Responsible. Transferable. Sustainable.

In respect of the Remaining Extent of the Farm Sandham No. 171; Remaining Extent and Portion 1 of Farm Hartfell No. 172 and Remaining Extent, Portions 1 and 2 of Farm Bullsrun No. 164, in the Administrative District of Hay

DMR Ref: 30/5/1/1/2/11724 PR

Basic Assessment Report and Environmental Management Plan for the

ENDEMIC VISION
ENVIRONMENTAL SERVICES

January 2016

Responsible. Transferable. Sustainable.

Declaration of Consultant Independence

This report has been prepared by EndemicVision Environmental Services (Pty) Limited, with all reasonable skill, care and diligence within the terms of the contract with the client. EndemicVision Environmental Services is a multidisciplinary environmental management and consulting company with more than 20 years of experience in field. The technical appointments for this project are detailed below.

Team Member	Qualifications	Experience	Project Role
Chrizette Neethling	MSc – Current BSc Honors BA – EM ND Conservation NC Business Management	Over 20 years of broad based environmental experience with more than 35 projects completed in mining, biodiversity and development industries.	Project Manager and Ecologist
Bonni van Tonder	BSc. Hons.	One years' experience in conducting environmental impact assessments.	Environmental Technician

The author of this report, EndemicVision Environmental Services, does hereby declare that it is an independent consultant and has no business, financial, personal or other interest in the activity, application or appeal in respect of which it was appointed other than fair remuneration for work performed in connection with the activity, application or appeal. There are no circumstances that compromise the objectivity of the persons performing such work. All opinions expressed in this report are its own.

Signed: **C.D. Neethling** Dated: **22 January 2016**

Responsible. Transferable. Sustainable.

Table of Contents

Responsible. Transferable. Sustainable.

List of Tables

List of Figures

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: Genet Manganese (Pty) Ltd

TEL NO: +27 (13) 590 0858

FAX NO: +27 (86) 552 6500

POSTAL ADDRESS: P.O. Box 13180, Leraatsfontein, Witbank, Mpumalanga, 1038

PHYSICAL ADDRESS: Genet House, Wilge Powerstation, Voltargo, Mpumalange, 2226

FILE REFERENCE NUMBER SAMRAD: NC 30/5/1/1/2/11724 PR (see Annexure A)

1. IMPORTANT NOTICE

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

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

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

It is therefore 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.

2. Objective of the basic assessment process

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

(a) determine the policy and legislative context within which the proposed activity is located and how the activity complies with and responds to the policy and legislative context;

(b) identify the alternatives considered, including the activity, location, and technology alternatives;

(c) describe the need and desirability of the proposed alternatives,

(d) through the undertaking of an impact and risk assessment process inclusive of cumulative impacts which 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 the 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.

Responsible. Transferable. Sustainable.

PART A

SCOPE OF ASSESSMENT AND BASIC ASSESSMENT REPORT

3. Contact Person and correspondence address

a) Details of

i) Details of the EAP

Name of the Practitioner: EndemicVision Environmental Services (Pty) Ltd
Chrizette Neethling
Tel No.: +27 (0) 53 723 1206
Fax No. : +27 (86) 590 7261
e-mail address: cdn@endemicvision.co.za

ii) Expertise of the EAP

(1) **The qualifications of the EAP**

Please refer to the Annexure B for the Curriculum Vitae of Chrizette Neethling

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

Please refer to the Annexure B for the Curriculum Vitae of Chrizette Neethling

b) Location of the overall Activity

The following table presents the location and associated cadastral details associated with the proposed project area.

Table 1: Location Details

Farm Name:	Sandham No. 171 - Remaining Extent Hartfell No. 172 - Remaining Extent and Portion 1 Bullsrun No. 164 - Remaining Extent, Portions 1 and 2
Application area (Ha)	9 283 ha
Magisterial district:	Postmasburg
Distance and direction from nearest town	70 km north of Prieska
21 digit Surveyor General Code for each farm portion	Sandham 171 Hay RD - Remaining Extent - C03100000000017100000 Hartfell 172 Hay RD - Remaining Extent - C03100000000017200000 - Portion 1 - C03100000000017200001 Bullsrun 164 Hay RD - Remaining Extent - C03100000000016400000 - Portion 1 - C03100000000016400001 - Portion 2 - C03100000000016400002

c) Locality map

Show nearest town, scale not smaller than 1:250 000

The following figure illustrates the farm associated with the proposed Prospecting Area, as well as the Regional Setting.

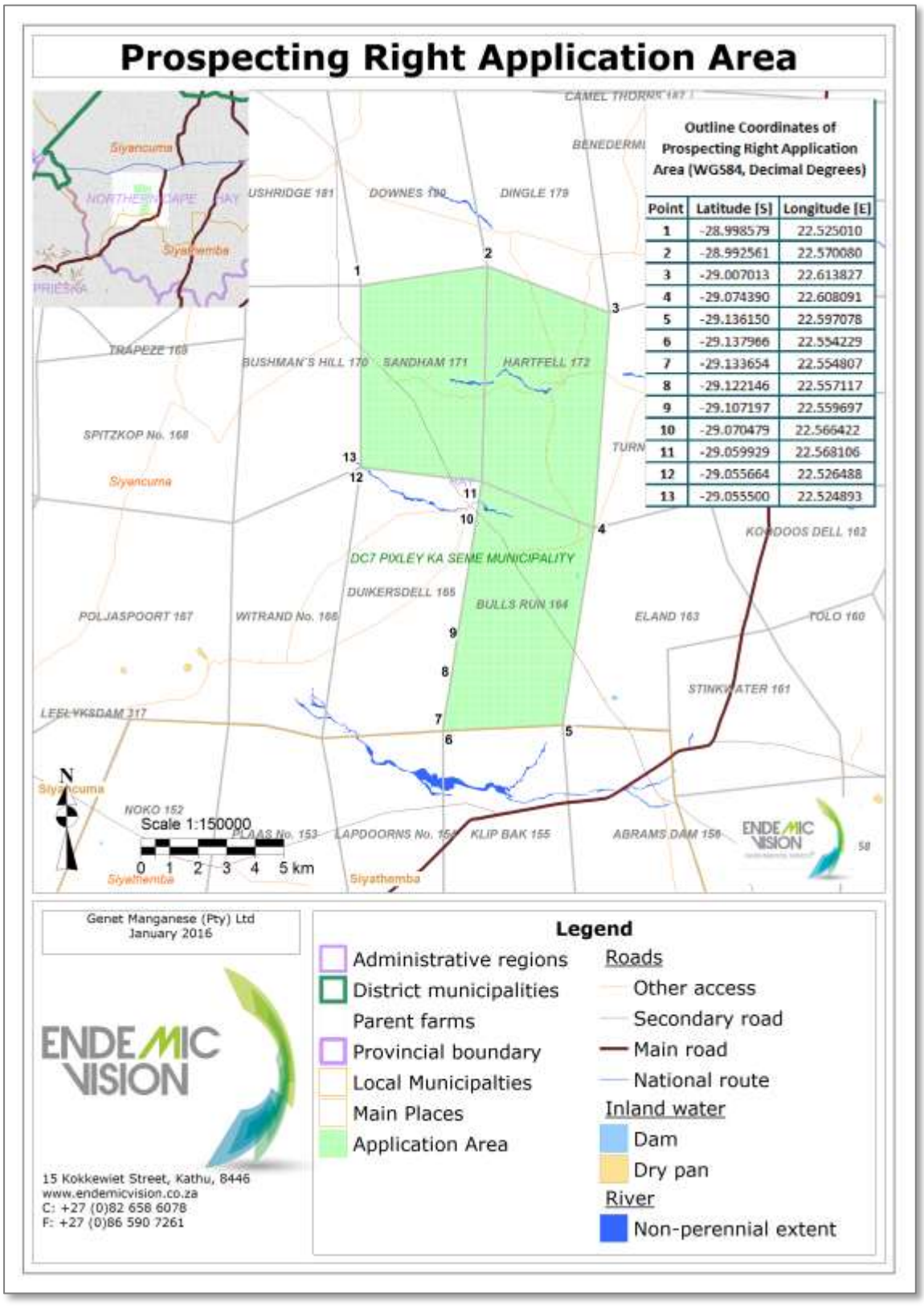

Figure 1: Location of the Prospecting Right Application Area

The Prospecting Right area applied for is located approximately 38 km north-west of Niekershoop and 70 km north of Prieska within the Administrative District Hay, in the Siyancuma Local Municipality and Pixley ka Seme District Municipality, Northern Cape Province.

The figure below illustrates the setting of the proposed Prospecting Area within the borders of the Siyancuma Local Municipality.

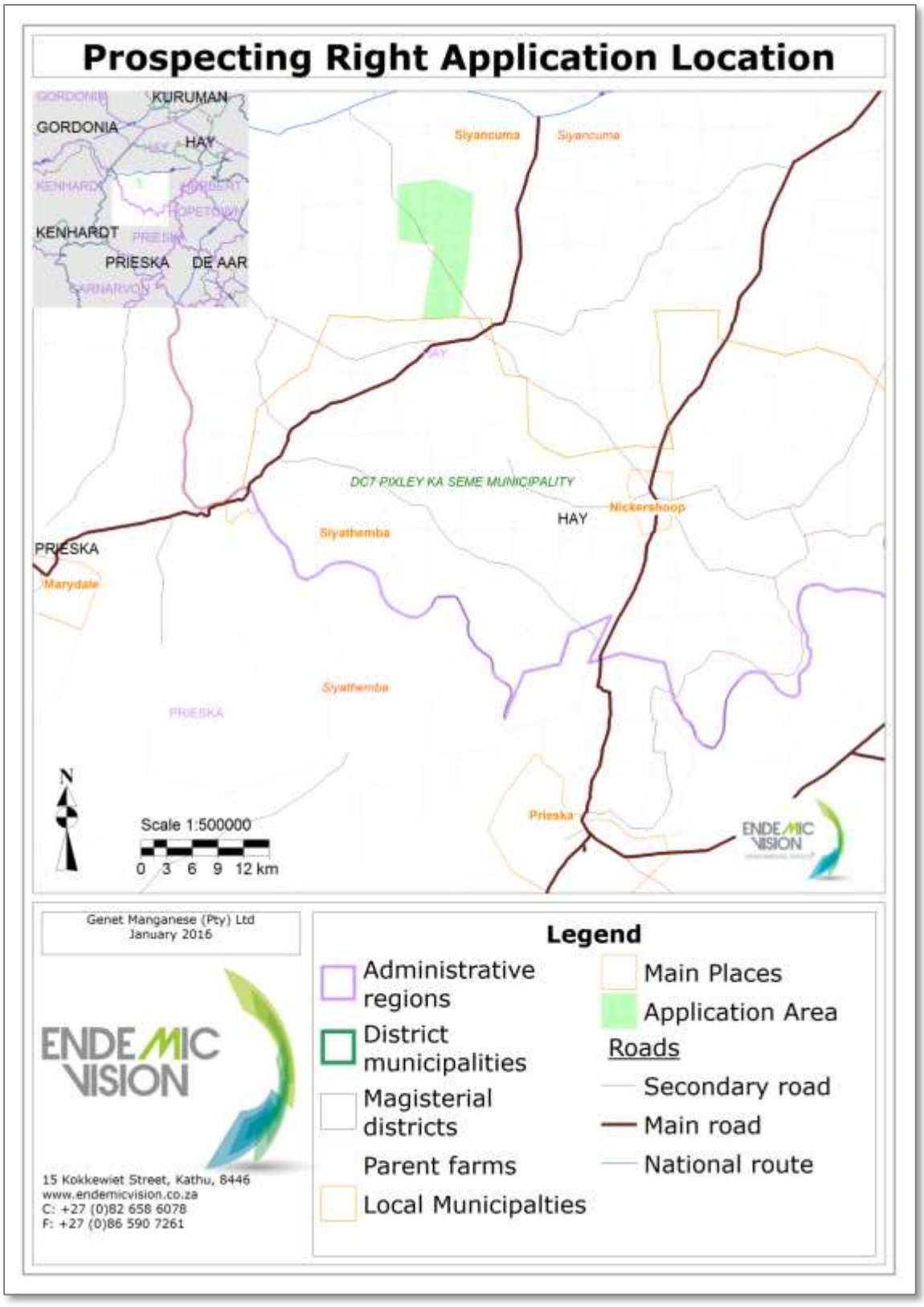

Figure 2: Local Setting of the Prospecting Right Area within the Municipal Border

d) Description of the scope of the proposed overall activity

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

The application is for a prospecting right for copper, manganese and iron ore. It is planned to determine the mineral resource and distribution for this project by means of non-invasive as well as invasive prospecting methods. The information obtained during the initial non-invasive field survey and evaluation process of the geological maps and data, will then be used to determine the target area and planned positions of the intended invasive prospecting. The entire prospecting programme will take place over a 60 month (5 year) period. The Prospecting Works Programme provides the detailed phases of the proposed project.

Invasive prospecting will take place via:

- **Trenching and pitting**

The planned prospecting would be performed by a Backhoe excavator. Dimensions will typically range between 15m length x 2m wide x 3m depth to 20m length x 2m width x 3m depth. Different trench positions would initially typically be planned at a spacing of 500m apart on the target areas during the exploration process. Once a body is exposed with a trench, a channel sample will be taken from the sidewall of the 3m trench wall for quality and analysis purposes as well as mapping of the strata. It is expected that there will be a total of 33 trenches will be excavated, sampled and then rehabilitated.

- **Triple-cube Core Drilling**

In conjunction with the trenching, diamond drilling will be applied in the exploration program. For this purpose drilling will make use of a triple-tube core barrel. It is envisaged that only one hole be drilled for each trench excavation position of depths of approximately 50 meters. Depending on the results from reconnaissance and geological mapping the drill holes will be laid out in a grid fashion to cover prospective ground. The amount of boreholes required at this stage is an estimate based on a preliminary assessment of the surface topography as well as a 44% discount for potential mineral surface area loss. It is expected that a total of 93 logs will be drilled, sampled and rehabilitated.

Depending on the mineralogy and occurrence of the ore-bodies, it might be decided to only conduct core drilling, without trenching, in certain areas.

The current road infrastructure on the properties will be utilised as far as possible for gaining access to the drill-hole positions. A significant amount of well traversed roads currently exist on the properties. In this way the disturbance of the surface area will be kept to a minimum.

On completion of each drilled hole it will be rehabilitated during the closing and rehabilitation of the nearby trench. The sump will also be closed and rehabilitated at the same time by means of filling the hole with the original excavated material. At any time during the prospecting programme, no more than 1 trench and borehole and one campsite position will be left un-rehabilitated.

Bulk sampling is currently not planned, but if required the application will be amended accordingly.

Campsite positions are planned within a radius of 500m of each drilling site. Once a new campsite is developed the old campsite will be rehabilitated.

The infrastructure associated with the future prospecting to be conducted essentially consists of the following:

- Drilling boreholes with casing and capping for each drill site

- Drill sites
- Trench sites
- Campsites
- Existing roads used and/or upgraded where necessary
- No permanent fixtures or infrastructure development will take place.

The position of the trenches and holes will be planned only after field reconnaissance on the property and detailed studying of geological information available on the area is completed. Mapping of the prospecting activities could thus not be undertaken. For the purposes of this report, the overall prospecting area is presented in the figure below. In the following sections more details are provided in terms of each of the prospecting activities.

The applicant must submit a plan indicating the location of trenching and drilling activities once these areas have been finalized to the landowner as well as the Department of Mineral Resources.

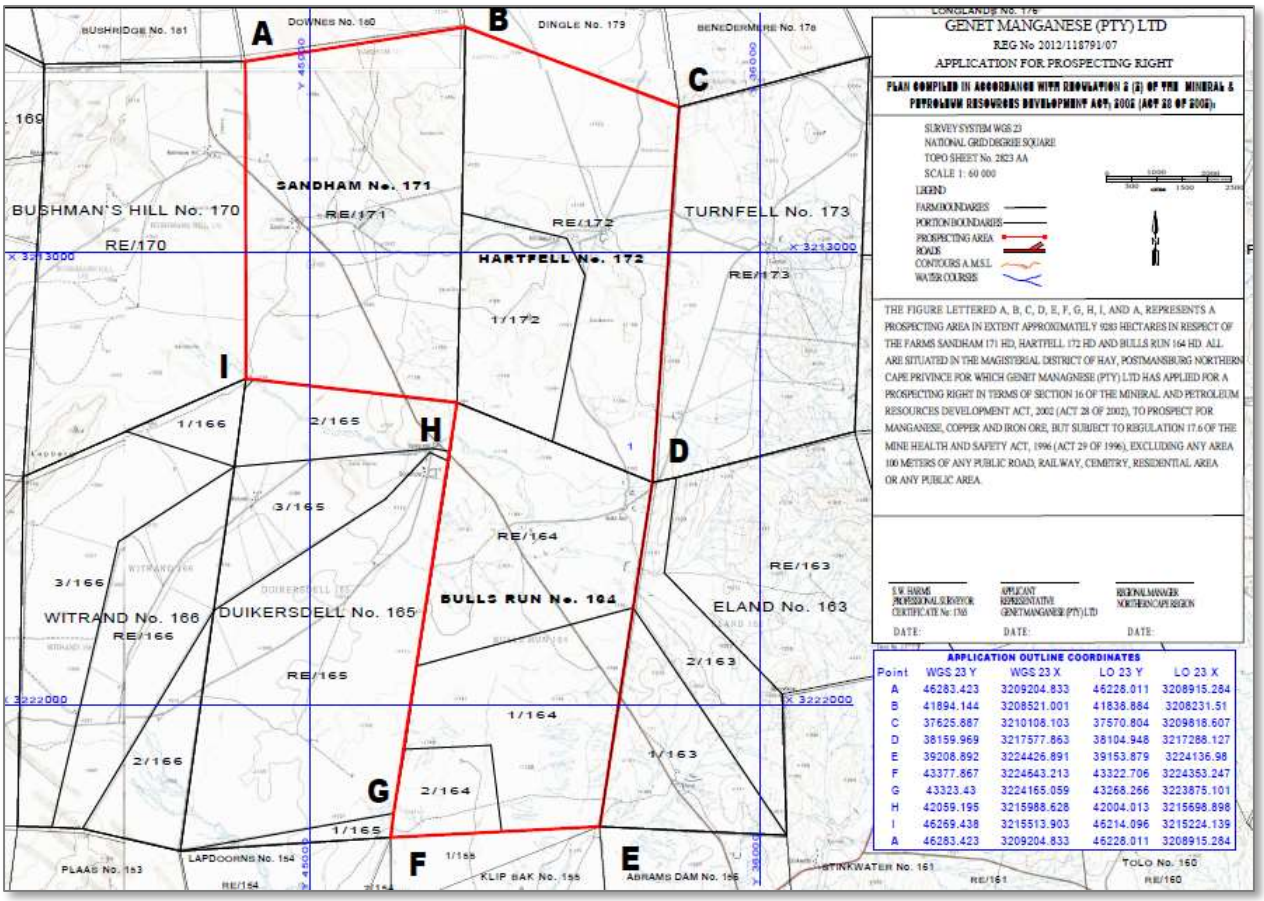

Figure 3: Location and Area of the Prospecting Right Application Area

(i) Listed and specified activities

Section 16 of the Mineral and Petroleum Resources Development Act, 2002 (Act No.28 of 2002) requires, upon request by the Minister that an Environmental Management Plan be submitted and that the applicant must notify and consult with Interested and Affected Parties (I&APs). Section 24 of the NEMA requires that activities, which may impact on the environment, must obtain an environmental authorisation from a relevant authority before commencing with the activities. Such activities are listed under Regulations Listing Notice 1 Government Notice (GN) 983, Listing Notice 2 GN 984 and Listing Notice GN 985 (dated 4 December 2014) of NEMA. The proposed prospecting activity triggers:

NEMA Government Notice 983: Listing Notice 1:

- Activity 20 – "Any activity including the operation of that activity which requires a prospecting right in terms of section 16 of the Mineral and Petroleum Resources Development Act, 2002 (Act No. 28 of 2002), including associated infrastructure, structures and earthworks, directly related to prospecting of a mineral resource, including activities for which an exemption has been issued in terms of section 106 of the Mineral and Petroleum Resources Development Act, 2002 (Act No. 28 of 2002)."
- Activity 22 – "The decommissioning of any activity requiring - (i) a closure certificate in terms of section 43 of the Mineral and Petroleum Resources Development Act, 2002 (Act No. 28 of 2002); or (ii) a prospecting right, mining right, mining permit, production right or exploration right, where the throughput of the activity has reduced by 90% or more over a period of 5 years excluding where the competent authority has in writing agreed that such reduction in throughput does not constitute closure."
- Activity 30 – "Any process or activity identified in terms of section 53(1) of the National Environmental Management: Biodiversity Act, 2004 (Act No. 10 of 2004)". This activity has been included for the single purpose of the presence of flora which may require permits for their removal.

NEMA Government Notice 985: Listing Notice 3:

- Activity 12 – "The clearance of an area of 300 square metres or more of indigenous vegetation except where such clearance of indigenous vegetation is required for maintenance purposes undertaken in accordance with a maintenance management plan."

Table 2: Prospecting Extent and Activities

NAME OF ACTIVITY	Aerial extent of the Activity Ha or m²	LISTED ACTIVITY Mark with an X where applicable or affected.	APPLICABLE LISTING NOTICE (GNR 983, GNR 984 or GNR 985)
Authorization phase (Prospecting Right)	-	**X**	GNR 983 (20 & 22)
Exploration Geological Mapping	-	**-**	-
Site access and roads	2320.75 m^2	**X**	GNR 985 (12)
Site camp (no site office)	1445.22 m^2	**X**	GNR 985 (12)
Drill site	1856.60 m^2	**X**	GNR 985 (12)
Excavation of drill sumps	139.25 m^2	**-**	GNR 985 (12)
Trench site	3249.05 m^2	**X**	GNR 985 (12)
Exploration drilling	-	**-**	-
Water management	-	-	-
Re-fuelling and maintenance	160.58 m^2	-	-
Ablution facilities	32.12 m^2	**-**	-
Core sampling	321.16 m^2	**X**	GNR 985 (12)
Waste management	**-**	**-**	-
Rehabilitation	**-**	**-**	-
Removal of nationally protected tree species (such as *A.erioloba, A.haematoxylon, B.albitrunca*). This activity is unlikely as the prospecting activities will be planned to avoid these areas. However, where these trees cannot be avoided, tree removal permits must be applied for at Northern Cape DENC.	**-**	**X**	GNR 983 (30)

(ii) Description of the activities to be undertaken

Describe Methodology or technology to be employed, including the type of commodity to be prospected / mined and for a linear activity, a description of the route of the activity

The following section presents a detailed description of all the activities associated with the proposed Prospecting Application.

The application is for a prospecting right for copper, manganese and iron ore. It is planned to determine the mineral resource and distribution for this project by means of non-invasive as well as invasive prospecting methods.

Site Access / Roads

Access roads to the site will be required during the construction phase of the project. Access road requirements can only be determined after the field reconnaissance on the property and detailed studying of geological information available on the area has been completed. Existing roads will be used as far as possible. A number of existing roads and tracks already traverse the proposed prospecting area, see below figure.

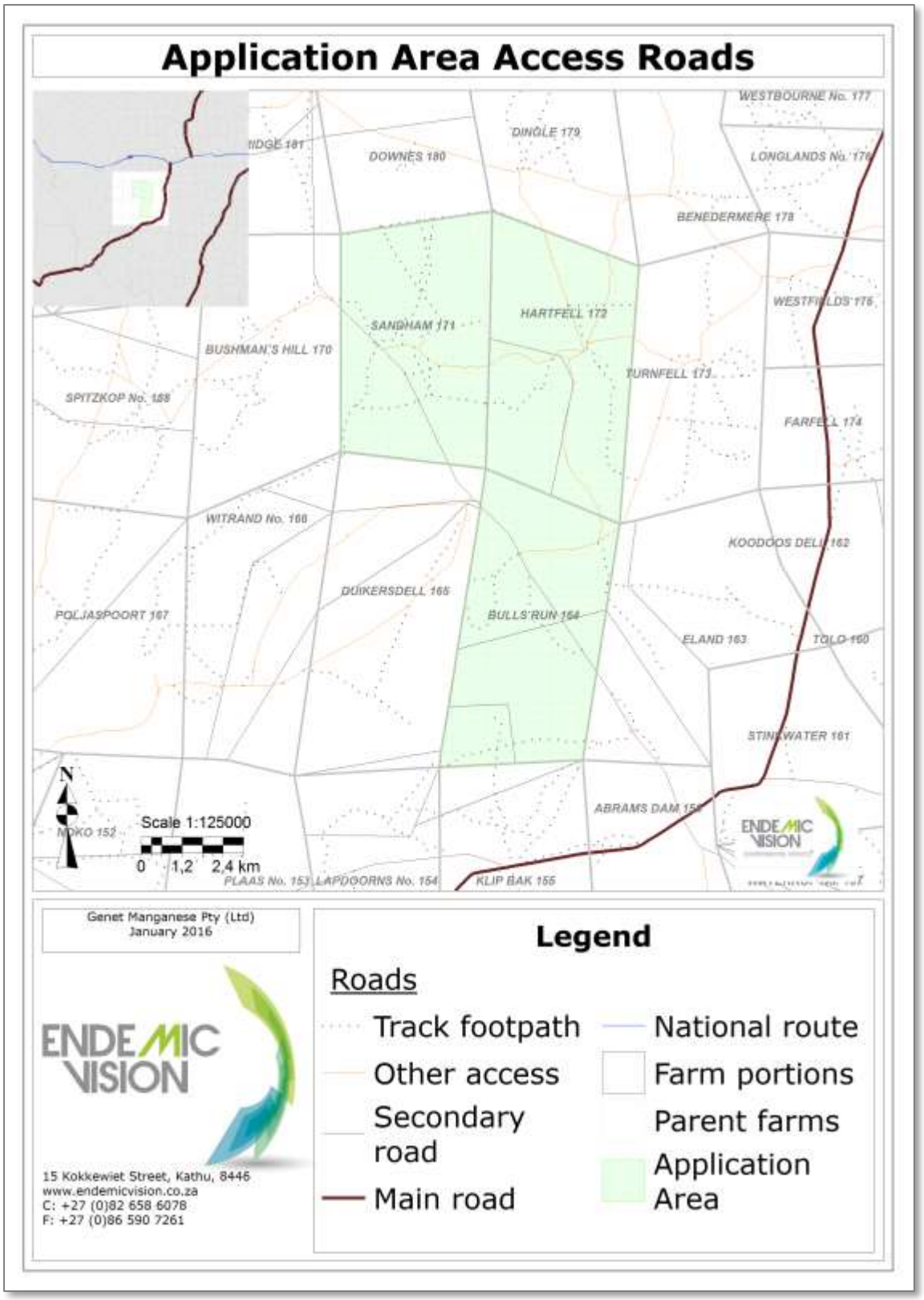

Figure 4: Existing Roads and Tracks

Existing single track roads present on the application area are illustrated below:

Figure 5: Hartfell Access Road

Figure 6: Hartfell Access Road

Figure 7: Sandham Access Road

Figure 8: Bullsrun Access Road

Once the prospecting sites have been identified, access roads may be established for access to the drill site if the identified drill site cannot be accessed via existing roads and tracks. New roads will be limited to the minimum and constructed with consultation of the landowner.

- Site Camp

Temporary campsite positions are planned within a radius of 500m of each drilling site. Once a new campsite is developed the old campsite will be rehabilitated. There will be no site office constructed.

- Drill Sites

During the construction phase drill sites will be cleared of only the necessary vegetation and topsoil is stockpiled for re-use after drilling where appropriate. Soil compaction will be prevented throughout the phases of the project.

- Trench Sites

The planned prospecting would be performed by a Backhoe excavator. Dimensions will typically range between 15m length x 2m wide x 3m depth to 20m length x 2m width x 3m depth. Different trench positions would initially typically be planned at a spacing of 500m apart on the target areas during the exploration process. Once a body is exposed with a trench, a channel sample will be taken from the sidewall of the 3m trench wall for quality and analysis purposes as well as mapping of the strata. It is expected that there will be a total of 93 trenches will be excavated, sampled and then rehabilitated.

Responsible. Transferable. Sustainable.

Excavation of Sumps

For the excavation of sumps, the topsoil will be stockpiled for re-use where appropriate. The sump will also be closed and rehabilitated by means of filling the hole with the original excavated material.

Exploration Drilling

In conjunction with the trenching, diamond drilling will be applied in the exploration program. For this purpose drilling will make use of a triple-tube core barrel. It is envisaged that only one hole be drilled for each trench excavation position of depths of approximately 50 meters. Depending on the results from reconnaissance and geological mapping the drill holes will be laid out in a grid fashion to cover prospective ground. The amount of boreholes required at this stage is an estimate based on a preliminary assessment of the surface topography as well as a 44% discount for potential mineral surface area loss. It is expected that a total of 93 logs will be drilled, sampled and rehabilitated.

Historically there are evidence of bulk sampling and exploration on the farm Hartfell Portion 1, see illustration below:

Figure 9: Historic Prospecting Activities (Hartfell/1)

Water Management

Groundwater abstraction as part of the drilling activities during the operational phase will be limited to between 1000 and 10 000 ℓ per day. The water use must not exceed the general authorisation volume for the area and spillage or waste will be limited.

Re-Fuelling and Maintenance

During all phases of the prospecting project limited quantities of diesel fuel, oil and lubricants will be stored on site for re-fuelling and maintenance. The only dangerous good that will be stored in a significant quantity is diesel fuel. A 1 000 ℓ diesel bowser will be used for the storage of diesel fuel on site.

Ablution Facilities

Ablution facilities will be required during all phases of the project and portable chemical toilets will be installed at the drill site for the use of 6 people on site.

