mineral resources & energy
Department:
Minerals Resources and Energy
REPUBLIC OF SOUTH AFRICA

THE DRAFT REPORT & ENVIRONMENTAL MANAGEMENT PROGRAMME

MURARA
ENVIRONMENTAL CONSULTANTS (PTY) LTD

DRAFT BASIC ASSESSMENT REPORT OF A PROSPECTING RIGHT AND ENVIRONMENTAL AUTHORISATION APPLICATION WITHOUT BULK SAMPLING FOR IRON ORE, MANGANESE ORE AND GOLD ORE, IN PORTION 2, 3 AND PART OF PORTION 01 OF THE FARM GOEDGEDACHT 27 IQ: SITUATED IN THE MAGISTERIAL DISTRICT OF VENTERSDORP IN THE NORTH WEST PROVINCE.

SAMRAD REF NUMBER: NW 30/5/1/1/2/13572 PR

REPORT PREPARED FOR	Gono Africa Mining (Pty) Ltd
PREPARED BY	Murara Environmental Consultants (Pty) Ltd
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Address	58 Bourke Street Sunnyside, Pretoria 0001

DECLARATION BY THE ENVIRONMENTAL ASSESSMENT PRACTITIONER:

I, Nephawe Mbavhalelo, declare that I (a) Act as the independent environmental practitioner in this application; do not have and will not have any financial interest in the undertaking of the activity, other than remuneration for work performed in terms of the Environmental Impact Assessment Regulations, 2017 as amended;

b) Do not have and will not have a vested interest in the proposed activity proceeding;
c) Have no, and will not engage in, conflicting interests in the undertaking of the activity;
d) Undertake to disclose, to the competent authority, any material information that has or may have the potential to influence the decision of the competent authority or the objectivity of any report, plan or document required in terms of the Environmental Impact Assessment Regulations, 2006;
e) Will ensure that information containing all relevant facts in respect of the application is distributed or made available to interested and affected parties and the public and that participation by interested and affected parties is facilitated in such a manner that all interested and affected parties will be provided with a reasonable opportunity to participate and to provide comments on documents that are produced to support the application;
f) Will ensure that the comments of all interested and affected parties are considered and recorded in reports that are submitted to the Department in respect of the application, provided that comments that are made by interested and affected parties in respect of a final report that will be submitted to the Department may be attached to the report without further amendment to the report;
g) Will keep a register of all interested and affected parties that participated in a public participation process; and
h) Will provide the Department with access to all information at my disposal regarding the application, whether such information is favourable to the applicant or not.

Signature of the Environmental Assessment Practitioner:

Murara Environmental Consultants (Pty) Ltd

Name of company:

Date: 27 January 2023

PART A

SCOPE OF ASSESSMENT AND BASIC ASSESSMENT REPORT

(A) Details of the EAP-

i) Who prepared the report;

Name of Practitioner	Qualifications	Contact details
Mbavhalelo Nephawe	Masters in Environmental Sciences in University of Venda (Refer to **Appendix 1**)	064 954 8869
	National Diploma in Safety Management (UNISA) (Refer to **Appendix 1**)	

ii) The expertise of the EAP, including curriculum vitae;

Mr Nephawe Mbavhalelo has more than 9 years of experience in environmental related projects.

These projects includes:

- Environmental Impacts assessment projects;
- Wetland and land rehabilitation;
- Water use registration and licensing of water users; and

He also has extensive experience in a wide range of environmentally related projects, processes, and applications for private, commercial and industrial clients, in addition the EAP has gather enough experience while working in various Provincial and National government departments. He has gained experience through his involvement in mining related projects.

