soil erosion from topsoil stockpile and soil compaction from drill pad platform.	Loss of soil resources	Operational Phase	11	If raise blade clearing is not undertaken, and the drill pad is cleared, topsoil will be stockpiled to a maximum height of 1.5m with a side slope of not more than 1:3.  The topsoil stockpile will be shaped to divert stormwater around the drill pad to minimise soil erosion of the pad.	7

Name of Activity	Potential Impact	Aspects Affected	Phase	Significance	Mitigation Type	Significance
					Management efforts using mechanical erosion control methods will be implemented if required. This may include the use of geotextiles.	
	Potential water and soil pollution resulting from hydrocarbon spills and drill maintenance activities.	Loss of water resources and loss of soil resources	Operational Phase	12	<p>Fuel storage tanks will have a secondary containment structure with a capacity of 110% of the total tank capacity.</p> <p>Oils and lubricant will be stored within secondary containment structures.</p> <p>Where practicable, vehicle maintenance will be undertaken off-site.</p> <p>If vehicle maintenance is undertaken in-site (i.e., such as</p>	5



Name of Activity	Potential Impact	Aspects Affected	Phase	Significance	Mitigation Type	Significance
					<p>breakdown maintenance), drip trays and. Or UPVC sheets will be used to prevent spills and leaks onto the soil.</p> <p>Unused machinery must be completely drained of oil and other hydrocarbons to ensure that leaks do not develop.</p> <p>Regular inspections of all vehicles must be carried out to ensure that all leaks identified early and rectified.</p> <p>Enough waste receptacles will be provided.</p> <p>Waste separation will be undertaken to source and</p>	

Name of Activity	Potential Impact	Aspects Affected	Phase	Significance	Mitigation Type	Significance
					<p>separate receptacles will be provided (i.e., general waste, recyclables, and hazardous waste).</p> <p>Receptacles will be closed (i.e., fitted with a lockable lid) to eliminate the possibility of access by animals overnight.</p> <p>Wastes will be removed and disposed of at an appropriately licensed landfill (facility disposal licenses will be verified) and recyclables will be taken to a licensed recycling facility.</p>	
	Dust emissions from drilling and general site activities (including vehicle entrained dust).	Increase in dust emissions.	Operational Phase	10	Based on visual observation wet dust suppression will be undertaken as and when required to manage	6

Name of Activity	Potential Impact	Aspects Affected	Phase	Significance	Mitigation Type	Significance
					dust emissions from vehicle movement.  Depending on the need and quantity of water used for wet suppression, chemical suppression alternatives must be considered to conserve water resources.	
	Visual impact affecting visual character and "sense of place"	Loss of aesthetic value	Operational Phase	6	Visual impact of structures will be mitigated through measures indicated on this table.  Visual dust dispersion will be mitigated through the same measures.	5
	Vehicle traffic and drill noise impact affecting animals on site.	Loss of fauna	Operational Phase	5	Site will be conducted during daytime hours 07h00- 17h30 to avoid night-time noise disturbances.	4

Name of Activity	Potential Impact	Aspects Affected	Phase	Significance	Mitigation Type	Significance
	Poor access control resulting in impacts on cattle movement, breeding, and grazing practices.	Loss of cattle's and other animals	Operational Phase	10	Access control procedures must be agreed on with farm owners.	8
	Influx of persons (job seekers) to site because of increased activity resulting in increased incidents of theft and opportunistic crime.	Increase in petty crimes	Operational Phase	8	<p>Casual labour will not be recruited at the site to eliminate the incentive for persons travelling to site seeking employment.</p> <p>The landowner (Department of Rural Development and Land Reform) will be notified of unauthorised persons encountered on site.</p> <p>If deemed necessary, the SAPS will be informed of unauthorised persons encountered on site.</p>	7

Name of Activity	Potential Impact	Aspects Affected	Phase	Significance	Mitigation Type	Significance
	Impact on the plans and associated ecosystems in the area.	Loss of sensitive environments, loss of fauna and flora	Operational Phase.	12	<p>The prospecting areas must be clearly demarcated.</p> <p>No prospecting activities may be undertaken within the pan areas.</p> <p>All site plans must indicate the presence of pans.</p>	5
Removal of temporary infrastructure including: (a) Removal of temporary site office shaded area, potable ablution facilities, water storage tanks and core bay. (b) Borehole capping	Destruction and/ or disturbance of on-site fauna.	Loss of sensitive environments, loss of fauna, loss of flora	Decommissioning	10	<p>Drill holes must be temporarily plugged immediately after drilling is complete and remain plugged until they are permanently plugged below ground to eliminate the risk posed to fauna by open drill holes.</p> <p>Drill holes must be permanently capped as soon as is practicable.</p>	7
Drill pad rehabilitation including:	Dust emissions from decommissioning	Increase in dust emissions	Decommissioning	9	Based on visual observation wet dust suppression will be undertaken as and when required to manage	Based 6

Name of Activity	Potential Impact	Aspects Affected	Phase	Significance	Mitigation Type	Significance
(a) Ripping of drill pad and access road. (b) Re-spreading of stockpiled topsoil. (c) Re-vegetation	activities (including vehicle entrained dust)				dust emissions from vehicle movement.  Depending on the need and quantity of water used for wet suppression, chemical suppression alternatives must be considered to conserve water resources.	
	Poor access control resulting in impacts on cattle and horses' movement, breeding, and grazing practices.	Loss of cattle and horses	Decommissioning	10	Access control procedures must be agreed on with farm owners and staff trained.	8
	Potential water and soil pollution resulting from hydrocarbon spills.	Loss of water and soil resources	Decommissioning	12	All fuel storage tanks will be emptied prior to removal.  Drill holes must be permanently capped as soon as is practicable to eliminate the risk of groundwater contamination.	7

Name of Activity	Potential Impact	Aspects Affected	Phase	Significance	Mitigation Type	Significance
					<p>Wastes will be removed and disposed of at an appropriately licensed landfill (facility disposal licenses will be verified) and recyclables will be taken to a licensed recycling facility.</p>	
	<p>Soil erosion resulting from the re-spreading of topsoil before vegetation is re-established</p>	<p>Loss of soil resources</p>	<p>Decommissioning</p>	11	<p>Mechanical erosion control methods will be implemented if required. This may include the use of geotextiles.</p> <p>Re-vegetation will be conducted through hand seeding exposed areas using indigenous grass species as determined by a suitably qualified ecologist.</p> <p>Re-vegetation efforts will be monitored every second month for</p>	7

Name of Activity	Potential Impact	Aspects Affected	Phase	Significance	Mitigation Type	Significance
					<p>a period of six months after initial seeding.</p> <p>An effective vegetation cover of 45% must be achieved. Re-seeding will be undertaken if this cover has not been achieved after six months</p>	



### 13.2. Summary of specialist reports.

Table 12: 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.
No studies have been conducted for this application. No graves observed on site.	N/A	N/A	N/A

## **14. ENVIRONMENTAL IMPACT STATEMENT**

### **14.1. Summary of the key findings of the environmental impact assessment;**

The proposed project site is characterised by its distinct flatness. Flat surface helps in terms of mobility as it creates the movability of rig to be easy. It is believed that Tungsten Ore occurrence is mostly on flat laying and slightly rocky area. On the site area, there is residential on site, grape farm, and just open veld on site. There are no graves observed within the prospecting area during the site visit.

### **14.2. Final Site Map**

Attach to **Appendix A.**

### **14.3. Summary of the positive and negative impacts and risks of the proposed activity and identified alternatives;**

- Increased ambient noise levels resulting from geophysics surveys site fly-overs and increased traffic movement during all prospecting phases as well as drilling activities.
- Potential water and soil pollution impacts resulting from hydrocarbon spills and soil erosion which may impact on environmental resources utilized by communities, landowners and other stakeholders.
- Potential water and soil pollution impacts result from hydrocarbon spills and soil erosion which may impact on ecosystem functioning.
- Increased vehicle activity with in the area resulting in the possible destruction and disturbance of fauna and flora.
- Poor access control to farms which may impact on other practices within the vicinity of the study area.
- Influx of persons (job seekers) to site as a result of increased activity and the possible resultant increase in opportunistic crime.
- Potential visual impacts caused by blasting/ extraction activities.

Prospecting will be undertaken by specialist sub-contractors and it is not anticipated that employment opportunities for local and/ or regional communities will result from the prospecting activities.

#### **14.4. Proposed impact management objectives and the impact management outcomes for inclusion in the EMPr;**

The objectives of the EMPr will be to:

- Provide sufficient information to strategically plan the prospecting activities as to avoid unnecessary social and environmental impacts.
- Provide sufficient information and guidance to plan prospecting activities in a manner that would reduce impacts (both social and environmental) as far as practically possible.
- Ensure an approach that will provide the necessary confidence in terms of environmental compliance.
- Provide a management plan that is effective and practical for implementation.

Through the implementation of the proposed mitigation measures, it is anticipated that the identified social & environmental Impacts can be managed and mitigated effectively. Through the implementation of the mitigation and management measures it is expected that:

- Noise impacts can be managed through consultation and through the restriction of operating hours;
- The pollution of soil and water resources can be effectively managed through containment;
- Ecological impact can be managed through the implementation of pollution prevention measures, minimizing land clearing, restricting working hours (faunal disturbance) and rehabilitation.
- Concerns regarding access control to farms can be managed through the development and ensuring compliance to an appropriate access control procedure.
- Risks associated with crime can be mitigated through avoiding recruitment activities on site, as well as monitoring and reporting.
- Visual impact can be minimized through giving consideration to drill site infrastructure placement and materials used.

## **14.5. Aspects for inclusion as conditions of Authorisation.**

The following conditions should be included into the Authorisation:

- A map detailing the drilling locations should be submitted to the relevant landowners and the DWS and DMR prior to the commencement of these activities;
- No activities may be undertaken in the pans;
- No activities, with the exception of the soil sampling, may take place within 32m from any river.

## **14.6. Description of any assumptions, uncertainties and gaps in knowledge.**

The following assumptions, uncertainties and gaps are applicable to this project:

- Due to significant time constraints allowed for the assessment of the impacts, and at the time of compiling the Basic Assessment Report and EMP:
  - The Stakeholder Consultation is not yet complete.
  - Landowners were not consulted with, in person.
  - Details regarding the presence and status of land claims are not available.
- No detailed site layout is available due to the nature of the prospecting activities. The study is therefore undertaken as a holistic assessment of the overall site.
- Site investigation by EAP was undertaken on the 12<sup>th</sup> of July 2022.