Waste Management

Waste management on site will be applied throughout all phases of the project. Disposal certificates will be obtained.

e) 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
Mineral and Petroleum Resources Development Act, 2002	Application for Prospecting in terms of Section 16	A Prospecting Right Application has been submitted to the DMR by the Applicant. The application was accepted by the DMR on the 14th of October 2015. DMR Reference Number: NC 30/5/1/1/2/11724 PR
National Environmental Management Act, 1998 and relevant EIA Regulations (2014)	The Basic Assessment Report and Environmental Management Programme for Environmental authorizations in terms of the National Environmental Management Act, 1998 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).	An Application for Environmental Authorisation was submitted to the DMR. The application was accepted by the DMR and requested the submission of the Basic BAR and EMP within 90 days of the letter. The Basic Assessment Report, Environmental Management Programme and the Stakeholder Consultation Process has been conducted with consideration of the EIA regulations.
National Water Act, 1998	Groundwater abstraction as part of drilling activities	Water use will be limited to between 1000 and 10 000 ℓ per day. The water use must not exceed the general authorisation volume for the area.
National Environmental Management : Biodiversity Act ,2004	Presence of nationally protected trees	The EMP will regulate the applicant to apply for Tree Removal Permit from the Northern Cape Department of Environment, Nature Conservation (DENC) prior to the potential removal of any sensitive and/or protected species.
National Heritage Resources Act, 1999	The activity may trigger the requirements under Section 38 of the NHRA. However, the requirements for permits are not known at this stage.	The South African Heritage Resources Agency (SAHRA) was contacted on 20 January 2016, at which time the agency indicated that a case officer has been assigned. Comment will be provided when the draft BAR and EMP has been uploaded to SAHRIS. The feedback from SAHRA will guide whether permits will be required. A heritage impact assessment has been conducted.

f) Need and desirability of the proposed activities

Motivate the need and desirability of the proposed development including the need and desirability of the activity in the context of the preferred location

The proposed prospecting area is targeted due to existing and historical mining activities that are known from within the larger region and it is anticipated that similar conditions will prevail for this project.

Genet Manganese applied for prospecting for copper, manganese and iron ore on the property as discussed in this report as part of the ferrous and base metal project to determine the mineral resource and distribution by means of non-invasive as well as invasive prospecting methods.

Genet Manganese (Pty) Ltd is a Mining company registered in 2012 with a wide range mining portfolio within the group. Although Genet Manganese (Pty) Ltd is a relatively new company, the holding company, members and subsidiary companies have been successfully involved in the mining industry for the past 10 years.

The need for the project is to ensure the long term viability of the company. The economic desirability of whether or not this is the most suitable area for prospecting can only be confirmed after initial non-intrusive geological surveys. The ecological desirability indicates that the site is relatively homogenous and the small scale, short term impact will not be detrimental. The social desirability is limited to the direct landowners who are primarily livestock farmers with no interest in mining.

g) Motivation for the overall preferred site, activities and technology alternative

The proposed prospecting area is targeted due to existing and historical mining activities that are known from within the larger region and it is anticipated that similar conditions will prevail for this project. No alternative other than drilling is possible to determine the presence and quality of the minerals (copper, iron and manganese) in the area.

It is anticipated (in the absence of preliminary field visits of the area prior to this application process) that the occurrence of mineral deposits on this property will be mainly associated with complex folding and paleo sinkholes in the dolomite formations. It is also anticipated that these formations will predominantly more likely occur on the higher elevation areas as well as hills and koppies.

The presence of people, streams/rivers, wetlands, graves, protected plant species and other sensitive areas will determine the locality of the camp site, access roads as well as the position of prospecting holes.

h) Full description of the process followed to reach the proposed preferred alternatives within the site

NB!! – This section is about the determination of the specific site layout and the location of infrastructure and activities on site, having taken into consideration the issues raised by interested and affected parties, and the consideration of alternatives to the initially proposed site layout

The information obtained during the initial non-invasive field survey and evaluation process of the geological maps and data, will then be used to determine the target area and planned positions of the intended invasive prospecting.

Depending on the mineralogy and occurrence of the ore-bodies, it might be decided to only conduct core drilling, without trenching, in certain areas.

Existing and historical mining activities are known from within the larger region and it is anticipated that similar conditions will prevail for this project.

The presence of people, streams/rivers, wetlands, graves, protected plant species and other sensitive areas will determine the locality of the camp site, access roads as well as the position of prospecting holes.

The position of the trenches and holes will be planned only after field reconnaissance on the property and detailed studying of geological information available on the area is completed. The current road infrastructure on the properties will be utilised as far as possible for gaining access to the drill-hole positions. A significant amount of well traversed roads currently exist on the properties. In this way the disturbance of the surface area will be kept to a minimum.

On completion of each drilled hole it will be rehabilitated during the closing and rehabilitation of the nearby trench. The sump will also be closed and rehabilitated at the same time by means of filling the hole with the original excavated material. At any time during the prospecting programme, no more than 1 trench and borehole and one campsite position will be left un-rehabilitated.

Bulk sampling is currently not planned, but if required the application will be amended accordingly.

Campsite positions are planned within a radius of 500m of each drilling site. Once a new campsite is developed the old campsite will be rehabilitated.

i) Details of the development footprint alternatives considered

……..
With reference to the site plan provided as Appendix 4 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.

……

The information obtained during the initial non-invasive field survey and evaluation process of the geological maps and data will be used to determine the target area and planned positions of the intended invasive prospecting.

There are therefore no impact alternative sites considered at this stage.

The presence of people, streams/rivers, wetlands, graves, protected plant species and other sensitive areas will determine the locality of the camp site, access roads as well as the position of prospecting holes. This information is mapped in the ecological specialist report.

ii) Details of the Public Participation Process Followed

…….
Describe the process undertaken to consult interested and affected parties including public meetings and one on one consultation. NB the affected parties must be specifically consulted regardless of whether or not they attended public meetings. (Information to be provided to affected parties must include sufficient detail of the intended operation to enable them to assess what impact the activities will have on them or on the use of their land)
…….

The diagram below sets out the approach for the engagement process for the proposed project:

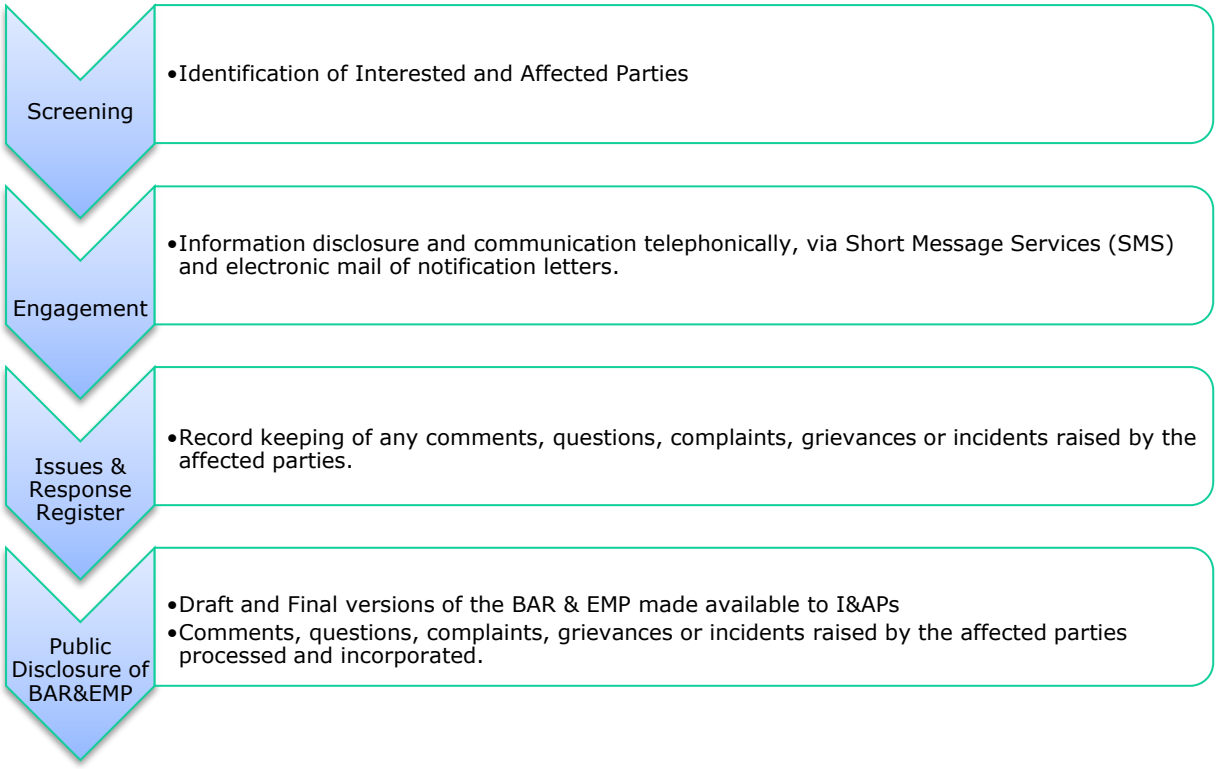

Figure 10: Public Participation Approach

- Screening – Identification of Interested and Affected Parties

The affected properties belong to private farmers and were identified through a title deed search and through consultation. No communities are situated on the affected property.

Other I&APs include Organs of State, who have jurisdiction over, or may have an interest in the proposed prospecting project. Adjacent landowners, other non-governmental organisations and/or private persons are included. A list of the stakeholders is included in *Table 4*.

Adjacent landowners were identified through the use of Geographical Information Systems (GIS) maps and consultation with the landowners for contact details. The affected and adjacent farm properties are illustrated in the figure below.

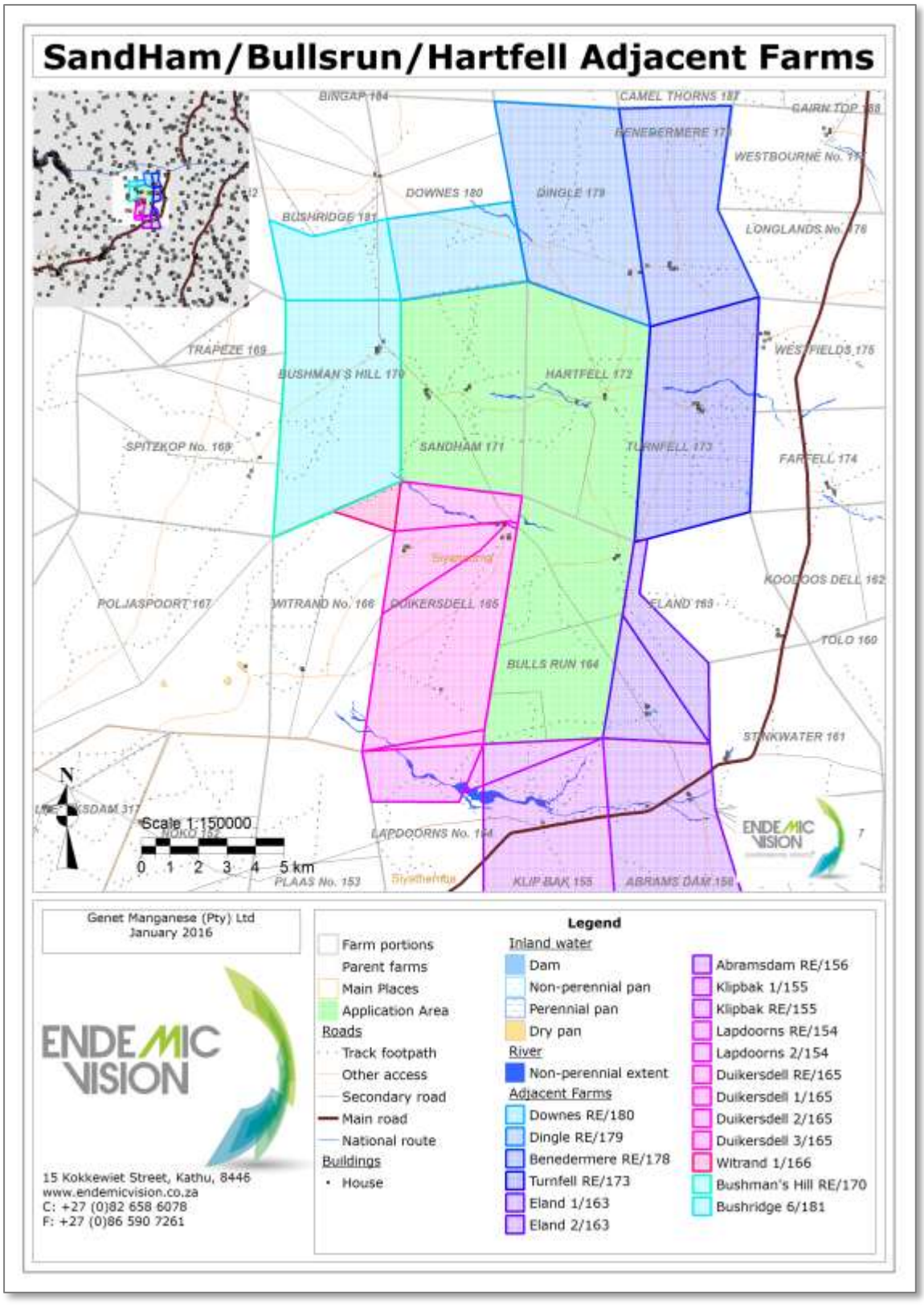

Figure 11: Affected and Adjacent Farm Properties

- **Landowners**

  The properties of interest are privately owned land. The landowners are the lawful occupiers of the proposed prospecting area.

- **Communities**

  No communities are situated on the affected properties and are privately owned land.

- **Traditional Leader**

  No traditional authority was identified for the affected property.

- **Land Claim**

  A request for a Land Claim Letter was e-mailed to Mr Pabalelo Mokale on 20 January 2016 from the Northern Cape Department of Rural Development and Land Reform. The response letter has not yet been received. Information from the response letter will be updated in the final document.

- **Municipality**

  The project is located within the Administrative District of Hay, in the Siyancuma Local Municipality and Pixley ka Seme District Municipality, Northern Cape Province. Me Lorraine Oliphant from the local municipality and Mr Greeff from the District Municipality were informed via e-mail of the Prospecting application.

- **Relevant Government Departments**

  The following other departments were informed of the proposed project by e-mail:

  - Northern Cape Department of Agriculture, Forestry & Fisheries (DAFF)
  - Northern Cape Department of Environmental Affairs & Nature Conservation (DENC); Pixley ka seme District Environmental Officer
  - Department of Mineral Resources (DMR): Regional Manager Northern Cape (Kimberley)
  - Provincial Department of Agriculture, Land Reform and Rural Development : Sustainable Resource Management (Pixley ka Seme District)
  - Provincial Heritage Resources Authority of Northern Cape: Ngwao-Boswa Jwa Kapa Bokone

- **Cultural and Heritage Significance**

  The South African Heritage Resource Agency (SAHRA) has been informed of the proposed prospecting project by e-mail. The case will further be uploaded to SAHRIS with the draft documents and heritage report for comment.

- **Other interested parties**

  The Environmental Specialist at Kolomela iron ore mine, a nearby mine, has been informed of the proposed prospecting project via e-mail. A Background Information Document (BID) was provided.

Responsible. Transferable. Sustainable.

Table 4: Identified Stakeholders

Ref. No.	Reg.	SECTOR	CONTACT PERSON	ALTERNATIVE	DESIGNATION
1	41(b)(i)	Occupiers of the site, if the proponent or applicant is not the owner or person in control of the site			
		RE of Hartfell 172 & RE of Sandham 171	Jaco Coetzee	Johannes Coetzee	Hartveld Trust
		Ptn 1 of Hartfell 172	Roedolf Johannes (Roelf) Botes		
		Ptn 1 & Ptn 2 of Bullsrun 164	Johannes Jordaan		Temdale Boerdery
2	41(b)(ii)	Owners, persons in control of, and occupiers of land adjacent to the site			
		Benedermere RE/178 Dingle RE/179	A.J. (Andries) Coffee		
		Turnfell RE/173 Downes RE/180 Bushridge 6/181	Johannes Coetzee		
		Eland 1/163 Eland 2/163	Jaco Gous		
		Klipbak 1/155 Klipbak RE/155	DB Lubbe		
		Abramsdam RE/156	Rika Mostert		
		Witrand 1/166 Duikersdell 1/165 Duikersdell RE/165 Duikersdell 2/165 Duikersdell 3/165	Gert Coffee		
		Bushman's Hill RE/170 Lapdoorns RE/154 Lapdoorns 2/154	Maans Jordaan		
3	41(b)(iv)	The municipal councillor of the Ward			
		Siyancuma Local Municipality	Me. Lorraine Oliphant		Mayor
4	41(b)(iv)	The municipality which has jurisdiction in the area			
		Siyancuma Local Municipality	Me. Lorraine Oliphant		Mayor
		Pixley Ka Seme District Municipality	Mr. Greeff		Councillor
5	41(b)(v)	Any organ of state having jurisdiction in respect of any aspect of the activity			
		South African Heritage Resources Agency (SAHRA)	Natasha Higgitt		Heritage Officer: Northern Cape
		Provincial Heritage Resources Authority: Ngwao-Boswa Jwa Kapa Bokone	Mr Ratha Andrew Timothy		Manager
		Northern Cape Department of Agriculture, Forestry & Fisheries	Jacoline Mans		Chief Forester: NFA Regulations
		Provincial Department of Rural Development and Land Reform	Mr. Pabalelo Mokale		Land Claims Commissioner Regional offices
		Northern Cape Department of Environmental Affairs & Nature Conservation	Mr Isaac Gwija		Pixley ka seme District Environmental Officer
		Provincial Department of Agriculture, Land Reform and Rural Development	Mr. Hannes Roux		Sustainable Resource Management (Pixley ka Seme District)
6	41(b)(vi)	Any other party as required by the competent authority			
		N/A			
7	39(2)(b)	Competent Authority			
		Department of Mineral Resources	Sunday Mabaso	Secretary: Lungi Mondela	Regional Manager Northern Cape (Kimberley)

8	39(2)(d)	Potential, or where relevant, registered Interested and Affected Parties			
		Kolomela iron ore mine	Jaco Lambrechts		Environmental Specialist
		Private	Obey Piason		SHE/Risk

- Engagement Process

The landowners involved are private farmers. The landowners was contacted and informed of the application and provided with information and the BID by means at a meeting held by Genet Manganese (15 January 2016 for owners of Sandham, Hartfell RE & Bullsrun) and at a site visit by EndemicVision (12 January 2016 for Hartfell/1 and 18 January 2016 for Hartfell RE).

- An advert was placed in the provincial newspaper 'Gemsbok' on 20 January 2016.
- Information of the proposed project was sent to all interested and affected parties via e-mail/phone between 20 to 22 January 2016.
- SMS notifications were sent to all registered stakeholders and adjacent landowners to inform them of the newspaper advert and the start of the public participation process.
- All Government departments were informed of the application via e-mail.
- A poster (site notice) was placed at the entrance of the farms of interest on 14 January 2016.
- Posters were also distributed in the nearby town, Groblershoop.
- A draft copy of the EMP will be provided to all I&APs registered on the project database for a period of 30 days to allow I&AP the opportunity to comment on the findings of the EMP. The draft EMP report will be made available to the I&APs on 25 January 2016.

Table 5 provides a detailed account of the activities and the associated timeframes of the stakeholder engagement process.

Table 5: Details of the Stakeholder Engagement Process

ACTION	TIMEFRAME	COMMENT
Request for registration as a stakeholder	Between 20 January 2016 and 19 February 2016	Stakeholders are invited to register as Interested and Affected Parties
Landowner meetings	13, 15 & 18 January 2016	Site meeting with the landowner
Submit initial comments and concerns	On or before 19 February 2016	Stakeholders are required to submit all their initial comments
Public disclosure of draft Environmental Management Plan	25 January 2016 to 24 February 2016	The draft Basic Assessment Report and EMP will be provided to Stakeholders for comment.
Public disclosure of final Environmental Management Plan	25 February 2016	Stakeholder comments incorporated and final Basic Assessment Report and EMP will be provided to Stakeholders for comment.

- Issues and Response Register

Records are kept any comments, questions, complaints, grievances or incidents raised by the registered parties and will be processed and incorporated in the BAR & EMP. All comments received by Stakeholders are included in Table 6 below.

- Public Disclosure of BAR & EMP

The draft copy of the EMP as well as the final copy of the EMP will be provided to all I&APs registered on the project database for a period of 30 days to allow I&AP the opportunity to comment on the findings of the EMP. The draft EMP report will be made available to the I&APs on 25 January 2016 and the final report on 25 February 2016.

- Concluding Remarks on Stakeholder Consultation

  Key issues raised by landowners include the concern of groundwater use and the effect on boreholes used by landowners and adjacent landowners. A concern for dust pollution and the influx of job seekers to the area and potential increase in theft or crime due to job seekers and/or drilling personnel on site has also been raised.

  These findings and comments will be incorporated in the report and additional comments provided by stakeholders will be updated for the compilation of the final report.

iii) Summary of issues raised by I&Aps

……

Complete the table summarising comments and issues raised, and reaction to those responses

……

Table 6: Issues Raised by Stakeholders

Interested and Affected Parties		Date Comments Received	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.
AFFECTED PARTIES					
Landowner/s & Lawful occupier/s of the land					
Jaco Coetzee	X	18-Jan-16	Influx of unauthorised people to the site and drilling personnel on site could cause possible crime and theft.	Awaiting feedback	To be incorporated into final report
Roelf Botes	X	13-Jan-16	Groundwater concern.	Awaiting feedback	To be incorporated into final report
Johannes Jordaan	X	18-Jan-16	Concern regarding the use of groundwater and the impact on current borehole levels.	Awaiting feedback	To be incorporated into final report
Landowners of lawful occupiers on adjacent properties					
Andries Coffee	X		None received to date		
Johannes Coetzee	X		None received to date		
Jaco Gous	X		None received to date		
DB Lubbe	X		None received to date		
Rika Mostert	X		None received to date		
Gert Coffee	X	21-Jan-16	Concern of the impact of dust pollution in the area and the effect on groundwater resources. Personal experience with impacts associated with prospecting/mining as he is employed at Beeshoek mine, Postmasburg.	Awaiting feedback	To be incorporated into final report
Mans Jordaan	X		None received to date		
Municipal councillor					
Pixley Ka Seme District Municipality: Councillor	X		None received to date		
Municipality					
Siyancuma Local Municipality: Mayor	X		None received to date		

Organs of state (Responsible for infrastructure that may be affected Roads Department, Eskom, Telkom, DWA e					
South African Heritage Resources Agency (SAHRA): Heritage Officer: Northern Cape	**X**		None received to date: case to be submitted to SAHRIS for comment		
Provincial Heritage Resources Authority of Northern Cape: Ngwao-Boswa Jwa Kapa Bokone: Manager	**X**		None received to date		
Northern Cape Department of Agriculture, Forestry & Fisheries	**X**		None received to date		
Provincial Department of Agriculture, Land Reform and Rural Development : Sustainable Resource Management (Pixley ka Seme District)	**X**		None received to date		
Communities					
N/A					
Dept. Land Affairs					
Provincial Department of Rural Development and Land Reform: Land Claims Commissioner Regional offices	**X**		None received to date		
Traditional Leaders					
N/A					
Dept. Environmental Affairs					
Northern Cape Department of Environmental Affairs & Nature Conservation; Pixley ka seme District Environmental Officer	**X**		None received to date		
Other Competent Authorities affected					
Department of Mineral Resources: Regional Manager Northern Cape (Kimberley)	**X**		None received to date		
OTHER AFFECTED PARTIES					
Kolomela iron ore mine: Environmental Specialist	**X**				
INTERESTED PARTIES					
SHE/Risk – Obey Piason	**X**		None received to date		

iv) The Environmental attributes associated with the alternatives

The environmental attributed described must include socio-economic, social, heritage, cultural, geographical, physical and biological aspects

As discussed in the previous section, the proposed prospecting area is targeted due to existing and historical mining activities that are known from within the larger region and it is anticipated that similar conditions will prevail for this project. Genet Manganese applied for prospecting for copper, manganese and iron ore on the property as discussed in this report as part of the ferrous and base metal project to determine the mineral resource and distribution by means of non-invasive as well as invasive prospecting methods.

The presence of people, streams/rivers, wetlands, graves and other sensitive areas will determine the locality of the camp site, access roads as well as the position of prospecting holes. No alternative other than drilling is possible to determine the presence and quality of the minerals (copper, iron and manganese) in the area.

No alternative are available that will have an impact on a different setting than the environment discussed below.

(1) Baseline Environment

(a) Type of environment affected by the proposed activity

Its current geographical, physical, biological, socio-economic, and cultural character

Climatic Context

Climatic conditions are a key driver of biomes and weather patterns can impact on rehabilitation success. A short climatic and weather background is provided.

The climate data was obtained from the New Local Climate Estimator, developed by the Food and Agricultural Organisation of the United Nations in 2005. The climate can be considered to be semi-arid with hot summers and cool to cold winter temperatures. Temperatures vary between –9°C and +42°C, with an average of 19.2°C. In spring, summer and autumn months, the average rainfall varies between 19mm (October) and 74mm per month (March), while potential evapo-transpiration will be between 145mm (October) to 130mm (March) per month.

No or very little rain falls between June and September, while evapo-transpiration is never less than 60mm per month. This implies that the area has a precipitation deficit of 1075mm per year and a moisture index of -75% and can therefore be classified as a dry region (semi-arid) for agricultural purposes.

Wind in the area has been recorded to blow at a maximum speed of up to 6.48 km/h in the summer there is an average of 9.8 to 10.1 sunshine hours per day and average day lengths of 12 to 14 hours.

Geology and Soils

The interaction of re-vegetated plants with the physical, chemical and biological components of the soil environment, determine whether vegetation will persist on rehabilitated areas (van Rensburg, 2004).

The main geology consists of the Griqualand West Super group (contemporaneous with the Transvaal Super group). The Koegas Subgroup occurs in the Prieska area. It conformably overlies the Asbestos Hills Subgroup and is made up of mudstone, quartzite, jaspilite with crocidolite lenses, iron formation and dolomite.

Recent sedimentary elements of a tertiary and quaternary stratigraphy are visible as dune intrusions between the outcrops.

Arkose conglomerate sediments of the Waterberg group is within the zone of influence and can be seen in some substrates along the western areas of the site.

The main rock types are sedimentary rock types with dolomite, quartz, lime stone, iron formation and shale.

The main soil forms are Hutton Form and Prieska From with a hardpan carbonate horizon in some places. Namib soil forms are present where dune intrusions occur.

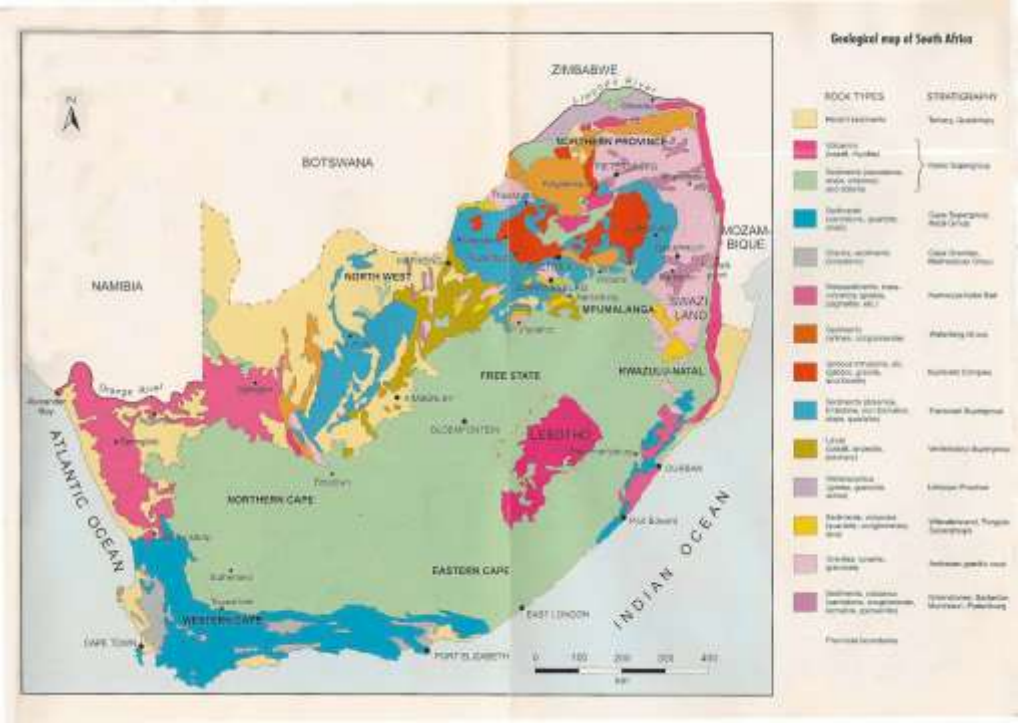

Figure 12: Geological layout (Source: Council of Geoscience)

Flora Context

The study area falls within the Eastern Kalahari Bush veld Bioregion of the Savannah Biome (Mucina & Rutherford 2006). This is seen as a relatively species-poor area. Less than 2.5% of the total species list of the southern Kalahari is regarded as endemic, while less than 6% of the plant species is regarded as near-endemic species (Van Rooyen & Van Rooyen 1998).

Furthermore, the project area lies on the edge of the Griqualand West Centre of Endemism (GWC), an area with an unusually high occurrence of species with very restricted distributions (Anderson, 2003). The GWC is one of 84 African centres of endemism and is one of 14 centres in Southern Africa. These centres have global conservation significance. Searsia tridactyla and Tarchonanthus obovatus are plant species recorded near Kathu that are regarded as endemic to the GWC.

This centre of endemism is important because it safeguard the greatest number of endemic plant species that are extremely vulnerable. A relatively small disturbance can impact range-restricted species situated here. The cumulative impact of numerous mining projects in the area threatens the ecological integrity of the area and continued biodiversity richness.

Vegetation Types

The site consists of numerous vegetation types with Gordonia Duneveld as the dominant vegetation type followed by Olifantshoek plains thornveldt and Northern Upper Karoo vegetation type. Kuruman mountain bush veld occurs on the outcrops. Koranna Langerberg mountain bushveld and Southern Kalahari salt pans occurring in the surrounding area, but not evident on site.

Gordonia Duneveld

Gordonia is also known as Kalahari thornveld and Kalahari shrub bushveld (Acocks 1953) or as shrubby Kalahari Dune Bushveld (Low & Rebelo 1996). Gordonia dune veld consists of parallel dunes in open shrub land with ridges of grassland dominated by Stipagrostis amabilis on the dune crests and Acacia haematoxylon on the dune slopes. Lower slopes and inter dune straaten are dominated with Acacia melifera and/or Rhigozum trichotomum.