B) The Location of the Activity:

The proposed activities will be conducting prospecting right within portion 2, 3 and part of portion 01 of the farm Goedgedacht 27 IQ: Situated in the Magisterial District of Ventersdorp in the North West Province. The farm coordinates are as follows;

Points	Longitude	Latitude
1	-26.091994	27.241068
2	-26.092875	27.249837
3	-26.72309238	27.269950
4	-26.095196	27.283496
5	-26.095362	27.292380
6	-26.100454	27.292278
6	-26.110652	27.291910
8	-26.118795	027.291734
9	-26.144606	27.291414
10	-26.144817	27.258422
11	-26.145002	27.224224
12	-26.133248	27.221580
13	-26.114914	27.217601
14	-26.116048	27.233100
15	-26.116572	27.249963
16	-26.116969	27.260270
17	-26.110721	27.256331

18	-26.108832	27.258493
19	-26.102143	27.254942
20	-26.100547	27.257328
21	-26.098922	27.259442
22	-26.099335	27.267102
23	-26.100554	27.269017
24	-26.100253	27.276053
24	-26.101045	27.274348
26	-26.100527	27.276014
27	-26.101955	27.276023
28	-26.102415	27.277092
29	-26.100199	27.283320

C) A plan which locates the proposed activity or activities applied for as well as associated structures and infrastructure at an appropriate scale.

A plan of proposed activity and locality map at an appropriate scale is attached in **(Appendix 2)**

D) A description of the scope for proposed activity, including-

(i) All listed and specified activities triggered

Name of Activity	Aerial Extent of Activity (Ha or m^2)	Listed Activity	Applicable Listing Notice
Prospecting right: Only 6 (six) boreholes with depth of 100m will be drilled and each borehole will cover the area of 10m X 20m (square meters). The five boreholes will be drilled during phase 2 and phase 3.	3600,349 ha	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).	GNR 327
Clearance of indigenous vegetation		Activity 27 as amended: The clearance of an area of 1 hectare or more, but less than 20 hectares of indigenous vegetation, except where such clearance of indigenous vegetation is required for- (i) The undertaking of a linear activity; or (ii) Maintenance purposes undertaken in accordance with a maintenance management plan.	GNR 327

Name of Activity	Aerial Extent of Activity (Ha or m^2)	Listed Activity	Applicable Listing Notice
Boreholes	0.2	N/A	N/A

(ii) A description of the activities to be undertaken including associated structures and infrastructure.

Only six (6) boreholes will be opened with the size of **10 m x 20 m.** The existing roads and tracks already traverse the proposed prospecting site and where practicable, these roads will be used. Water will be supplied to the prospecting operation by local Municipality. The construction will be undertaken with use of Bulldozer and Grader.

E) A description of the policy and legislative context within which the development is proposed including.

i) An identification of all legislation, policies, plans, guidelines, spatial tools, municipal development planning frameworks, and instruments that are applicable to this activity and have been considered in the preparation of the report:

- Environmental Impact Assessment (EIA) regulations
- The National Heritage Resources Act (Act No. 25 of 1999)
- Promotion of Administrative Justice Act (Act No.3 Of 2000)
- National Environmental Management: Waste Act (Act No. 59 of 2008)
- Mineral and Petroleum Resources Development Act (Act No. 28 of 2002)
- The National Environmental Management Act (Act No. 107 of 1998
- The Constitution of South Africa (Act No. 108 of 1996)

Name	Overview	Permits
Environmental Impact Assessment (EIA) regulations	New regulations have been promulgated in terms of Chapter 5 of NEMA and were published on 08 December 2014 in Government Notice No. R. 985. Development and land use activities which require Environmental Authorisation in terms of the NEMA EIA Regulations, 2014, are in Listing Notice 3 (GG No. R.983, LN3) identified via geographic areas with the intention being that activities only require Environmental Authorisation when located within designated sensitive areas.	General Authorization is required from the Department of Minerals and Energy
The National Heritage Resources Act (Act No. 25 of 1999)	Section 34 (1)): No person may alter or demolish any structure or part of a structure which is older than 60 years without a permit issued by the South African Heritage Resources Agency (SAHRA), or the responsible provincial resources authority.	Special attention will be given to the identification of possible cultural or heritage resources on site. Heritage resources including archaeological and paleontological sites over 100 years old, graves older than 60 years, structure older than 60 years are protected by the National Heritage Resources Act no 25 of 1999. Therefore, if such resources are found during the prospecting or development activities, they shall not be disturbed without a permit from the relevant heritage resource Authority, which means that before such sites are disturbed by development it is incumbent on the developer to ensure that a heritage impact assessment is done and the