## **15. Reasoned opinion as to whether the proposed activity should or should not be authorised**

### **15.1. Reasons why the activity should be authorized or not.**

According to the impact assessment undertaken for the proposed project, the key impacts of the project are on soils, natural vegetation, and landowners/occupiers. The project will also have positive impacts due to the employment to be created although for a short term (maximum of 2 years).

The public are provided an opportunity to review the DBAR and EMPr and provide their input/comments and concerns. All comments that will be received during Public Participation Process will be included in the Final BAR and EMPr. Their comments will be addressed as far as possible to the satisfaction of the interested and affected parties.

The management of the impacts identified in the impact assessment for all phases of the proposed project will be undertaken through a range of programmes and plans contained in the EMPr. In consideration of the programmes and plans contained within the EMPr, layouts and method statements compiled for the project, which is assumed will be effectively implemented, there will be significant reduction in the significance of potential impacts. Based on the above, it is therefore the opinion of the EAP that the activity should be authorised.

## **15.2. Conditions that must be included in the authorisation**

The following conditions must be included in the authorisations:

- A map detailing the drilling locations should be submitted to the relevant landowners and DMR prior to the commencement of these activities;
- No activities may be under taken in the pans ;
- No activities, with the exception of the soil sampling, may take place within 32m from any river.

## **15.3. Period for which the Environmental Authorisation is required.**

The Prospecting Right has been applied for a period of 5 (Five) years.

## **16. Undertaking**

The signed undertaking is presented at the end of the current document.

## **17. Financial Provision**

According to Appendix 3 of the EIA Regulations, 2014 as amended, where applicable, details of any financial provisions for the rehabilitation, closure, and ongoing post decommissioning management of negative environmental impacts must be provide in

the BAR and EMPr. To avoid duplication, the financial provision for the proposed project has only been provided under the relevant section of the EMPr.

### 17.1. Explain how the aforesaid amount was derived.

Most important to note is that the prescribed method for estimating a closure costs, as provided for by the DMR in the form of the Guideline Document for the Evaluation of Financial Provisions, only acts as a guideline, and therefore indicates the minimum requirements for assessing and reporting on a closure cost estimate.

#### 17.1.1. Method of Assessment

As mentioned before, Fecund Consultants Pty Ltd made use of the Guideline Document for the Evaluation of Financial Provisions made by the Mining Industry. The following table presents the step-by-step details on how the financial provision has been derived. For the purposes of determining the quantum for closures, it is assumed that the infrastructure will have no salvage value.

Table 14: Method of assessment of financial provision.

Step	Description	DMR Applicable Table	Outcomes
1	Determine primary mineral and saleable mineral by-products	Table B.12	<b>Low Risk</b>
2	Determine Risk Class	Table B.12	<b>Primary Risk Class: C</b> (Small operation, no waste, no processing). Risk Class C is considered a low risk with a low probability of occurrence of the impact with a negligible consequence.
3	Determine the Area Sensitivity	Table B.4	<b>Medium to High Sensitivity.</b>

Step	Description	DMR Applicable Table	Outcomes
4.1	Determine the level of information	N/A	Limited information is available which is based on desktop investigations and consultation with stakeholders.
4.2	Determine the closure components	Table B.5	
4.3	Determine the unit rates for closure components	Table B.6	
4.4	Determine and apply the weighting factors	Table B.7 Table B.8	Weighting factor 1 (Nature of the terrain): 1 (generally flat terrain) Weighting factor 2 (Peri-urban, less than 150km from a developed urban area): 1.05(Rural/Urban).
4.5	Identify areas of disturbance	N/A	No areas of disturbance are considered in this assessment. The area in which the prospecting activities are planned is considered to be undisturbed.
4.6	Identify closure costs from specialist studies	Table B.9	Due to the fact that the operation in question is NOT a mining operation, no residual impacts should take place. If self-succession does not take place satisfactorily the client may be subjected to additional specialist investigations (ecological and paedology) to determine seeding and re-vegetation requirements.
4.7	Calculate Closure Costs	Table B.10	See the following section.

### **17.1.2. Quantity Estimation**

For the purposes of this assessment, Envirostep Pty Ltd can confirm that the method adopted to obtain and compile the schedule of quantities is sound, correct, and provides detail that is required by the DMR. The information will allow for continued monitoring and updating of quantities and provides the ideal platform to manage and monitor the actual on-site rehabilitation measures and costs incurred.

### **17.1.3. Determination of Rates**

The method of determining the applicable rehabilitation rates is based on practical experience and information by third party contractors.

The following table summarises the unit rates for closure components as specified in the DMR Guideline Document and indicates which rates were used by Fecund Consultants Pty Ltd in this assessment.



**CALCULATION OF THE QUANTUM**

Applicant:  
Evaluators:

**Envirostep Pty Ltd**  
**Fecund Consultants Pty Ltd**

Ref No.:  
Date:

**NC 30/5/1/2/2/ 13091 PR**  
**03/08/2022**

No.	Description	Unit	A	B	C	D	E=A*B*C*D
			Quantity	Master Rate	Multiplication factor	Weighting factor 1	Amount (Rands)
1	Dismantling of processing plant and related structures (including overland conveyors and powerlines)	m3	0	14,05	1	1	0
2 (A)	Demolition of steel buildings and structures	m2	0	195,76	1	1	0
2(B)	Demolition of reinforced concrete buildings and structures	m2	0	288,49	1	1	0
3	Rehabilitation of access roads	m2	0,001	35,03	1	1	0,03503
4 (A)	Demolition and rehabilitation of electrified railway lines	m	0	340,01	1	1	0
4 (A)	Demolition and rehabilitation of non-electrified railway lines	m	0	185,46	1	1	0
5	Demolition of housing and/or administration facilities	m2	0	391,53	1	1	0
6	Opencast rehabilitation including final voids and ramps	ha	0	205242,16	1	1	0
7	Sealing of shafts adits and inclines	m3	0	105,09	1	1	0
8 (A)	Rehabilitation of overburden and spoils	ha	0,001	136828,1	1	1	136,8281
8 (B)	Rehabilitation of processing waste deposits and evaporation ponds (non-polluting potential)	ha	0	170416,93	1	1	0
8 ( C )	Rehabilitation of processing waste deposits and evaporation ponds (polluting potential)	ha	0	494971,55	1	1	0
9	Rehabilitation of subsided areas	ha	0,1	114572,93	1	1	11457,293
10	General surface rehabilitation	ha	0,2	108390,94	1	1	21678,188
11	River diversions	ha	0	108390,94	1	1	0
12	Fencing	m	0	123,64	1	1	0
13	Water management	ha	0	41213,28	1	1	0
14	2 to 3 years of maintenance and aftercare	ha	0	14424,65	1	1	0
15 (A)	Specialist study	Sum	0			1	0
15 (B)	Specialist study	Sum				1	0
<b>Sub Total 1</b>							<b>33272,34413</b>

1	Preliminary and General	3992,681296	<b>weighting factor 2</b>	3992,681296
			1	
2	Contingencies		3327,234413	3327,234413
<b>Subtotal 2</b>				<b>40592,26</b>
<b>VAT (14%)</b>				<b>5682,92</b>

<b>Grand Total</b>	<b>46275</b>
--------------------	--------------

#### **17.1.4. Financial Provision**

The financial provision required by the holder of the prospecting right must be provided for by one or more of the following methods in order to achieve the total quantum of rehabilitation and remediation of environmental impacts and damage as well as final closure:

- Approved dedicated trust fund;
- Financial guarantee from a South African registered bank or any other approved financial institution;
- Cash deposit to be deposited at the office of the Regional Manager; or
- Any other manner determined by the Minister.

The client is required to annually assess the total quantum of environmental liability for the operation and ensure that financial provision is sufficient to cover the current liability (in the event of premature closure), as well as the end of life liability.

As per Government Legislature, the client is required to ensure full financial cover for the current liability at any point in the life of the operation. Pecuniary provision must be made for the short fall between the existing trust fund balance and the premature closure or current environmental rehabilitation liability if applicable.

#### **17.1.5. Confirm that this amount can be provided for from operating expenditure.**

It should be noted that the current expenditure provided for in the Financial and Technical ability does not include the calculated Financial Provision as included into this Basic Assessment, as these values were not available at the time of the submission.

## **18. Specific information required by the Competent Authority**

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

### **18.1.1. Impact on the socio-economic conditions of any directly affected person.**

No specific report was generated for the purposes of the socio-economic conditions. All findings are presented hereafter:

#### *a. Potential impacts on communities, individuals or competing land uses in close proximity*

The following impacts are regarded as community impacts:

- Potential water and soil pollution resulting from hydrocarbon spills and soil erosion;
- Noise due to the undertaking of the site fly -overs;
- Poor access control resulting in impacts on people movement
- Influx of persons (job seekers) to site as a result of increased activity and the possible resultant increase in opportunistic crime; and
- Visual Impact

Prospecting will be undertaken by specialist sub- contractors and it is not anticipated that employment opportunities for local and/ or regional communities will result from the prospecting activities.

#### *b. Measures to manage the potential impacts on communities, individuals or competing land uses in close proximity*

- Pollution Prevention
  - ❖ Mitigation and management measures must be implemented to prevent environmental pollution which may impact on environmental resources

utilized by communities, landowners and other stakeholders. These mitigation and management measures are discussed in the following section.

- Noise due to the undertaking of the site fly-overs and prospecting activities;
  - ❖ Site activities will be conducted during day time hours 07h00 –17h30 to avoid night time noise disturbances and night time collisions with fauna.
- Influx of persons (job seekers) to site as a result of increased activity and the possible resultant increase in opportunistic crime;
  - ❖ Casual labour will not be recruited at the site to eliminate the incentive for persons travelling to site seeking employment.
  - ❖ The landowner (all private and state land owners) will be notified of unauthorised persons encountered on site.
  - ❖ If deemed necessary, the South African Police Service will be informed of unauthorised persons encountered on site.
- Visual Impact
  - ❖ Based on visual observation, wet dust suppression will be undertaken to manage dust emissions from vehicle movement and other construction activities as and when needed. Depending on the need and quantity of water used for wet suppression, a suitable, low environmental impact chemical suppression alternative must be considered in order to conserve water resources.
  - ❖ The portable ablution facilities, vertical water tanks and any other infrastructure should be acquired with a consideration for colour. Natural earth, green and mat black options which will blend in with the surrounding area must be favoured.
  - ❖ A waste management system will be implemented and sufficient waste bins will be provided for on-site. A fine system will be implemented to further prohibit littering and poor housekeeping practices.