Important trees include Acacia heamatoxylon; Acacia melifera subsp. detinens; Dominant shrubs include Grewia flava; Rhigozum trichotomum, Aptosimum albomarginatum, Monechma incanum, Requienia sphaerosperma, Lycium bosciifolium, Lycium pumilum, Talinum caffrum.

Biogeographically important grasses include Shcmidtia kalahariensis, Braciaria glomerata, Bulbostylis hispidula, Centropodia glauca, Eragrostis lehmanniana, Stipagrostis ciliate, Stipagrostis obtuse, Stipagrostis uniplumis, Stipagrostic amabilis, Anthephora argentea, Megaloprotachne albescens.

Gordonia dune veld is a least threatened vegetation type with a conservation target of 16%. 14% of this vegetation type is conserved in the Kgalagadi Transfrontier Park.

Northern Upper Karoo

Northern Upper Karoo vegetation type is dominated by dwarf Karoo shrubs, grasses and low trees. Dominant species include *Acacia melifera susp. detinens*.

The vegetation type is characterised specifically by protected species like Acacia erioloba, Boscia albitrunca, Acacia heamatoxylon and numerous Aloe species.

Important grasses include, but are not limited to Aristida adscensionis, Aristida congesta, Aristidua diffusa, Enneapogon desvauxii, Sporobolus fimbriatus, Stipagrostis obtuse, Eragrostis bicolor, Eragrostis porosa, Fingerhuthia Africana, Heteropogon contortus, Stipagrostis ciliate, Themeda triandra, Targus berteronianus, Tragus koelerioides, Tragus racemosus.

Tall shrubs of grazing and ecological value include Lyciaum cinereium, Lycim horridum, Lycium oxycarpum, Lycium schizocalyx, Chrysocoma cilliata, Gnidia polycephala, Pentzia calcarea, Pentzia globosa, Pentzia incana, Rosenia humulis.

Endemic taxa include Lithops hookeri, Stomatium pluridens, Atriplex spongiosa, Galenia exigua and Manulea desericola.

This vegetation type is least threatened with a target of 21% of which none is conserved in statutory conservation areas. About 4% has been cleared for cultivation (the highest proportion of any type in the Nama-Karoo). Erosion is moderate to low.

This vegetation type can be invaded, specifically by *Prosopis glandulosa*, regarded as one of the 12 agriculturally most important invasive alien plants in South Africa.

Olifantshoek plains thorn veldt

Olifantshoek plains thornveldt vegetation type consists of plains that have open tree and shrub layers with a usually sparse grass layer.

Olifantshoek plains thornveldt is least threatened with a target of 16%. Only 0.3% is statutorily conserved in the Witsand Nature Reserve. 1% of the area has been transformed and erosion is very low.

The vegetation type is characterised specifically by protected species like Acacia luederitzii, Acacia erioloba, Rhus tenuinervis, Boscia albitrunca, Acacia heamatoxylon.

Important grasses include Schmmidtia papophoroides, Stipagrostis uniplumis, Aristida congesta, Brachiaria serrate, Digitaria eriantha, Melinis repens.

Tall shrubs include Rhigozum obovatum, Tarchonanthus camphoratus, Lessertia ffrutescens, Lycium hirsutum.

Endemic taxon includes Amphiglossa tecta.

Kuruman Mountain Bushveld

Kuruman Thornveld is characterised by flat rocky plains and some sloping hills with very well-developed, closed shrub layer and well-developed open tree stratum consisting of Acacia erioloba. Hills have gentle to moderate slopes and hill pediment areas with an open shrub veld with *Lebeckia macrantha* prominent in places. Grass layer is well developed (Mucina & Rutherford, 2011).

Important trees include Rhus lancea, Diospyros austro-africana, Euclea crispa, Euclea undulate, Olea europaea, Rhus pyroides, Rhus tridactyla, Tarchonanthus camphoratus, Tephrosia longipes.

Important shrubs include Comphocarpus gruticosus, Thus ciliate, Anthospermum rigidum, Helichrysum zeyheri, Lantan rugosa, Wahlenbergia nodosa.

Important grasses includes Andropogon chinensis, Andropogon chirensis, anthephora pubescns, Aristida congesta, Digitaria eriantha, Themeda triandra, Triraphis andropogonoides, Aristida diffusa, Brachiaria nigropedata, Bulbostylis burchellii, Cymbopogon caesius, Diheteropogon amplectens, Elionurus muticus, Eragrostis chloromelas, Eragrstis nindensis, Eustachys paspaloides, Heteropogon contortus, Melinis repens, Schizachyrium sanguineum, Trichoneura grandiglumis.

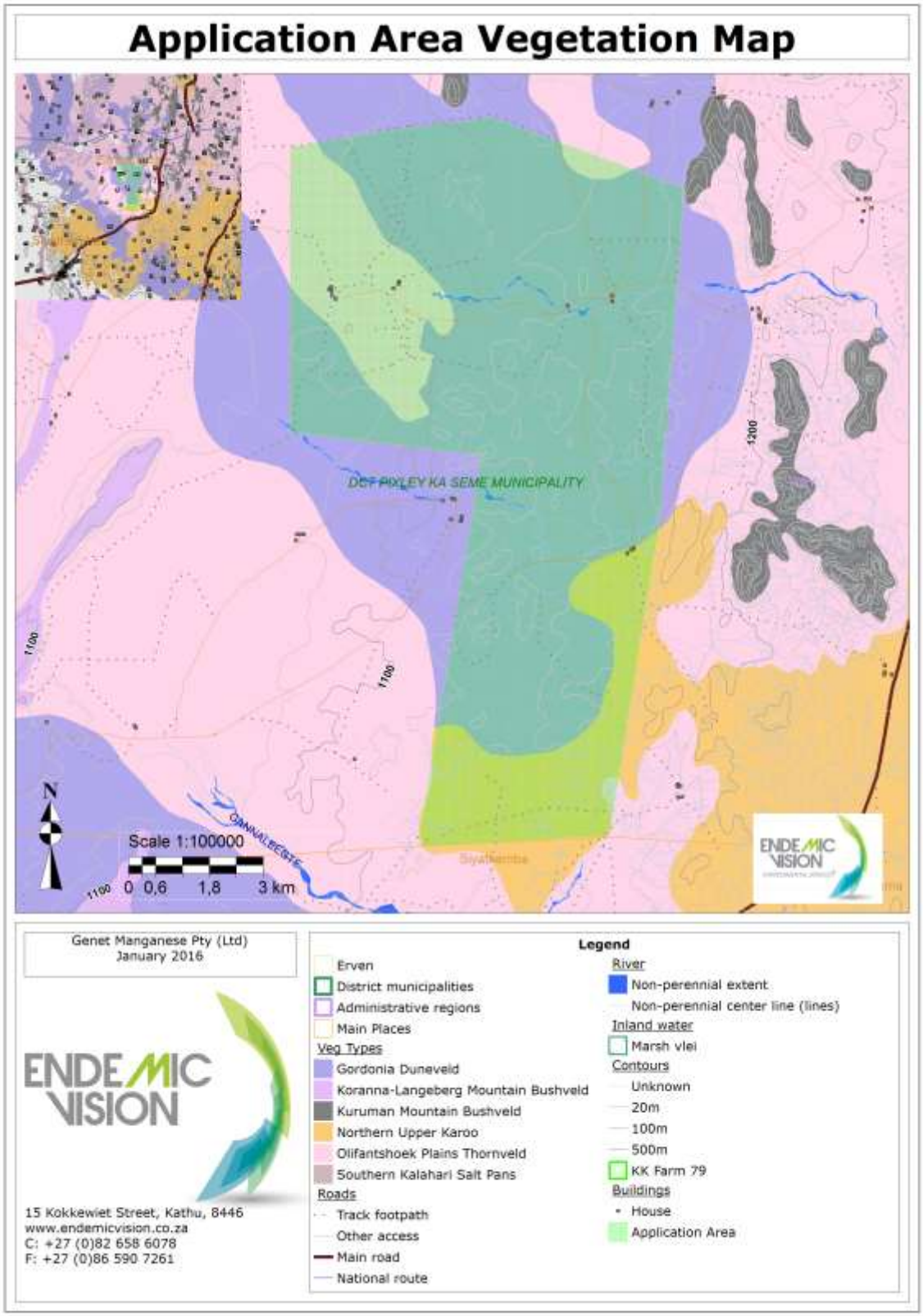

Figure 13: Vegetation Types (Mucina & Rutherford, 2011)

Vegetation Diversity

Listed species known to occur in the vicinity are extracted from national data bases. The Northern Cape Province has over 22 055 plant species. The expected species list for the area includes 1048 species according to the Quarter Degree Square checklist. The species diversity is considered relatively low with a homogenous vegetation constituency except for outcrop areas.

The alien plant species component of the vegetation profile is minor on site, with moderate potential; consist mainly of Prosopis glandulosa and some Cacti species.

Fauna Context

A wide range of fauna species could possibly occur in the area. The regional species diversity account for 56 fauna species. The area checklists for mammals, amphibian, reptiles and avi-fauna are attached as Appendix A of this report.

The actual number of fauna found by means of sightings and evidence of habitat use by the mammals is much less.

The species diversity, within a 10km radius zone of influence from the development, account for 13 species as listed below.

Listed mammals which may occur at the site include the Brown Hyena (Hyaena brunnea) (Near Threatened), Black-footed Cat (Felis nigripes) (Vulnerable), Honey Badger (Mellivora capensis) (Endangered), South African hedgehog (Atelerix frontalis) (Near Threatened) and Ground Pangolin (Smutsia temminckii) (Vulnerable). However, due to the fragmentation of the landscape and the relatively high human density in the area, it is not likely that many of these species would actually occur at the site on a regular basis.

It is probably only the Black-footed cat and South African Hedgehog which could be present at the site.

Avifauna species for the area include 156 bird species. Bird activity on the site was however low. The only listed species that could frequent the area is the Cape Vulture, Marshall Eagle and Kori bustard. Cape Vulture and Kori bustard was found on surrounding farms.

Listed reptile species could all occur on site, specifically because of the rocky nature of some portions of the site.

Most amphibians are protected, a total of 11 listed amphibian species could possibly be found on site, but would require a more intensive investigation. All species listed could possibly be in the zone of influence of the project, primarily because of the diverse habitats on site.

The only amphibian species of conservation concern which is known from the area is the Giant Bullfrog (Pyxicephalus adspersus) which breeds in temporary pans. There are riverbed depressions and floodplain areas in the vicinity of the site and it is therefore probable that the Giant Bullfrog occurs at the site.

Ecological Sensitive Area Context

The ecological status, considering the biotic and abiotic elements and the way they interact is considered for this assessment. The key driver to determine ecological sensitivity is unique diversity (high occurrence of species of special concern), habitat integrity and ecosystem services provided.

Specific habitats that affect flora and fauna interactions with the environment are found on the site including the dry rivulet beds and outcrops.

Neither the rivulets nor outcrops are significantly unique, but do provide alternative habitats.

Ecological sensitive areas are investigated and presented spatially to assist in the evaluation of the baseline area and possible impacts. Information is integrated by focusing on the following aspects:

- Areas deemed important in terms of area wide conservation planning
- Areas with unique habitats for important fauna species
- Areas of important plant species populations
- Areas of high ecological integrity

- Areas with important ecological processes and
- The degree of ecological connectivity between systems within a landscape matrix
- Key ecosystem services.

Non-perennial Rivers and Rivulets

All river systems are considered sensitive areas, primarily because of the ecosystem services, ecological processes, unique habitat features, and the fact that 82% of the rivers are threatened and the rest very poorly conserved (Driver, et al., 2005)

Non-perennial rivers occur on site, but are mostly dry riverbeds; dry-bed rivulets are also present from the outcrops.

The ecosystem services include, but are not limited to:

- recharge downstream aquifers,
- transporting sediments (rich in organic matter and nutrients),
- transportation of seeds, macro-invertebrate eggs,
- providing temporary breeding sites for amphibians
- provide niche habitats for large protected species, Acacia erioloba.

Biodiversity Management Context

Biodiversity management of the area must also be considered with this assessment. The nearest statutory protected area is the Witsand Nature Reserve, approximately 80km from the property. The property is situated in the Griqualand Centre of Endemism.

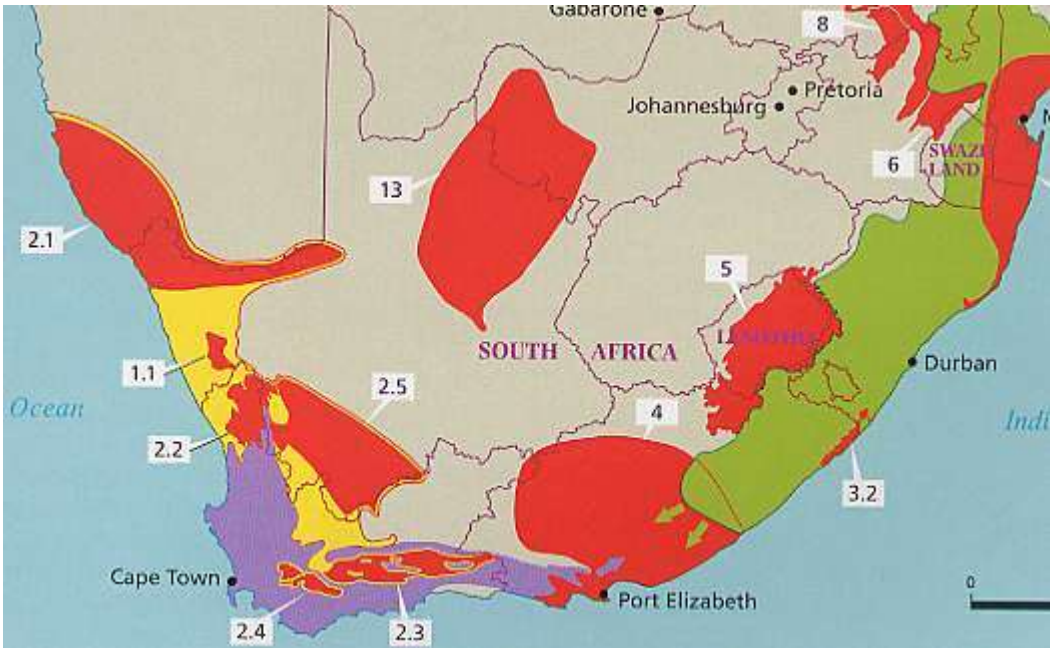

Figure 14: Griqua West Centre of Endemism indicated as area 13

The Griqualand West Centre of Endemism is an area with an unusually high occurrence of species with very restricted distributions. This center thus has global conservation significance. The Griqualand West Centre includes the Ghaap Plateau; an area identified by Cape Nature Conservation as a priority for conservation within the Northern Cape and is generally regarded as an ecologically sensitive habitat. The GWC is one of 84 African centres of endemism and is one of 14 centres in southern Africa. These centres have global conservation significance.

The Ghaap Plateau is characterized by a number of endorheic pans which fill with water for short periods after heavy rains. These wetlands make up 21% of South Africa's wetlands and are afforded special protection. The project area has no endorheic pans.

Environmental Baseline Determination

Area status in terms of historic impacts

Historical impacts include grazing by goats, sheep and cattle, prospecting and bulk sampling for minerals, single track roads used to access the area, boundary fences constructed by the landowner. Public or shared farm roads, as well as telephone and power lines, occur on the site, some of these services are however not maintained anymore. In some areas bulk earthworks along the outcrop lower slopes have been constructed as soil conservation and water preservation measures.

An important ecological impact on the extent of the area is the provincial road that transverse and fragment the property into two portions.

Figure 15: Historic bulk sampling on the property

Baseline vegetation description

The baseline vegetation can be considered undisturbed for most part, with no crop production or hard transformation on the property besides the homestead footprint.

The vegetation is considered relatively homogenous with only two vegetation types and six habitat types of relatively low species diversity. The habitat types are considered transitional zones of the same vegetation type and not distinct areas.

Area status in terms of habitats

A habitat is the particular natural environmental or ecological area inhabited by organisms. A habitat is made up of physical factors such as soil, moisture, the range of temperature, availability of light, biotic factors such as the availability of food and the presence of predators (Bothma & du Toit, 2010).

Four different habitat types were found on site namely:

1. Outcrops
2. Dune veld

3. Karoo Plains
4. Dry riverbeds
5. Open Thornveld

The site is dominated by Dune veld, Karoo plains and Outcrop.

The lower slope of most of the outcrops has black thorn thickets with sometimes adjacent Three-thorn thickets. There are also interspersed patches of black thorn thickets on the open thornveld and dune veld. Defined False Camel Thorn habitats could not be categorised, but the species are found as part of the dune veld.

The geographical distribution is mapped below and the visual depiction of the different habitats are presented in the below catalogue.

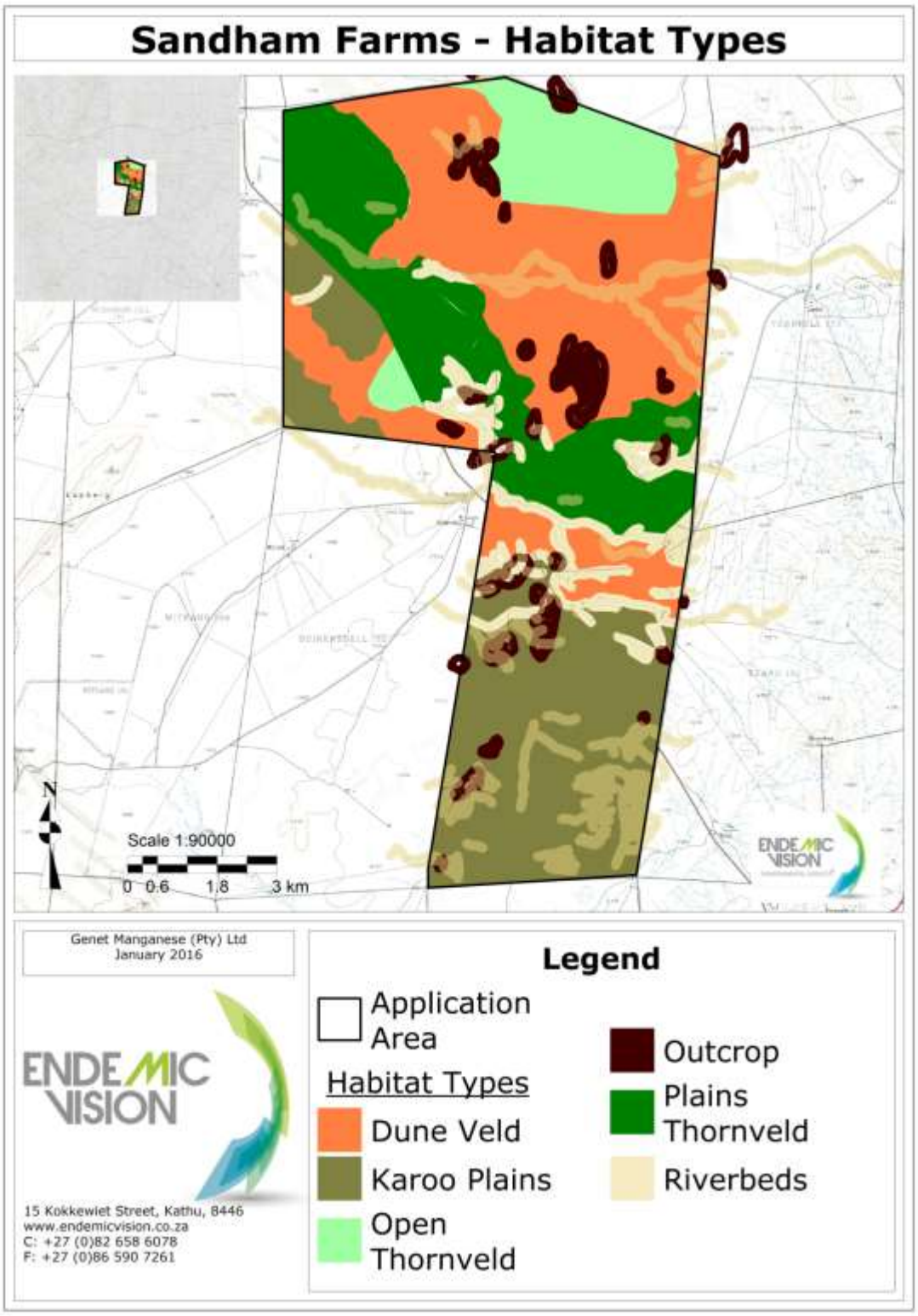

Figure 16: Habitat type distribution for the site

Rivulets are also indicated on the map and presented with a 100 meter buffer as the National Water Act requires that no infrastructure be constructed within this perimeter.

The Dune veld and Open Thornveld and Karoo plains are considered the most ecologically functional regarding vegetation structure, crown cover, composition and diversity. All three habitat types seem to be presented throughout the area.

Karoo plains are found important shrub element habitat type that supports highly palatable species valuable for grazing.

Riverbeds

Outcrops

Dune veld

Plains thorn veld

Karoo plains

Plains Thorn veld

Figure 17: Catalogue of habitat types

The non-perennial rivers (unnamed) and rivulets are considered important in terms of unique species and ecological functioning. The rivulets can be seen as indications of soil erosion considering the narrow short extend of the rivulets. The non-perennial rivers are known to flood at times and have areas of water accumulation that could function as important avi-fauna and herpetofauna habitats.

Figure 18: Riverbed habitats

Outcrops are seen as unique habitats, many times serving as unique fauna and flora habitats. Not all the outcrops are deemed sensitive, however, and none of the outcrops are seen as significantly unique.

Although Lithop species are declared for the area and in some cases marginal habitats for this species could be found, no confirmation of historic known occurrence or site assessment confirmation of occurrence could be found.

Because of the time of year and extremely dry conditions before the site assessments on site verification of the species could not take place. Lithops bromfieldii (image below) is however recorded on the Précis data base for this area. The

species is considered endemic and according to IUCN red list of Least Concern status; according to NEMBA lists, unknown status; according to CITES unknown status.

Figure 19: Lithops bromfieldii

Area status in terms of vegetation diversity

The area is considered to have relatively low species diversity and is homogenous within each habitat type. The highest diversity occurs on the outcrops and Karoo plains with unique shrub and succulent elements. Unique species are also found on the outcrops and in the river areas, presenting species not normally found in the plains and dune habitat types.

The total number of expected species for this area is 293 of which 114 was seen on site. The species lists of expected and assessed species are attached as appendix A of the ecological assessment report.

Baseline Fauna Description

Mammals

Of the 79 species that is expected to occur in the applicable quarter degree square only 18 was found on site. It should however be noted that only a superficial survey was completed in one season for a limited amount of time. Fauna activity was most evident in the river habitats and also in the grassland habitats.

Herpeto-fauna

Reptiles and amphibian data was collected by means of visual observation. Lizard species were found throughout the site with most seen on outcrops.

Species of Special Concern

Species of special concern are presented according to the listing notices that dictate their protection. The listing notices of the following legislation were used to indicate species of special concern for this study:

- Nature and Environmental Conservation Ordinance (No. 19 of 1974) listing species as indigenous, protected or specially protected.
- National Forests Act (NFA 1998),
- National Management Biodiversity Act (2004) listing threatened or species and exotic species
- The Red Data List of South African listing threatened plant species (i.e. critically endangered, endangered and vulnerable species)
- Endemic species (range-restricted species) listed in any of the above or by the South African National Biodiversity Institute (2007) are also species of special concern as their distribution may be very localized and they could be threatened by developments.

Protected species, which are mostly geophytes and succulent species, have more specialised habitat requirements. The succulent species in particular are habitat specialists and occur in very specific closed and isolated habitat patches.

Species of special concern are listed in the tables below and the possibility, probability and definite occurrence of the species on the site indicated.

The Outcrop areas have the highest incidents of the protected tree, Boscia albitrunca. Boscia albitrunca also occurs in the Open Thorn veld and Dune veld habitats. Boscia albitrunca, Acacia erioloba and Acacia heamatoxylon are considered nationally protected trees.

Species lists and details of the above fauna and flora status of the site is available in the ecological assessment report attached to this report.

Biodiversity Assessment

The Biodiversity impact assessment score is a calculated index score between zero and eighty (0-80). The score is assessed for each biodiversity impact. Consequences can be positive and negative.

The biodiversity impact assessment of activities related to the prospecting project is tabled below. The greatest impacts without mitigation measures is the impacts on groundwater, specifically hydrocarbon pollution during drilling followed by sensitive habitat loss, specifically the Lithops habitat that is localized and can be destroyed in totality. The third highest impact is rehabilitation – this is a positive impact and is indicated here as a minimum requirement for additional mitigation measures added to increase this positive impact.

Loss of vegetation cover and loss of topsoil is two interrelated top five impacts. It is definite that these impacts will take place, albeit at small scale. The impact is considered long term in this ecosystem as soil loss may be permanent, and vegetation cover can take many years to return if it does return.

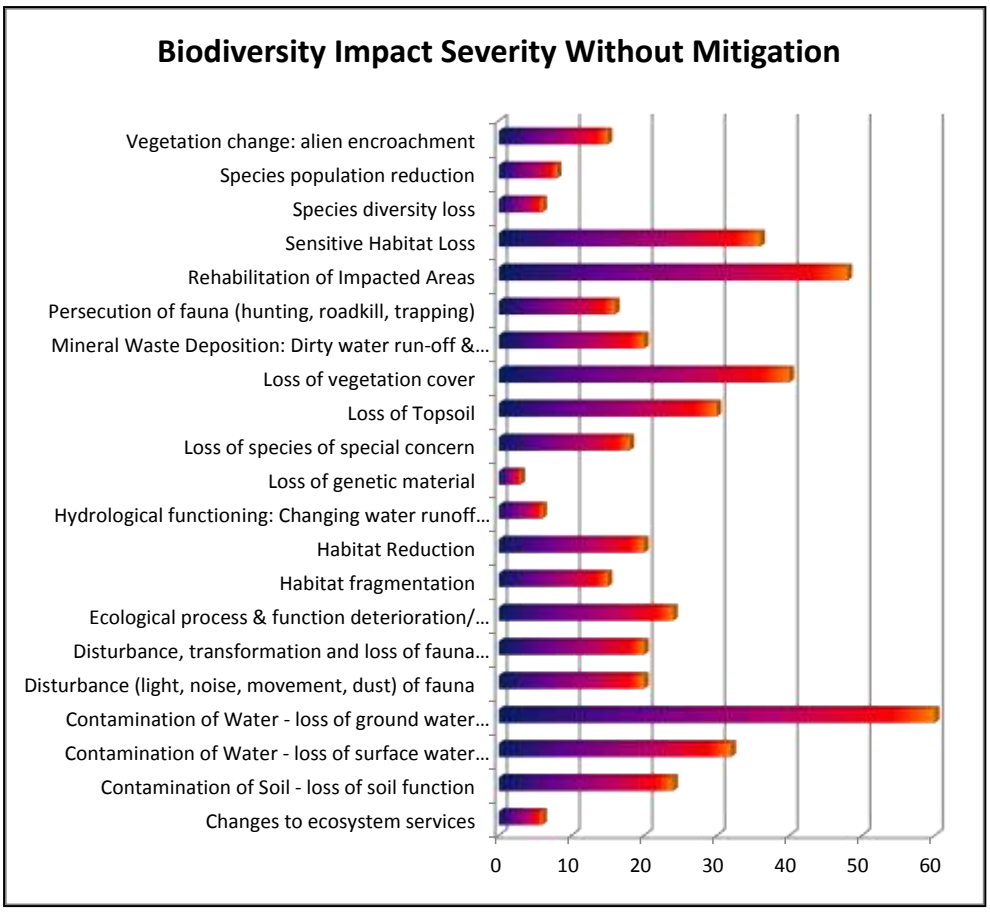

Figure 20: Biodiversity Impact Graph

Table 7: Biodiversity Impact Assessment Detail

IMPACT	CONSEQUENCE OF IMPACT			LIKELIHOOD
Type	Duration	Scale	Severity	Probability
Changes to ecosystem services	1	1	1	2
Contamination of Soil - loss of soil function	2	1	3	4
Contamination of Water - loss of surface water function	3	1	4	4
Contamination of Water - loss of ground water function	5	1	6	5
Disturbance (light, noise, movement, dust) of fauna	1	1	2	5
Disturbance, transformation and loss of fauna habitat	1	1	2	5
Ecological process & function deterioration/ breakdown	3	1	2	4
Habitat fragmentation	2	1	2	3
Habitat Reduction	3	1	1	4
Hydrological functioning: Changing water runoff patterns.	1	1	1	2
Loss of genetic material	1	1	1	1
Loss of species of special concern	1	1	4	3
Loss of Topsoil	3	1	2	5
Loss of vegetation cover	4	1	3	5
Mineral Waste Deposition: Dirty water run-off & Dust	2	1	2	4
Persecution of fauna (hunting, roadkill, trapping)	1	1	2	4
Rehabilitation of Impacted Areas	3	1	8	4
Sensitive Habitat Loss	4	1	4	4
Species diversity loss	1	1	1	2
Species population reduction	1	1	2	2
Vegetation change: alien encroachment	1	1	3	3

Heritage Resources

Shallow marine and lacustrine stromatolites and organic-walled microfossils preserved within Transvaal Supergroup dolomites of the Ghaap Plateau, provide a record of early microbial dominated life in shallow seas and lakes during the Early / Mid Precambrian (c. 2.7-2.5 Ga). Stromatolites are layered mounds, columns, and sheet-like sedimentary rocks. They were originally formed by the growth of layer upon layer of cyanobacteria, a single-celled photosynthesizing microbe that lives today in a wide range of environments ranging from the shallow shelf to lakes, rivers, and even soils. Bacteria, including the photosynthetic cyanobacteria, were the only form of life on Earth for the first 2 billion years that life existed on Earth.

The Precambrian dolomites at the eastern edge of the Ghaap Plateau have been incised at various points by drainage lines that created gorges in which travertine deposits have formed. As a result, the tufas at Norlim (Buxton) near Taung contain solution caves which are fossiliferous, including the one within the Thabaseek Tufa that produced the type specimen of *Australopithecus australis.* Situated about 600m north-west of the *A. australis* type site, another solution cavity called Equus Cave yielded the Quaternary fossil remains of more than 40 mammalian species, including the extinct taxa *Equus capensis*, *Antidorcas bondi* and *Megalotragus priscus*.