		Provincial Heritage Resources Authority and SAHRA must be contacted immediately, and work must stop.
Promotion of Administrative Justice Act (Act No.3 Of 2000)	The Promotion of Administrative Justice Act (PAJA) aims to make the administration effective and accountable to people for its actions. It promotes South African citizens' right to just administration. Section 33 of the Constitution guarantees that administrative action will be reasonable, lawful and procedurally fair and it makes sure that people have the right to ask for written reasons when administrative action has a negative impact on them.	The process of public participation will be transparent without any fear or favor and all decision shall be made available to the public
National Environmental Management: Waste Act (Act No. 59 of 2008)	In terms of the Waste Act, no person may commence, undertake or conduct a waste management activity except in accordance with: The requirements or standards determined in terms of the Waste Act for that activity; and A waste management license issued in respect of that activity, if a license is required.	The waste produced during the construction and operation and storage thereof is below the minimum threshold specified in the listed activities Category A, B or C. However, the waste produced during construction should be disposed of at the registered municipality landfill.
Mineral and Petroleum Resources Development Act (Act No. 28 of 2002)	This legislation is designed in making provision for equitable access to and sustainable development of the nation's mineral and petroleum resources; and to provide for matters connected therewith.	General Authorization is required from the Department of Minerals and Energy.

F. Motivation for the need and desirability for the proposed development including the need and desirability of the activity in the context of the preferred location.

The primary use of iron ore is to make steel and is the most widely used of all metals. Manganese is used to produce a variety of important alloys and to deoxidize steel and desulfurize. It is also used in dry cell batteries. Manganese is used as a black-brown pigment in paint. It is an essential trace element for living creatures. Despite the slow economic recovery from the 2008 economic recession, there is still a high demand for both minerals.

The potential benefits of the proposed project are:

- Long-term, national benefits of reliable Manganese, Gold and iron ore supply and the resultant socio-economic benefits.
- Key contributions include employment and procurement of goods and services in remote communities, social programs, payment of taxes and royalties to governments, investments] in infrastructure and the distribution of profits to public and private shareholders
- Needed job creation and other Local, Provincial and National Socio-Economic benefits.
- Local growth in the economy of and surrounding areas, and for local businesses including those that supply, transport etc.
- Economic benefits for contractors and other suppliers of goods and services. The activity is needed and desirable in South Africa as there is abundance of Manganese and iron ore in the proposed area.
- This has potential in the generation of income for local government thereby directly contributing to its economy and economy of the country.

G) Motivation for the preferred development footprint within the approved site including a full description of the process followed to reach the proposed development footprint within the approved site.

The preferred activity is the prospecting of Iron Ore, Manganese Ore and Gold Ore. After thorough desktop study, the applicant concludes that there is availability of Iron Ore, Manganese Ore and Gold ore on the proposed prospecting area, specifically on Goedgedacht 27 JQ.

Technology Alternatives

There is various mining technology used within mining industry e.g. Open cast mining, long wall mining, board and pillar mining, nevertheless drilling as part of exploration have been selected as the best method.

Material Alternatives

No in-put material alternatives are considered for this proposed project. There are no new facilities to be constructed at the project site, hence movable facilities will be used for the proposed project.

Operational Alternatives

Exploration Drilling Methods

Drilling of minerals applied for is used to determine the depth, thickness and quality of the minerals applied for at any point across a prospecting area. Drilling is also used to determine the strata with which the minerals applied for are associated. Drilling can either be done by non-core drilling or core drilling techniques.

Non-Core Drilling Methods

Non-core drilling techniques mostly uses the rotary drilling methods. In this technique, a string of metal rods is rotated axially and a bit at the base of the string is forced downward, under controlled pressure, breaking up the ground and advancing the depth of the hole. Cuttings are swept away from the bit and lifted to the surface either by means of pumped circulating water or by jets of compressed air. Logging of the hole drilled by non-core drilling methods is mainly based on the cuttings obtained as the drill progresses. In view for the difficulty and error bound logging, this method of drilling was discarded and may be used only for infill drilling wherever necessary.