Prospecting will be undertaken by specialist sub- contractors and it is not anticipated that employment opportunities for local and/ or regional communities will result from the prospecting activities.

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

No graves were seen on site during the site visit, and should they be discovered during the prospecting activities, all activities should stop and an Archaeologist should be consulted.

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

None.

## **PART B**

# **ENVIRONMENTAL MANAGEMENT PROGRAMME REPORT**

## **1. Environmental Management Programme.**

### **1.1. Details of the EAP**

The requirement for the provision of the details and expertise of the EAP are included in PART A, section 1 (a).

### **1.2. Description of the Aspects of the Activity**

The requirement to describe the aspects of the activity that are covered by the Environmental Management Programme is already included in PART A, section 3.

### **1.3. Composite Map**

Please refer to Appendix A for the Composite Map.

### **1.4. Description of Impact management objectives including management statements**

#### **1.4.1. Determination of closure objectives.**

The following are the closure objectives, general principles and objectives guiding closure of the Prospecting right area closure planning:

- Rehabilitation of areas disturbed as a consequence of prospecting to a land capability that will support and sustain a predetermined post-closure land use.
- Removal of all infrastructure/equipment that cannot be beneficially re-used, as per agreements established, and returning the associated disturbed land to the planned final land use.
- Removal of existing contaminated material from affected areas.
- Establishment of final landforms that are stable and safe in the long run.
- Establishment and implementation of measures that meet specific closure related performance objectives.
- Monitoring and maintenance of rehabilitated areas forming part of site closure to ensure the long-term effectiveness and sustainability of measures implemented.



**1.4.2. Volumes and rate of water use required for the operation.**

This information is not applicable for this application.

**1.4.3. Has a water use licence has been applied for?**

Not applicable.

### 1.5. Impacts to be mitigated in their respective phases

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

Table 13: Impacts to be mitigated in their respective phases.

Activities	Phase	Size and scale of disturbance	Mitigation Measures	Compliance with standards	Time period for implementation
<b>Phase 1: Data Acquisition and Desktop Study</b>					
Data collection and assessment (desktop study only)	Planning	Entire property (8430 ha) excluding portion 1 and R of the farm Boschpan 339 HO - nature reserve	1. No mitigation proposed	Identification of the potential of invasive prospecting activities to occur within sensitive environments such as the pans and river systems, in this event the necessary consultation must be initiated with the DWS.	N/A
Data Assessment	Planning	Entire property	2. No mitigation proposed.	Identification of the potential of invasive prospecting activities to	N/A

Activities	Phase	Size and scale of disturbance	Mitigation Measures	Compliance with standards	Time period for implementation
				occur within sensitive environments such as the pans and river systems, in this event the necessary consultation must be initiated with the DWS.	
<b>Phase 2: Target Generation and Ground Truthing</b>					
Site fly-over	Planning	Entire property	3. Directly affected, adjacent landowners and game farms in proximity to the site will be informed of the planned dates of the airborne geophysics survey and a grievance mechanism will be made available. Mitigation alternatives are limited to timing of the flyovers which may affect aspects such as	Identification of the potential of invasive prospecting activities to occur within sensitive environments such as the pans and river systems, in this event the necessary consultation must be initiated with the DWS.	N/A

Activities	Phase	Size and scale of disturbance	Mitigation Measures	Compliance with standards	Time period for implementation
			<p>hunting activities on game farms.</p> <p>4. Farms owners must be consulted and informed of any low fly-overs which may affect cattle being held in restricted holding pens, which may result in injury or damage.</p> <p>5. No mitigation proposed of noise impacts.</p>		
Ground surveys	Planning	Entire property	6. Access control procedures must be agreed on with farm owners and all staff trained on these procedures.	Identification of the potential of invasive prospecting activities to occur within sensitive environments such as the pans and river systems, in	N/A

Activities	Phase	Size and scale of disturbance	Mitigation Measures	Compliance with standards	Time period for implementation
				this event the necessary consultation must be initiated with the DWS.	
No construction or site establishment activities will be undertaken	N/A	N/A	7. No mitigation required for construction as no facilities will be erected.	N/A	N/A
Soil sampling (30kg of soil per sample)	Operational	Less than 10ha	<p>8. Use existing track and roads in all instances as far as is practicable.</p> <p>9. As part of the soil sampling programme, not racks will be cleared for once-off access to sampling sites.</p> <p>10. Avoid significant vegetation such as trees and large shrubs in the event that driving through</p>	<p>No bulk sampling activities in terms of Section 20 of the MPRDA have been allowed for. Soil sampling should be restricted to the 1m<sup>2</sup> size and depth of maximum 30cm.</p> <p>The applicant must adhere to the NEMA Section 2 Principle and</p>	Concurrently with the completion of prospecting activities in an area.

Activities	Phase	Size and scale of disturbance	Mitigation Measures	Compliance with standards	Time period for implementation
			<p>the veld is required to access an identified sampling site.</p> <p>11. Site activities will be conducted during day time hours 07h00 – 17h30 to avoid night time noise disturbances and night time collisions with fauna.</p> <p>12. Vehicle speed will be reduced, particularly in highly vegetated areas to avoid deaths by vehicle impacts.</p> <p>13. Access control procedures must be agreed on with farm owners and all staff trained on these procedures.</p>	<p>ensure that a cradle to grave approach is followed in terms of waste management and that all activities are under taken with a precautionary approach. Where impacts may result a proactive manner should be implemented to ensure that potential negative results are avoided.</p> <p>The applicant must comply with the conditions of the Environmental Authorisation at all times.</p>	

Activities	Phase	Size and scale of disturbance	Mitigation Measures	Compliance with standards	Time period for implementation
			<p>14. A waste management system will be implemented and sufficient waste bins will be provided for on site. A fine system will be implemented to further prohibit littering and poor housekeeping practices.</p> <p>15. Waste separation will be under taken at source and separate receptacles will be provided (i.e. general waste, recyclables and hazardous waste).</p> <p>16. Receptacles will be closed (i.e. fitted with a lockable lid) to eliminate the possibility of access by animals overnight.</p>		

Activities	Phase	Size and scale of disturbance	Mitigation Measures	Compliance with standards	Time period for implementation
			<p>17. Wastes will be removed and disposed of at an appropriately licensed landfill (facility disposal licenses will be verified) and recyclables will be taken to a licensed recycling facility.</p> <p>18. Only soil sampling may be undertaken in the river bed. No other activities (drilling, roads, may be undertaken.</p> <p>19. No sampling within the riverbed will be permitted during rainy periods. A first aid station and emergency plan must be available on site.</p>		



Activities	Phase	Size and scale of disturbance	Mitigation Measures	Compliance with standards	Time period for implementation
			20. Soil disturbances are to be limited as far as is practicable.		
No Decommissioning associated with the soil sample		N/A	21. No mitigation proposed.	N/A	N/A
<b>Phase 3: Scout Drilling and Delineation Drilling</b>					
Site Access	Construction	Less than 1600 m <sup>2</sup>	<p>22. Map indicating the location of each of the drilling sites must be submitted to the relevant landowners, as well as to the DMR. Upon agreement of the location of the activities can the applicant proceed.</p> <p>23. Use existing track and roads in all instances as far as is practicable.</p>	<p>The prospecting activities must be undertaken in line with the approved Prospecting Works Programme.</p> <p>The financial provision required for rehabilitation must be guaranteed before the commencement of prospecting activities.</p>	Concurrently with the completion of prospecting activities in an area.

Activities	Phase	Size and scale of disturbance	Mitigation Measures	Compliance with standards	Time period for implementation
			<p>24. Where track clearing is necessary, raised blade clearing will be conducted to minimise disturbance and aid rehabilitation efforts and significant vegetation such as trees and large shrubs will be avoid.</p> <p>25. Site activities will be conducted during day time hours 07h00–17h30 to avoid night time noise disturbances and night time collisions with fauna.</p> <p>26. Vehicle speed will be reduced, particularly in highly vegetated areas is one way to avoid deaths by vehicle impacts.</p>	<p>Activities should stay clear of pans and outside of the 32m river buffer to avoid the need to apply for a Section 21 (c) and (i) Water Use License.</p>	

Activities	Phase	Size and scale of disturbance	Mitigation Measures	Compliance with standards	Time period for implementation
			<p>27. Where track clearing is necessary, raised blade clearing be conducted to minimise disturbance and aid rehabilitation efforts.</p> <p>28. As part of rehabilitation, all compacted roads and drill pads will be ripped and ring day time hours 07h00–17h30 to avoid night time noise disturbances.</p> <p>29. Access controls and staff trained.</p> <p>30. Prior to the establishment of new access roads and management measure for the protection of such</p>		

Activities	Phase	Size and scale of disturbance	Mitigation Measures	Compliance with standards	Time period for implementation
			resources must be implemented		

## 1.6. Impact Management Outcomes

Measures to rehabilitate the environment affected by the undertaking of any listed activity is presented in the following table.

Table 14: Impact Management Outcomes

Activity	Potential impact	Aspects affected	Phase	Mitigation type	Standard to be achieved
<b>Phase1: Data Acquisition and Desktop Study</b>					
Data collection and assessment (desktop only)	None identified.	N/A	Planning	Control potential deviations from the approved Prospecting Works Programme through the effective Implementation of the data acquisition and desktop study.	Remain within the ambits of the Prospecting Works Programme and Environmental Authorisation.
Data Assessment	None identified.	N/A	Planning	Control potential deviations from the approved Prospecting Works Programme through the effective implementation of the data Acquisition and desktop study.	Remain within the ambits of the Prospecting Works Programme and Environmental Authorisation.

Activity	Potential impact	Aspects affected	Phase	Mitigation type	Standard to be achieved
<b>Phase 2: Target Generation and Ground Truthing</b>					
Site fly-over	Noise impacts resulting from site fly-overs affecting cattle and game farm animals.	N/A	Planning	Control potential deviations from the approved Prospecting Works Programme through the effective implementation of the site fly over study.  Control through the limiting of the activities to the day time and the implementation of an open and transparent channel of communication.	Remain within the ambits of the Prospecting Works Programme and Environmental Authorisation.
	Nuisance noise impacts on communities and landowners and other persons	Noise generation	Planning		
Ground surveys	Poor access control resulting in	Loss of vegetation		Control potential deviations from the approved	Remain within the ambits of the

Activity	Potential impact	Aspects affected	Phase	Mitigation type	Standard to be achieved
	impacts on cattle movement, breeding and grazing practices.			Prospecting Works Programme through the effective implementation of the ground surveys.	Prospecting Works Programme and Environmental Authorisation.
No construction or site establishment activities will be undertaken.	No anticipated impacts	N/A	N/A		
Soil sampling (30kg of soil per sample)	Destruction and/or disturbance of on-site fauna and flora.	Loss of Fauna and Flora	Operational Phase	Control through the clear delineation of the prospecting area.	Remain within the ambits of the Prospecting Works.  No removal of vegetation outside of demarcated areas.
	Poor access control resulting in impacts on cattle movement, breeding and grazing practices.	Noise generation	Operational Phase	Control through the limiting of the activities to the day time and the implementation of an open and transparent channel of communication.	Remain within the Noise Regulation Standards for Rural Areas.