Several prehistoric specularite and haematite mines are found around Postmasburg, including underground workings on the farms Paling M87, open mining pits at Gloucester 13 and Mount Huxley, as well as open mining pits next to the town reservoir. The most famous mining site is Blinkklipkop (Gatkoppies), situated about 5 km northeast of Postmasburg on the townlands. The first description of this site was given P.B. Borchards, a member of the 1801 Truter and Somerville expedition to the Bechuana. Lichtenstein, in his *Travels in Southern Africa*, recounts a visit to the site in 1805, and William Burchell visited Blinkklipkop on June 18 1812 as noted in his *Travels in the Interior of Southern Africa*. The specularite mine at Doornfontein has a maximum length of over 100 m and consists of four interlinked chambers. It was estimated that over 36 million kilograms of specularite had been removed from the entire working. Excavations conducted by Peter Beaumont yielded mining tools stone artefacts of various types of pottery, bone arrow heads, and hundreds of ostrich eggshell beads. The animal bone remains indicated that the miners lived mainly on buffalo and zebra. Extensive damage on the antelope horn cores revealed that these had been used as chisels. The Blinkklipkop and Doornfontein sites near provide evidence of LSA mining practices and the introduction in the region by 1200 BP, of domesticated ovicaprids and possibly cattle as well as pottery. The Stone Age archaeological footprint in the region is represented by Early, Middle and Later Stone Age sites often associated with pans, while the landscape in general is characterized by low density surface scatters (Beaumont 1995; Kiberd 2006). MSA surface scatters have also been recorded at Elswater, Brakfontein and Nuwejaarskraal near Douglas. Rock engravings have been recorded in the younger valley fills along the steeper slopes located near the eastern and south-eastern margins of Sandfontein 356 (van Riet Low 19). In addition, rock art sites have been recorded on a number of farms around Prieska, including Kleindoring, Wonderdraai and Omdraaisvlei. Historical ruins and graveyards associated with the asbestos mining industry during the first half of the 20th century are located at Kliphuis and Engeldewilgeboomfontein north of Prieska. Further away, stone pipes and LSA artefacts have been recorded on the farm Doornkuil near Britstown, while prehistoric graves and clay pottery have been recorded along the Orange River in the vicinity of Douglas.

Regional socio-economic environment

Population density, growth and location

The Northern Cape has by far the biggest land mass of all South Africa’s provinces, being more than ten times the size of Gauteng. It covers 29.7% of South Africa's land surface at 361 830 square km. In 2007, the population of the Northern Cape was 822 727. The Prospecting Right area applied for is located approximately 44 km south-west of Postmasburg within the Administrative District of Hay, in the Siyancuma Local Municipality and Pixley ka Seme District Municipality.

The municipality also includes Beeshoek, Biochoko, Ditloung, Glosam, Goedgedacht, Tsantsabane (Postmasburg non-urban areas) and Vergenoeg. The population of the Tsantsabane local municipal area as at the 2001 census is 31 013 persons. The growth rate in the area between 1996 and 2001 was relatively low at only 1% compared to 1.2% in the province and 1.5% in South Africa.

Major economic activities and sources of employment

The main sectors of employment of the economically active population in Postmasburg are community, social and personal services, wholesale and retail trade, private households and mining. It is significant that 12% of the economically active population in Biochoko and 54% of the economically active population in Beeshoek are employed in mining and quarrying. The informal sector provides legal as well as illegal jobs in the district which might in some cases go unrecorded.

Unemployment

Only 20% of the population in the Tsantsabane local municipal area is employed. In the Postmasburg urban area 23% of the population is employed while 29% of the population in the non-urban area is employed.

This implies that in most instances, nearly 80% of the population relies on the income of other household members, on pensions, remittances and child grants.

Housing

A significant housing backlog exists within the lower income areas around Postmasburg. The municipality has made land available to the project for the development of housing. This has been done in exchange for Kumba being responsible for the installation of infrastructure and services (water and sanitation) in the development area. It is however expected that the rocky/calcrete nature of the soils in certain areas may cause difficulties with the installation of services.

Social infrastructure

Numerous schools operate in and around the Postmasburg area. The majority of schools have the capacity to accommodate more pupils. Although schools in the Postmasburg town itself are well equipped and staffed, those in the surrounding townships of Boichoko and Postdene are lacking equipment and capacity to provide the desired standards of education. The most prominent needs identified by all schools, but particularly those in Boichoko and Postdene, include sports and computer facilities as well as computer training. The Newtown area is in particular need of new schools and one of the most important programmes in the area is the rehabilitation of street children.

Health facilities in the Postmasburg area include a hospital and a clinic in town as well as clinics in Boichoko and Postdene. A mobile clinic serves the rural areas around the town. The following needs and problems that the region' health infrastructure experience has been identified: The clinics in Boichoko and Postdene experience service problems and personnel shortages. Clinics are needed in the Groenwater/Skeyfontein and Newtown areas. Medicine and equipment are generally lacking.

An influx of labourers to the area would clearly place additional pressure on the existing limited health facilities, services and medical supplies. The police force for the Tsantsabane municipality which includes Postmasburg as well as Olifantshoek, Groenwater and Skeyfontein, has a limited number of staff and vehicles. An influx of jobseekers to the area due to the development could lead to the escalation of crime, especially in the face of high levels of unemployment. This would necessitate the upgrading of the current security system.

Water supply

A significant backlog exists in the provision of municipal services in the Postmasburg region.

According to the 2001 census data, 41% of the population in the Postmasburg town area has piped water inside the dwelling and 27% has piped water inside the yard. In the rural area surrounding the mine, only 21% of the population has piped water inside the dwelling. Thirteen percent (13%) of the population in Biochoko have piped water inside the dwelling and 85% have piped water inside the yard.

Sanitation services have improved as 71% of the population in the Postmasburg Town area and 92% in Biochoko has a flush toilet connected to a sewer system.

Power Supply

Metered electricity is supplied by Eskom. In a number of areas, additional high masts are required to expand the electricity network.

(b) Description of the current land uses.

The land use in the application and surrounding area is grazing (sheep, cattle and goats). There are evidence of historic bulk sampling and prospecting activities of the Farm Hartfell, Portion 1.

(c) Description of specific environmental features and infrastructure on the site.

Using the biodiversity sensitivity criterion, the site habitats are categorized into low and moderate biodiversity values for this site. None of the habitat types is critically sensitive or highly sensitive. Two moderate habitat types are outcrops and riverbeds. The table of habitats and their sensitivity ratings are presented below.

Table 8: Biodiversity Sensitivity Rating for habitat types

Habitat Type	Biodiversity Sensitivity
1. Outcrops	Moderate
2. Dune veld	Low
3. Karoo Plains	Low
4. Dry riverbeds	Moderate
5. Open Thornveld	Low

None of the habitat types are critically sensitive or of high sensitivity. Two of the habitat types are moderately sensitive, Outcrops and riverbeds.

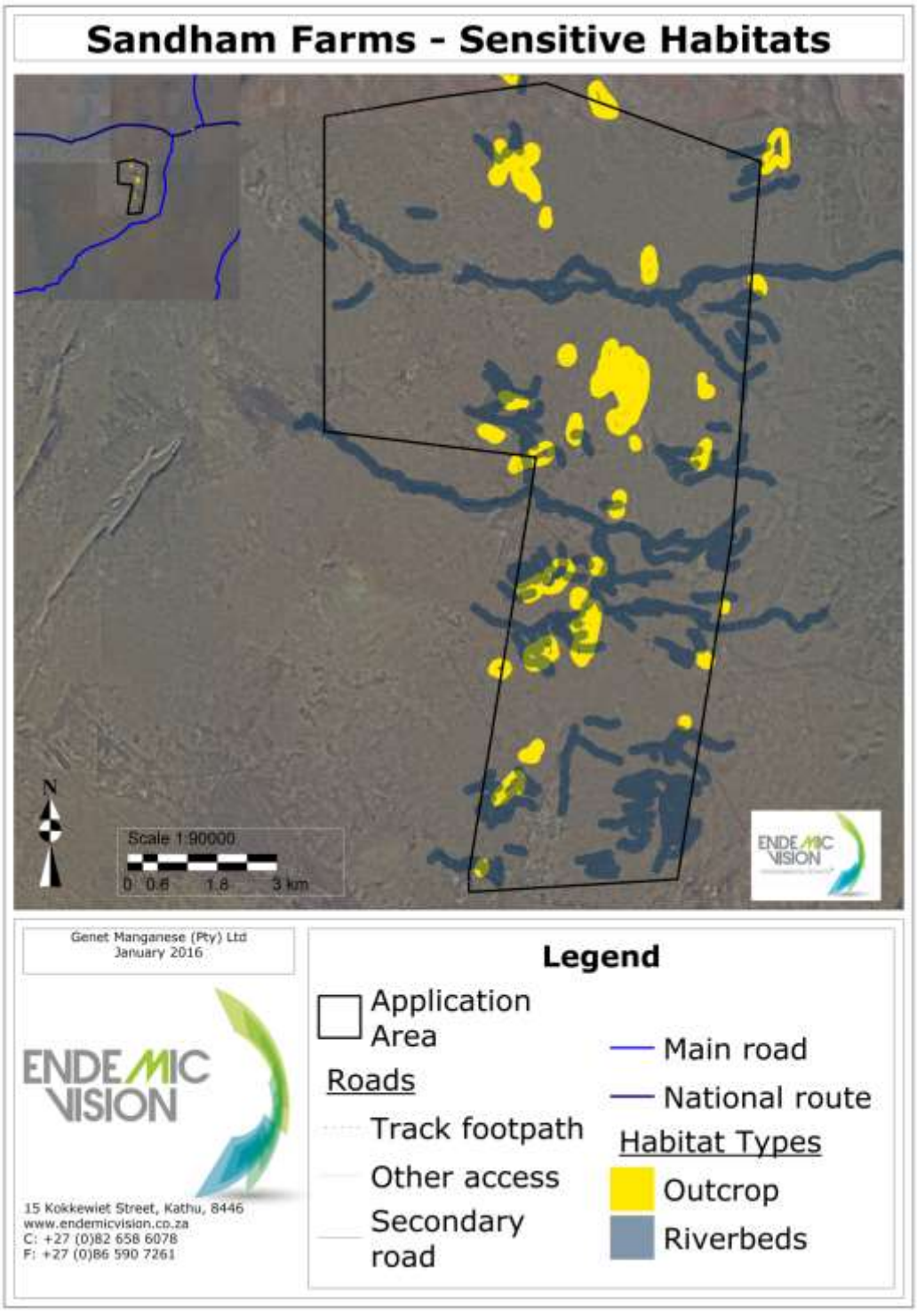

Figure 21: Biodiversity Sensitivity Map

There are graves on the site as discussed in the heritage resources report, please refer to Appendix C.

(d) Environmental and current land use map

Show all environmental and current land use features

Please refer to the sensitive habitats map for the site; the Vegetation Types map and the site map (Topo cadastral map) indicating services infrastructure indicating the environmental and land use features associated with the proposed prospecting area.

The stone tool archaeological component is negligible and clearly derived, but still regarded as a meaningful indication of past human activity on the landscape. It is advised as a matter of prudence that the supposedly unmarked graves (Bullsrun) area is to be avoided during the operational phase of the project. Formal and clearly marked graveyard is located near the Sandham farmstead (site coordinates 29° 1'37.00"S 22°32'11.12"E), the Hartfell farmstead (site coordinates 29° 1'45.99"S 22°35'9.43"E) and Bullsrun farmstead (site coordinates 29° 4'46.05"S 22°36'12.91"E).

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

Provide a list of the potential impacts identified of the activities described in the initial site layout that will be undertaken, as informed by both the typical known impacts of such activities, and as informed by the consultations with affected parties together with the significance, probability, and duration of the impacts. Please indicate the extent to which they can be reversed, the extent to which they may cause irreplaceable loss of resources, and can be avoided, managed or mitigated

This section identifies and evaluates the actual and potential environmental consequences associated with the proposed prospecting activity. The potential for mitigation of negative impacts and enhancement of positive impacts (DEAT, 2003) to enable sustainable development principles are adhered to.

Activities to be undertaken in the prospecting project and its respective construction and operational and decommissioning phases, give rise to certain impacts. For the purpose of assessing these impacts, the project has been divided into three phases from which impacting activities can be identified, namely:

- Construction Phase

Construction phase consist of the construction of access roads (where necessary) and cleared surfaces for drill sites to allow for drilling and camp sites. Drill sites are only cleared of the necessary vegetation and the topsoil is stockpiled for re-use after drilling where appropriate. Road clearance will take place mechanically to ensure safe passage of vehicles and machines. Water supply pipeline will be laid overland with minimum disturbance.

- Operational Phase

The operational phase consist of trenching site construction, drilling boreholes, collecting geological material, operating drilling machinery and storing drilling equipment on a temporary basis at the drill sites.

- Decommissioning Phase

The closure phase include the cleaning of drill sites, making drill sites safe, closing the borehole with a secure cap, replacement of topsoil and de-compaction of the site. Drill site monitoring and concurrent rehabilitation is then conducted depending on the agreed final land use and the requirements to achieve the agreed land use.

The following table illustrates the potential impacts associated with each activity. Kindly note that impact significance is indicated in *Table 9*.

Table 9: Impacts identified and the extent to which they may cause irreplaceable loss of resources, and/or can be avoided, managed or mitigated

ACTIVITIES	POTENTIAL IMPACT	PHASE	REVERSIBLE	LOSS OF RESOURCES	CAN BE AVOIDED, MANAGED OR MITIGATED
Non-invasive Prospecting Activities					
Data Collection & Physical Survey	None identified	Planning	N/A	N/A	N/A
Invasive Prospecting Activities					
Site access/roads	Destruction and/or disturbance of on-site fauna, flora and sensitive areas	Construction	Partial	No	Yes
	Soil compaction resulting from repeated use of access roads to sites		Yes	No	No
	Vehicle traffic noise impact affecting fauna/livestock and/or wildlife		Yes	No	No
	Poor access control resulting in impacts on livestock/wildlife movement, breeding and grazing practices		Yes	No	Yes
	Potential destruction of heritage resources		No	Yes	Yes
	Poor access control resulting in un-authorised people entering the site	All phases	Yes	No	Yes
	Activities within the watercourse could result in disturbance to the natural geomorphology and safety hazards during rainy periods		Yes	Potential	Yes
	Useable infrastructure for future use	Decommissioning	N/A	N/A	N/A
	Rehabilitation of access roads		N/A	N/A	N/A
Drill sites	Destruction and/or disturbance of on-site fauna, flora and sensitive areas	Construction	Partial	No	Yes
	Dust emission resulting from site clearing, soil stripping and construction activities (including dust generated by vehicle movement)		Yes	No	Partial
	Noise as a result of construction, operation and vehicle movement resulting in disturbance of fauna / livestock / wildlife	Construction & Operational	Yes	No	Partial
	Soil contamination resulting from waste generation, disposal of drill fluids or storage of hazardous materials	Operational	Partial	Potential	Yes
	Soil disturbance and compaction and topsoil stockpiling resulting in soil erosion	All phases	Yes	Potential	Yes
	Visual impact affecting visual character	Operational	Yes	No	Partial
	Influx of persons (job seekers) to site as a result of increased activity resulting in increased incidents of theft and opportunistic crime	All phases	Yes	No	Yes
	Potential destruction of heritage resources	Construction	No	Yes	Yes
	Rehabilitation of drill sites	Decommissioning	N/A	N/A	N/A

ACTIVITIES	POTENTIAL IMPACT	PHASE	REVERSIBLE	LOSS OF RESOURCES	CAN BE AVOIDED, MANAGED OR MITIGATED
Trench sites	Destruction and/or disturbance of on-site fauna, flora and sensitive areas	All phases	Partial	No	Yes
	Dust emission resulting from site clearing, soil stripping and trench construction (including dust generated by vehicle movement)		Yes	No	Partial
	Noise as a result of construction, operation and vehicle movement resulting in disturbance of fauna / livestock / wildlife		Yes	No	Partial
	Soil contamination resulting from waste generation, disposal or storage of hazardous materials and use of heavy machinery		Partial	Potential	Yes
	Soil disturbance and compaction and topsoil stockpiling resulting in soil erosion		Yes	Potential	Yes
	Visual impact affecting visual character	Construction & Operational	Yes	Potential	Partial
	Influx of persons (job seekers) to site as a result of increased activity resulting in increased incidents of theft and opportunistic crime	All phases	Yes	No	Yes
	Potential destruction of heritage resources	Construction	No	Yes	Yes
	Rehabilitation of trenches	Decommissioning	N/A	N/A	N/A
Excavation of sumps	Destruction or disturbance of onsite fauna / livestock / wildlife	Operational	No	Potential	Yes
	Water and soil pollution resulting from disposal of drill fluids		Partial	Potential	Yes
	Rehabilitation of sumps	Decommissioning	N/A	N/A	N/A
Exploration drilling	Dust emission from drilling and general site activities (including dust generated by vehicle movement)	Operational	Yes	No	Partial
	Noise impact as a result of exploration drilling, causing disturbance of fauna / livestock / wildlife		Yes	No	Partial
	Water and soil pollution resulting from disposal of drill fluids, hydrocarbon spills, storage of hazardous materials and waste generation		Partial	Potential	Yes
	Potential water resource impacts resulting from groundwater extraction for prospecting activities		No	Potential	Yes
	Impact on water courses and associated ecosystems in the area		Partial	Potential	Yes
	Useable infrastructure for future use	Decommissioning	N/A	N/A	N/A
	Rehabilitation of boreholes		N/A	N/A	N/A

ACTIVITIES	POTENTIAL IMPACT	PHASE	REVERSIBLE	LOSS OF RESOURCES	CAN BE AVOIDED, MANAGED OR MITIGATED
Camp Sites	Destruction and/or disturbance of on-site fauna, flora and sensitive areas	Construction	Partial	No	Yes
	Destruction or disturbance of onsite fauna / livestock / wildlife	All phases	No	Potential	Yes
	Dust emission resulting from site clearing, soil stripping and construction activities (including dust generated by vehicle movement)	Construction	Yes	No	Partial
	Noise as a result of construction, operation and vehicle movement resulting in disturbance of fauna / livestock / wildlife	All phases	Yes	No	Partial
	Potential water and soil pollution resulting from waste generation		Partial	Potential	Yes
	Soil disturbance and compaction and topsoil stockpiling resulting in soil erosion		Yes	Potential	Yes
	Visual impact affecting visual character		Yes	No	Partial
	Potential destruction of heritage resources	Construction	No	Yes	Yes
	Losses as a result of fire	All phases	Partial	Potential	Yes
	Rehabilitation of camp sites	Decommissioning	N/A	N/A	N/A
Water management	Spillages of water due to negligence or unmaintained equipment	Operational	No	Potential	Yes
	Potential water resource impacts resulting from groundwater extraction for prospecting activities		No	Potential	Yes
Re-Fuelling and maintenance	Potential water and soil pollution resulting from hydrocarbon spills and hazardous waste storage	All phases	Partial	Potential	Yes
Ablution facilities	Potential water and soil pollution resulting from waste spills resulting from improper maintenance		Partial	Potential	Yes
Waste management	Potential water and soil pollution resulting from improper waste storage and management		Partial	Potential	Yes

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

Describe how the significance, probability, and duration of the aforesaid identified impacts that were identified through the consultation process was determined in order to decide the extent to which the initial site layout needs revision

Standard evaluation methods are applied as defined below.

An impact can be defined as any change in the physical-chemical, biological, cultural and/or socio-economic environmental system that can be attributed to human activities related to alternatives under study for meeting a project need. Assessment of impacts will be based on DEAT's (2014) Guideline Document: EIA Regulations. The various environmental impacts and benefits of this project are discussed in terms of impact status, probability, duration, scale/extent and magnitude/severity.

The significance of the aspects/impacts of the process will be rated by using a matrix derived from Plomp (2004) and adapted to some extent to fit this process. These matrixes use the consequence and the likelihood of the different aspects and associated impacts to determine the significance of the impacts.

The significance of the potential impacts will be determined through a synthesis of the criteria below:

- **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 the cause of the effect, the aspect that will be affected and how it will be affected. The nature of the impact can be described as negative, positive or neutral.

RATING	DESCRIPTION	RATING
Positive	A benefit to the receiving environment	P
Negative	A cost to the receiving environment	N

- **Impact Probability**

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

Table 10: Impact Probability Rating

RATING	DESCRIPTION	WEIGHT
Improbable	The possibility of the impact occurring is very low, due to the circumstances, design or experience.	1
Probable	There is a probability that the impact will occur to the extent that provision must be made therefore.	2
Highly Probable	It is most likely that the impact will occur at some stage of the development.	4
Definite	The impact will take place regardless of any prevention plans.	5

- **Impact Duration**

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

Table 11: Impact Duration Rating

RATING	DESCRIPTION	WEIGHT
Short term	The impact will either disappear with mitigation or will be mitigated through natural processes in a time span shorter than any of the phases.	1
Medium term	The impact will last up to the end of the phases, where after it will be negated.	3
Long term	The impact will last for the entire operational phase of the project but will be mitigated by direct human action or by natural processes thereafter.	4
Permanent	Impact that will be non-transitory. Mitigation either by man or natural processes will not occur in such a way or in such a time span that the impact can be considered transient.	5

- **Impact Scale/Extent**

The scale/extent of the impact is considered as the physical and spatial size of the impact. Impact scale/extent can be site specific (within the boundaries of the development area), local and/or regional.

Table 12: Impact Scale/Extent Rating

RATING	DESCRIPTION	WEIGHT
Site	The impacted area extends only as far as the activity, e.g. footprint	1
Local	The impact could affect the whole, or a measurable portion of the above mentioned properties and adjacent properties.	2
Regional	The impact could affect the area including the neighbouring residential areas.	3

- **Impact Magnitude/Severity**

The magnitude/severity of the impact is determined to quantify the magnitude of the impacts and benefits associated with the proposed project (Does the impact destroy the environment, or alter its function).

Table 13: Impact Magnitude/Severity Rating

RATING	DESCRIPTION	WEIGHT
Low	The impact alters the affected environment in such a way that natural processes are not affected.	2
Medium	The affected environment is altered, but functions and processes continue in a modified way.	6
High	Function or process of the affected environment is disturbed to the extent where it temporarily or permanently ceases.	8

- **Impact Significance**

The impact significance is an indication of the importance of the impact in terms of both physical extent and time scale, and therefore indicates the level of mitigation required. The significance rating is utilised to rate each identified impact in terms of its overall magnitude and significance.

Table 14: Impact Significance Rating

RATING	DESCRIPTION	WEIGHT
Sum (Duration, Scale, Magnitude) x Probability		
Negligible	The impact is non-existent or unsubstantial and is of no or little importance to any stakeholder and can be ignored.	<20
Low	The impact is limited in extent, has low to medium intensity; whatever its probability of occurrence is, the impact will not have a material effect on the decision and is likely to require management intervention with increased costs.	<40
Moderate	The impact is of importance to one or more stakeholders, and its intensity will be medium or high; therefore, the impact may materially affect the decision, and management intervention will be required.	<60
High	The impact could render development options controversial or the project unacceptable if it cannot be reduced to acceptable levels; and/or the cost of management intervention will be a significant factor in mitigation.	>60

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

Provide a discussion in terms of advantages and disadvantages of the initial site layout compared to alternative layout options to accommodate concerns raised by affected parties

As discussed in the previous section, the proposed prospecting area is targeted due to existing and historical mining activities that are known from within the larger region and it is anticipated that similar conditions will prevail for this project.

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

Potential positive and negative impacts of the proposed activity include the following:

- **Potential impact on heritage resources**

A Heritage Impact Assessment of the prospecting area has been conducted to identify any cultural, heritage and/or archaeological features which may be impacted on.

There are formal graves on the site. The stone tool archaeological component is negligible and clearly derived, but still regarded as a meaningful indication of past human activity on the landscape.

- **Impacts on communities, individuals or 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;
- Potential water resource impacts resulting from groundwater extraction for prospecting activities;
- Noise due to prospecting activities;
- Poor access control resulting in impacts on livestock/wildlife 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

Prospecting will be undertaken by contractors, the Genet Mining crew and specialists and it is not anticipated that employment opportunities for local and/or regional communities will result from the prospecting activities.

Destruction and/or disturbance of on-site fauna, flora and sensitive areas

The top five impacts that the prospecting project team should manage include ground water contamination, rehabilitation (positive impact), vegetation loss, soil loss and sensitive habitat loss.

Water quality and availability

Limited quantities of hazardous goods (fuel, oil and lubricants) will be stored on site. A diesel bowser will be used for storage of diesel on site for re-fuelling. The transportation, handling and storage of such materials may result in spills and further water quality impacts in the event of spills when carried by storm water to the water courses.

1000 to 10 000 ℓ will be used per day for the prospecting activities and use must not exceed the general authorisation volume for the area. Water management should be implemented to prevent unnecessary spillage and waste of water.

Possible pollution sources include stockpiled soil and all areas cleared of vegetation. The eroded soil particles may be carried by storm water to watercourses which will result in an increase in the Total Suspended Solids (TSS) and Total Dissolved Solids (TDS) of the watercourses. The storage of hazardous goods, temporary ablution facilities and discharge of drill fluids may also lead to surface- and groundwater pollution if not managed properly.

Influx/presence of persons resulting in increased crime rates

The potential impacts of an increase in crime associated with an influx of unemployed persons travelling to mine sites seeking employment may occur. Drilling crew living residing at the camp sites on the farm also poses the danger of crime and livestock/wildlife/fauna trapping.

Visual impact

The prospecting activities may result in localised visual impacts due to the general characteristics of the farm and surrounding area that can be regarded as tranquil and natural wilderness.

Positive impacts

- While no significant short term positive impacts are associated with the prospecting activities, in the event that viable mineral reserve is confirmed, and pending the outcome of detailed social and environmental impact assessment processes, a positive socio-economic benefit must be investigated and optimized. Based on existing and historical mining activities which are known from within the larger region it is anticipated that similar conditions will prevail for this prospecting project.
- The potential to transfer boreholes (striking water) and access roads as usable infrastructure for the future use by the landowner can be considered as a potential positive impact.
- Rehabilitation of impacted areas.

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

With regard to the issues and concerns raised by affected parties provide a list of the issues raised and an assessment/ discussion of the mitigations or site layout alternatives available to accommodate or address their concerns, together with an assessment of the impacts or risks associated with the mitigation or alternatives considered

This section 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 *Table 15*.

- **Measures to manage the potential impact on heritage resources**

A Heritage Impact Assessment has been conducted on the area where drilling activities are planned.

The early identification of the formal graveyards provides the opportunity for the prospecting team to demarcate and avoid the areas of cultural and/or heritage significance (such as the formal graveyards and unmarked graves locality). The impact of these areas can therefore be avoided.

Should any unknown heritage sites be identified during the drilling activities, all activities will cease immediately and the SAHRA will be contacted. After assessment, and if appropriate, a permit will be obtained from SAHRA to remove such remains/artefacts.

- **Measures to manage the potential impacts on communities, individuals or land uses in close proximity**
  - Potential water and soil pollution resulting from hydrocarbon spills and soil erosion;
    - Mitigation and management measures must be implemented to prevent environmental pollution which may impact on environmental resources utilized by communities, landowners and other stakeholders. The mitigation measures are discussed in detail in the sections that follow.
  - Potential water resource impacts resulting from groundwater extraction for prospecting activities;
    - Water management in terms of the prevention of spillage/waste of water should be implemented on site.
    - Groundwater monitoring should be in place and implemented.
  - Noise due to prospecting activities;
    - Site activities will be conducted during daytime hours to avoid night time noise disturbances and night time collusions with fauna/livestock/wildlife.
    - Background noise level not to increase with more than 5dB.
  - Poor access control resulting in impacts on livestock/wildlife movement, breeding and grazing practices;
    - Access control procedures must be agreed on with the farm owner and all staff trained on these procedures to prevent un-authorised people from entering the site.
  - Influx of persons (job seekers) to site as a result of increased activity and the possible resultant increase in opportunistic crime; and
    - Conduct access control to prevent un-authorised people from entering the site.
    - Casual labour will not be recruited at the site to eliminate the incentive for persons travelling to site seeking employment.
    - The landowner will be notified of un-authorised persons encountered on site.
    - If deemed necessary, the South African Police Service will be informed of un-authorised persons encountered on site.

- Prospecting will be undertaken by contractors, the Genet Mining crew and specialists and it is not anticipated that employment opportunities for local and/or regional communities will result from the prospecting activities.

- **Measures to manage potential destruction and/or disturbance of on-site fauna, flora and sensitive areas**
  - Site activities will be conducted during daytime hours to avoid night time noise disturbances and night time collusions with fauna/livestock/wildlife.
  - Drill holes must be temporarily plugged directly after drilling is completed and remain plugged until they are permanently plugged below ground to eliminate risk posed to fauna by open drill holes.
  - A concurrent rehabilitation plan for permanent (permanent drill platforms or trenches) infrastructure and temporary infrastructure (laydown areas, trenches) should be in place, implemented and monitored for compliance.
  - Vegetative material should be used for rehabilitation, as brush packing and seed dispersal mechanism where rehabilitation is taking place.
  - The loss of the sensitive habitats must be avoided.

- **Measures to manage the potential impact on water quality and availability**

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

- Current infrastructure on the surface properties for access to the drill-hole positions must be used as far as is practical to minimize the potential for soil erosion. Should roads be required to drill sites, clearing will be undertaken with a view to maintain vegetation cover to limit soil erosion potential.
- The area impacted by the drill site must be kept to a minimum and vegetation removal minimized to limit soil erosion.
- Prevent wind erosion by mulching with rocks and brush packing with damaged vegetation.
- When establishing the drill pad, topsoil that will be removed will be stockpiled up-slope of the pad. The stockpile will be shaped to divert storm water around the drill pad. The stockpile will be re-used for the rehabilitation of the sites.
- To reduce potential for water pollution during the drilling activities, a sump will be constructed with sufficient capacity to receive drill fluids and allow for evaporation.
- To avoid clean storm water inflow, the sump will be constructed to divert storm water away.
- A waste management system will be implemented and sufficient waste bins provided on site. A system to prohibit littering and poor housekeeping practices on site will be implemented.
- Oils and lubricant will be stored within secondary containment structures.
- Vehicle maintenance will be undertaken off-site where practical. Vehicle maintenance undertaken on-site, the use of drip trays and/or PVC sheets will be used to prevent spills and leaks onto the soil.
- Waste separation will be undertaken on-site and separate containers will be provided (i.e. general waste, hazardous waste, recyclable waste)
- Disposal of waste will be at an appropriately licensed landfill/facility and recyclables will be taken to a licensed recycling facility.
- Waste containers will be closed (i.e. fitted with a lockable lid) to eliminate the possible access of animals overnight.
- Drill holes must be temporarily plugged directly after drilling is completed and remain plugged until they are permanently plugged below ground to eliminate risk posed to fauna by open drill holes.