Core-Drilling Methods

Core drilling techniques uses diamond drilling methods. In this technique, a hollow cylindrical drill bit impregnated with industrial diamonds is attached to a series of metal drill rods and rotated under controlled downward pressure. A circle of rock is ground away, the cutting removed by water flushing and a cylindrical core remains in the hollow centre of the drill string. Core drilling is the only satisfactory means of obtaining representative samples of ores at depth for analysis.

No Go Option

Gono Africa Mining (Pty) Ltd intends on prospecting the proposed area in order to determine availability of minerals applied for. Should it be determined that proposed prospecting area has economic value, prospecting operations will contribute to job creation within the Ventersdorp area. The proposed prospecting operations will also assist with the establishment of small/medium businesses, infrastructure development, community development and poverty eradication in the

surrounding communities. The applicant envisaged that, minerals applied for might be present on this property and therefore is applying for a prospecting right.

H) A full description of the process followed to reach the proposed development footprint within the approved site, including:

i. Details of all alternatives considered.

After several consultations between the EAP, the developer and investors, it is concluded that there is high probability of Iron Ore, Manganese Ore and Gold Ore occurring within the farm and therefore applicant would like to commence with the prospecting activities after competent authority approved the application.

ii. Details of the public participation process undertaken in terms of regulation 41 of the Regulations, including copies of the supporting documents and inputs.

Advertisement and Notices

1. Newspaper advertisement

An advertisement has placed in English at the local newspaper (Platinum Weekly) on the **27 January 2023** notifying the public of the EIA process and requesting Interested and Affected Parties (I&APs) to register with and submit their comments to Murara Environmental Consultants Pty Ltd. I&APs have been given the opportunity to raise comments within 30 days the advertisement released (**see appendix 3**).

2. Site notices

Site notices have been placed as anticipated on site in English to inform surrounding communities and immediately adjacent landowners about the proposed project. The site notices placed on the **26 January 2023** and I&APs have been given the opportunity to raise comments within the specified timeframes, **see the appendix 3.**

3. Direct notification and circulation of Basic Assessment Report to identified I&Aps

Identified I&APs, including key stakeholders representing various sectors, have been directly informed of the proposed development and, the availability of the **Basic Assessment Report** via registered post on **27 January 2023** and were requested to submit comments by email.

The hard copies also made available to the various stakeholders. The following stakeholders were also consulted:

- Department of Economic Development, Environment, Conservation and Tourism
- Department of Water & Sanitation (DWS)
- Department of Mineral Resource and Energy
- Northwest Department of Agriculture
- Provincial Heritage Resources Agency (PHRA), Northwest
- Municipal Manager at the JB Marks Local Municipality
- Dr Kenneth Kaunda District Municipality
- Ward Councilor
- Department of Rural Development and Land reform

It is expected from I&APs to provide their inputs and comments within 30 days after receipt of the notification or Basic Assessment Report and EMPr. When the comment period ended, all comments received will be included in the final Basic Assessment Report & EMPr and submitted to the competed authority.

iii. SUMMARY OF ISSUES RAISED BY I&APS

(Complete the table summarizing comments and issues raised, and reaction to those responses)

Interested and Affected Parties **List the names of persons consulted in this column, and** **Mark with an X where those who must be consulted were in fact consulted.**		**Issues raised**	**EAPs response to issues as mandated by the applicant**	**Section and paragraph reference in this report where the issue and or response where incorporated**
Organization	**Contact person**			
Landowner				
1. Jupie Kluyts Trust (portion 1)	Kluyts Jacob Francois	Not yet available	Not yet available	The applicant will engage the Land Owner with regard to the proposed project.