Activity	Potential impact	Aspects affected	Phase	Mitigation type	Standard to be achieved
	Vehicle traffic noise impact affecting cattle and/ or wildlife.	Loss of cattle and/or nuisance creation	Operational Phase	Control through the limiting of the activities to the day time and the Implementation of an open and transparent channel of communication.	Remain within the ambits of the Prospecting Works Programme and Environmental Authorisation.
	Poor housekeeping could result in littering and the associated impacts this will have on the area, contamination of river systems in the rainy season and also the potential health hazard to cattle.	Loss of aesthetic value, loss of water resources, loss of fauna and flora	Operational Phase	Control through the limiting of the Activities to the day time and the implementation of an open and transparent channel of communication. Control through the implementation of environmental induction and toolbox talks, as well as the Implementation of a fine system.	Remain within the ambits of the Prospecting Works Programme and Environmental Authorisation. No removal of vegetation outside of demarcated areas.



Activity	Potential impact	Aspects affected	Phase	Mitigation type	Standard to be achieved
	Activities within the river bed could result in the disturbance to the natural geomorphology.	Loss of fauna and flora, altering the river bed	Operational Phase	Control through the clear delineation of the prospecting area.	Remain within the ambits of the Prospecting Works Programme and Environmental Authorisation.
	Activities within the river bed could result in safety hazards during periods.	Loss and/or damage to life	Operational Phase	Control through the clear delineation of the prospecting area.	Maintain a 100% fatal and injury free operation.
	Soil disturbance from soil resulting in soil structure destruction, compaction and erosion.	Loss soil Resources	Operational Phase	Control through the clear delineation of the prospecting area.  Control through the implementation of a soil management programme in terms of the correct topsoil removal, stockpiling and rehabilitation practices as discussed in the EMP.	Retain topsoil for the re-use in rehabilitation.

Activity	Potential impact	Aspects affected	Phase	Mitigation type	Standard to be achieved
No decommissioning activities will be required	No anticipated impacts	N/A	Decommissioning Phase	N/A	N/A
Site Access	Destruction and/or disturbance of on-site fauna and flora.	Loss of Fauna and Flora	Construction Phase	Control through the clear delineation of the prospecting area.	Remain within the ambits of the Prospecting Works Programme and Environmental Authorisation.
	Soil compaction resulting from repeated use of access roads to drill sites.	Loss of soil Resources	Construction Phase	Control through the clear delineation of the prospecting area.  Control through the implementation of a soil management programme in terms of the correct topsoil removal, stockpiling and rehabilitation practices as discussed in the EMP.	Remain within the ambits of the Prospecting Works Programme and Environmental Authorisation.  Retain topsoil integrity for the reuse in rehabilitation.

Activity	Potential impact	Aspects affected	Phase	Mitigation type	Standard to be achieved
	Vehicle traffic affecting cattle and/ or wildlife.	Loss of fauna	Construction Phase	Control through the clear delineation of the prospecting area. Control through the limiting of the activities to the day time and the implementation of an open and Transparent channel of communication.	Remain within the ambits of the Prospecting Works Programme and Environmental Authorisation.
	Poor access control resulting in impacts on cattle movement, breeding and grazing practices.	Loss of fauna	Construction Phase	Control through the clear delineation of the prospecting area. Control through the limiting of the activities to the day time and the implementation of an open and Transparent channel of communication.	Remain within the ambits of the Prospecting Works Programme and Environmental Authorisation.
Site establishment activities including:	Destruction and/ or disturbance of	Loss of Fauna and Flora	Construction Phase	Control through the clear delineation of the prospecting area	Remain within the ambits of the

Activity	Potential impact	Aspects affected	Phase	Mitigation type	Standard to be achieved
(a) Vegetation clearing of drill pad area.	on-site fauna and flora.				Prospecting Works Programme and Environmental Authorisation.
(b) Topsoil stripping and stockpiling.	Soil disturbance and topsoil stockpiling	Loss of soil resources	Construction Phase	Control through the clear delineation of the prospecting area.	Remain within the ambits of the Prospecting Works Programme and Environmental Authorisation.
(c) Drill and compaction.	resulting in soil compaction and erosion.			Control through the implementation of a soil management programme in terms of the correct topsoil removal, stockpiling and rehabilitation practices as discussed in the EMP.	Retain topsoil integrity for the reuse in rehabilitation.
(d) Excavation and lining of drill water sump					
(e) Erection of temporary site office shaded area, potable ablution faculties and water storage tanks and core bay	Dust emission resulting from site clearing, soil stripping and construction activities	Dust emissions	Construction Phase	Control to the implementation of dust suppression methods, when this is required. Dust suppression methods could include wet suppression.	Remain within the designated area Demarcated for prospecting activities.
(f) Erection of fuel storage tank					

Activity	Potential impact	Aspects affected	Phase	Mitigation type	Standard to be achieved
(g) Waste generation and management.	(including vehicle entrained dust)				Remain within the National Environmental Management: Air Quality Act, 2004 Dust Regulation guidelines for rural communities.
	Visual impact affecting visual character land "sense of place"	Loss in aesthetics	Construction Phase	Control through the clear delineation of the prospecting area.  Control through the implementation of environmental induction and toolbox talks, as well as the implementation of a fine system.	Remain within the ambits of the Prospecting Works Programme and Environmental Authorisation.  No removal of vegetation Outside of demarcated areas.
	Influx of persons (job seekers) to site as a result of	Increase in petty crimes	Construction Phase	Control through the limiting of the activities to the day time and the	Maintain a 100% crime

Activity	Potential impact	Aspects affected	Phase	Mitigation type	Standard to be achieved
	increased activity resulting in increased incidents of theft and opportunistic crime.			implementation of an open and Transparent channel of communication.	Free area within the control of the prospecting activities and applicant.
Exploration drilling ad core sample collection and storage including. (a) Scout and delineation drilling (b) Drill maintenance and re-fuelling. (c) Core sample collection and storage. (d) Drill fluid collection,	Water and soil pollution resulting from disposal of drill fluids.	Loss of water resources, loss of soil resources	Operational Phase	Control through the clear delineation of the prospecting area.  Control through the implementation of environmental induction and toolbox talks, as well as the implementation of a fine system.  Control through the implementation of a soil management programme in terms of the correct topsoil	Remain within the ambits of the Prospecting Works Programme and Environmental Authorisation.  Retain topsoil integrity for the reuse in rehabilitation.

Activity	Potential impact	Aspects affected	Phase	Mitigation type	Standard to be achieved
storage and evaporation. (e) Waste generation and management				removal, stockpiling and rehabilitation practices as discussed in the EMP.  Control through the implementation of the NWA GN704 water management principles.	
	Continued soil erosion from topsoil stockpile and soil compaction from drill pad platform.	Loss of soil resources	Operational Phase	Control through the clear delineation of the prospecting area.  Control through the implementation of a soil management programme in terms of the correct topsoil removal, stockpiling and rehabilitation practices as discussed in the EMP.	Remain within the ambits of the Prospecting Works Programme and Environmental Authorisation.  Retain topsoil integrity for the reuse in rehabilitation.
	Potential water and soil pollution resulting from	Loss of water	Operational Phase	Control through the clear delineation of the prospecting area.	Remain within the ambits of the Prospecting Works

Activity	Potential impact	Aspects affected	Phase	Mitigation type	Standard to be achieved
	hydrocarbon spills and drill maintenance activities.	resources, loss of soil resources		Control through the implementation of the NWA GN704 water management principles.	Programme and Environmental Authorisation.  Retain topsoil integrity for the reuse in rehabilitation.
	Dust emissions from drilling and general site activities (including vehicle entrained dust)	Increase in dust emissions	Operational Phase	Control to the implementation of dust suppression methods, when this is required. Dust suppression methods could include wet suppression.	Remain within the designated area demarcated for prospecting activities.  Remain within the National Environmental Management: Air Quality Act, 2004 Dust Regulation guidelines for rural communities.



Activity	Potential impact	Aspects affected	Phase	Mitigation type	Standard to be achieved
	Visual Impact affecting visual character and sense and "sense of place"	Loss in aesthetic value	Operational Phase	Control through the clear delineation of the prospecting area.  Control through the implementation of the conditions in the EMP.	Remain within the ambits of the Prospecting Works Programme and Environmental Authorisation.  No removal of vegetation outside of demarcated areas.
	Vehicle traffic and drill noise impact affecting wildlife game farm animals.	Loss of fauna	Operational Phase	Control through the clear delineation of the prospecting area.  Control through the implementation of environmental induction and toolbox talks, as well as the implementation of a fine system.	Remain within the ambits of the Prospecting Works Programme and Environmental Authorisation.

Activity	Potential impact	Aspects affected	Phase	Mitigation type	Standard to be achieved
	Poor access control resulting in impacts on cattle movement, breeding and grazing practices.	Loss of cattle	Operational Phase	<p>Control through the clear delineation of the prospecting area.</p> <p>Control through the implementation of environmental induction and toolbox talks, as well as the implementation of a fine system.</p> <p>Control through the limiting of the activities to the day time and the implementation of an open and transparent channel of communication.</p>	Remain within the ambits of the Prospecting Works Programme and Environmental Authorisation.
	Influx of persons (job seekers) to site as a result of increased activity	Increase in petty crimes	Operational Phase	Control through the limiting of the activities to the day time and the implementation of an open	Maintain a 100% crime free area within the

Activity	Potential impact	Aspects affected	Phase	Mitigation type	Standard to be achieved
	resulting in increased incidents of theft and opportunistic crime.			and transparent channel of communication.	Control of the prospecting activities and applicant.
Removal of temporary infrastructure including: (a) Removal of temporary site office shaded area, potable ablution facilities, water storage tanks and core bay (b) Borehole capping	Destruction and/or disturbance of on-site fauna	Loss of Sensitive environments, loss of fauna, loss of flora	Decommissioning	Control through the clear delineation of the prospecting area.  Control through the implementation of environmental induction and toolbox talks, as well as the implementation of a fine system.  Control through the limiting of the activities to the day time and the implementation of an open	Remain within the ambit of the Prospecting Works Programme and Environmental Authorisation.