- Drill holes must be permanently capped at decommissioning.
- Water management in terms of the prevention of spillage/waste of water should be implemented on site.

Measures to manage the potential visual impact

- All temporary infrastructures such as portable ablution facilities, water tanks etc. should be acquired with consideration for colour. Natural colour options which blend in with the surrounding area must be favoured.
- A waste management system will be implemented and sufficient waste bins provided on site. A system to prohibit littering and poor housekeeping practices on site will be implemented.
- Dust fall out will be managed to be less than 600 mg per day/m^2. 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 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

Measures to manage rehabilitation (positive impact)

- Rehabilitation in itself can result in additional impacts.
- Rehabilitation should be done according to similar vegetation diversity, vegetation cover constituency as described by the baseline.
- Rehabilitation should be monitored using Landscape Functional Analysis to ensure the rehabilitation efforts can be quantified as successful.
- Rehabilitation maintenance is required until the rehabilitation is self-sufficient.
- It is required that palatable grazing seed is re-established on impacted areas where rehabilitation takes place.

ix) Motivation where no alternative sites were considered

As discussed in the previous section, the proposed prospecting area is targeted due to existing and historical mining activities that are known from within the larger region and it is anticipated that similar conditions will prevail for this project. No alternative other than drilling is possible to determine the presence and quality of the minerals (copper, iron and manganese) in the area.

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

x) Statement motivating the alternative development location within the overall site

Provide a statement motivating the final site layout that is proposed

The information obtained during the field survey and evaluation process of the geological maps and data, will be used to determine the target area and planned positions of the intended invasive prospecting. The positions of possible phase II trenches and drill holes will be based on results received from the laboratory as well as from the evidence obtained during the drilling process.

The presence of people, streams/rivers, wetlands, graves and other sensitive areas will determine the locality of the camp site, access roads as well as the position of prospecting holes.

i) 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

Including (i) a description of all environmental issues and risks that where identified during the environmental impact assessment process and (ii) an assessment of the significance of each issue and risk and an indication of the extent to which the issue and risk could be avoided or addressed by the adoption of mitigation measures

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

During the consultation process attempts were made to obtain information on the presence and quality of groundwater as well as other water features like pans and fountains. Maps of the area were shown and the I&AP requested to indicate the possible position of these features. Information regarding graves in the area was also requested. Physical identification of the graves will be requested in order to obtain GPS coordinates of the locality to ensure that it will be incorporated into the baseline plans. I&APs are also offered the opportunity to raise any other issues that could have an impact on the prospecting plan and EMP.

For the environmental issues and risks identified an ecological and heritage specialist conducted a high level desktop assessment to determine the environmental setting in which the prospecting project is located. The various resources used to determine the significance and sensitivity of the environmental considerations include:

- Geographic Information System maps
- South African National Biodiversity Institute (SANBI) Biodiversity Geographic Database LUDS system;
- Department of Water Affairs information documents; etc.

The site visit was undertaken on 13 and 18 January 2016 to ensure that the information gathered as part of the desktop investigation reflects the current status of the land.

The baseline studies and impact findings, with strong focus on the views of the stakeholders were incorporated into the assessment of impacts and ranking of these.

The ratings of the identified impacts were undertaken in a quantitative manner as provided from section (vi) above. A risk matrix will be used to determine the significance of the impacts. The magnitude of the impact, the extent of the impact, the reversibility of the impact, the duration of the impact and the probability of the impact occurring were taken into consideration. The assessment has been conducted without implementing any mitigation or management measures and then with the implementation of management and mitigation measures. During the process a score was determined to divide the significance of the impacts into negligible, low, moderate and high.

The identification of management measures and impact management objectives were developed to ensure that adverse socio-economic impacts and minimised and socio-economic benefits are maximised. Measures were further defined to avoid, prevent, limit or manage any impacts. Closure objectives were further measured against Section 28 of the National Environmental Management Act (Act 107 of 1998) and Regulation 52(2)(f) of the MPRDA regulations.

j) Assessment of each identified potentially significant impact and risk

This section of the report must consider all the known typical impacts of each of the activities (including those that could or should have been identified by knowledgeable persons) and not only those that were raised by registered interested and affected parties

This section identifies and evaluates the actual and potential environmental consequences associated with the proposed drilling activity. The potential for mitigation of negative impacts and enhancement of positive impacts (DEAT, 2003) to enable sustainable development principles are adhered to.

Table 15: Impact Assessment

ACTIVITIES	POTENTIAL IMPACT	ASPECT	PHASE	IMPACT STATUS	SIGNIFICANCE if not mitigated	MITIGATION	SIGNIFICANCE if mitigated
Non-invasive Prospecting Activities							
Data Collection & Physical Survey	None identified	N/A	Planning	N/A	N/A	- No mitigation proposed	N/A
Invasive Prospecting Activities							

Site access/roads	Destruction and/or disturbance of on-site fauna, flora and sensitive areas	Loss of fauna, flora & sensitive habitat	Construction	Negative	50	- A map indicating the finalised location of the planned invasive prospecting activities must be submitted to the landowner, as well as to the DMR. Upon agreement of the location of the activities, the applicant can proceed. - Use existing tracks and roads in all instances as far as possible. - Where track clearing will be necessary, it will be undertaken to minimise disturbance and aid rehabilitation efforts and significant vegetation such as trees and large shrubs will be avoided (or protected species). - Site activities will be conducted during daytime hours to avoid night time noise disturbances and night time collusions with fauna/livestock/wildlife. - Vehicle speed will be reduced, particularly in high vegetated areas in order to avoid deaths by vehicle impacts. - The applicant will be responsible for all environmental disturbance on site as a result of prospecting and will rehabilitate these impacts to the satisfaction of the landowner. - Any nationally protected trees within close proximity of the development footprint to be identified as no-go areas or special permits obtained to remove the trees as soon as it becomes apparent the destruction of specimens cannot be avoided. - No impact on specimens may take place before such permits are obtained. All obligations of such permits must be adhered to. - Drill camp establishment should not be allowed in the veld, but should be constructed temporarily at a demarcated area historically disturbed. Preferably areas used for similar function.	20

Site access/roads	Soil compaction resulting from repeated use of access roads to sites	Loss of soil resources	Construction	Negative	24	- Current infrastructure on the surface properties for access to the drill-hole positions must be used as far as is practical to minimize the potential for soil erosion. Should roads be required to drill sites, clearing will be undertaken with a view to maintain vegetation cover to limit soil erosion potential. - As part of rehabilitation, all compacted roads and drill pads will be ripped and re-vegetated (if required). - Where significant risk of erosion is identified, additional mechanical erosion control measures must be implemented.	12
Site access/roads	Vehicle traffic noise impact affecting cattle and/or wildlife	Loss of fauna	Construction	Negative	25	- Site activities will be conducted during daytime hours to avoid night time noise disturbances and night time collusions with fauna/livestock/wildlife. - Background noise level not to increase with more than 5dB.	20
Site access/roads	Poor access control resulting in impacts on livestock/wildlife movement, breeding and grazing practices	Loss of fauna	Construction	Negative	16	- Access control procedures must be agreed on with farm owners or occupants and all staff trained on these procedures. - The applicant will prior to the commencement of prospecting activities, in consultation with farm owners and/or occupants, ensure that the prospecting schedules does not adversely impact on daily farm management activities. - An open channel of communication will be developed with designated personnel responsible to remain in contact with the farmers, throughout the prospecting activities.	8

Site access/roads	Potential destruction of heritage resources	Loss of Cultural and/or Heritage Significance	Construction	Negative	52	- Should any unknown heritage sites be identified during the drilling activities, all activities will cease immediately and the SAHRA will be contacted. After assessment, and if appropriate, a permit will be obtained from SAHRA to remove such remains/artefacts. - Ensure staff training and orientation regarding the procedure should remains or artefacts be found within the project area. - It is advised as a matter of prudence that the formal graves and supposedly unmarked graves area is to be avoided during the operational phase of the project	26
Site access/roads	Poor access control resulting in un-authorised people entering the site	Increase in petty crimes	All phases	Negative	16	- Conduct access control to prevent un-authorised people from entering the site. - Access control procedures must be agreed on with the farm owner and all staff trained on these procedures to prevent un-authorised people from entering the site. - The landowner will be notified of un-authorised persons encountered on site. - If deemed necessary, the South African Police Service will be informed of un-authorised persons encountered on site.	8
Site access/roads	Activities within the watercourse could result in disturbance to the natural geomorphology and safety hazards during rainy periods	Loss of fauna, flora & altering of watercourse. Loss and/or damage to life.	All phases	Negative	16	- No prospecting activities, such as drilling, roads, and trenching, camp sites may be undertaken in the watercourses. - A first aid station and emergency plan must be available on site.	8
Site access/roads	Useable infrastructure for future use	Access	Decommissioning	Positive	35 (P)	- If requested, newly constructed access roads to the drill sites will be transferred as an asset for the future use of the landowner	28 (P)

Site access/roads	Rehabilitation of access roads	Soil resource	Decommissioning	Positive	40 (P)	- Rehabilitated tracks may not be disturbed by additional vehicular movement and the monitoring thereof shall be carried out on foot. - Rehabilitation should be done according to similar vegetation diversity, vegetation cover constituency as described by the baseline. - Rehabilitation should be monitored using Landscape Functional Analysis to ensure the rehabilitation efforts can be quantified as successful. - Rehabilitation maintenance is required until the rehabilitation is self-sufficient. - It is required that palatable grazing seed is re-established on impacted areas where rehabilitation takes place.	32 (P)

Drill sites	Destruction and/or disturbance of on-site fauna, flora and sensitive areas	Loss of fauna and flora	Construction	Negative	50	- The removal of vegetation within the drill site area will be minimised. - Vegetation clearance will be undertaken to minimise disturbance and aid rehabilitation efforts and significant vegetation such as trees and large shrubs will be avoided (or protected species). - A fire emergency procedure will be developed to contain and minimise the destruction of flora and faunal habitat which may result from fire. - The collection, hunting or harvesting of any plants or animals at the site will be strictly forbidden. - An open channel of communication will be developed, with designated personnel responsible to remain in contact with the farmers throughout the prospecting activities. - The applicant will be responsible for all environmental disturbances on site as a result of prospecting and will rehabilitate these impacts to the satisfaction of the landowner.	8
Drill sites	Dust emission resulting from site clearing, soil stripping and construction activities (including dust generated by vehicle movement)	Dust emissions	Construction	Negative	25	- Dust fall out will be managed to be less than 600 mg per day/m2. - 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 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	10

Drill sites	Noise as a result of construction, operation and vehicle movement resulting in disturbance of fauna / livestock / wildlife	Ambient noise levels	Construction & Operational	Negative	25	- Site activities will be conducted during daytime hours to avoid night time noise disturbances and night time collusions with fauna/livestock/wildlife. - Background noise level not to increase with more than 5dB.	20
Drill sites	Soil contamination resulting from waste generation, disposal of drill fluids or storage of hazardous materials	Loss of soil resources	Operational	Negative	20	- A waste management system will be implemented and sufficient waste bins provided on site. A system to prohibit littering and poor housekeeping practices on site will be implemented. - Oils and lubricant will be stored within secondary containment structures. - Waste separation will be undertaken on-site and separate containers will be provided (i.e. general waste, hazardous waste, recyclable waste) - Waste containers will be closed (i.e. fitted with a lockable lid) to eliminate the possible access of animals overnight.	8

Drill sites	Soil disturbance and compaction and topsoil stockpiling resulting in soil erosion	Soil resources	All phases	Negative	24	- Vegetation clearing of drill sites will be undertaken with a view to maintain vegetation cover to limit soil erosion potential. - The area impacted by the drill site must be kept to a minimum and vegetation removal minimized to limit soil erosion. - Prevent wind erosion by mulching with rocks and brush packing with damaged vegetation. - When establishing the drill pad, topsoil that will be removed will be stockpiled up-slope of the pad. The stockpile will be shaped to divert storm water around the drill pad. The stockpile will be re-used for the rehabilitation of the sites. - Mechanical erosion control methods will be implemented if required. This may include the use of geotextiles to stabilise slopes.	8
Drill sites	Visual impact affecting visual character	Loss of aesthetic value	Operational	Negative	8	- All temporary infrastructures such as portable ablution facilities, water tanks etc. should be acquired with consideration for colour. Natural colour options which blend in with the surrounding area must be favoured. - A waste management system will be implemented and sufficient waste bins provided on site. - A system to prohibit littering and poor housekeeping practices on site will be implemented.	4

Drill sites	Influx of persons (job seekers) to site as a result of increased activity resulting in increased incidents of theft and opportunistic crime	Increase in petty crimes	All phases	Negative	16	- Conduct access control to prevent un-authorised people from entering the site. - Casual labour will not be recruited at the site to eliminate the incentive for persons travelling to site seeking employment. - The landowner will be notified of un-authorised persons encountered on site. - If deemed necessary, the South African Police Service will be informed of un-authorised persons encountered on site.	8
Drill sites	Potential destruction of heritage resources	Loss of Cultural and/or Heritage Significance	Construction	Negative	52	- Should any unknown heritage sites be identified during the drilling activities, all activities will cease immediately and the SAHRA will be contacted. After assessment, and if appropriate, a permit will be obtained from SAHRA to remove such remains/artefacts. - Ensure staff training and orientation regarding the procedure should remains or artefacts be found within the project area. - It is advised as a matter of prudence that the formal graves and supposedly unmarked graves area is to be avoided during the operational phase of the project	26

Drill sites	Rehabilitation of drill sites	Soil resources, vegetation re-establishment	Decommissioning	Positive	40 (P)	- Re-vegetation will be conducted through hand seeding exposed areas using indigenous grass species as determined by a suitably qualified ecologist. - Re-vegetation efforts will be monitored every second month for a period of six months after initial seeding. - An effective vegetation cover must be achieved. The site is to be returned back to its pre-mining land use. - Soil must be loosened at drill sites that have been denuded of vegetation or where soils have been compacted or crusts formed. - Avoid wind and water erosion at drill sites by mulching with rocks and limit further access. - All foreign matter, such as rubble, will be removed from the site. - All temporary structures and storage facilities will be removed from the drill site. - Once project activities have been completed the disturbed areas should be levelled to correspond to local slope conditions. - Photographs will be taken before, during and after drilling to monitor environmental impacts. - Rehabilitation should be done according to similar vegetation diversity, vegetation cover constituency as described by the baseline. - Rehabilitation should be monitored using Landscape Functional Analysis to ensure the rehabilitation efforts can be quantified as successful. - Rehabilitation maintenance is required until the rehabilitation is self-sufficient. - It is required that palatable grazing seed is re-established on impacted areas where rehabilitation takes place.	32 (P)

Trench sites	Destruction and/or disturbance of on-site fauna, flora and sensitive areas	Loss of fauna, flora & sensitive habitat	All phases	Negative	50	- The removal of vegetation within the trench site area will be minimised. - Vegetation clearance will be undertaken to minimise disturbance and aid rehabilitation efforts and significant vegetation such as trees and large shrubs will be avoided (or protected species). - A fire emergency procedure will be developed to contain and minimise the destruction of flora and faunal habitat which may result from fire. - The collection, hunting or harvesting of any plants or animals at the site will be strictly forbidden. - An open channel of communication will be developed, with designated personnel responsible to remain in contact with the farmers throughout the prospecting activities. - The applicant will be responsible for all environmental disturbances on site as a result of prospecting and will rehabilitate these impacts to the satisfaction of the landowner. - Any nationally protected trees within close proximity of the development footprint to be identified as no-go areas or special permits obtained to remove the trees as soon as it becomes apparent the destruction of specimens cannot be avoided. - No impact on specimens may take place before such permits are obtained. All obligations of such permits must be adhered to. - Drill camp establishment should not be allowed in the veld, but should be constructed temporarily at a demarcated area historically disturbed. Preferably areas used for similar function.	8

Trench sites	Dust emission resulting from site clearing, soil stripping and trench construction (including dust generated by vehicle movement)	Dust emissions		Negative	25	- Dust fall out will be managed to be less than 600 mg per day/m2. - 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 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	10
Trench sites	Noise as a result of construction, operation and vehicle movement resulting in disturbance of fauna / livestock / wildlife	Ambient noise levels		Negative	25	- Site activities will be conducted during daytime hours to avoid night time noise disturbances and night time collusions with fauna/livestock/wildlife. - Background noise level not to increase with more than 5dB.	20
Trench sites	Soil contamination resulting from waste generation, disposal or storage of hazardous materials and use of heavy machinery	Loss of soil resources		Negative	20	- A waste management system will be implemented and sufficient waste bins provided on site. A system to prohibit littering and poor housekeeping practices on site will be implemented. - Oils and lubricant will be stored within secondary containment structures. - Waste separation will be undertaken on-site and separate containers will be provided (i.e. general waste, hazardous waste, recyclable waste) - Waste containers will be closed (i.e. fitted with a lockable lid) to eliminate the possible access of animals overnight.	8

Trench sites	Soil disturbance and compaction and topsoil stockpiling resulting in soil erosion	Loss of soil resources		Negative	24	- Vegetation clearing of trench sites will be undertaken with a view to maintain vegetation cover to limit soil erosion potential. - The area impacted by the trench site must be kept to a minimum and vegetation removal minimized to limit soil erosion. - Prevent wind erosion by mulching with rocks and brush packing with damaged vegetation. - When establishing the trench, topsoil that will be removed will be stockpiled up-slope of the trench. The stockpile will be shaped to divert storm water around the trench. The stockpile will be re-used for the rehabilitation of the sites. - Mechanical erosion control methods will be implemented if required for topsoil stockpiling. This may include the use of geotextiles to stabilise slopes.	8
Trench sites	Visual impact affecting visual character	Loss of aesthetic value	Construction & Operational		8	- All temporary infrastructures such as portable ablution facilities, water tanks etc. should be acquired with consideration for colour. Natural colour options which blend in with the surrounding area must be favoured. - A waste management system will be implemented and sufficient waste bins provided on site. - A system to prohibit littering and poor housekeeping practices on site will be implemented.	4

Trench sites	Influx of persons (job seekers) to site as a result of increased activity resulting in increased incidents of theft and opportunistic crime	Increase in petty crimes	All phases	Negative	16	- Conduct access control to prevent un-authorised people from entering the site. - Casual labour will not be recruited at the site to eliminate the incentive for persons travelling to site seeking employment. - The landowner will be notified of un-authorised persons encountered on site. - If deemed necessary, the South African Police Service will be informed of un-authorised persons encountered on site.	8
Trench sites	Potential destruction of heritage resources	Loss of Cultural and/or Heritage Significance	Construction	Negative	52	- Should any unknown heritage sites be identified during the trenching activities, all activities will cease immediately and the SAHRA will be contacted. After assessment, and if appropriate, a permit will be obtained from SAHRA to remove such remains/artefacts. - Ensure staff training and orientation regarding the procedure should remains or artefacts be found within the project area. - It is advised as a matter of prudence that the formal graves and supposedly unmarked graves area is to be avoided during the operational phase of the project	26

Trench sites	Rehabilitation of trenches	Soil resource	Decommissioning	Positive	40 (P)	- Excavations must be backfilled with subsoil, compacted and levelled with previously stored topsoil and subsoil on the surface avoided. - Photographs will be taken before, during and after trenching to monitor environmental impacts. - Once project activities have been completed the disturbed areas should be levelled to correspond to local slope conditions. - Rehabilitation should be done according to similar vegetation diversity, vegetation cover constituency as described by the baseline. - Rehabilitation should be monitored using Landscape Functional Analysis to ensure the rehabilitation efforts can be quantified as successful. - Rehabilitation maintenance is required until the rehabilitation is self-sufficient. - It is required that palatable grazing seed is re-established on impacted areas where rehabilitation takes place.	32 (P)
Excavation of sumps	Destruction or disturbance of onsite fauna / livestock / wildlife	Loss of fauna	Operational	Negative	24	- The design of the drill fluid sump must incorporate effective fauna egress to avoid entrapment.	8
Excavation of sumps	Water and soil pollution resulting from disposal of drill fluids	Loss of water resources, loss of soil resources	Operational	Negative	32	- To reduce potential for water pollution during the drilling activities, a sump will be constructed with sufficient capacity to receive drill fluids and allow for evaporation. - To avoid clean storm water inflow, the sump will be constructed to divert storm water away.	8

Excavation of sumps	Rehabilitation of sumps	Soil resource, vegetation establishment	Decommissioning	Positive	40 (P)	- Drill sludge and the PVC sump lining will be removed and disposed of at a registered waste disposal site. - Sludge from the above ground drill sump will be collected, removed from the drill site and disposed of at an approved waste disposal site. - Any excavations should be backfilled with subsoil, compacted and levelled with previously stored topsoil.	32 (P)
Exploration drilling	Destruction and/or disturbance of on-site fauna	Loss of fauna	All phases	Negative	24	- Drill holes must be temporarily plugged directly after drilling is completed and remain plugged until they are permanently plugged below ground to eliminate risk posed to fauna by open drill holes. - All vehicles will adhere to a low speed limit to avoid collisions with susceptible species such as snakes and tortoises, as well as to minimize dust generation.	8
Exploration drilling	Dust emission from drilling and general site activities (including dust generated by vehicle movement)	Dust emissions	Operational	Negative	25	- Dust fall out will be managed to be less than 600 mg per day/m^2. - Maintain low speed limits on vehicles travelling by gravel roads in order to avoid excess dust.	10
Exploration drilling	Noise impact as a result of exploration drilling, causing disturbance of fauna / livestock / wildlife	Ambient noise levels	Operational	Negative	25	- Exploration drilling activities will be conducted during daytime hours to avoid night time noise disturbances and night time collusions with fauna/livestock/wildlife. - Background noise level not to increase with more than 5dB.	20

Exploration drilling	Water and soil pollution resulting from disposal of drill fluids, hydrocarbon spills, storage of hazardous materials and waste generation	Loss of soil resources, loss of water resources	Operational	Negative	32	- In order to contain oil and fuel spills, drip pans or PVC lining will be provided for drilling equipment and storage facilities where hydrocarbon leakage is possible. - Provision will be made to contain non-biodegradable oil and fuel spills by use of drip pans and appropriate lining for drilling equipment and storage facilities where hydrocarbon leakage is possible. - Emergency plans will be developed to deal with accidental spillage of chemicals. Leakage and spillage should be contained and cleaned up immediately to minimise the pollution to water quality. - If any spillage of hydrocarbons (diesel or oil) is detected, drilling will cease immediately and the leakage contained before restarting. - Any pollution of the drill site must be cleaned and the disturbed area rehabilitated. Rehabilitation includes the removal of hydrocarbon-polluted soil to a registered disposal site. - Diesel storage tanks or any materials brought on site should be adequately bunded.	8
Exploration drilling	Potential water resource impacts resulting from groundwater extraction for prospecting activities	Loss of water resource	Operational	Negative	56	- Use must not exceed the general authorisation volume for the area. - Prevent spillage and waste of water - Water management in terms of the prevention of spillage/waste of water should be implemented on site. - Groundwater monitoring should be in place and implemented.	28

Exploration drilling	Impact on water courses and associated ecosystems in the area	Sensitive environments, fauna and flora	Operational	Negative	40	- Where applicable, a random number of prospecting boreholes will be sampled for water quality analysis indicating possible hydrocarbon impacts. - Prospecting areas must be clearly demarcated. - No prospecting activities may be undertaken within 100m from watercourses.	8
Exploration drilling	Useable infrastructure for future use	Water resource	Decommissioning	Positive	35 (P)	- Ensure the transfer of boreholes (striking water) for the future use by the landowner.	28 (P)
Exploration drilling	Rehabilitation of boreholes	Loss of fauna, water resource	Decommissioning	Positive	40 (P)	- Drill holes should be capped to avoid small fauna falling into the drill hole and marked.	32 (P)
Camp Sites	Destruction and/or disturbance of on-site fauna, flora and sensitive areas	Loss of fauna	Construction	Negative	50	- The collection, hunting or harvesting of any plants or animals at the site will be strictly forbidden. - Drill camp establishment should not be allowed in the veld, but should be constructed temporarily at a demarcated area historically disturbed. Preferably areas used for similar function.	8
Camp Sites	Destruction or disturbance of onsite fauna / livestock / wildlife	Fauna loss	All phases	Negative	24	- A detailed induction programme will be developed on site which will focus on the landowners' requirements for environmental management and concerns regarding poaching.	8

Camp Sites	Dust emission resulting from site clearing, soil stripping and construction activities (including dust generated by vehicle movement)	Dust emissions	Construction	Negative	25	- Dust fall out will be managed to be less than 600 mg per day/m^2. - 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 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	10
Camp Sites	Noise as a result of construction, operation and vehicle movement resulting in disturbance of fauna / livestock / wildlife	Ambient noise levels	All phases	Negative	25	- Exploration drilling activities will be conducted during daytime hours to avoid night time noise disturbances and night time collusions with fauna/livestock/wildlife. - Background noise level not to increase with more than 5dB.	20
Camp Sites	Potential water and soil pollution resulting from waste generation	Loss of soil resources, loss of water resources	All phases	Negative	32	- A waste management system will be implemented and sufficient waste bins provided on site. A system to prohibit littering and poor housekeeping practices on site will be implemented. - Oils and lubricant will be stored within secondary containment structures. - Waste separation will be undertaken on-site and separate containers will be provided (i.e. general waste, hazardous waste, recyclable waste) - Waste containers will be closed (i.e. fitted with a lockable lid) to eliminate the possible access of animals overnight.	8

Camp Sites	Soil disturbance and compaction and topsoil stockpiling resulting in soil erosion	Soil resource	All phases	Negative	24	- Vegetation clearing of camp sites will be undertaken with a view to maintain vegetation cover to limit soil erosion potential. - The area impacted by the camp site must be kept to a minimum and vegetation removal minimized to limit soil erosion. - Prevent wind erosion by mulching with rocks and brush packing with damaged vegetation. - When establishing the camp site, topsoil that will be removed will be stockpiled up-slope of the site. The stockpile will be shaped to divert storm water around the camp site. The stockpile will be re-used for the rehabilitation of the sites. - Mechanical erosion control methods will be implemented if required. This may include the use of geotextiles to stabilise slopes.	8
Camp Sites	Visual impact affecting visual character	Loss of aesthetic value	All phases	Negative	8	- All temporary infrastructures such as portable ablution facilities, water tanks etc. should be acquired with consideration for colour. Natural colour options which blend in with the surrounding area must be favoured. - A waste management system will be implemented and sufficient waste bins provided on site. - A system to prohibit littering and poor housekeeping practices on site will be implemented.	4

Camp Sites	Potential destruction of heritage resources	Loss of Cultural and/or Heritage Significance	Construction	Negative	52	- Should any unknown heritage sites be identified during the drilling activities, all activities will cease immediately and the SAHRA will be contacted. After assessment, and if appropriate, a permit will be obtained from SAHRA to remove such remains/artefacts. - Ensure staff training and orientation regarding the procedure should remains or artefacts be found within the project area. - It is advised as a matter of prudence that the formal graves and supposedly unmarked graves area is to be avoided during the operational phase of the project	26
Camp Sites	Losses as a result of fire	Grazing land, livestock, game and property	All phases	Negative	22	- No open fires for any purpose (cooking etc.) will be allowed. - Smoking is prohibited. - Emergency preparedness and response plans will be developed and agreed to with relevant directly affected and directly adjacent landowners.	11

Camp Sites	Rehabilitation of camp sites	Loss of soil resource, vegetation re-establishment	Decommissioning	Negative	40 (P)	- Re-vegetation will be conducted through hand seeding exposed areas using indigenous grass species as determined by a suitably qualified ecologist. - Re-vegetation efforts will be monitored every second month for a period of six months after initial seeding. - An effective vegetation cover must be achieved. The site is to be returned back to its pre-mining land use. - Soil must be loosened at camp sites that have been denuded of vegetation or where soils have been compacted or crusts formed. - Avoid wind and water erosion at camp sites by mulching with rocks and limit further access. - All foreign matter, such as rubble, will be removed from the site. - All temporary structures and storage facilities will be removed from the camp site. - Once project activities have been completed the disturbed areas should be levelled to correspond to local slope conditions. - Photographs will be taken before, during and after drilling to monitor environmental impacts. - Rehabilitation should be done according to similar vegetation diversity, vegetation cover constituency as described by the baseline. - Rehabilitation should be monitored using Landscape Functional Analysis to ensure the rehabilitation efforts can be quantified as successful. - Rehabilitation maintenance is required until the rehabilitation is self-sufficient. - It is required that palatable grazing seed is re-established on impacted areas where rehabilitation takes place.	32 (P)

Water management	Spillages of water due to negligence or unmaintained equipment	Loss of Water resources	Operational	Negative	40	- The water pipeline laid to the drill site should be maintained properly to minimise unnecessary wastage. - Use must not exceed general authorisation volume for the area. - Prevent spillages of water due to negligence or un-maintained storage facilities	8
Water management	Potential water resource impacts resulting from groundwater extraction for prospecting activities	Loss of Water resources	Operational	Negative	56	- Water management in terms of the prevention of spillage/waste of water should be implemented on site. - Groundwater monitoring should be in place and implemented.	28
Re-Fuelling and maintenance	Potential water and soil pollution resulting from hydrocarbon spills and hazardous waste storage	Loss of soil resources, loss of water resources	All phases	Negative	32	- Vehicle maintenance will be undertaken off-site where practical. Vehicle maintenance undertaken on-site, the use of drip trays and/or PVC sheets will be used to prevent spills and leaks onto the soil. - Regular inspections of all vehicles and machinery must be carried out to ensure that all leaks are identifies early and rectified.	8
Ablution facilities	Potential water and soil pollution resulting from waste spills resulting from improper maintenance	Loss of soil resources, loss of water resources	All phases	Negative	32	- All sewage wastes will be collected by approved waste contractors and transferred to an appropriately licensed waste management facility for treatment and/or disposal according to procedures in place. - Emergency plans should be developed to deal with accidental spillage of sewage waste. Leakage and spillage should be contained and cleaned up immediately to minimise the pollution to water quality and human health.	8

Waste management	Potential water and soil pollution resulting from improper waste storage and management	Loss of soil resources, loss of water resources	All phases	Negative	32	- Disposal of waste will be at an appropriately licensed landfill/facility and recyclables will be taken to a licensed recycling facility. - A waste management system will be implemented and sufficient waste bins provided on site. A system to prohibit littering and poor housekeeping practices on site will be implemented. - Oils and lubricant will be stored within secondary containment structures. - Waste separation will be undertaken on-site and separate containers will be provided (i.e. general waste, hazardous waste, recyclable waste) - Waste containers will be closed (i.e. fitted with a lockable lid) to eliminate the possible access of animals overnight. - Emergency plans should be developed to deal with accidental spillage of chemicals. Leakage and spillage should be contained and cleaned up immediately to minimise the pollution to water quality. - Ensure surface areas exposed to annual rainfall is clean from any hazardous materials that could affect rainwater quality. - Unused machinery must be completely drained of oil and other hydrocarbons to ensure that leaks do not develop.	8

k) Summary of specialist reports

This summary must be completed if any specialist reports informed the impact assessment and final site layout process and must be in the following tabular form:

Table 16: 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
Ecological Study	1. Mitigation Measures for Rehabilitation of Impacted Areas • Rehabilitation in itself can result in additional impacts. • Rehabilitation should be done according to similar vegetation diversity, vegetation cover constituency as described by the baseline. • Rehabilitation should be monitored using Landscape Functional Analysis to ensure the rehabilitation efforts can be quantified as successful. • Rehabilitation maintenance is required until the rehabilitation is self-sufficient. • It is required that palatable grazing seed is re-established on impacted areas where rehabilitation takes place. 2. Mitigation Measures for Vegetation Loss • Vegetation loss results in numerous impacts downstream. Vegetation loss should be restored as quickly as possible on affected areas. • A concurrent rehabilitation plan for permanent (permanent drill platforms or trenches) infrastructure and temporary infrastructure	X	Baseline Environment: Type of environment affected by the proposed activity Description of specific environmental features and infrastructure on the site 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 The possible mitigation measures that could be applied and the level of risk Assessment of each identified potentially significant impact and

	(laydown areas, trenches) should be in place, implemented and monitored for compliance. - Vegetative material should be used for rehabilitation, as brush packing and seed dispersal mechanism where rehabilitation is taking place. 3. Mitigation Measures for Loss of species of special concern - Any nationally protected trees within close proximity of the development footprint to be identified as no-go areas or special permits obtained to remove the trees as soon as it becomes apparent the destruction of specimens cannot be avoided. - No impact on specimens may take place before such permits are obtained. All obligations of such permits must be adhered to.		risk Summary of the key findings of the environmental impact assessment;
Heritage Impact Assessment	1. Significance of impacts is summarized in Table 4. Potential palaeontological impact resulting from the proposed drilling activities is considered low to very low. The palaeontological component at the study area is assigned the rating of Generally Protected C (GP.C). 2. The stone tool archaeological component is negligible and clearly derived, but still regarded as a meaningful indication of past human activity on the landscape. It is advised as a matter of prudence that the supposedly unmarked graves area (Fig. 5) is to be avoided during the operational phase of the project. The study areas are assigned site ratings of Generally Protected C (GP.C).	X	Baseline Environment: Type of environment affected by the proposed activity Description of specific environmental features and infrastructure on the site 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 The possible mitigation measures that could be applied and the level of risk

			Assessment of each identified potentially significant impact and risk Summary of the key findings of the environmental impact assessment;

Attach copies of Specialist Reports as appendices, marked C (Heritage Impact Assessment) and Annexure D (Ecological Study)

I) Environmental impact statement

i) Summary of the key findings of the environmental impact assessment;

For access control, management measures must be appropriate to address the unintentional movement of livestock and game farm animals between camps and farm portions and onto public roads. The prevention of access to persons not employed by either the prospecting company and/or landowner should be addressed.