2. Goedgedacht – FJIM CC (Portion 2) 3. Grand select 153 CC (Portion 3)	Mostert Johan Wilhelm Joubert David Hercules	Not yet available Not yet available	Not yet available Not yet available	The applicant will engage the Land Owner with regard to the proposed project. The applicant will engage the Land Owner with regard to the proposed project.
The Municipality in which jurisdiction the development is located				
JB Marks Local Municipality	Municipal Manager	Not yet available	Not yet available	Not yet available
Dr. Kenneth Kaunda District Municipality	Municipal Manager	Not yet available	Not yet available	Not yet available
Municipal councilor of the ward in which the site is located				

Ward Councilor	Ward councilor	Not yet available	No yet available	Not yet available
Organs of state having jurisdiction				
The Department of Water & Sanitation (DWS)	Theunissen Cornia	Not yet available	Not yet available	Not yet available
Department of Economic Development, Environment, Conservation and Tourism	Lebo Diale and Ellis Thebe	Not yet available	Not yet available	Not yet availabl
Department of Mineral Resource and Energy	Mr Nethwadzi Phumudzo	Not yet available	Not yet available	Not yet available

(IV) The environmental attributes associated with the alternatives focusing on the geographical, physical, biological, social, economic, heritage and cultural aspects.

The application area is situated in Magisterial District of Ventersdorp, North West Province.

- **ARCHAEOLOGICAL AND CULTURAL HERITAGE THEME**

According to screening tool report, the area shows low sensitivity in terms of archaeological and cultural heritage however should any archaeological and cultural heritage materials discovered, the applicant must immediately cease the mining activities and report to the relevant competent authority.

- **GEOLOGY AND TOPOGRAPHY**

Manganese, Iron ore and Gold ore minerals of the Lichtenburg – Ventersdorp area occur mainly as sinuous ridges or 'runs' and in isolated sinkholes that occur almost entirely on a flat to very gently 6 southward sloping surfaces developed on chert-rich and chert-poor formations of the Malmani Subgroup dolomites of the Transvaal Supergroup. The topography of the application area comprises of, and undulating slopes dissected by prominent rocky chert ridges. The Ventersdorp rifting lasted about 50 million years, beginning with the eruption of the Klipriviersberg Group basalts at about 2714 ± 8 Ma (Armstrong et al., 1991).

The proposed prospecting area falls under Carletonville Dolomite Grassland (Gh15). The dolomite surface is overlain by basal Rooihoogte formation breccias, followed by quartzites and conglomerates of the Timeball Hill and Boshoek Formations, and Hekpoort Formation volcanics, all part of the Pretoria Group. These are preserved to the north of the dolomites as east-west orientated ridges decreasing in elevation into the Bushveld Basin. On the south of the Lichtenburg – Ventersdorp area, the Malmani dolomites overlie the Black Reef Formation, at the base of the Transvaal Supergroup, and further south are Ventersdorp and Witwatersrand Supergroups rocks, respectively.

They occur from close to Randfontein in the east to midway between Lichtenburg, Venterdorp and Mahikeng, over an area of approximately150 km (east-west) by 40 km (north-south). In the west, around Lichtenburg, the runs are orientated northeast-southwest; in the central part, near Ventersdorp, they are almost north-south; and close to Randfontein west-northwest east-southeast. Reworked or younger gravels occur to the south along the Mooi River as terraces, and as a palaeochannel to the southwest near Mahikeng.

- **CONSERVATION STATUS**

The area is considered vulnerable with target of 24%. The proposed project is adjacent to Somerville private nature receive. Small extent conserved in statutory reserves (Sterkfontein Caves—part of the Cradle of Humankind World Heritage Site, Oog Van Malmanie, Abe Bailey, Boskop Dam, Schoonspruit, Krugersdorp, Olifantsvlei, Groenkloof) and in at least six private conservation areas. Almost a quarter already transformed for cultivation, by urban sprawl. Erosion very low (84%) and low (15%) (Mucina & Rutherford, 2006).

- **CLIMATE**

The study area is situated within the summer rainfall region of South Africa and within the medium rainfall band of 600+ mm to 800 mm per annum. The general climate of the study site is similar to that of Pretoria. Climatic registers show that Pretoria normally receives about 573 mm of rain per year, with most rainfall occurring during summer. The area normally receives the lowest rainfall (0 mm) in June and the highest (110 mm) in January. The average midday temperatures for Pretoria range from 18,3 °C in June, to 27,5 °C in January. The region is the coldest during July when temperatures drop on average to around 1,7 °C during the night. Frost is not uncommon in the area of the study site during the cold, winter months, but not frequent (www.saexplorer.co.za). The prospecting area is situated within the temperate interior climatic zone, but relatively close to the cold interior zone of South Africa.