Activity	Potential impact	Aspects affected	Phase	Mitigation type	Standard to be achieved
Drill pad rehabilitation including: a) Ripping of drill pad and access road b) Re-spreading of stockpiled topsoil. c) Re-vegetation.	Dust emissions from decommissioning activities (including vehicle entrained dust).	Increase in dust emissions	Decommissioning	Control to the implementation of dust suppression methods, when this is required. Dust suppression methods could include wet suppression	Remain within the designated area demarcated for prospecting activities.  Remain within the National Environmental Management: Air Quality Act, 2004 Dust Regulation guidelines for rural communities.
	Poor access control resulting in impacts on cattle movement, breeding and grazing practices.	Loss of cattle	Decommissioning	Control through the implementation of environmental induction and toolbox talks, as well as the implementation of a fine system.	Remain within the ambits of the Prospecting Works Programme and Environmental Authorisation.
					and transparent channel of communication.

Activity	Potential impact	Aspects affected	Phase	Mitigation type	Standard to be achieved
				Control through the limiting of the activities to the day time and the implementation of an open and transparent channel of communication.	
	Potential water and soil pollution resulting from hydrocarbon spills.	Increase in dust emissions	Decommissioning	Control to the implementation of dust suppression methods, when this is required. Dust suppression methods could include wet suppression.	Remain within the ambits of the Prospecting Works Programme and Environmental Authorisation.
	Soil erosion resulting from the re-spreading of topsoil before vegetation is re-established.	Loss of soil resources	Decommissioning	Control through the clear delineation of the prospecting area.  Control through the implementation of environmental induction and toolbox talks, as well as	Remain within the ambits of the Prospecting Works Programme and Environmental Authorisation.

Activity	Potential impact	Aspects affected	Phase	Mitigation type	Standard to be achieved
				<p>the implementation of a fine system.</p> <p>Control through the implementation of a soil management programme in terms of the correct topsoil removal, stockpiling and rehabilitation practices as discussed in the EMP.</p>	

## 1.7. Impact Management Actions

Table 15: Impact Management Actions

Activity	Potential impact	Mitigation type	Time period for implementation	Compliance with standards
<b>Phase 1: Data Acquisition and Desktop Study</b>				
Data collection and assessment (desktop only)	None identified.	No mitigation proposed	N/A	Remain within the ambits of the Prospecting Works Programme and Environmental Authorisation.
Data Assessment	None identified.	No mitigation proposed	N/A	Remain within the ambits of the Prospecting Works Programme and Environmental Authorisation.
<b>Phase 2: Target Generation and Ground Truthing</b>				
Site fly-over	Noise impacts Resulting from site fly-overs affecting cattle and game farm animals.	Directly affected, adjacent Landowners and game farms in proximity to the site will be informed of the planned dates of the	N/A	Remain within the ambits of the Prospecting Works Programme and Environmental Authorisation.

Activity	Potential impact	Mitigation type	Time period for implementation	Compliance with standards
		<p>airborne geophysics survey and aggrievance mechanism will be made available. Mitigation alternatives are limited to timing of the flyovers which may affect aspects such as hunting activities on game farms.</p> <p>Farms owners must be consulted and informed of any low flyovers which may affect cattle being held in restricted holding pens, which may result in injury or damage.</p>		
	Nuisance noise impacts on communities and	No mitigation proposed	N/A	Remain within the Noise Regulation Standards for Rural Areas.



Activity	Potential impact	Mitigation type	Time period for implementation	Compliance with standards
	landowners and other persons.			
Ground surveys	Poor access control resulting in impacts on cattle movement, breeding and grazing practices.	Access control procedures must be agreed on with farm owners and all staff trained on these procedures.	N/A	Remain within the ambits of the Prospecting Works Programme and Environmental Authorisation.
No construction or site establishment activities will be undertaken	No anticipated impacts.	No mitigation proposed	N/A	N/A
Soil sampling (30kg of soil per sample)	Destruction and/ or disturbance of on-site fauna and flora.	Use existing track and roads in all instances as far as is practicable.  As part of the soil sampling programme, no tracks will be cleared for once-off access to sampling sites.	Concurrently with the completion of prospecting activities in an area.	Remain within the ambits of the Prospecting Works.  No removal of vegetation outside of demarcated areas.

Activity	Potential impact	Mitigation type	Time period for implementation	Compliance with standards
		<p>Avoid significant vegetation such as trees and large shrubs in the event that driving through the veld is required to access an identified sampling site.</p> <p>Site activities will be conducted during daytime hours 07h00 – 17h30 to avoid night time noise disturbances and night time collisions with fauna.</p> <p>Vehicle speed will be reduced, particularly in highly vegetated areas to</p>		

Activity	Potential impact	Mitigation type	Time period for implementation	Compliance with standards
		avoid deaths by vehicle impacts.		
	Poor access control resulting in impacts on cattle movement, breeding and grazing practices.	Access control procedures must be agreed on with farm owners and all staff trained on these procedures.	Concurrently with the completion of prospecting activities.	Remain within the Noise Regulation Standards for Rural Areas.
	Vehicle traffic noise impact affecting cattle and/ or wildlife.	Site activities will be conducted during day time hours 07h00– 17h30 to avoid night time noise disturbances and night time collisions with fauna.	Concurrently with the completion of prospecting activities.	Remain within the ambits of the Prospecting Works Programme and Environmental Authorisation.
	Poor housekeeping could result in littering and the associated impacts this will have on the aesthetic of the area, contamination	Waste management system will be implemented and sufficient waste bins will be provided for on site. A fine system will be implemented to further	Concurrently with the completion of prospecting activities in an area.	Remain within the ambits of the Prospecting Works Programme and Environmental Authorisation.

Activity	Potential impact	Mitigation type	Time period for implementation	Compliance with standards
	<p>of river systems in the rainy season and also potential health hazard to cattle.</p>	<p>prohibit littering and poor housekeeping practices.</p> <p>Waste separation will be undertaken at source and separate receptacles will be provided (i.e. general waste, recyclables and hazardous waste).</p> <p>Receptacles will be closed (i.e. fitted with a lockable lid) to eliminate the possibility of access by animals overnight.</p> <p>Wastes will be removed and disposed of at an appropriately licensed landfill (facility disposal</p>		<p>No removal of vegetation outside of demarcated areas.</p>

Activity	Potential impact	Mitigation type	Time period for implementation	Compliance with standards
		licenses will be verified) and recyclables will be taken to a licensed recycling facility.		
	Activities within the river bed could result in the natural geomorphology.	Only soil sampling may be Undertaken in the river bed. No other activities (drilling, roads, etc.) may be undertaken.	Concurrently with the completion of prospecting activities	Remain within the ambits of the Prospecting Works Programme and Environmental Authorisation.
	Activities within the river bed could result in safety hazards during rainy periods.	No sampling within the riverbed will be permitted during rainy periods.  A first aid station and emergency plan must be available on site.	Concurrently with the completion of prospecting activities	Maintain a 100% fatal and injury free operation.
	Soil disturbance from soil sampling resulting in soil structure.	Soil disturbances are to be limited as far as is practicable.	Concurrently with the completion of prospecting activities in an area.	Retain topsoil for the reuse in rehabilitation.

Activity	Potential impact	Mitigation type	Time period for implementation	Compliance with standards
No decommissioning activities will be required	No anticipated impacts	No mitigation proposed	N/A	N/A
<b>Phase 3: Scout Drilling and Delineation Drilling</b>				
Site Access	Destruction and/ or disturbance of on-site fauna and flora.	<p>Map indicating the location of each of the drilling sites must be submitted to the relevant landowners, as well as to the DMR and DWS. Upon agreement of the location of the activities can the applicant proceed.</p> <p>Use existing track and roads in all instances as far as is practicable.</p> <p>Where track clearing is necessary, raised blade</p>	Concurrently with the completion of prospecting activities	Remain within the ambits of the Prospecting Works Programme and Environmental Authorisation.

Activity	Potential impact	Mitigation type	Time period for implementation	Compliance with standards
		<p>clearing will be conducted to minimise disturbance and aid rehabilitation efforts and significant vegetation such as trees and large shrubs will be avoided.</p> <p>Site activities will be Conducted during daytime hours 07h00–17h30 to avoid night time noise disturbances and night time collisions with fauna.</p> <p>Vehicle speed will be reduced, particularly in highly vegetated areas is one way to avoid deaths by vehicle impacts.</p>		

Activity	Potential impact	Mitigation type	Time period for implementation	Compliance with standards
	Soil compaction	<p>Where track clearing is necessary, raised blade Clearing be conducted to minimise disturbance and aid rehabilitation efforts.</p> <p>As part of rehabilitation, all compacted roads and drill pads will be ripped and re-vegetated.</p>	Concurrently with the completion of prospecting activities	<p>Remain within the ambits of the Prospecting Works Programme and Environmental Authorisation.</p> <p>Retain topsoil integrity for the reuse in rehabilitation.</p>
	Vehicle traffic impact affecting cattle and/ or wildlife.	Site activities will be conducted during day time hours 07h00 – 17h30 to avoid night time noise disturbances.	Concurrently with the completion of prospecting activities	Remain within the ambits of the Prospecting Works Programme and Environmental Authorisation.
	Poor access control resulting in impacts on cattle movement,	Access control procedures must be agreed on with farm owners and staff trained.	Concurrently with the completion of prospecting activities.	Remain within the ambits of the Prospecting Works Programme and Environmental Authorisation.