Additional consultation with the affected landowners will be required prior to invasive prospecting activities for the purpose of agreeing on access control requirements. A map of the finalised positions of the proposed drilling, trenching and camp sites and access roads to the sites must be provided to the landowners and DMR for approval. Access roads and prospecting sites should be planned in such a way as to avoid protected plant species.

The area consists of four vegetation types (Northern Upper Karoo, Gordonia Duneveld, Kuruman Mountain Bushveld and Olifantshoek plains thornveld). Five habitat types (Riverbeds, Open thornveld, plains thornveld, Karoo plains, Dune veld, Outcrops) occur on the site.

Primarily most of the area is well represented in the landscape and of low biodiversity sensitivity.

The more (moderately) biodiverse sensitive areas are outcrop and riverbed habitats.

The top five impacts that the prospecting project team should manage include ground water contamination, rehabilitation (positive impact), vegetation loss, soil loss, heritage impact and sensitive habitat loss.

Potential palaeontological impact resulting from the proposed drilling activities is considered low to very low. The palaeontological component at the study area is assigned the rating of Generally Protected C (GP.C). The stone tool archaeological component is negligible and clearly derived, but still regarded as a meaningful indication of past human activity on the landscape. It is advised as a matter of prudence that the supposedly unmarked graves area is to be avoided during the operational phase of the project. The study areas are assigned site ratings of Generally Protected C (GP.C).

Concerns highlighted through the stakeholder engagement process include impacts to the groundwater resources, dust pollution and increased crime due to persons (drilling personnel/unauthorised) on site. Groundwater monitoring should be in place and implemented, dust emission should be controlled and access control implemented to limit impact concerns.

ii) Final Site Map

……

Provide a map at an appropriate scale which superimposes the proposed overall activity and its associated structures and infrastructure on the environmental sensitivities of the preferred site indicating any areas that should be avoided, including buffers. Attach as Annexure F

……

A final site map has not yet been developed as the extent of prospecting will only be determined after each phase of the proposed project.

Please refer to Appendix F for the composite map.

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

Not replacing the impacts identified in *Table 15*, the summary of highlighted potential impacts includes:

- Increased ambient noise levels resulting from increased traffic movement and invasive prospecting activities during all prospecting phases.

- Poor access control to the farm which may impact on livestock/game 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.
- Potential water and soil pollution impacts resulting from hydrocarbon spills and soil erosion which may impact on environmental resources utilized by landowners and stakeholders.
- Potential water availability impacts resulting from groundwater extraction for drilling activities which may impact on environmental resources utilized by landowners and stakeholders.
- Potential water and soil pollution impacts resulting from hydrocarbon spills and soil erosion may impact on ecosystem functioning.
- Potential visual impacts caused by drilling activities.
- Increased vehicle activity and vegetation clearance within the area resulting in the possible destruction and disturbance of fauna and flora.
- The Prospecting activities will be undertaken by contractors, the Genet Mining crew and specialists and it is not anticipated that employment opportunities for local and/or regional communities will result from the prospecting activities.
- Dust emissions caused by increased vehicle movement on site.
- Potential sensitive habitat loss
- Rehabilitation of impacted areas (positive)
- Loss of vegetation cover
- Rehabilitation of impacted areas

m) Proposed impact management objectives and the impact management outcomes for inclusion in the EMPr

Based on the assessment and where applicable the recommendations from specialist reports, the recording of proposed impact management objectives, and the impact management outcomes for the development for inclusion in the EMPr as well as for inclusion as conditions of authorization

Impact management objectives will be developed to ensure that adverse socio-economic impacts and minimised and socio-economic benefits are maximised. Measures will further be defined to avoid, prevent, limit or manage any impacts.

The objectives of the EMPr will be to:

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

Through the implementation of the mitigation and management measures it is expected that:

- Noise impacts can be managed through consultation and restriction of operating hours.
- Concerns regarding access control to farms can be managed through the development of an appropriate access control procedure and the compliance to the procedure.
- Risks associated with crime can be mitigated through the avoidance of recruitment activities on site and also monitoring and reporting.

- The water and soil resource pollution can be effectively managed through containment.
- Water resource availability can be managed through groundwater monitoring strategies.
- Ecological impact can be managed through the implementation of pollution prevention measures, land clearance minimisation, faunal disturbance by restricting working hours and rehabilitation.
- Visual impact can be minimised through the consideration of the material used for temporary infrastructure and drill site infrastructure used.
- Early consultation with the landowners and maintaining an open channel of communication must be ensured.

n) Aspects for inclusion as conditions of Authorisation

Any aspects which must be made conditions of the Environmental Authorisation

The following conditions should be considered for inclusion in the Authorisation:

- A map detailing the drilling and/or trenching locations and planned access roads should be submitted to the landowners and DMR prior to the commencement of these activities. Any nationally protected trees within close proximity of the development footprint to be identified as no-go areas or special permits obtained to remove the trees as soon as it becomes apparent the destruction of specimens cannot be avoided.
- No activities may take place within 100 m from any watercourse (rivulets). And sensitive habitats avoided.
- Written consent must be obtained from the landowners by the applicant to undertake the prospecting activities.

o) Description of any assumptions, uncertainties and gaps in knowledge

Which relate to the assessment and mitigation measures proposed

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

- No detailed site layout is available due to the nature of the prospecting activities. The study is therefore undertaken as all-inclusive assessment of the overall site.
- Feedback from SAHRA is not yet available.

p) Reasoned opinion as to whether the proposed activity should or should not be authorised

i) Reasons why the activity should be authorized or not.

The proposed prospecting area is targeted due to existing and historical mining activities that are known from within the larger region and it is anticipated that similar conditions will prevail for this project. No alternative other than drilling is possible to determine the presence and quality of the minerals (copper, iron and manganese) in the area. With the implementation of the recommended management measures the potential impacts can be managed.

The option of not authorizing the activities will result in a significant loss to valuable information regarding the presence and quality of the minerals (copper, iron and manganese) present on the property. Should economic reserves be present, the opportunity to utilize these reserves for future phases will be lost if the applicant does not get the opportunity to prospect.

ii) Conditions that must be included in the authorisation

The following conditions should be considered for inclusion in the Authorisation:

- A map detailing the drilling and/or trenching locations and planned access roads should be submitted to the landowners and DMR prior to the commencement of these activities. Any nationally protected trees within close proximity of the development footprint to be identified as no-go areas or special permits obtained to remove the trees as soon as it becomes apparent the destruction of specimens cannot be avoided.
- No activities may take place within 100 m from any watercourse (rivulets). And sensitive habitats avoided.
- Written consent must be obtained from the landowners by the applicant to undertake the prospecting activities.

q) Period for which the Environmental Authorisation is required

The entire prospecting programme will take place over a 60 month (5 year) period.

r) Undertaking

Confirm that the undertaking required to meet the requirements of this section is provided at the end of the EMPr and is applicable to both the Basic assessment report and the Environmental Management Programme report.

An undertaking by the EAP and the client is provided for in Section 2 of the EMP (Part B) and is applicable to both the Basic Assessment Report and the Environmental Management Programme report.

s) Financial Provision

State the amount that is required to both manage and rehabilitate the environment in respect of rehabilitation.

The total associated rehabilitation cost to be incurred during the 5 year prospecting period on this project amounts **R216 035.16**. The calculation of the rehabilitation liability is based on the fact that the rehabilitation will progress concurrently with the exploration being done. Not more than 1 trench and borehole and its particular sump will be left un-rehabilitated at any one particular time. The campsites will be re-habilitated immediately after the campsite is moved to the new position. Therefore the annual environmental guarantee required amounts **R43 207.03** only.

i) Explain how the aforesaid amount was derived.

The following section details the methodologies adopted to calculate the quantities, associated rehabilitation (clean closure) rates and eventually the final (clean) closure cost estimate

The guideline document of the DMR regarding financial provision will be used to calculate the financial provision.

The evaluation is conducted in accordance with the Mineral and Petroleum Resources Act, regulation 54 as stipulated below:

Quantum of financial provision

(1) The quantum of the financial provision as determined in a guideline document published by the Department from time to time, include a detailed itemization of all actual costs required for-

(a) premature closure regarding-

(i) the rehabilitation of the surface of the area;

(ii) the prevention and management of pollution of the atmosphere; and

(iii) the prevention and management of pollution of water and the soil; and

(iv) the prevention of leakage of water and minerals between subsurface formations and the surface.

(b) decommissioning and final closure of the operation; and

(c) post closure management of residual and latent environmental impacts.

(2) The holder of a prospecting right, mining right or mining permit must annually update and review the quantum of the financial provision -

(a) in consultation with a competent person;

(b) as required in terms of the approved environmental management programme or environmental management plan; or

(c) as requested by the Minister.

(3) Any inadequacies with regard to the financial provision must be rectified by the holder of a prospecting right, mining right or mining permit -

(a) in an amendment of the environmental management programme or environmental management plan, as the case may be;

(b) within the timeframe provided for; or

(c) as determined by the Minister.

The cost estimate of the expenditure to be incurred for each phase of the proposed prospecting operation are also presented in the Prospecting Work Programme.

The calculation of the rehabilitation liability is based on the fact that the rehabilitation will progress concurrently with the exploration being done. Not more than 1 trench and borehole and its particular sump will be left un-rehabilitated at any one particular time. The campsites will be re-habilitated immediately after the campsite is moved to the new position.

Table 17: Summary of costs pertaining to the rehabilitation and management of environmental impacts

Activity	Rate	Year 1	Year 2	Year 3	Year 4	Year 5
Phase 1						
Environmental management monthly visits X 1	R1200-00 per day	R 1 200				
Annual Provision						
General Surface Rehab / Ha Disturbed: 0.19	R 100 851 / Ha	R 19 212				
Sealing of Boreholes 18	R 1 154 / Hole	R 21 434				
Aftercare / Ha Disturbed: 0.19	R 13 446 / Ha	R 2 561				
Phase 2	**Rate**	**Year 1**	**Year 2**	**Year 3**	**Year 4**	**Year 5**
Environmental management monthly visits X 1	R1200-00 per day		R 1 200			
Annual Provision						
General Surface Rehab / Ha Disturbed: 0.19	R 100 851 / Ha		R 19 212			
Sealing of Boreholes 18	R 1 154 / Hole		R 21 434			
Aftercare / Ha Disturbed: 0.19	R 13 446 / Ha		R 2 561			
Phase 3	**Rate**	**Year 1**	**Year 2**	**Year 3**	**Year 4**	**Year 5**
Environmental management monthly visits X 1	R1200-00 per day			R 1 200		
Annual Provision						
General Surface Rehab / Ha Disturbed: 0.19	R 100 851 / Ha			R 19 212		
Sealing of Boreholes 18	R 1 154 / Hole			R 21 434		
Aftercare / Ha Disturbed: 0.19	R 13 446 / Ha			R 2 561		
Phase 4	**Rate**	**Year 1**	**Year 2**	**Year 3**	**Year 4**	**Year 5**
Environmental management monthly visits X 1	R1200-00 per day				R 1 200	
Annual Provision						
General Surface Rehab / Ha Disturbed: 0.19	R 100 851 / Ha				R 19 212	
Sealing of Boreholes 0.19	R 1 154 / Hole				R 21 434	
Aftercare / Ha Disturbed: 0.19	R 13 446 / Ha				R 2 561	
Phase 5	**Rate**	**Year 1**	**Year 2**	**Year 3**	**Year 4**	**Year 5**
Environmental management monthly visits X 1	R1200-00 per day					R 1 200
Annual Provision						
General Surface Rehab / Ha Disturbed: 0.19	R 100 851 / Ha					R 19 212
Sealing of Boreholes 18	R 1 154 / Hole					R 21 434
Aftercare / Ha Disturbed: 0.19	R 13 446 / Ha					R 2 561
GRAND TOTAL PROJECT COST		**R 44 407**	**R 44 407**	**R 44 407**	**R 44 407**	**R 44 407**
						R 222 035

The total associated rehabilitation cost to be incurred during the 5 year prospecting period on this project amounts **R216 035.16**. The calculation of the rehabilitation liability is based on the fact that the rehabilitation will progress concurrently with the exploration being done. Not more than 1 trench and borehole and its particular sump will be left un-rehabilitated at any one particular time. The campsites will be re-habilitated immediately after the campsite is moved to the new position. Therefore the annual environmental guarantee required amounts **R43 207.03** only.

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

Confirm that the amount, is anticipated to be an operating cost and is provided for as such in the Mining work programme, Financial and Technical Competence Report or Prospecting Work Programme as the case may be.

Genet Manganese (Pty) Ltd, a member of the Genet Group of Companies (Genet South Africa (Pty) Ltd), will be funding all associated cost with the Hartfell (including Sandham and Bullsrun farms) Ferrous and Base Metal Project as indicated and undertaken in the company resolution as provided in the Prospecting Work Programme.

Genet Manganese (Pty) Ltd is a Mining company registered in 2012 with a wide range mining portfolio within the group. Although Genet Manganese (Pty) Ltd is a relatively new company, the holding company, members and subsidiary companies have been successfully involved in the mining industry for the past 10 years. Genet Manganese (Pty) Ltd is currently in the process of finalizing the company HDSA shareholding structure and it is anticipated that this process will be finalized shortly. As such it can be prepared for submission to the DMR on request at the time of this application review.

t) Specific Information required by the competent Authority

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

(1) Impact on the socio-economic conditions of any directly affected person.

Provide the results of Investigation, assessment, and evaluation of the impact of the mining, bulk sampling or alluvial diamond prospecting on any directly affected person including the landowner, lawful occupier, or, where applicable, potential beneficiaries of any land restitution claim, attach the investigation report as an Appendix

No specific report was generated for the purposes of the socio-economic conditions and anticipated impacts are presented in *Table 15.*

The findings are presented below:

- **Impacts on communities, individuals or 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;
  - Potential water resource impacts resulting from groundwater extraction for prospecting activities.
  - Noise due to prospecting activities;
  - Poor access control resulting in impacts on livestock/wildlife 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

  Prospecting will be undertaken by contractors, the Genet Mining crew and specialists and it is not anticipated that employment opportunities for local and/or regional communities will result from the prospecting activities.

- **Visual impact**

The prospecting activities may result in localised visual impacts due to the general characteristics of the farm and surrounding area that can be regarded as tranquil and natural wilderness.

- **Measures to manage the potential impacts on communities, individuals or land uses in close proximity**
  - Potential water and soil pollution resulting from hydrocarbon spills and soil erosion;
    - Mitigation and management measures must be implemented to prevent environmental pollution which may impact on environmental resources utilized by communities, landowners and other stakeholders. The mitigation measures are discussed in detail in the sections that follow.
  - Potential water resource impacts resulting from groundwater extraction for prospecting activities;
    - Water management in terms of the prevention of spillage/waste of water should be implemented on site.
    - Groundwater monitoring should be in place and implemented.
  - Noise due to prospecting activities;
    - Site activities will be conducted during daytime hours to avoid night time noise disturbances and night time collusions with fauna/livestock/wildlife.
    - Background noise level not to increase with more than 5dB.
  - Poor access control resulting in impacts on livestock/wildlife movement, breeding and grazing practices;
    - Access control procedures must be agreed on with the farm owner and all staff trained on these procedures to prevent un-authorised people from entering the site.
  - Influx of persons (job seekers) to site as a result of increased activity and the possible resultant increase in opportunistic crime; and
    - Conduct access control to prevent un-authorised people from entering the site.
    - Casual labour will not be recruited at the site to eliminate the incentive for persons travelling to site seeking employment.
    - The landowner will be notified of un-authorised persons encountered on site.
    - If deemed necessary, the South African Police Service will be informed of un-authorised persons encountered on site.

- Prospecting will be undertaken by contractors, the Genet Mining crew and specialists and it is not anticipated that employment opportunities for local and/or regional communities will result from the prospecting activities.

- **Measures to manage the potential visual impact**
  - All temporary infrastructures such as portable ablution facilities, water tanks etc. should be acquired with consideration for colour. Natural colour options which blend in with the surrounding area must be favoured.
  - A waste management system will be implemented and sufficient waste bins provided on site. A system to prohibit littering and poor housekeeping practices on site will be implemented.
  - Dust fall out will be managed to be less than 600 mg per day/m^2. 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 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

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

*Provide the results of Investigation, assessment, and evaluation of the impact of the mining, bulk sampling or alluvial diamond prospecting on any national estate referred to in section 3(2) of the National Heritage Resources Act, 1999 (Act No. 25 of 1999) with the exception of the national estate contemplated in section 3(2)(i)(vi) and (vii) of that Act, attach the investigation report as **Appendix 2.19.2** and confirm that the applicable mitigation is reflected in 2.5.3; 2.11.6.and 2.12.herein.*

Potential palaeontological impact resulting from the proposed drilling activities is considered low to very low. The palaeontological component at the study area is assigned the rating of Generally Protected C (GP.C). The stone tool archaeological component is negligible and clearly derived, but still regarded as a meaningful indication of past human activity on the landscape. It is advised as a matter of prudence that the formal grave yards at the Sandham farmstead (site coordinates 29° 1'37.00"S 22°32'11.12"E), the Hartfell farmstead (site coordinates 29° 1'45.99"S 22°35'9.43"E) and Bullsrun farmstead (site coordinates 29° 4'46.05"S 22°36'12.91"E) as well as the supposedly unmarked graves area is to be avoided during the operational phase of the project. The study areas are assigned site ratings of Generally Protected C (GP.C).

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

The EAP managing the application must provide the competent authority with detailed, written proof of an investigation as required by section 24(4)(b)(i) of the Act and motivation if no reasonable or feasible alternatives, as contemplated in sub-regulation 22(2)(h), exist. The EAP must attach such motivation as Appendix Z

Existing and historical mining activities are known from within the larger region and it is anticipated that similar conditions will prevail for this project.

Due to the anticipated complexity and variability of occurrence of the manganese copper and iron ore, it is planned to complete an eight week desktop study on the entire prospecting area prior to any planning of the exploration programme.

This study would include but not be limited to the studying of existing 1: 250 000 geological plans and maps, old mining plans from this area, topography maps and any other related geological and geophysical information about this area currently available. After completion of this study, geological mapping of the area would be undertaken from evidence gathered and from information obtained after a detailed geological field survey of the area has been conducted. The information obtained during the field survey and evaluation process of the geological maps and data, will then be used to determine the target area and planned positions of the intended invasive prospecting.

It is anticipated (in the absence of preliminary field visits of the area prior to this application process) that the occurrence of mineral deposits on these properties will be mainly associated with complex folding and paleo sinkholes in the dolomite formations. It is also anticipated that these formations will predominantly more likely occur on the higher elevation areas as well as hills and koppies. Nevertheless, all areas on the application area will be considered by means of physical surveys and inspections on the ground first.

From the evidence obtained during the geological field surveys, a planned trenching and pitting programme as well as drilling will be introduced in order to expose the manganese ore body and to determine the extent of its occurrence. It is also anticipated that it is most likely that a view independent pockets will occur spread over the entire prospecting area. It is thus not anticipated that the total resource will occur as a single large ore body.

No alternative other than drilling is possible to determine the presence and quality of the minerals (copper, iron and manganese) in the area.

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

Responsible. Transferable. Sustainable.

PART B

ENVIRONMENTAL MANAGEMENT PROGRAMME REPORT

1. Draft environmental management programme

a) Details of the EAP,

Confirm that the requirement for the provision of the details and expertise of the EAP are already included in PART A, section 1(a) herein as required.

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

b) Description of the Aspects of the Activity

Confirm that the requirement to describe the aspects of the activity that are covered by the draft environmental management programme is already included in PART A, section (1)(h) herein as required.

The requirement to describe the aspects of the activity that are covered by the draft environmental management programme is included in Part A, Section (1)(h).

c) Composite Map

*Provide a map **(Attached as an Appendix F**) at an appropriate scale which superimposes the proposed activity, its associated structures, and infrastructure on the environmental sensitivities of the preferred site, indicating any areas that any areas that should be avoided, including buffers.*

Please refer to Appendix F for the composite map.

d) Description of Impact management objectives including management statements

i) Determination of closure objectives.

Ensure that the closure objectives are informed by the type of environment described.

The closure objectives are to:

- To ensure that the biodiversity and environment on the site is protected.
- To make sure that the following commitments will be achieved as a minimum:
  - The site is to be returned back to its pre-mining land use. In this case the land use must return to farm land conditions. If the site is in the veld, the site must be restored to veld conditions. No drop in land capability is to occur.
  - The site will be made safe for both humans and animals;
  - The site will be rehabilitated to be physically, chemically and biologically stable;
  - The residual impacts will be managed to acceptable levels and will not deteriorate over time;
  - Closure will be achieved with minimal socio-economic upheaval.
- To provide sufficient funds at the end of life of mine, to properly implement the closure plan, and also to make provision for possible premature closure, and post closure monitoring requirements.
- Concurrent rehabilitation is required from the contracted company. Each drill site, camp site and trench site has to be cleaned from all evidence of pollution and made safe as part of decommissioning. All drill holes are capped and marked for safety of persons and animals on site.

- Post drilling rehabilitation status evaluation will be evaluated and provide specific remedial measures for implementation until satisfactory rehabilitation has been completed.

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

During the operational phase of the prospecting activities an estimate of 1000 to 10 000 ℓ water will be used per day. It is currently not anticipated that water use will exceed the general authorisation volume for the area.

iii) Has a water use licence been applied for?

The use of abstracting groundwater will be Generally Authorised in terms of the NWA. The potential abstraction of water due to drilling activities will be between 1000 to 10 000 ℓ water per day. Should it be deemed necessary, on instruction by the department, to submit a water use license application, this will be undertaken.

iv) Impacts to be mitigated in their respective phases

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

Table 18: Impacts & Mitigation Measures

ACTIVITIES	PHASE	SIZE AND SCALE OF DISTURBANCE	MITIGATION MEASURES	COMPLIANCE WITH STANDARDS	TIME PERIOD FOR IMPLEMENTATION
Non-invasive Prospecting Activities					
Data Collection & Physical Survey	Planning	9 283 ha (total property)	- 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 DWA.	N/A
Invasive Prospecting Activities					
Site access/roads	Construction phase	2320.75 m^2	- A map indicating the finalised location of the planned invasive prospecting activities must be submitted to the landowner, as well as to the DMR. Upon agreement of the location of the activities, the applicant can proceed. - Use existing tracks and roads in all instances as far as possible. - Where track clearing will be necessary, it will be undertaken to minimise disturbance and aid rehabilitation efforts and significant vegetation such as trees and large shrubs will be avoided (or protected species). - Site activities will be conducted during daytime hours to avoid night time noise disturbances and night time collusions with fauna/livestock/wildlife. - Vehicle speed will be reduced, particularly in high vegetated areas in	Landowners to sign off locality of roads. Proposed and actual roads need to be noted on a drawing that can be audited. Compliance can further be measured as part of the EMP performance assessment. The financial provision required for rehabilitation must be guaranteed before the commencement of prospecting activities. The prospecting activities must be undertaken in line with the approved Prospecting Work Programme. Activities should stay clear of sensitive areas and outside of the 100m watercourse (rivulet) buffer in order to avoid the need to apply for a water use licence.	Concurrently with the completion of prospecting activities in the area.

			order to avoid deaths by vehicle impacts. - The applicant will be responsible for all environmental disturbances on site as a result of prospecting and will rehabilitate these impacts to the satisfaction of the landowner. - Any nationally protected trees within close proximity of the development footprint to be identified as no-go areas or special permits obtained to remove the trees as soon as it becomes apparent the destruction of specimens cannot be avoided. - No impact on specimens may take place before such permits are obtained. All obligations of such permits must be adhered to. - Drill camp establishment should not be allowed in the veld, but should be constructed temporarily at a demarcated area historically disturbed. Preferably areas used for similar function. - Current infrastructure on the surface properties for access to the drill-hole positions must be used as far as is practical to minimize the potential for soil erosion. Should roads be required to drill sites, clearing will be undertaken with a view to maintain vegetation cover to limit soil erosion potential. - As part of rehabilitation, all compacted roads and drill pads will be ripped and re-vegetated (if required). - Where significant risk of erosion is identified, additional mechanical erosion control measures must be implemented. - Site activities will be conducted during daytime hours to avoid night time noise disturbances and night time collusions with fauna/livestock/wildlife.		

			- Background noise level not to increase with more than 5dB. - Access control procedures must be agreed on with farm owners or occupants and all staff trained on these procedures. - The applicant will prior to the commencement of prospecting activities, in consultation with farm owners and/or occupants, ensure that the prospecting schedules does not adversely impact on daily farm management activities. - An open channel of communication will be developed with designated personnel responsible to remain in contact with the farmers, throughout the prospecting activities. - Should any unknown heritage sites be identified during the drilling activities, all activities will cease immediately and the SAHRA will be contacted. After assessment, and if appropriate, a permit will be obtained from SAHRA to remove such remains/artefacts. - Ensure staff training and orientation regarding the procedure should remains or artefacts be found within the project area.		
	All phases		- Conduct access control to prevent un-authorised people from entering the site. - Access control procedures must be agreed on with the farm owner and all staff trained on these procedures to prevent un-authorised people from entering the site. - The landowner will be notified of un-authorised persons encountered on site. - If deemed necessary, the South African Police Service will be informed of un-authorised persons encountered on site.	Compliance can further be measured as part of the EMP performance assessment. The prospecting activities must be undertaken in line with the approved Prospecting Work Programme.	Concurrently with the completion of prospecting activities in the area.