- **ENVIRONMENTAL SENSITIVITY**

The screening tool report shows that the following themes are sensitive within the area:

The screening tool report shows that the following sensitive themes;

- Aquatic biodiversity- very high sensitive
- Terrestrial- very high sensitive
- Palaeontology- very high sensitive
- Animal species- high sensitive
- Agricultural- high sensitive
- Plant species- low sensitive
- Civil aviation-low sensitive
- Defence-low sensitive
- Archaeological and cultural heritage-low sensitive

v) The impacts and risks identified for each alternative, including the nature, significance, consequences, extent, duration, and probability of the impacts including the degree to which these impacts;

(a) Can be reversed;

(b) May cause irreplaceable loss of resources; and

(c) Can be avoided, managed or mitigated;

Significance of potential impacts

The following sections present the outcome of the significance rating implementation. The results suggest that the prospecting activities will have a minimal impact on the natural vegetation and the agricultural activities.

Pre-Construction Phase

Direct impacts: During this phase, minor negative impacts are foreseen over the short term. The site preparation may result in the temporary loss or fragmentation of indigenous natural fauna and flora, loss or fragmentation of habitats, minimal soil erosion, heritage, hydrology, and temporary noise disturbance, generation of waste, and risk to safety of livestock, and increased risk of veld fires. The abovementioned impacts are discussed in more detail below:

- **Destruction or fragmentation of habitats**

It is noted that the proposed prospecting site is mostly covered in natural vegetation. Faunal species will primarily be affected due to loss of habitat, which in this case will be minimal.

Loss or fragmentation of habitats	**Pre-mitigation impact rating**	**Post mitigation impact rating**
Status (positive or negative)	Negative	Negative
Extent	Site (1)	Site (1)

Probability	Definite (4)	Probable (3)
Duration	Long term (3)	Long term (3)
Magnitude	Medium (2)	Medium (2)
Reversibility	Partly reversible (2)	Completely reversible (1)
Irreplaceable loss of resources	Significant loss of resource (3)	Marginal loss of resource (2)
Cumulative impact	Medium cumulative impacts (3)	
Significance	**Negative low (32)**	**Negative low (26)**
Can impacts be mitigated?	The impact can be mitigated and the person responsible to the environmental management must make sure that no alien invasive species are being introduced to the prospecting area.	

- **Increase in vehicle traffic**

The movement of heavy vehicles during the clearance of vegetation and topsoil has the potential to damage local farm roads and create dust and safety impacts for other road users in the area. Access will be obtained from a gravel road passing through. The volume of traffic along this road is low to medium and the movement of heavy vehicles along this road is likely to damage the road surface and impact on other road users.

Increase in vehicle traffic	Pre-mitigation impact rating	Post mitigation impact rating
Status (positive or negative)	Negative	Negative

Extent	Local (2)	Site (1)
Probability	Probable (3)	Possible (2)
Duration	Medium term (2)	Medium term (2)
Magnitude	High (3)	Medium (2)
Reversibility	Completely reversible (1)	Completely reversible (1)
Irreplaceable loss of resources	No loss of resource (1)	No loss of resource (1)
Cumulative impact	Medium cumulative impact (3). If damage to roads is not repaired, then this will affect the farming activities in the area and result in higher maintenance costs for vehicles of local farmers and other road users. The costs will be borne by road users who were no responsible for the damage. There will be also an improvement on the gravel road as it is badly damaged.	
Significance	**Negative medium impacts (36)**	**Negative low (20)**
Can impacts be mitigated?	The potential impacts associated with heavy vehicles can be effectively mitigated. The mitigation measures include: • The contractor must ensure that damage caused by construction on the off-gravel roads. The costs associated with the repair must be borne by the contractor. • Dust suppression measures must be implemented for heavy vehicles such as wetting of gravel roads on a regular basis and ensuring that vehicles used to transport sand and building materials are fitted with tarpaulins or covers. • All vehicles must be road-worthy, and drivers must be qualified and made aware of the potential road safety issues and need for strict speed limits.	