Activity	Potential impact	Mitigation type	Time period for implementation	Compliance with standards
	breeding and grazing practices.			
<p>Site establishment activities including:</p> <p>(a) Vegetation clearing of drill pad area.</p> <p>(b) Topsoil stripping and stockpiling</p> <p>(a) Excavation and lining of drill water sump</p> <p>(b) Erection of temporary site office shaded area, potable ablution facilities and water storage tanks and core bay</p>	<p>Destruction and/ or disturbance of on-site fauna and flora.</p>	<p>The removal of vegetation within the drill pad area will be minimized.</p> <p>If practicable, raised blade clearing be conducted for the entire drill pad to minimise disturbance and aid rehabilitation efforts.</p> <p>The design of the drill fluid sump must incorporate effective fauna egress to avoid entrapment.</p> <p>A fire emergency procedure will be</p>	<p>Concurrently with the completion of prospecting activities</p>	<p>Remain within the ambits of the Prospecting Works Programme and Environmental Authorisation.</p>

Activity	Potential impact	Mitigation type	Time period for implementation	Compliance with standards
<p>(c) Erection of fuel storage tank</p> <p>(d) Erection of safety barrier.</p>		<p>developed to contain and minimise the destruction of flora and faunal habitat which may result from fire.</p>		
<p>(e) Waste generation and management</p>	<p>Soil disturbance and top soil stockpiling resulting in soil compaction and erosion.</p>	<p>In the event that the drill pad is cleared of all vegetation, lower blade clearing will be undertaken prior to the stripping of topsoil.</p> <p>Topsoil including the remaining vegetation, will be stripped and stockpiled up-slope of the pad. The stockpile will be shaped to divert stormwater around the drill pad to minimise soil erosion of the pad.</p>	<p>Concurrently with the completion of prospecting activities</p>	<p>Remain within the ambits of the Prospecting Works Programme and Environmental Authorisation.</p> <p>Retain topsoil integrity for the reuse in rehabilitation.</p>

Activity	Potential impact	Mitigation type	Time period for implementation	Compliance with standards
		<p>Where practicable topsoil will be stripped to a depth of 10 cm.</p> <p>Vegetation removed through lower blade clearing will be mixed with topsoil to increase organic content and to preserve the seed bank in order to aid rehabilitation efforts.</p> <p>Topsoil will be stockpiles to a maximum height of 1.5m with a side slope of not more than 1:3.</p> <p>Mechanical erosion control methods will be implemented if required.</p>		

Activity	Potential impact	Mitigation type	Time period for implementation	Compliance with standards
		This may include the use of geotextiles to stabilise slopes.		
	Dust emissions resulting from site clearing, soil stripping and construction activities (including vehicle entrained dust).	Based on visual observation, wet dust suppression will be undertaken to manage dust emissions from vehicle movement and other construction activities as and when needed.  Depending on the need and quantity of water used for wet suppression, a suitable, low environmental impact chemical suppression alternative must be	Concurrently with the completion of prospecting activities	Remain within the designated area demarcated for prospecting activities.  Remain within the National Environmental Management: Air Quality Act, 2004 Dust Regulation guidelines for rural communities.

Activity	Potential impact	Mitigation type	Time period for implementation	Compliance with standards
		considered in order to conserve water resources.		
	Visual impact affecting visual character and "sense of place"	The shaded office area, portable ablution facilities, vertical water tanks and any other infrastructure should be acquired with a consideration for colour. Natural earth, green and Mat-black options which will blend in with the surrounding area must be favoured.	Concurrently with the completion of prospecting activities	Remain within the ambits of the Prospecting Works Programme and Environmental Authorisation.  No removal of vegetation outside of demarcated areas.
	Influx of persons (job seekers) to site as a result of increased activity resulting in increased incidents of theft and opportunistic crime.	Casual labour will not be recruited at the site to eliminate the incentive for persons travelling to site seeking employment.	Concurrently with the completion of prospecting activities	Maintain a 100% crime free area within the control of the prospecting activities and applicant.

Activity	Potential impact	Mitigation type	Time period for implementation	Compliance with standards
		<p>The landowner (all private and state land owners) will be notified of unauthorised persons encountered on site.</p> <p>If deemed necessary, the South African Police Service will be informed of unauthorised persons encountered on site.</p>		
<p>Exploration drilling and core sample collection and storage including: a) Scout and drilling</p>	<p>Water and soil pollution resulting from disposal of drill fluids.</p>	<p>A sump will be constructed with a sufficient capacity to receive drill fluids and allow for evaporation.</p> <p>The sump will be constructed to divert stormwater away and/ or around the sump to avoid clean stormwater inflow.</p>	<p>Concurrently with the completion of prospecting activities</p>	<p>Remain within the ambits of the Prospecting Works Programme and Environmental Authorisation.</p> <p>Retain topsoil integrity for the reuse</p>

Activity	Potential impact	Mitigation type	Time period for implementation	Compliance with standards
	<p>Continued soil erosion from topsoil stockpile and soil compaction from drill pad platform.</p>	<p>In the event that raise blade clearing is not undertaken, and the drill pad is cleared, topsoil will be stockpiles to a maximum height of 1.5m with a side slope of not more than 1:3.</p> <p>The topsoil stockpile will be shaped to divert stormwater around the drill pad to minimise soil erosion of the pad.</p> <p>Management efforts through the use of mechanical erosion control methods will be implemented if required.</p>	<p>Concurrently with the completion of prospecting activities</p>	<p>Remain within the ambits of the Prospecting Works Programme and Environmental Authorisation.</p> <p>Retain topsoil integrity for the reuse in rehabilitation.</p>

Activity	Potential impact	Mitigation type	Time period for implementation	Compliance with standards
		This may include the use of geotextiles.		
	Potential water and soil pollution resulting from hydrocarbon spills and drill maintenance activities.	<p>Fuel storage tanks will have a secondary containment structure with a capacity of 110% of the total tank capacity.</p> <p>Oils and lubricant will be stored within secondary containment structures.</p> <p>Where practicable, vehicle maintenance will be under taken off-site.</p> <p>In the event that vehicle maintenance is undertaken on-site (i.e. such as breakdown maintenance), drip trays</p>	Concurrently with the completion of prospecting activities	<p>Remain within the ambits of the Prospecting Works Programme and Environmental Authorisation.</p> <p>Retain topsoil integrity for the reuse in rehabilitation.</p>



Activity	Potential impact	Mitigation type	Time period for implementation	Compliance with standards
		<p>and/ UPVC sheets will be used to prevent spills and leaks onto the soil.</p> <p>Unused machinery must be completely drained of oil and other hydrocarbons to ensure that leaks do not develop.</p> <p>Regular inspections of all vehicles must be carried out to ensure that all leaks are identified early and rectified.</p> <p>A sufficient number of waste receptacles will be provided.</p>		

Activity	Potential impact	Mitigation type	Time period for implementation	Compliance with standards
		<p>Waste separation will be under taken at source and separate receptacles will be provided (i.e. general waste, recyclables and hazardous waste).</p> <p>Receptacles will be closed (i.e. fitted with a lockable lid) to eliminate the possibility of access by animals overnight.</p> <p>Wastes will be removed and disposed of at an appropriately licensed landfill (facility disposal licenses will be verified) and recyclables will be</p>		

Activity	Potential impact	Mitigation type	Time period for implementation	Compliance with standards
		taken to a licensed recycling facility.		
	Dust emissions from drilling and general site activities (including vehicle entrained dust)	Based on visual observation wet dust suppression will be undertaken as and when required to manage dust emissions from vehicle movement. Depending on the need and quantity of water used for wet suppression, chemical suppression alternatives must be considered in order to conserve water resources.	Concurrently with the completion of prospecting activities	Remain within the designated area demarcated for prospecting activities.  Remain within the National Environmental Management: Air Quality Act, 2004 Dust Regulation guidelines for rural communities
	Visual impact affecting visual character and "sense of place"	Visual impact of structures will be mitigated through a fence around the drilling site.	Concurrently with the completion of prospecting activities	Remain within the ambits of the Prospecting Works Programme and Environmental Authorisation.

Activity	Potential impact	Mitigation type	Time period for implementation	Compliance with standards
		Visual dust dispersion will be mitigated through water browser.		No removal of vegetation outside of demarcated areas.
	Vehicle traffic and drill noise impact affecting wildlife game farm animals.	Site activities will be conducted during daytime hours 07h00–17h30 to avoid night time noise disturbances.	Concurrently with the completion of prospecting activities.	Remain within the ambits of the Prospecting Works Programme and Environmental Authorisation.
	Poor access control resulting in impacts on cattle movement, breeding and grazing practices.	Access control procedures must be agreed on with farm owners.	Concurrently with the completion of prospecting activities	Remain within the ambits of the Prospecting Works Programme and Environmental Authorisation.
	Influx of persons (job seekers) to site as a result of increased activity resulting in increased incidents	Casual labour will not be recruited at the site to eliminate the incentive for persons travelling to site seeking employment.	Concurrently with the completion of prospecting activities	Maintain a 100% crime free area within the control of the prospecting activities and applicant.

Activity	Potential impact	Mitigation type	Time period for implementation	Compliance with standards
	of theft and opportunistic crime.	<p>The landowner (the Department of Rural Development and Land Reform) will be notified of unauthorised persons encountered on site.</p> <p>If deemed necessary, the South African Police Service will be informed of unauthorised persons encountered on site.</p>		
	Impact on the pans and associated ecosystems in the area.	<p>The prospecting areas must be clearly demarcated.</p> <p>No prospecting activities may be undertaken within the pan areas.</p>	Concurrently with the completion of prospecting activities	Remain within the ambits of the Prospecting Works Programme and Environmental Authorisation.

Activity	Potential impact	Mitigation type	Time period for implementation	Compliance with standards
		All site plans must indicate the presence of pans.		
Removal of temporary infrastructure including: a. <i>Removal of temporary site office shaded area, potable ablution facilities, water storage tanks and core bay</i> b. <i>Borehole capping</i>  Ripping of drill pad and access road Re-vegetation	Destruction and/ or disturbance of on-site fauna.	Drill holes must be temporarily plugged immediately after drilling is completed and remain plugged until they are permanently plugged below ground to eliminate the risk posed to fauna by open drill holes.  Drill holes must be permanently capped as soon as is practicable.	Concurrently with the completion of prospecting activities	Remain within the ambits of the Prospecting Works Programme and Environmental Authorisation.
	Dust emissions from decommissioning activities (include	Based on visual observation wet dust suppression will be under	Concurrently with the completion of prospecting	Remain within the designated area

Activity	Potential impact	Mitigation type	Time period for implementation	Compliance with standards
	vehicle entrained dust)	<p>taken to manage dust emissions from vehicle movement.</p> <p>Depending on the need and quantity of water used for wet suppression, chemical suppression alternatives must be considered in order to conserve water resources.</p>	activities	<p>demarcated for prospecting activities.</p> <p>Remain within the National Environmental Management: Air Quality Act, 2004 Dust Regulation guidelines for rural communities.</p>
	Poor access control resulting in impacts on cattle movement, breeding and grazing practices.	Access control procedures must be agreed on with farm owners and all staff trained.	Concurrently with the completion of prospecting activities	Remain within the ambits of the Prospecting Works Programme and Environmental Authorisation.
	Potential water and soil pollution resulting from hydrocarbon spills.	All fuel storage tanks will be emptied prior to removal.	Concurrently with the completion of prospecting activities	Remain within the ambits of the Prospecting Works Programme and

Activity	Potential impact	Mitigation type	Time period for implementation	Compliance with standards
		<p>Drill holes must be permanently capped as soon as is practicable to eliminate the risk of groundwater contamination.</p> <p>Wastes will be removed and disposed of at an appropriately licensed landfill (facility disposal licenses will be verified) and recyclables will be taken to a licensed recycling facility.</p>		Environmental Authorisation.
	Soil erosion resulting from the re-spreading of topsoil before vegetation is re-established.	<p>Mechanical erosion control methods will be implemented if required. This may include the use of geotextiles.</p>	Concurrently with the completion of prospecting activities	Remain within the ambits of the Prospecting Works Programme and Environmental Authorisation.