			- No prospecting activities, such as drilling, roads, and trenching, camp sites may be undertaken in the watercourses. - A first aid station and emergency plan must be available on site.		
Site access/roads	Decommissioning	2320.75 m^2	- If requested, newly constructed access roads to the drill sites will be transferred as an asset for the future use of the landowner - Rehabilitated tracks may not be disturbed by additional vehicular movement and the monitoring thereof shall be carried out on foot. - Rehabilitation should be done according to similar vegetation diversity, vegetation cover constituency as described by the baseline. - Rehabilitation should be monitored using Landscape Functional Analysis to ensure the rehabilitation efforts can be quantified as successful. - Rehabilitation maintenance is required until the rehabilitation is self-sufficient. - It is required that palatable grazing seed is re-established on impacted areas where rehabilitation takes place.	Compliance can further be measured as part of the EMP performance assessment. The financial provision required for rehabilitation must be guaranteed before the commencement of prospecting activities. The prospecting activities must be undertaken in line with the approved Prospecting Work Programme.	Concurrently with the completion of prospecting activities in the area.
Drill sites	Construction phase	1856.60 m^2	- The removal of vegetation within the drill site area will be minimised. - Vegetation clearance will be undertaken to minimise disturbance and aid rehabilitation efforts and significant vegetation such as trees and large shrubs will be avoided (or protected species). - A fire emergency procedure will be developed to contain and minimise the destruction of flora and faunal habitat which may result from fire. - The collection, hunting or harvesting of any plants or animals at the site will be	The prospecting activities must be undertaken in line with the approved Prospecting Work Programme. The applicant must comply with the conditions of the Environmental Authorisation at all times. Dust control: Dust fall out to be less than 600 mg per day/m^2 Noise control: Background noise level not to increase with more than 5dB.	Concurrently with the completion of prospecting activities in the area.

			strictly forbidden. - An open channel of communication will be developed, with designated personnel responsible to remain in contact with the farmers throughout the prospecting activities. - The applicant will be responsible for all environmental disturbances on site as a result of prospecting and will rehabilitate these impacts to the satisfaction of the landowner. - Dust fall out will be managed to be less than 600 mg per day/m^2. - 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 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 - Site activities will be conducted during daytime hours to avoid night time noise disturbances and night time collusions with fauna/livestock/wildlife. - Background noise level not to increase with more than 5dB. - Should any unknown heritage sites be identified during the drilling activities, all activities will cease immediately and the SAHRA will be contacted. After assessment, and if appropriate, a permit will be obtained from SAHRA to remove such remains/artefacts.	Prevent soil contamination: Measure the soil quality and compare with natural conditions.	
	Operational phase		- A waste management system will be implemented and sufficient waste bins provided on site. A system to prohibit		

			littering and poor housekeeping practices on site will be implemented. - Oils and lubricant will be stored within secondary containment structures. - Waste separation will be undertaken on-site and separate containers will be provided (i.e. general waste, hazardous waste, recyclable waste) - Waste containers will be closed (i.e. fitted with a lockable lid) to eliminate the possible access of animals overnight. - All temporary infrastructures such as portable ablution facilities, water tanks etc. should be acquired with consideration for colour. Natural colour options which blend in with the surrounding area must be favoured. - A waste management system will be implemented and sufficient waste bins provided on site. - A system to prohibit littering and poor housekeeping practices on site will be implemented.		
	All phases		- Vegetation clearing of drill sites will be undertaken with a view to maintain vegetation cover to limit soil erosion potential. - The area impacted by the drill site must be kept to a minimum and vegetation removal minimized to limit soil erosion. - Prevent wind erosion by mulching with rocks and brush packing with damaged vegetation. - When establishing the drill pad, topsoil that will be removed will be stockpiled up-slope of the pad. The stockpile will be shaped to divert storm water around the drill pad. The stockpile will be re-used		

			for the rehabilitation of the sites. - Mechanical erosion control methods will be implemented if required. This may include the use of geotextiles to stabilise slopes. - Conduct access control to prevent un-authorised people from entering the site. - Casual labour will not be recruited at the site to eliminate the incentive for persons travelling to site seeking employment. - The landowner will be notified of un-authorised persons encountered on site. - If deemed necessary, the South African Police Service will be informed of un-authorised persons encountered on site.		
	Decommissioning	1856.60 m^2	- Re-vegetation will be conducted through hand seeding exposed areas using indigenous grass species as determined by a suitably qualified ecologist. - Re-vegetation efforts will be monitored every second month for a period of six months after initial seeding. - An effective vegetation cover must be achieved. The site is to be returned back to its pre-mining land use. - Soil must be loosened at drill sites that have been denuded of vegetation or where soils have been compacted or crusts formed. - Avoid wind and water erosion at drill sites by mulching with rocks and limit further access. - All foreign matter, such as rubble, will be removed from the site. - All temporary structures and storage facilities will be removed from the drill	The prospecting activities must be undertaken in line with the approved Prospecting Work Programme. The applicant must comply with the conditions of the Environmental Authorisation at all times. The financial provision required for rehabilitation must be guaranteed before the commencement of prospecting activities. Conduct an audit and report the rehabilitation of drill site including sumps	Concurrently with the completion of prospecting activities in the area.

			site. - Once project activities have been completed the disturbed areas should be levelled to correspond to local slope conditions. - Photographs will be taken before, during and after drilling to monitor environmental impacts. - Rehabilitation should be done according to similar vegetation diversity, vegetation cover constituency as described by the baseline. - Rehabilitation should be monitored using Landscape Functional Analysis to ensure the rehabilitation efforts can be quantified as successful. - Rehabilitation maintenance is required until the rehabilitation is self-sufficient. - It is required that palatable grazing seed is re-established on impacted areas where rehabilitation takes place.		
Trench sites	Construction	3249.05 m^2	- Should any unknown heritage sites be identified during the trenching activities, all activities will cease immediately and the SAHRA will be contacted. After assessment, and if appropriate, a permit will be obtained from SAHRA to remove such remains/artefacts. - Ensure staff training and orientation regarding the procedure should remains or artefacts be found within the project area.	The prospecting activities must be undertaken in line with the approved Prospecting Work Programme. The applicant must comply with the conditions of the Environmental Authorisation at all times. Dust control: Dust fall out to be less than 600 mg per day/m^2 Noise control: Background noise level not to increase with more than 5dB. Prevent soil contamination: Measure the soil quality and compare with natural conditions.	
	All phases		- The removal of vegetation within the trench site area will be minimised. - Vegetation clearance will be undertaken to minimise disturbance and aid rehabilitation efforts and significant vegetation such as trees and large shrubs will be avoided (or protected species).		Concurrently with the completion of prospecting activities in the area.

			- A fire emergency procedure will be developed to contain and minimise the destruction of flora and faunal habitat which may result from fire. - The collection, hunting or harvesting of any plants or animals at the site will be strictly forbidden. - An open channel of communication will be developed, with designated personnel responsible to remain in contact with the farmers throughout the prospecting activities. - The applicant will be responsible for all environmental disturbance on site as a result of prospecting and will rehabilitate these impacts to the satisfaction of the landowner. - Any nationally protected trees within close proximity of the development footprint to be identified as no-go areas or special permits obtained to remove the trees as soon as it becomes apparent the destruction of specimens cannot be avoided. - No impact on specimens may take place before such permits are obtained. All obligations of such permits must be adhered to. - Drill camp establishment should not be allowed in the veld, but should be constructed temporarily at a demarcated area historically disturbed. Preferably areas used for similar function. - Dust fall out will be managed to be less than 600 mg per day/m^2. - 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.	Prevent soil compaction: Compare densities of soils with natural conditions. The financial provision required for rehabilitation must be guaranteed before the commencement of prospecting activities. Conduct an audit and report the rehabilitation of trenches.	

			- Depending on 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 - Site activities will be conducted during daytime hours to avoid night time noise disturbances and night time collusions with fauna/livestock/wildlife. - Background noise level not to increase with more than 5dB. - A waste management system will be implemented and sufficient waste bins provided on site. A system to prohibit littering and poor housekeeping practices on site will be implemented. - Oils and lubricant will be stored within secondary containment structures. - Waste separation will be undertaken on-site and separate containers will be provided (i.e. general waste, hazardous waste, recyclable waste) - Waste containers will be closed (i.e. fitted with a lockable lid) to eliminate the possible access of animals overnight. - Vegetation clearing of trench sites will be undertaken with a view to maintain vegetation cover to limit soil erosion potential. - The area impacted by the trench site must be kept to a minimum and vegetation removal minimized to limit soil erosion. - Prevent wind erosion by mulching with rocks and brush packing with damaged vegetation. - When establishing the trench, topsoil		

			that will be removed will be stockpiled up-slope of the trench. The stockpile will be shaped to divert storm water around the trench. The stockpile will be re-used for the rehabilitation of the sites. - Mechanical erosion control methods will be implemented if required for topsoil stockpiling. This may include the use of geotextiles to stabilise slopes. - All temporary infrastructures such as portable ablution facilities, water tanks etc. should be acquired with consideration for colour. Natural colour options which blend in with the surrounding area must be favoured. - A waste management system will be implemented and sufficient waste bins provided on site. - A system to prohibit littering and poor housekeeping practices on site will be implemented. - Conduct access control to prevent un-authorised people from entering the site. - Casual labour will not be recruited at the site to eliminate the incentive for persons travelling to site seeking employment. - The landowner will be notified of un-authorised persons encountered on site. - If deemed necessary, the South African Police Service will be informed of un-authorised persons encountered on site.		
	Decommissioning phase		- Excavations must be backfilled with subsoil, compacted and levelled with previously stored topsoil and subsoil on the surface avoided. - Photographs will be taken before, during and after trenching to monitor environmental impacts.		

			- Once project activities have been completed the disturbed areas should be levelled to correspond to local slope conditions. - Rehabilitation should be done according to similar vegetation diversity, vegetation cover constituency as described by the baseline. - Rehabilitation should be monitored using Landscape Functional Analysis to ensure the rehabilitation efforts can be quantified as successful. - Rehabilitation maintenance is required until the rehabilitation is self-sufficient. - It is required that palatable grazing seed is re-established on impacted areas where rehabilitation takes place.		
Excavation of sumps	All phases	139.25 m^2	- The design of the drill fluid sump must incorporate effective fauna egress to avoid entrapment. - To reduce potential for water pollution during the drilling activities, a sump will be constructed with sufficient capacity to receive drill fluids and allow for evaporation. - To avoid clean storm water inflow, the sump will be constructed to divert storm water away.	The prospecting activities must be undertaken in line with the approved Prospecting Work Programme. The applicant must comply with the conditions of the Environmental Authorisation at all times. Soil Management: Compare densities and fertility of soils with natural conditions. Conduct an audit and report the rehabilitation of drill site including sumps	Concurrently with the completion of prospecting activities in the area.
	Decommissioning		- Drill sludge and the PVC sump lining will be removed and disposed of at a registered waste disposal site. - Sludge from the above ground drill sump will be collected, removed from the drill site and disposed of at an approved waste disposal site. - Any excavations should be backfilled with subsoil, compacted and levelled with previously stored topsoil.		

Exploration drilling	Operational phase	1856.60 m^2	- Drill holes must be temporarily plugged directly after drilling is completed and remain plugged until they are permanently plugged below ground to eliminate risk posed to fauna by open drill holes. - All vehicles will adhere to a low speed limit to avoid collisions with susceptible species such as snakes and tortoises, as well as to minimize dust generation. - Dust fall out will be managed to be less than 600 mg per day/m^2. - Maintain low speed limits on vehicles travelling by gravel roads in order to avoid excess dust. - Exploration drilling activities will be conducted during daytime hours to avoid night time noise disturbances and night time collusions with fauna/livestock/wildlife. - Background noise level not to increase with more than 5dB. - In order to contain oil and fuel spills, drip pans or PVC lining will be provided for drilling equipment and storage facilities where hydrocarbon leakage is possible. - Provision will be made to contain non-biodegradable oil and fuel spills by use of drip pans and appropriate lining for drilling equipment and storage facilities where hydrocarbon leakage is possible. - Emergency plans will be developed to deal with accidental spillage of chemicals. Leakage and spillage should be contained and cleaned up immediately to minimise the pollution to water quality. - If any spillage of hydrocarbons (diesel or oil) is detected, drilling will cease	The prospecting activities must be undertaken in line with the approved Prospecting Work Programme. The applicant must comply with the conditions of the Environmental Authorisation at all times. Dust control: Dust fall out to be less than 600 mg per day/m2 Noise control: Background noise level not to increase with more than 5dB. The financial provision required for rehabilitation must be guaranteed before the commencement of prospecting activities. Conduct an audit and report the rehabilitation of drill site and boreholes.	Concurrently with the completion of prospecting activities in the area.

			immediately and the leakage contained before restarting. - Any pollution of the drill site must be cleaned and the disturbed area rehabilitated. Rehabilitation includes the removal of hydrocarbon-polluted soil to a registered disposal site. - Diesel storage tanks or any materials brought on site should be adequately bunded. - Use must not exceed the general authorisation volume for the area. - Prevent spillage and waste of water - Water management in terms of the prevention of spillage/waste of water should be implemented on site. - Groundwater monitoring should be in place and implemented. - Where applicable, a random number of prospecting boreholes will be sampled for water quality analysis indicating possible hydrocarbon impacts. - Prospecting areas must be clearly demarcated. - No prospecting activities may be undertaken within 100m from watercourses.		
	Decommissioning phase		- Ensure the transfer of boreholes (striking water) for the future use by the landowner. - Drill holes should be capped to avoid small fauna falling into the drill hole and marked.		
Camp Sites	Construction phase	1445.22 m^2	- The collection, hunting or harvesting of any plants or animals at the site will be strictly forbidden.	The prospecting activities must be undertaken in line with the approved Prospecting Work Programme.	Concurrently with the completion of prospecting activities in the area.

			- Drill camp establishment should not be allowed in the veld, but should be constructed temporarily at a demarcated area historically disturbed. Preferably areas used for similar function. - Dust fall out will be managed to be less than 600 mg per day/m^2. - 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 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 - Should any unknown heritage sites be identified during the drilling activities, all activities will cease immediately and the SAHRA will be contacted. After assessment, and if appropriate, a permit will be obtained from SAHRA to remove such remains/artefacts. - Ensure staff training and orientation regarding the procedure should remains or artefacts be found within the project area.	The applicant must comply with the conditions of the Environmental Authorisation at all times. Dust control: Dust fall out to be less than 600 mg per day/m2 Noise control: Background noise level not to increase with more than 5dB. The financial provision required for rehabilitation must be guaranteed before the commencement of prospecting activities. Conduct an audit and report the rehabilitation of camp sites.	
	All phases		- A detailed induction programme will be developed on site which will focus on the landowners' requirements for environmental management and concerns regarding poaching. - Exploration drilling activities will be conducted during daytime hours to avoid night time noise disturbances and night time collusions with fauna/livestock/wildlife. - Background noise level not to increase with more than 5dB.		

			- A waste management system will be implemented and sufficient waste bins provided on site. A system to prohibit littering and poor housekeeping practices on site will be implemented. - Oils and lubricant will be stored within secondary containment structures. - Waste separation will be undertaken on-site and separate containers will be provided (i.e. general waste, hazardous waste, recyclable waste) - Waste containers will be closed (i.e. fitted with a lockable lid) to eliminate the possible access of animals overnight. - Vegetation clearing of camp sites will be undertaken with a view to maintain vegetation cover to limit soil erosion potential. - The area impacted by the camp site must be kept to a minimum and vegetation removal minimized to limit soil erosion. - Prevent wind erosion by mulching with rocks and brush packing with damaged vegetation. - When establishing the camp site, topsoil that will be removed will be stockpiled up-slope of the site. The stockpile will be shaped to divert storm water around the camp site. The stockpile will be re-used for the rehabilitation of the sites. - Mechanical erosion control methods will be implemented if required. This may include the use of geotextiles to stabilise slopes. - All temporary infrastructures such as portable ablution facilities, water tanks etc. should be acquired with		

			consideration for colour. Natural colour options which blend in with the surrounding area must be favoured. - A waste management system will be implemented and sufficient waste bins provided on site. - A system to prohibit littering and poor housekeeping practices on site will be implemented. - No open fires for any purpose (cooking etc.) will be allowed. - Smoking is prohibited. - Emergency preparedness and response plans will be developed and agreed to with relevant directly affected and directly adjacent landowners.		
	Decommissioning phase		- Re-vegetation will be conducted through hand seeding exposed areas using indigenous grass species as determined by a suitably qualified ecologist. - Re-vegetation efforts will be monitored every second month for a period of six months after initial seeding. - An effective vegetation cover must be achieved. The site is to be returned back to its pre-mining land use. - Soil must be loosened at camp sites that have been denuded of vegetation or where soils have been compacted or crusts formed. - Avoid wind and water erosion at camp sites by mulching with rocks and limit further access. - All foreign matter, such as rubble, will be removed from the site. - All temporary structures and storage		

			facilities will be removed from the camp site. - Once project activities have been completed the disturbed areas should be levelled to correspond to local slope conditions. - Photographs will be taken before, during and after drilling to monitor environmental impacts. - Rehabilitation should be done according to similar vegetation diversity, vegetation cover constituency as described by the baseline. - Rehabilitation should be monitored using Landscape Functional Analysis to ensure the rehabilitation efforts can be quantified as successful. - Rehabilitation maintenance is required until the rehabilitation is self-sufficient. - It is required that palatable grazing seed is re-established on impacted areas where rehabilitation takes place.		
Water Management	Operational phase	1000 to 10 000 ℓ will be used per day	- The water pipeline laid to the drill site should be maintained properly to minimise unnecessary wastage. - Use must not exceed general authorisation volume for the area. - Prevent spillages of water due to negligence or un-maintained storage facilities - Water management in terms of the prevention of spillage/waste of water should be implemented on site. - Groundwater monitoring should be in place and implemented.	Use must not exceed general authorisation volume for the area. The applicant must comply with the conditions of the Environmental Authorisation at all times.	Concurrently with the completion of prospecting activities in the area.
Re-Fuelling and maintenance	All phases	Use 1 000 ℓ diesel bowser	- Vehicle maintenance will be undertaken off-site where practical. Vehicle	Record and report all hydrocarbon spills.	Concurrently with the completion of prospecting

			maintenance undertaken on-site, the use of drip trays and/or PVC sheets will be used to prevent spills and leaks onto the soil. - Regular inspections of all vehicles and machinery must be carried out to ensure that all leaks are identifies early and rectified.	The applicant must comply with the conditions of the Environmental Authorisation at all times.	activities in the area.
Ablution Facilities	All phases	6 people	- All sewage wastes will be collected by approved waste contractors and transferred to an appropriately licensed waste management facility for treatment and/or disposal according to procedures in place. - Emergency plans should be developed to deal with accidental spillage of sewage waste. Leakage and spillage should be contained and cleaned up immediately to minimise the pollution to water quality and human health.	The applicant must comply with the conditions of the Environmental Authorisation at all times. Ensure that the chemical toilets are clean and maintained.	Concurrently with the completion of prospecting activities in the area.
Waste Management	All phases	5 years	- Disposal of waste will be at an appropriately licensed landfill/facility and recyclables will be taken to a licensed recycling facility. - A waste management system will be implemented and sufficient waste bins provided on site. A system to prohibit littering and poor housekeeping practices on site will be implemented. - Oils and lubricant will be stored within secondary containment structures. - Waste separation will be undertaken on-site and separate containers will be provided (i.e. general waste, hazardous waste, recyclable waste) - Waste containers will be closed (i.e. fitted with a lockable lid) to eliminate the possible access of animals overnight. - Emergency plans should be developed to deal with accidental spillage of	The applicant must comply with the conditions of the Environmental Authorisation at all times. Waste disposal certificates should be obtained. Conduct an audit and report waste management.	Concurrently with the completion of prospecting activities in the area.

			chemicals. Leakage and spillage should be contained and cleaned up immediately to minimise the pollution to water quality. - Ensure surface areas exposed to annual rainfall is clean from any hazardous materials that could affect rainwater quality. - Unused machinery must be completely drained of oil and other hydrocarbons to ensure that leaks do not develop.		

e) Impact Management Outcomes

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

Table 19: Impact Management Outcomes

ACTIVITIES	POTENTIAL IMPACT	ASPECT	PHASE	MITIGATION TYPE	STANDARD TO BE ACHIEVED
Non-invasive Prospecting Activities					
Data Collection & Physical Survey	None identified	N/A	Planning	Control potential deviations from the approved Prospecting Work Programme through the effective implementation of the data acquisition and desktop study.	N/A
Invasive Prospecting Activities					
Site access/roads	Destruction and/or disturbance of on-site fauna, flora and sensitive areas	Loss of fauna, flora & sensitive habitat	Construction	Control through the clear delineation of the prospecting area.	- Section 2 of the National Environmental Management Act 107 of 1998 - The conditions of the Environmental Authorisation and approved Environmental Management Programme - Section 21 of the National Water Act 36 of 1998 - Heritage Resources Act 25 of 1999 - Mine Health and Safety Act 29 of 1996
Site access/roads	Soil compaction resulting from repeated use of access roads to sites	Loss of soil resources	Construction	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.	

Site access/roads	Vehicle traffic noise impact affecting cattle and/or wildlife	Loss of fauna	Construction	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.	- Occupational Health and Safety Act 85 of 1993 - National Environmental Management Act 107 of 1998 as it relates to any listed activities. - National Environmental Management Waste Act 59 of 2008 - Noise Regulation Standards for Rural Areas - National Environmental Management: Air Quality Act, 2004 Dust Regulation guidelines for rural communities - Achieve rehabilitation objectives
Site access/roads	Poor access control resulting in impacts on livestock/wildlife movement, breeding and grazing practices	Loss of fauna	Construction	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.	
Site access/roads	Potential destruction of heritage resources	Loss of Cultural and/or Heritage Significance	Construction	Control through the clear delineation of the prospecting area.	
Site access/roads	Poor access control resulting in un-authorised people entering the site	Increase in petty crimes	All phases	Control through the limiting of the activities to the day time and the implementation of an open and transparent channel of communication.	
Site access/roads	Activities within the watercourse could result in disturbance to the natural geomorphology and safety hazards during rainy periods	Loss of fauna, flora & altering of watercourse. Loss and/or damage to life.	All phases	Control through the clear delineation of the prospecting area.	
Site access/roads	Useable infrastructure for future use	Access	Decommissioning	Mitigation through rehabilitation	
Site access/roads	Rehabilitation of access roads	Soil resource	Decommissioning	Mitigation through rehabilitation	
Drill sites	Destruction and/or disturbance of on-site fauna, flora and sensitive areas	Loss of fauna and flora	Construction	Control through the clear delineation of the prospecting area.	- Section 2 of the National Environmental Management Act 107 of 1998 - The conditions of the Environmental Authorisation and approved Environmental Management Programme
Drill sites	Dust emission resulting from site clearing, soil stripping and construction activities (including dust generated by vehicle movement)	Dust emissions	Construction	Control to the implementation of dust suppression methods, when this is required. Dust suppression methods could include wet suppression.	

Drill sites	Noise as a result of construction, operation and vehicle movement resulting in disturbance of fauna / livestock / wildlife	Ambient noise levels	Construction & Operational	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.	- Section 21 of the National Water Act 36 of 1998 - Heritage Resources Act 25 of 1999 - Mine Health and Safety Act 29 of 1996 - Occupational Health and Safety Act 85 of 1993 - National Environmental Management Act 107 of 1998 as it relates to any listed activities. - National Environmental Management Waste Act 59 of 2008 - Noise Regulation Standards for Rural Areas - National Environmental Management: Air Quality Act, 2004 Dust Regulation guidelines for rural communities - Achieve rehabilitation objective
Drill sites	Soil contamination resulting from waste generation, disposal of drill fluids or storage of hazardous materials	Loss of soil resources	Operational	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.Control through the implementation of environmental induction and toolbox talks.	
Drill sites	Soil disturbance and compaction and topsoil stockpiling resulting in soil erosion	Soil resources	All phases	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.	
Drill sites	Visual impact affecting visual character	Loss of aesthetic value	Operational	Control through the clear delineation of the prospecting area. Control through the implementation of environmental induction and toolbox talks.	

Drill sites	Influx of persons (job seekers) to site as a result of increased activity resulting in increased incidents of theft and opportunistic crime	Increase in petty crimes	All phases	Control through the limiting of the activities to the day time and the implementation of an open and transparent channel of communication.	
Drill sites	Potential destruction of heritage resources	Loss of Cultural and/or Heritage Significance	Construction	Control through the clear delineation of the prospecting area.	
Drill sites	Rehabilitation of drill sites	Soil resources, vegetation re-establishment	Decommissioning	Mitigation through rehabilitation	
Trench sites	Destruction and/or disturbance of on-site fauna, flora and sensitive areas	Loss of fauna, flora & sensitive habitat	All phases	Control through the clear delineation of the prospecting area.	- Section 2 of the National Environmental Management Act 107 of 1998 - The conditions of the Environmental Authorisation and approved Environmental Management Programme - Section 21 of the National Water Act 36 of 1998 - Heritage Resources Act 25 of 1999 - Mine Health and Safety Act 29 of 1996 - Occupational Health and Safety Act 85 of 1993 - National Environmental Management Act 107 of 1998 as it relates to any listed activities. - National Environmental Management Waste Act 59 of 2008 - Noise Regulation Standards for Rural Areas - National Environmental Management: Air Quality Act, 2004 Dust Regulation guidelines for rural communities
Trench sites	Dust emission resulting from site clearing, soil stripping and trench construction (including dust generated by vehicle movement)	Dust emissions		Control to the implementation of dust suppression methods, when this is required. Dust suppression methods could include wet suppression.	
Trench sites	Noise as a result of construction, operation and vehicle movement resulting in disturbance of fauna / livestock / wildlife	Ambient noise levels		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.	
Trench sites	Soil contamination resulting from waste generation, disposal or storage of hazardous materials and use of heavy machinery	Loss of soil resources		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. Control through the implementation of environmental induction and toolbox talks.	

Trench sites	Soil disturbance and compaction and topsoil stockpiling resulting in soil erosion	Loss of soil resources		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.	- Achieve rehabilitation objectives
Trench sites	Visual impact affecting visual character	Loss of aesthetic value	Construction & Operational	Control through the clear delineation of the prospecting area. Control through the implementation of environmental induction and toolbox talks.	
Trench sites	Influx of persons (job seekers) to site as a result of increased activity resulting in increased incidents of theft and opportunistic crime	Increase in petty crimes	All phases	Control through the limiting of the activities to the day time and the implementation of an open and transparent channel of communication.	
Trench sites	Potential destruction of heritage resources	Loss of Cultural and/or Heritage Significance	Construction	Control through the clear delineation of the prospecting area.	
Trench sites	Rehabilitation of trenches	Soil resource	Decommissioning	Mitigation through rehabilitation	
Excavation of sumps	Destruction or disturbance of onsite fauna / livestock / wildlife	Loss of fauna	Operational	Control through the clear delineation of the prospecting area.	- Section 2 of the National Environmental Management Act 107 of 1998

Excavation of sumps	Water and soil pollution resulting from disposal of drill fluids	Loss of water resources, loss of soil resources	Operational	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. Control through the implementation of environmental induction and toolbox talks. Control through the implementation of the NWA GN704 water management principles.	- The conditions of the Environmental Authorisation and approved Environmental Management Programme - Section 21 of the National Water Act 36 of 1998 - Mine Health and Safety Act 29 of 1996 - Occupational Health and Safety Act 85 of 1993 - National Environmental Management Act 107 of 1998 as it relates to any listed activities. - National Environmental Management Waste Act 59 of 2008 - Achieve rehabilitation objectives
Excavation of sumps	Rehabilitation of sumps	Soil resource, vegetation establishment	Decommissioning	Mitigation through rehabilitation	
Exploration drilling	Destruction and/or disturbance of on-site fauna	Loss of fauna	All phases	Control through the clear delineation of the prospecting area.	- Section 2 of the National Environmental Management Act 107 of 1998 - The conditions of the Environmental Authorisation and approved Environmental Management Programme - Section 21 of the National Water Act 36 of 1998 - Heritage Resources Act 25 of 1999 - Mine Health and Safety Act 29 of 1996 - Occupational Health and Safety Act 85 of 1993 - National Environmental
Exploration drilling	Dust emission from drilling and general site activities (including dust generated by vehicle movement)	Dust emissions	Operational	Control to the implementation of dust suppression methods, when this is required. Dust suppression methods could include wet suppression.	
Exploration drilling	Noise impact as a result of exploration drilling, causing disturbance of fauna / livestock / wildlife	Ambient noise levels	Operational	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.	

Exploration drilling	Water and soil pollution resulting from disposal of drill fluids, hydrocarbon spills, storage of hazardous materials and waste generation	Loss of soil resources, loss of water resources	Operational	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. Control through the implementation of environmental induction and toolbox talks. Control through the implementation of the NWA GN704 water management principles.	Management Act 107 of 1998 as it relates to any listed activities. - National Environmental Management Waste Act 59 of 2008 - Noise Regulation Standards for Rural Areas - National Environmental Management: Air Quality Act, 2004 Dust Regulation guidelines for rural communities - Achieve rehabilitation objectives
Exploration drilling	Potential water resource impacts resulting from groundwater extraction for prospecting activities	Loss of water resource	Operational	Control through the implementation of environmental induction and toolbox talks.Control through the implementation of the NWA GN704 water management principles.Control through groundwater monitoring implementation	

Exploration drilling	Impact on water courses and associated ecosystems in the area	Sensitive environments, fauna and flora	Operational	Control through the clear delineation of the prospecting area. Control through the implementation of environmental induction and toolbox talks. Control through the limiting of the activities to the day time and the implementation of an open and transparent channel of communication.	
Exploration drilling	Useable infrastructure for future use	Water resource	Decommissioning	Mitigation through rehabilitation	
Exploration drilling	Rehabilitation of boreholes	Loss of fauna, water resource	Decommissioning	Mitigation through rehabilitation	
Camp Sites	Destruction and/or disturbance of on-site fauna, flora and sensitive areas	Loss of fauna	Construction	Control through the clear delineation of the prospecting area. Control through the implementation of environmental induction and toolbox talks. Control through the limiting of the activities to the day time and the implementation of an open and transparent channel of communication.	- Section 2 of the National Environmental Management Act 107 of 1998 - The conditions of the Environmental Authorisation and approved Environmental Management Programme - Section 21 of the National Water Act 36 of 1998 - Heritage Resources Act 25 of 1999 - Mine Health and Safety Act 29 of 1996 - Occupational Health and Safety Act 85 of 1993 - National Environmental Management Act 107 of 1998 as it relates to any listed activities. - National Environmental Management Waste Act 59 of 2008
Camp Sites	Destruction or disturbance of onsite fauna / livestock / wildlife	Fauna loss	All phases	Control through the clear delineation of the prospecting area.	
Camp Sites	Dust emission resulting from site clearing, soil stripping and construction activities (including dust generated by vehicle movement)	Dust emissions	Construction	Control to the implementation of dust suppression methods, when this is required. Dust suppression methods could include wet suppression.	