Activity	Potential impact	Mitigation type	Time period for implementation	Compliance with standards
		Re-vegetation will be conducted through hand seeding exposed areas using indigenous grass species as determined by a suitably qualified ecologist.		

## **2. Financial Provision**

### **2.1. Determination of the amount of Financial Provision.**

#### **2.1.1. Describe the closure objectives and the extent to which they have been aligned to the baseline environment described under the Regulation under Regulation 22 (2) (d) as described in 2.4 herein.**

Each phase of the prospecting activities is dependent on the success of the previous. Depending on the outcome of the Phase 1 assessment, an airborne/ground geophysics survey and/or loam sampling programme will be initiated. Targets that have been prioritized through detailed anomaly-specific loam sampling will be tested by initial drilling.

The location and extent of soil sampling and drill sites can therefore not be determined at this stage. Mapping of the prospecting activities could thus not be undertaken.

The rehabilitation plan is developed on the basis that the rehabilitated areas are safe, stable, non-polluting and are able to support a self-sustaining ecosystem similar to surrounding natural environment. To ensure that the rehabilitation plan is aligned with the closure objective, a high level risk assessment of the prospecting components has been undertaken to establish the potential risks associated therewith.

The closure objectives are to:

- Eliminate any safety risk as associated with drill holes and sumps through adequate drill-hole capping and backfilling.
- Remove and/ or rehabilitate all pollution and pollution sources such as waste materials and spills;
- To establish rehabilitated area which is not subject to soil erosion which may result in the loss of soil, degradation of the environment and cause pollution of surface water resources; and

- Restore disturbed area and re-vegetate these areas with grass species naturally occurring in the area to restore the ecological function of such areas as far as is practicable.

**2.1.2. Confirm specifically that the environmental objectives in relation to closure have been consulted with landowner and interested and affected parties.**

This Basic Assessment Report and Environmental Management Plan will be made available to each registered stakeholder for review and comment from the 03<sup>rd</sup> of August 2022 for a period of 30 days of public review. All comments will be captured in the issues and response section and will be included into the final report.

**2.1.3. Provide a rehabilitation plan that describes and shows the scale and aerial extent of the main prospecting activities, including the anticipated prospecting area at the time of closure.**

Each phase of the prospecting activities is dependent on the success of the previous. Depending on the outcome of the Phase 1 assessment, an airborne/ground geophysics survey and/or loam sampling programme will be initiated. Targets that have been prioritized through detailed anomaly-specific loam sampling will be tested by initial drilling.

The location and extent of soil sampling and drill sites can therefore not be determined at this stage. Mapping of the prospecting activities could thus not be undertaken.

Due to the nature of the activities, the impacts will be very limited and of short duration. The management plan is provided in such a manner as to ensure concurrent rehabilitation. The areas for drilling purposes will be the main area experiencing impacts. In this event the activities will be temporary in nature, and a detailed management plan has been provided to address potential impacts associated with these activities.

The only rehabilitation that will specifically be required is borehole capping and revegetation:

a. Borehole capping

Drill holes must be permanently capped as soon as is practicable. Figure 10 below provides the prepared procedure for the secure plugging of exploration drill holes.

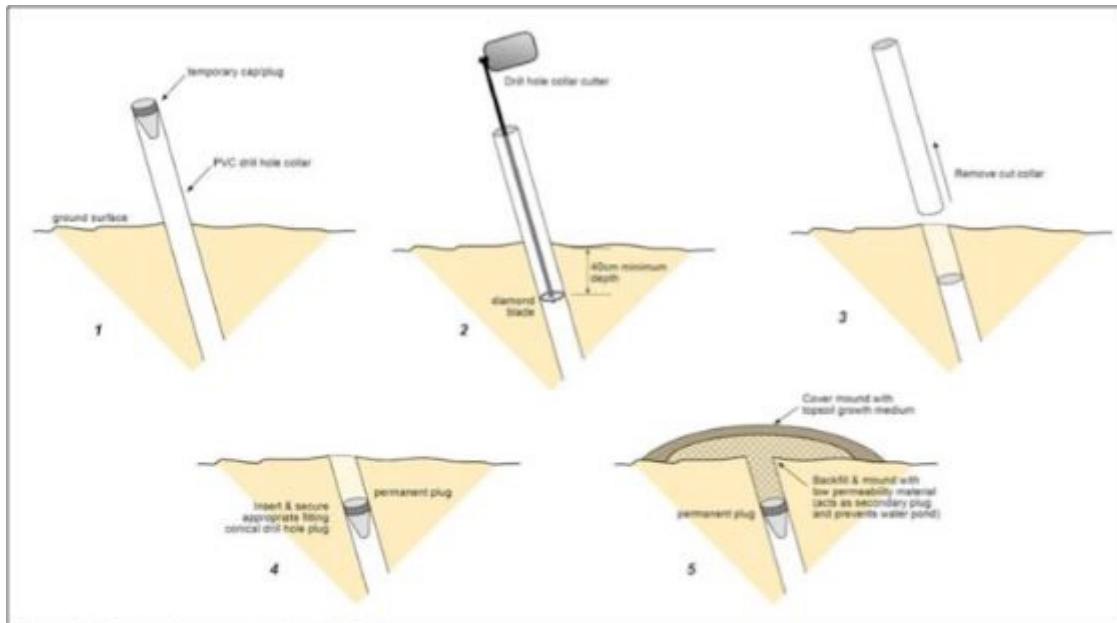


Figure 10: Borehole capping (Source: Department of Mines and Petroleum, Guidelines for Environmentally Responsible Mineral Exploration & Prospecting in Western Australia, March 2012)

b. Re-vegetation

It is recommended that a standard commercial fertilizer high in the standard elements is added to the soil before re-vegetation, at a rate of 10-20kg/ha (application rate to be confirmed based on input from a suitably qualified specialist). The fertilizer should be added to the soil in as low release granular form.

A suitably qualified ecologist will be appointed to determine the appropriate veld grass mix for hand seeding. Re-vegetation efforts will be monitored every second month for a period of six months after initial seeding. An effective vegetation cover of 45% must be achieved. Re-seeding will be under taken if this cover has not been achieved after six months.

**2.1.4. Explain why it can be confirmed that the rehabilitation plan is compatible with the closure objectives.**

Due to the nature of the activities, the impacts will be very limited and of short duration. The management plan is provided in such a manner as to ensure concurrent rehabilitation. The areas for drilling purposes will be the main area experiencing impacts. In this event the activities will be temporary in nature, and a detailed management plan has been provided to address potential impacts associated with these activities.

**2.1.5. Calculate and state the quantum of the financial provision required to manage and rehabilitate the environment in accordance with the applicable guideline.**

The financial provision for the environmental rehabilitation and closure of any drilling activities and its associated operations forms an integral part of the MPRDA. Sections 41(1), 41(2), 41(3) and 45 of the MPRDA deals with the financial provision for rehabilitation and closure. During 2012 the DMR made updated rates available for the calculation of the closure costs, where contractor's costs are not available these are used in assessments.

The "Guideline Document for the Evaluation of Financial Provision made by the Mining Industry" was developed by the DMR in January 2005, in order to empower the personnel at Regional DMR offices to review the quantum determination for the rehabilitation and closure of prospecting sites. With the determination of the quantum for closure it must be assumed that the infrastructure has no salvage value (clean closure). The closure cost estimate (clean closure) was determined in accordance with the DMR guidelines and is based, where possible, on actual costs provided by a third party contractor.

**2.1.6. Confirm that the financial provision will be provided as determined.**

It should be noted that the current expenditure provided for in the Prospecting Works Programme does not include the calculated Financial Provision as included into this Basic Assessment, as these values were not available at the time of the submission- into the Prospecting Work Programme prior the decision by the DMR should this decision be positive.

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

- a. Monitoring of Impact Management Actions
- b. Monitoring and reporting frequency
- c. Responsible persons
- d. Time period for implementing impact management actions
- e. Mechanism for monitoring compliance

Table 16: Mechanisms for monitoring compliance

Source Activity	Impacts requiring monitoring programmes	Functional requirements for monitoring	Roles and responsibilities	Monitoring and reporting frequency and time periods for implementing impact management actions
Phase 1: Data Acquisition and Desktop Study	None identified.	None	N/A	N/A
Phase 2: Target Generation and Ground Truthing	Noise impacts resulting from site fly-overs affecting cattle and game farm animals	Adjacent landowners will be informed of the planned dates of the Airborne geophysics survey and aggrievance	Prospecting Manager	Once-off upfront consultation with affected parties. As required as grievances are received.

Source Activity	Impacts requiring monitoring programmes	Functional requirements for monitoring	Roles and responsibilities	Monitoring and reporting frequency and time periods for implementing impact management actions
		mechanism will be made available.		<p>Consultation to be signed-off by Environmental Management;</p> <p>All grievances to be signed-off by Environmental Management;</p> <p>All corrective action and close out of grievances to be signed off by Environmental Management;</p> <p>Proof of consultation to be submitted to the Department of Mineral Resources prior to airborne survey is conducted;</p> <p>Record of grievances, corrective action taken and close out to be submitted to the Department of Mineral resources at the end of the project phase.</p>



Source Activity	Impacts requiring monitoring programmes	Functional requirements for monitoring	Roles and responsibilities	Monitoring and reporting frequency and time periods for implementing impact management actions
Phase 3: Ground Geophysics and Soil Sampling	All site activities to be undertaken must be communicated with directly affected landowners.	As soon as the extent of site activities are known. These must be communicated with directly affected landowners. The following procedures must developed in conjunction with these landowners:	Prospecting Manager	Confirmation of the extent of site activities to be submitted to the Department of Mineral Resources prior to such activities been undertaken; Proof of consultation with directly affected landowners and the outcome of such consultation to be submitted to the Department of Mineral Resources; Continuous monitoring of compliance with the access control procedure will be undertaken.
Phase III : Exploratory Drilling	Visual inspection of soil erosion and/ or compact ion	All exposed areas, access roads, the drill pad and soil stockpiles must be monitored	Prospecting Manager Contractor	Weekly and after rain events

Source Activity	Impacts requiring monitoring programmes	Functional requirements for monitoring	Roles and responsibilities	Monitoring and reporting frequency and time periods for implementing impact management actions
		for erosion on a regular basis and specifically after rain events.		<ol style="list-style-type: none"> <li>1. Monthly monitoring reports to be signed-off by the Environmental Manager.</li> <li>2. Corrective action to be confirmed and signed-off by the Environmental Manager.</li> <li>3. Consolidated monthly monitoring reports (including the corrective action taken) to be submitted to the Department of Mineral Resources.</li> </ol>
	Dust generated will be assessed through visual observation.	If dust outfall is excessive and regarded to affect any sensitive receptors a monitoring programme must initiated based on the input of a suitably qualified air quality specialist.	Prospecting Manager	On-going <ol style="list-style-type: none"> <li>1. Monthly monitored reports to be signed-off by the Environmental Manager.</li> <li>2. Corrective to be confirmed and signed-off by the Environmental Manager.</li> </ol>

Source Activity	Impacts requiring monitoring programmes	Functional requirements for monitoring	Roles and responsibilities	Monitoring and reporting frequency and time periods for implementing impact management actions
				<p>3. Consolidated monthly monitoring reports (including the Department Resources.</p>
	<p>Visual inspection of biodiversity impacts the occurrence of invader species.</p>	<p>Visual inspection of clearing activities and other possible secondary impact on biodiversity will be undertaken. The introduction of alien invasive vegetation species will be determined.</p>	<p>Prospecting Manager Contractor.</p>	<p>Once-off during clearing activities. Weekly inspection of secondary impacts.</p> <ol style="list-style-type: none"> <li>1. Monthly monitoring reports to be signed-off by the Environmental Manager.</li> <li>2. Corrective action to be confirmed and signed-off by the Environmental Manager.</li> <li>3. Consolidated monthly monitoring reports (including the corrective action taken) to be submitted to the Department of Mineral Resources.</li> </ol>

Source Activity	Impacts requiring monitoring programmes	Functional requirements for monitoring	Roles and responsibilities	Monitoring and reporting frequency and time periods for implementing impact management actions
	<p>Visual inspection of pollution incidents, the integrity of secondary containment structures and waste management.</p>	<p>All secondary containment structure will be inspected on a regular basis to confirm the integrity thereof and to identify potential leaks.</p> <p>All spill incidents will be identified and corrective action taken in accordance with an established spill response procedure.</p> <p>Waste management practices will be monitored to prevent contamination and littering.</p>	<p>Prospecting Manager Contractor</p>	<p>Daily</p> <ol style="list-style-type: none"> <li>1. Monthly monitoring reports to be signed-off by the Environmental Manager.</li> <li>2. Corrective action to be confirmed and signed-off by the Environmental Manager.</li> <li>3. Consolidated monthly monitoring reports (including the corrective action taken) to be submitted to the Department of Mineral Resources.</li> <li>4. Incident reporting will be undertaken as required in terms of the relevant legislation including, but not limited to, the:</li> </ol>

Source Activity	Impacts requiring monitoring programmes	Functional requirements for monitoring	Roles and responsibilities	Monitoring and reporting frequency and time periods for implementing impact management actions
				a) Mineral and Petroleum Resources Development Act 28 of 2002; and b) National Water Act 36 of 1998.
Post Closure Monitoring	Follow-up inspections and monitoring of rehabilitation	Inspection of all rehabilitated areas to assess whether any soil erosion is occurring and implement corrective action where required.  Confirm that the set target of 45% cover for all re-vegetated areas have been achieved after a period of 6 months and re-seed where	Prospecting Manager	Monthly for a period of 6 months after rehabilitation activities are concluded. 1. Monthly monitoring reports to be signed-off by the Environmental Manager 2. Corrective action to be confirmed and signed-off by the Environmental Manager. 3. Consolidated monthly monitoring reports (including the corrective action taken) to be

Source Activity	Impacts requiring monitoring programmes	Functional requirements for monitoring	Roles and responsibilities	Monitoring and reporting frequency and time periods for implementing impact management actions
		<p>required</p> <p>Identify any areas of subsidence around drill holes and undertake additional backfilling if required.</p>		<p>submitted to the Department of Mineral Resources.</p> <p>4. Final impact and risk assessment report for site closure to be submitted to the Department of Mineral Resources for approval</p>

**3.1. Indicate the frequency of the submission of the performance assessment/ environmental audit report.**

Annual performance assessments must be undertaken on the EMP. These reports must also include the assessment of the financial provision. The reports should be submitted to the DMR.

**4. Environmental Awareness Plan**

**4.1. Manner in which the applicant intends to inform his or her employees of any environmental risk which may result from their work.**

An Environmental Awareness and Risk Assessment Schedule have been developed and is outline in Table below. The purpose of this schedule is to ensure that employees are not only trained but that the principles are continuously re- enforced.

Table 17: Environmental Training and Awareness Schedule

Frequency	Time allocation	Objective
Induction (all staff and workers)	1 hour training on environmental awareness training as part of site induction	31. Develop an understanding of what is meant by the natural environmental and social environment and establish a common language as it relates to environmental, health, safety and community aspects.  32. Establish a basic knowledge of the environmental legal framework and consequences of non-compliance.

Frequency	Time allocation	Objective
		<p>33. Clarify the content and required actions for the implementation of the Environmental Management Plan.</p> <p>34. Confirm the spatial extent of areas regarded as sensitive and clarify restrictions.</p> <p>35. Provide a detailed understanding of the definition, the method for identification and required response to emergency incidents</p>
Monthly Awareness Talks (all staff and workers)	30 minute awareness talks	Based on actual identified risks and incidents (if occurred) reinforce legal requirements, appropriate responses and measures for the adaptation of mitigation and/or management practices.
Risk Assessments (supervisor and workers involved in task)	Daily task based risk assessment	Establish an understanding of the risks associated with a specific task and the required mitigation and management measures on a daily basis as part of daily tool box talks.



## **4.2. Manner in which risks will be dealt with in order to avoid pollution or the degradation of the environment.**

As prescribed in Table 17 above, Task/ Issue Based Risk Assessments must be undertaken with all workers involved in the specific task in order to establish an understanding of the risks associated with a specific task and the required mitigation and management measures.

### **4.2.1. Environmental Awareness Training Content – Induction Training:**

The following environmental awareness training will be provided to all staff and workers who will be involved in prospecting activities.

- Description of the approved prospecting activities and content of the prospecting right;
- An overview of the applicable legislation and regulations as it relates to environmental, health, safety and community including (but not limited to):
  - ❖ General Environmental Legal Principles and Requirements
  - ❖ Air Quality Management
  - ❖ Water and Wastewater Management
  - ❖ Hazardous Substances
  - ❖ Non-Mining-Related Waste Management
  - ❖ The Appropriate Remediation Strategies & Deteriorated Water Resources
  - ❖ Biodiversity
  - ❖ Weeds and Invader Plants
  - ❖ Rehabilitation
  - ❖ Contractors and Tenants
  - ❖ Energy & Conservation
  - ❖ Heritage Resources
  - ❖ General Health and Safety Matters
  - ❖ Basic Conditions of Employment
  - ❖ Compensation for Occupational Injuries and Diseases
  - ❖ General Mine Health and Safety Matters

- ❖ Smoking in the Workplace
- ❖ Noise & Hearing Conservation
- ❖ Handling, Storage and use of Hazardous Substances
- ❖ Weapons and Fire arms
  
- Content and implementation of the approved Environmental Management Plan
  - ❖ Allocated responsibilities and functions
  - ❖ Management and Mitigation Measures
  - ❖ Identification of risks and requirements adaptation
  
- Sensitive environments and features
  - ❖ Description of environmentally sensitive areas and features
  - ❖ Prohibitions as it relates to activities in or in proximity to such areas.
  
- Emergency Situations and Remediation
  - ❖ Methodology for the identify areas where accidents and emergency situations may occur, communities and individuals that may be impacted
  - ❖ An overview of the response procedures,
  - ❖ Equipment and resources
  - ❖ Designate of responsibilities
  - ❖ Communication, including communication with potentially Affected Communities
  - ❖ Training schedule to ensure effective response.

#### **4.2.2. Development of procedures and checklists**

The following procedures will be developed and all staff and workers will be adequately trained on the content and implementation thereof.

#### **4.2.3. Emergency Preparedness and Response**

The procedure will be developed to specifically include risk identification, preparedness, response measures and reporting. The procedure will specifically include spill and fire risk, preparedness and response measures. The appropriate emergency control centres (fire department, hospitals) will be identified and the contact numbers obtained and made

available on site. The procedure must be developed in consultation with all potentially affected landowners.

In the event that risks are identified which may affected adjacent landowners or other persons), the procedure will include the appropriate communication strategy to inform such persons and provide response measures to minimize the impact.

#### **4.2.4. Incident Reporting Procedure**

Incident reporting will be undertaken in accordance with an established incident reporting procedure to (including but not limited to):

- Provide details of the responsible person including any person who: (i) is responsible for the incident; (ii) owns any hazardous substance involved in the incident ;or (iii) was in control when the incident occurred;
- Provide details of the incident ( time, date, location);
- The details of the cause of the incident;
- Identify the aspects of the environment impacted;
- The details corrective action taken, and
- The identification of any potential residual or secondary risks that must be monitored and corrected or managed.

#### **4.2.5. Environmental and Social Audit Checklist**

An environmental audit checklist will be established to include the environmental and social mitigation and management measures as developed and approved as part of the Environmental Management Plan. Non- conformances will be identified and corrective action taken where required.

## **5. Specific information required by the Competent Authority**

No specific information was required by the Competent Authority.

## 6. 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; and
- 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:

Fecund Consultants Pty Ltd

---

Name of company:

03/08/2022

---

Date:

**-END-**

## APPENDIX A: MAPS

## **APPENDIX B: CONSULTATION REPORT**

## **APPENDIX C: DETAILS OF THE EAP**