Camp Sites	Noise as a result of construction, operation and vehicle movement resulting in disturbance of fauna / livestock / wildlife	Ambient noise levels	All phases	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.	- Noise Regulation Standards for Rural Areas - National Environmental Management: Air Quality Act, 2004 Dust Regulation guidelines for rural communities
Camp Sites	Potential water and soil pollution resulting from waste generation	Loss of soil resources, loss of water resources	All phases	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. Control through the implementation of environmental induction and toolbox talks. Control through the implementation of the NWA GN704 water management principles.	
Camp Sites	Soil disturbance and compaction and topsoil stockpiling resulting in soil erosion	Soil resource	All phases	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.	

Camp Sites	Visual impact affecting visual character	Loss of aesthetic value	All phases	Control through the clear delineation of the prospecting area. Control through the implementation of environmental induction and toolbox talks.	
Camp Sites	Potential destruction of heritage resources	Loss of Cultural and/or Heritage Significance	Construction	Control through the clear delineation of the prospecting area.	
Camp Sites	Losses as a result of fire	Grazing land, livestock, game and property	All phases	Control through the implementation of emergency preparedness response plan. Control through the implementation of environmental induction and toolbox talks.	
Camp Sites	Rehabilitation of camp sites	Loss of soil resource, vegetation re-establishment	Decommissioning	Mitigation through rehabilitation	

Water management	Spillages of water due to negligence or unmaintained equipment	Loss of Water resources	Operational	Control through the implementation of environmental induction and toolbox talks.Control through the implementation of the NWA GN704 water management principles.Control through groundwater monitoring implementation	- Section 2 of the National Environmental Management Act 107 of 1998 - The conditions of the Environmental Authorisation and approved Environmental Management Programme - Section 21 of the National Water Act 36 of 1998 - Mine Health and Safety Act 29 of 1996 - Occupational Health and Safety Act 85 of 1993 - National Environmental Management Act 107 of 1998 as it relates to any listed activities. - National Environmental Management Waste Act 59 of 2008
Water management	Potential water resource impacts resulting from groundwater extraction for prospecting activities	Loss of Water resources	Operational	Control through the implementation of environmental induction and toolbox talks. Control through the implementation of the NWA GN704 water management principles.	

Re-Fuelling and maintenance	Potential water and soil pollution resulting from hydrocarbon spills and hazardous waste storage	Loss of soil resources, loss of water resources	All phases	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.Control through the implementation of environmental induction and toolbox talks.Control through the implementation of the NWA GN704 water management principles.	- Section 2 of the National Environmental Management Act 107 of 1998 - The conditions of the Environmental Authorisation and approved Environmental Management Programme - Section 21 of the National Water Act 36 of 1998 - Mine Health and Safety Act 29 of 1996 - Occupational Health and Safety Act 85 of 1993 - National Environmental Management Act 107 of 1998 as it relates to any listed activities. - National Environmental Management Waste Act 59 of 2008

Ablution facilities	Potential water and soil pollution resulting from waste spills resulting from improper maintenance	Loss of soil resources, loss of water resources	All phases	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.Control through the implementation of environmental induction and toolbox talks.Control through the implementation of the NWA GN704 water management principles.	- Section 2 of the National Environmental Management Act 107 of 1998 - The conditions of the Environmental Authorisation and approved Environmental Management Programme - Section 21 of the National Water Act 36 of 1998 - Mine Health and Safety Act 29 of 1996 - Occupational Health and Safety Act 85 of 1993 - National Environmental Management Act 107 of 1998 as it relates to any listed activities. - National Environmental Management Waste Act 59 of 2008

Waste management	Potential water and soil pollution resulting from improper waste storage and management	Loss of soil resources, loss of water resources	All phases	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.Control through the implementation of environmental induction and toolbox talks.Control through the implementation of the NWA GN704 water management principles.	- Section 2 of the National Environmental Management Act 107 of 1998 - The conditions of the Environmental Authorisation and approved Environmental Management Programme - Section 21 of the National Water Act 36 of 1998 - Mine Health and Safety Act 29 of 1996 - Occupational Health and Safety Act 85 of 1993 - National Environmental Management Act 107 of 1998 as it relates to any listed activities. - National Environmental Management Waste Act 59 of 2008

f) Impact Management Actions

A description of impact management actions, identifying the manner in which the impact management objectives and outcomes contemplated in paragraphs (c) and (d) will be achieved

Table 20: Impact Management Actions

ACTIVITIES	POTENTIAL IMPACT	MITIGATION TYPE	TIME PERIOD FOR IMPLEMENTATION	STANDARD TO BE ACHIEVED
Non-invasive Prospecting Activities				
Data Collection & Physical Survey	None identified	Control potential deviations from the approved Prospecting Work Programme through the effective implementation of the data acquisition and desktop study.	N/A	N/A
Invasive Prospecting Activities				
Site access/roads	Destruction and/or disturbance of on-site fauna, flora and sensitive areas	Control through the clear delineation of the prospecting area.	Concurrently with the completion of prospecting activities in the area.	- Section 2 of the National Environmental Management Act 107 of 1998 - The conditions of the Environmental Authorisation and approved Environmental Management Programme - Section 21 of the National Water Act 36 of 1998 - Heritage Resources Act 25 of 1999 - Mine Health and Safety Act 29 of 1996 - Occupational Health and Safety Act 85
Site access/roads	Soil compaction resulting from repeated use of access roads to sites	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.		

Site access/roads	Vehicle traffic noise impact affecting cattle and/or wildlife	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.		of 1993 - National Environmental Management Act 107 of 1998 as it relates to any listed activities. - National Environmental Management Waste Act 59 of 2008 - Noise Regulation Standards for Rural Areas - National Environmental Management: Air Quality Act, 2004 Dust Regulation guidelines for rural communities - Achieve rehabilitation objectives
Site access/roads	Poor access control resulting in impacts on livestock/wildlife movement, breeding and grazing practices	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.		
Site access/roads	Potential destruction of heritage resources	Control through the clear delineation of the prospecting area.		
Site access/roads	Poor access control resulting in un-authorised people entering the site	Control through the limiting of the activities to the day time and the implementation of an open and transparent channel of communication.		
Site access/roads	Activities within the watercourse could result in disturbance to the natural geomorphology and safety hazards during rainy periods	Control through the clear delineation of the prospecting area.		
Site access/roads	Useable infrastructure for future use	Mitigation through rehabilitation		
Site access/roads	Rehabilitation of access roads	Mitigation through rehabilitation		
Drill sites	Destruction and/or disturbance of on-site fauna, flora and sensitive areas	Control through the clear delineation of the prospecting area.	Concurrently with the completion of prospecting activities in the area.	- Section 2 of the National Environmental Management Act 107 of 1998 - The conditions of the Environmental Authorisation and approved Environmental Management Programme
Drill sites	Dust emission resulting from site clearing, soil stripping and construction activities (including dust generated by vehicle movement)	Control to the implementation of dust suppression methods, when this is required. Dust suppression methods could include wet suppression.		

Drill sites	Noise as a result of construction, operation and vehicle movement resulting in disturbance of fauna / livestock / wildlife	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.		- Section 21 of the National Water Act 36 of 1998 - Heritage Resources Act 25 of 1999 - Mine Health and Safety Act 29 of 1996 - Occupational Health and Safety Act 85 of 1993 - National Environmental Management Act 107 of 1998 as it relates to any listed activities. - National Environmental Management Waste Act 59 of 2008 - Noise Regulation Standards for Rural Areas - National Environmental Management: Air Quality Act, 2004 Dust Regulation guidelines for rural communities - Achieve rehabilitation objective
Drill sites	Soil contamination resulting from waste generation, disposal of drill fluids or storage of hazardous materials	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.Control through the implementation of environmental induction and toolbox talks.		
Drill sites	Soil disturbance and compaction and topsoil stockpiling resulting in soil erosion	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.		
Drill sites	Visual impact affecting visual character	Control through the clear delineation of the prospecting area. Control through the implementation of environmental induction and toolbox talks.		

Drill sites	Influx of persons (job seekers) to site as a result of increased activity resulting in increased incidents of theft and opportunistic crime	Control through the limiting of the activities to the day time and the implementation of an open and transparent channel of communication.		
Drill sites	Potential destruction of heritage resources	Control through the clear delineation of the prospecting area.		
Drill sites	Rehabilitation of drill sites	Mitigation through rehabilitation		
Trench sites	Destruction and/or disturbance of on-site fauna, flora and sensitive areas	Control through the clear delineation of the prospecting area.	Concurrently with the completion of prospecting activities in the area.	- Section 2 of the National Environmental Management Act 107 of 1998 - The conditions of the Environmental Authorisation and approved Environmental Management Programme - Section 21 of the National Water Act 36 of 1998 - Heritage Resources Act 25 of 1999 - Mine Health and Safety Act 29 of 1996 - Occupational Health and Safety Act 85 of 1993 - National Environmental Management Act 107 of 1998 as it relates to any listed activities. - National Environmental Management Waste Act 59 of 2008 - Noise Regulation Standards for Rural Areas - National Environmental Management: Air Quality Act, 2004 Dust Regulation guidelines for rural communities - Achieve rehabilitation objectives
Trench sites	Dust emission resulting from site clearing, soil stripping and trench construction (including dust generated by vehicle movement)	Control to the implementation of dust suppression methods, when this is required. Dust suppression methods could include wet suppression.		
Trench sites	Noise as a result of construction, operation and vehicle movement resulting in disturbance of fauna / livestock / wildlife	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.		
Trench sites	Soil contamination resulting from waste generation, disposal or storage of hazardous materials and use of heavy machinery	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. Control through the implementation of environmental induction and toolbox talks.		

Trench sites	Soil disturbance and compaction and topsoil stockpiling resulting in soil erosion	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.		
Trench sites	Visual impact affecting visual character	Control through the clear delineation of the prospecting area. Control through the implementation of environmental induction and toolbox talks.		
Trench sites	Influx of persons (job seekers) to site as a result of increased activity resulting in increased incidents of theft and opportunistic crime	Control through the limiting of the activities to the day time and the implementation of an open and transparent channel of communication.		
Trench sites	Potential destruction of heritage resources	Control through the clear delineation of the prospecting area.		
Trench sites	Rehabilitation of trenches	Mitigation through rehabilitation		
Excavation of sumps	Destruction or disturbance of onsite fauna / livestock / wildlife	Control through the clear delineation of the prospecting area.	Concurrently with the completion of prospecting activities in the area.	- Section 2 of the National Environmental Management Act 107 of 1998

Excavation of sumps	Water and soil pollution resulting from disposal of drill fluids	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. Control through the implementation of environmental induction and toolbox talks. Control through the implementation of the NWA GN704 water management principles.		- The conditions of the Environmental Authorisation and approved Environmental Management Programme - Section 21 of the National Water Act 36 of 1998 - Mine Health and Safety Act 29 of 1996 - Occupational Health and Safety Act 85 of 1993 - National Environmental Management Act 107 of 1998 as it relates to any listed activities. - National Environmental Management Waste Act 59 of 2008 - Achieve rehabilitation objectives
Excavation of sumps	Rehabilitation of sumps	Mitigation through rehabilitation		
Exploration drilling	Destruction and/or disturbance of on-site fauna	Control through the clear delineation of the prospecting area.	Concurrently with the completion of prospecting activities in the area.	- Section 2 of the National Environmental Management Act 107 of 1998 - The conditions of the Environmental Authorisation and approved Environmental Management Programme - Section 21 of the National Water Act 36 of 1998 - Heritage Resources Act 25 of 1999 - Mine Health and Safety Act 29 of 1996 - Occupational Health and Safety Act 85 of 1993 - National Environmental Management Act 107 of 1998 as it relates to any listed activities.
Exploration drilling	Dust emission from drilling and general site activities (including dust generated by vehicle movement)	Control to the implementation of dust suppression methods, when this is required. Dust suppression methods could include wet suppression.		
Exploration drilling	Noise impact as a result of exploration drilling, causing disturbance of fauna / livestock / wildlife	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.		

Exploration drilling	Water and soil pollution resulting from disposal of drill fluids, hydrocarbon spills, storage of hazardous materials and waste generation	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. Control through the implementation of environmental induction and toolbox talks. Control through the implementation of the NWA GN704 water management principles.		- National Environmental Management Waste Act 59 of 2008 - Noise Regulation Standards for Rural Areas - National Environmental Management: Air Quality Act, 2004 Dust Regulation guidelines for rural communities - Achieve rehabilitation objectives
Exploration drilling	Potential water resource impacts resulting from groundwater extraction for prospecting activities	Control through the implementation of environmental induction and toolbox talks.Control through the implementation of the NWA GN704 water management principles.Control through groundwater monitoring implementation		

Exploration drilling	Impact on water courses and associated ecosystems in the area	Control through the clear delineation of the prospecting area. Control through the implementation of environmental induction and toolbox talks. Control through the limiting of the activities to the day time and the implementation of an open and transparent channel of communication.		
Exploration drilling	Useable infrastructure for future use	Mitigation through rehabilitation		
Exploration drilling	Rehabilitation of boreholes	Mitigation through rehabilitation		
Camp Sites	Destruction and/or disturbance of on-site fauna, flora and sensitive areas	Control through the clear delineation of the prospecting area. Control through the implementation of environmental induction and toolbox talks. Control through the limiting of the activities to the day time and the implementation of an open and transparent channel of communication.	Concurrently with the completion of prospecting activities in the area.	- Section 2 of the National Environmental Management Act 107 of 1998 - The conditions of the Environmental Authorisation and approved Environmental Management Programme - Section 21 of the National Water Act 36 of 1998 - Heritage Resources Act 25 of 1999 - Mine Health and Safety Act 29 of 1996 - Occupational Health and Safety Act 85 of 1993 - National Environmental Management Act 107 of 1998 as it relates to any listed activities. - National Environmental Management Waste Act 59 of 2008 - Noise Regulation Standards for Rural Areas
Camp Sites	Destruction or disturbance of onsite fauna / livestock / wildlife	Control through the clear delineation of the prospecting area.		
Camp Sites	Dust emission resulting from site clearing, soil stripping and construction activities (including dust generated by vehicle movement)	Control to the implementation of dust suppression methods, when this is required. Dust suppression methods could include wet suppression.		

Camp Sites	Noise as a result of construction, operation and vehicle movement resulting in disturbance of fauna / livestock / wildlife	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.		- National Environmental Management: Air Quality Act, 2004 Dust Regulation guidelines for rural communities
Camp Sites	Potential water and soil pollution resulting from waste generation	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. Control through the implementation of environmental induction and toolbox talks. Control through the implementation of the NWA GN704 water management principles.		
Camp Sites	Soil disturbance and compaction and topsoil stockpiling resulting in soil erosion	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.		

Camp Sites	Visual impact affecting visual character	Control through the clear delineation of the prospecting area. Control through the implementation of environmental induction and toolbox talks.		
Camp Sites	Potential destruction of heritage resources	Control through the clear delineation of the prospecting area.		
Camp Sites	Losses as a result of fire	Control through the implementation of emergency preparedness response plan. Control through the implementation of environmental induction and toolbox talks.		
Camp Sites	Rehabilitation of camp sites	Mitigation through rehabilitation		

Water management	Spillages of water due to negligence or unmaintained equipment	Control through the implementation of environmental induction and toolbox talks.Control through the implementation of the NWA GN704 water management principles.Control through groundwater monitoring implementation	Concurrently with the completion of prospecting activities in the area.	- Section 2 of the National Environmental Management Act 107 of 1998 - The conditions of the Environmental Authorisation and approved Environmental Management Programme - Section 21 of the National Water Act 36 of 1998 - Mine Health and Safety Act 29 of 1996 - Occupational Health and Safety Act 85 of 1993 - National Environmental Management Act 107 of 1998 as it relates to any listed activities. - National Environmental Management Waste Act 59 of 2008
Water management	Potential water resource impacts resulting from groundwater extraction for prospecting activities	Control through the implementation of environmental induction and toolbox talks. Control through the implementation of the NWA GN704 water management principles.		

Re-Fuelling and maintenance	Potential water and soil pollution resulting from hydrocarbon spills and hazardous waste storage	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.Control through the implementation of environmental induction and toolbox talks.Control through the implementation of the NWA GN704 water management principles.	Concurrently with the completion of prospecting activities in the area.	- Section 2 of the National Environmental Management Act 107 of 1998 - The conditions of the Environmental Authorisation and approved Environmental Management Programme - Section 21 of the National Water Act 36 of 1998 - Mine Health and Safety Act 29 of 1996 - Occupational Health and Safety Act 85 of 1993 - National Environmental Management Act 107 of 1998 as it relates to any listed activities. - National Environmental Management Waste Act 59 of 2008

Ablution facilities	Potential water and soil pollution resulting from waste spills resulting from improper maintenance	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.Control through the implementation of environmental induction and toolbox talks.Control through the implementation of the NWA GN704 water management principles.	Concurrently with the completion of prospecting activities in the area.	- Section 2 of the National Environmental Management Act 107 of 1998 - The conditions of the Environmental Authorisation and approved Environmental Management Programme - Section 21 of the National Water Act 36 of 1998 - Mine Health and Safety Act 29 of 1996 - Occupational Health and Safety Act 85 of 1993 - National Environmental Management Act 107 of 1998 as it relates to any listed activities. - National Environmental Management Waste Act 59 of 2008

Waste management	Potential water and soil pollution resulting from improper waste storage and management	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.Control through the implementation of environmental induction and toolbox talks.Control through the implementation of the NWA GN704 water management principles.	Concurrently with the completion of prospecting activities in the area.	- Section 2 of the National Environmental Management Act 107 of 1998 - The conditions of the Environmental Authorisation and approved Environmental Management Programme - Section 21 of the National Water Act 36 of 1998 - Mine Health and Safety Act 29 of 1996 - Occupational Health and Safety Act 85 of 1993 - National Environmental Management Act 107 of 1998 as it relates to any listed activities. - National Environmental Management Waste Act 59 of 2008

i) Financial Provision

(1) Determination of the amount of Financial Provision.

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

The position of the trenches and holes will be planned only after field reconnaissance on the property and detailed studying of geological information available on the area is completed. The current road infrastructure on the properties will be utilised as far as possible for gaining access to the drill-hole positions. A significant amount of well traversed roads currently exist on the properties. In this way the disturbance of the surface area will be kept to a minimum.

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

The closure objectives are to:

- To ensure that the biodiversity and environment on the site is protected.
- To make sure that the following commitments will be achieved as a minimum:
  - The site is to be returned back to its pre-mining land use. In this case the land use must return to farm land conditions. If the site is in the veld, the site must be restored to veld conditions. No drop in land capability is to occur.
  - The site will be made safe for both humans and animals;
  - The site will be rehabilitated to be physically, chemically and biologically stable;
  - The residual impacts will be managed to acceptable levels and will not deteriorate over time;
  - Closure will be achieved with minimal socio-economic upheaval.
- To provide sufficient funds at the end of life of mine, to properly implement the closure plan, and also to make provision for possible premature closure, and post closure monitoring requirements.
- Concurrent rehabilitation is required from the contracted company. Each drill site, camp site and trench site has to be cleaned from all evidence of pollution and made safe as part of decommissioning. All drill holes are capped and marked for safety of persons and animals on site.
- Post drilling rehabilitation status evaluation will be evaluated and provide specific remedial measures for implementation until satisfactory rehabilitation has been completed.

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

The Basic Assessment Report and Environmental Management Plan are now made available to each registered stakeholder for review and comment. All comments will be recorded in the issues and response section and will be included into the final report.

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

As previously discussed, the position of the trenches and holes will be planned only after field reconnaissance on the property and detailed studying of geological information available on the area is completed. The current road infrastructure on the properties will be utilised as far as possible for gaining access to the drill-hole positions. A significant amount of well traversed roads currently exist on the properties. In this way the disturbance of the surface area will be kept to a minimum.

The location of trenching and drill sites can therefore not be determined at this stage. Mapping of the prospecting activities for the rehabilitation plan could therefore not be undertaken at this stage.

Due to the nature of the activities, the impacts will be limited and of short duration. The management plan is provided in such a manner as to ensure concurrent rehabilitation. The areas for drilling and trenching purposes will be the main area experiencing impact. It should be noted that the proposed prospecting will be undertaken over a large area but that the area to be disturbed per prospecting hole/trench will not exceed 102 m^2. Therefore in this instance the total area to be disturbed will not exceed 9 600 m^2. Rehabilitation of the trenches and drill sites will commence as soon as the core is been logged and assessed and therefore at closure only the last hole/trench will still have to be rehabilitated.

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

The rehabilitation plan has been developed on the basis that the rehabilitated areas are safe, stable, non-polluting and are able to support an ecosystem similar to the surrounding natural environment. Due to the nature of the activities, the impacts will be limited and of short duration. The management plan is provided in such a manner as to ensure concurrent rehabilitation. To ensure the alignment of the rehabilitation plan with the closure objective, a high level risk assessment of the prospecting activities has been conducted to establish the potential risks associated with it.

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

The total associated rehabilitation cost to be incurred during the 5 year prospecting period on this project amounts R216 035.16. The calculation of the rehabilitation liability is based on the fact that the rehabilitation will progress concurrently with the exploration being done. Not more than 1 trench and borehole and its particular sump will be left un-rehabilitated at any one particular time. The campsites will be re-habilitated immediately after the campsite is moved to the new position. Therefore the annual environmental guarantee required amounts R43 207.03 only.

Table 21: Estimated Total Rehabilitation Cost and Annual Provision

Activity	Rate	Year 1	Year 2	Year 3	Year 4	Year 5
Phase 1						
Environmental management monthly visits X 1	R1200-00 per day	R 1 200				
Annual Provision						
General Surface Rehab / Ha Disturbed: 0.19	R 100 851 / Ha	R 19 212				
Sealing of Boreholes 18	R 1 154 / Hole	R 21 434				
Aftercare / Ha Disturbed: 0.19	R 13 446 / Ha	R 2 561				
Phase 2	**Rate**	**Year 1**	**Year 2**	**Year 3**	**Year 4**	**Year 5**
Environmental management monthly visits X 1	R1200-00 per day		R 1 200			
Annual Provision						
General Surface Rehab / Ha Disturbed: 0.19	R 100 851 / Ha		R 19 212			
Sealing of Boreholes 18	R 1 154 / Hole		R 21 434			
Aftercare / Ha Disturbed: 0.19	R 13 446 / Ha		R 2 561			
Phase 3	**Rate**	**Year 1**	**Year 2**	**Year 3**	**Year 4**	**Year 5**
Environmental management monthly visits X 1	R1200-00 per day			R 1 200		
Annual Provision						
General Surface Rehab / Ha Disturbed: 0.19	R 100 851 / Ha			R 19 212		
Sealing of Boreholes 18	R 1 154 / Hole			R 21 434		
Aftercare / Ha Disturbed: 0.19	R 13 446 / Ha			R 2 561		
Phase 4	**Rate**	**Year 1**	**Year 2**	**Year 3**	**Year 4**	**Year 5**
Environmental management monthly visits X 1	R1200-00 per day				R 1 200	
Annual Provision						
General Surface Rehab / Ha Disturbed: 0.19	R 100 851 / Ha				R 19 212	
Sealing of Boreholes 0.19	R 1 154 / Hole				R 21 434	
Aftercare / Ha Disturbed: 0.19	R 13 446 / Ha				R 2 561	
Phase 5	**Rate**	**Year 1**	**Year 2**	**Year 3**	**Year 4**	**Year 5**
Environmental management monthly visits X 1	R1200-00 per day					R 1 200
Annual Provision						
General Surface Rehab / Ha Disturbed: 0.19	R 100 851 / Ha					R 19 212
Sealing of Boreholes 18	R 1 154 / Hole					R 21 434
Aftercare / Ha Disturbed: 0.19	R 13 446 / Ha					R 2 561
GRAND TOTAL PROJECT COST		**R 44 407**	**R 44 407**	**R 44 407**	**R 44 407**	**R 44 407**
						R 222 035

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

Genet Manganese (Pty) Ltd, a member of the Genet Group of Companies (Genet South Africa (Pty) Ltd), will be funding all associated cost with the Hartfell (including farms Sandham and Bullsrun) Ferrous and Base Metal Project as indicated and undertaken in the company resolution as provided in the Prospecting Work Programme.

Genet Manganese (Pty) Ltd is a Mining company registered in 2012 with a wide range mining portfolio within the group. Although Genet Manganese (Pty) Ltd is a relatively new company, the holding company, members and subsidiary companies have been successfully involved in the mining industry for the past 10 years. Genet Manganese (Pty) Ltd is currently in the process of finalizing the company HDSA shareholding structure and it is anticipated that this process will be finalized shortly. As such it can be prepared for submission to the DMR on request at the time of this application review.

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

g) Monitoring of Impact Management Actions

h) Monitoring and reporting frequency

i) Responsible persons

j) Time period for implementing impact management actions

k) Mechanism for monitoring compliance

It is the primary responsibility of Genet Manganese (Pty) Ltd to ensure that the execution of the monitoring and management programme is done in accordance with this environmental management programme (EMP). Genet Manganese (Pty) Ltd will appoint a Prospecting Manager that will be the appointed representative he/she will be ultimately responsible and accountable.

In instances where contractors will be appointed, it remains the responsibility of the Prospecting Manager to communicate the requirements of this EMP to the said contractors. An environmental officer or other appointed representative will at least conduct EMP audits monthly during prospecting to ensure compliance with the EMP.

It is recommended that a monitoring procedure be compiled for Genet Manganese (Pty) Ltd that will include all the relevant monitoring that must be conducted as well as the frequency of such monitoring. Roles and responsibilities need to be defined clearly in such a procedure. The Manager must ensure that all reporting to specific government department is done as per this EMP.

The table below provides details of how environmental impacts must be managed and monitored and also provides the monitoring frequency as well as the reporting frequency.

Table 22: Mechanisms for Monitoring Compliance

SOURCE ACTIVITY	IMPACTS REQUIRING MONITORING PROGRAMMES	FUNCTIONAL REQUIREMENTS FOR MONITORING	ROLES AND RESPONSIBILITIES (FOR THE EXECUTION OF THE MONITORING PROGRAMMES)	MONITORING AND REPORTING FREQUENCY and TIME PERIODS FOR IMPLEMENTING IMPACT MANAGEMENT ACTIONS
Site access/roads Drill sites Trench sites Camp sites Exploration drilling	Land disturbed by prospecting	Measure concurrent rehabilitation in terms of : - Number of holes drilled - Number of holes rehabilitated - Number of trenches - Number of trenches rehabilitated - Roads constructed - Roads rehabilitated or handed over to landowner	Prospecting Manager	Monitoring: Monthly Reporting: Monthly
		Remove all foreign matter from site and disposed at designated site	Prospecting Manager	Monitoring: Every drill site, daily Reporting: Monthly
		Cap and mark all boreholes	Prospecting Manager	Monitoring: Every drill site, daily Reporting: Monthly
		Take photographs prior and after drilling as records	Prospecting Manager	Monitoring: Every drill site, daily Reporting: Monthly
Exploration drilling Camp site Re-Fuelling and maintenance Excavation of sumps Ablution facilities Waste management	Soil loss and quality deterioration	Topsoil placement at sump areas	Prospecting Manager	Monitoring: Every drill site, daily Reporting: Monthly
		Prevent hydro carbons spills by using drip pans or PVC linings. Remove content of drip pan and dispose at a designated disposal site.	Prospecting Manager	Monitoring: Every drill site, daily Reporting: Monthly
		If spill occur, stop drilling and clean spill, remove contaminated soil off site to a designated disposal facility.	Prospecting Manager	Monitoring: Every drill site, daily Reporting: Monthly
Site access/roads Drill sites Trench sites Camp sites Excavation of sumps Exploration drilling	Fauna and flora affected by prospecting activities	Fence off drill site to ensure demarcation	Prospecting Manager	Monitoring: Every drill site Reporting: Monthly
		Avoid damaging endangered or protected plants	Prospecting Manager; Environmental Specialist	Monitoring: Prior to prospecting Reporting: Annually with performance assessment
		Translocate plants, obtain permits, where necessary	Prospecting Manager; Environmental Specialist	Monitoring: Prior to prospecting Reporting: Annually with performance assessment
		Monitor prevention of damage to fauna and flora	Prospecting Manager	Monitoring: Every drill site, daily Reporting: Monthly

Water management Exploration drilling	Groundwater quality affected by prospecting activities	Line sump with PVC sheet to prevent groundwater pollution	Prospecting Manager	Monitoring: Every drill site, daily Reporting: Monthly
		Clean hydro carbons spills	Prospecting Manager	Monitoring: Every drill site, daily Reporting: Monthly
Ablution facilities Waste management	Waste generated	Keep records for ton of hazardous waste removed from site.	Prospecting Manager	Monitoring: Monthly Reporting: Monthly

l) Indicate the frequency of the submission of the performance assessment/ environmental audit report

Internal and external inspections will be conducted on a regular basis to confirm the compliance to this EMP.

EMP performance results from these inspections will be reported to the relevant regulator according to the prescribed manner biennially.

m) Environmental Awareness Plan

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

All employees and subcontractor staff involved with the project will undergo Safety-Health-Environmental Induction that is updated on a regular basis to adhere to changes in compliance requirements.

A Safety-Health-Environmental (SHE) representative is appointed for the working teams to assist in highlighting operational SHE issues while drilling takes place.

The reporting hierarchy for operational performance is also used to ensure environmental communication and awareness. Competent contractors are appointed with supervisors that can translate SHE risks to foremen and operating staff. This takes place through morning meetings before drilling commence (toolbox meetings) and SHE meetings held specifically for this purpose.

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

Genet Mining will aim to apply a risk management system where risks are identified and rated.
Site inspections in terms of EMP compliance take place and will serve as a training opportunity.

Emergency procedures of risks are practiced at least annually and improvements made to ensure emergency preparedness and response is adequate to address environmental incidents.

Recommendations and Incident reporting of events takes place during site inspections and are addressed to ensure continual improvement of the environmental management on site.

n) Specific information required by the Competent Authority

Among others, confirm that the financial provision will be reviewed annually

No specific information has been required by the Competent Authority.

2. UNDERTAKING

The EAP herewith confirms

(a) the correctness of the information provided in the reports

(b) the inclusion of comments and inputs from stakeholders and I&APs ;

(c) the inclusion of inputs and recommendations from the specialist reports where relevant; 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:

_____

Name of company:

_____

Date:

-END-