- **Temporary noise disturbance**

The generation of noise over a period of months will occur due to preparation of the prospecting activity. There will be noise coming from machinery, people, and vehicles. The noise impact is unlikely to be significant; but activities should be limited to normal working days and hours (6:00 – 17:30).

Temporary noise disturbance	**Pre-mitigation impact rating**	**Post mitigation impact rating**
Status (positive or negative)	Negative	Negative
Extent	Local (2)	Local (2)
Probability	Definite (4)	Probable (3)
Duration	Medium term (1)	Medium term (1)
Magnitude	Medium (2)	Low (1)
Reversibility	Completely reversible (1)	Completely reversible (1)
Irreplaceable loss of resources	No loss of resource (1)	No loss of resource (1)
Cumulative impact	Low cumulative impact (2).	
Significance	**Negative low (22)**	**Negative low (10)**
Can impacts be mitigated?	The mitigation measures can be implemented related to noise pollution.	

- **Loss, destruction or fragmentation of indigenous natural fauna and flora:**

Loss or fragmentation of indigenous natural fauna and flora	**Pre-mitigation impact rating**	**Post mitigation impact rating**
Status (positive or negative)	Negative	Negative
Extent	Local (1)	Local (1)
Probability	Definite (4)	Possible (2)
Duration	Long-term (3)	Long-term (3)
Magnitude	Medium (3)	Medium (2)
Reversibility	Partly reversible (2)	Partly reversible (2)

Irreplaceable loss of resources	Significant loss of resource (3)	Marginal loss of resource (2)
Cumulative impact	Medium cumulative impacts (3)	
Significance	**Negative medium (48)**	**Negative low (26)**
Can impacts be mitigated?	The potential impacts associated with this should be effectively mitigated. The aspects that should be covered include: • The footprint associated with the construction related activities (access roads, construction platforms, workshop etc.) should be confined to the fenced off area and minimized where possible. • All areas disturbed by construction related activities, such as upgrading of the access roads on the site, construction platforms, workshop area etc., should be rehabilitated at the end of the construction phase. • The implementation of a rehabilitation programme should be included in the terms of reference for the contractor/s appointed. Specifications for the rehabilitation area provided throughout the EMPr – section (f) of the EMPr.	

- **Loss <u>Loss of topsoil</u>**

  Topsoil may be lost due to poor topsoil management during construction related soil profile disturbance.

Loss of topsoil	**Pre-mitigation impact rating**	**Post mitigation impact rating**
Status (positive or negative)	Negative	Negative
Geographical extent	Local (2)	Site (1)
Probability	Possible (2)	Unlikely (1)
Duration	Long term (3)	Short term (1)
Magnitude	High (3)	Medium (2)

Reversibility	Barely reversible (3)	Partly reversible (2)
Irreplaceable loss of resources	Significant (3)	Marginal (2)
Cumulative impact	Medium cumulative impacts (3)	
Significance	**Negative medium (48)**	**Negative low (20)**
Can impacts be mitigated?	The following mitigation measures are provided: • If an activity will mechanically disturb below surface in any way, then any available topsoil should first be stripped from the entire surface and stockpiled for re-spreading during rehabilitation. • Topsoil stockpiles must be conserved against losses through erosion by establishing vegetation cover on them. • Dispose of all subsurface spoils from excavations where they will not impact on undisturbed land. • During rehabilitation, the stockpiled topsoil must be evenly spread over the entire disturbed surface. • Erosion must be controlled where necessary on top soiled areas.	

- **Generation of waste**

  The workers on site are likely to generate general waste such as packaging, food wastes, bottles etc. Construction waste is likely to consist of packaging, cement, and scrap metals etc. The applicant will need to ensure that general and construction waste is appropriately disposed of i.e., taken to the nearest licensed landfill. Sufficient ablution facilities will have to be provided, in the form of portable toilets. No pit latrines, French drain systems or soak away systems shall be allowed.

Generation of waste	**Pre-mitigation impact rating**	**Post mitigation impact rating**
Status (positive or negative)	Negative	Negative

Extent	Local/district (2)	Local/district (2)
Probability	Definite (4)	Definite (4)
Duration	Medium term (1)	Medium term (1)
Magnitude	Medium (2)	Low (1)
Reversibility	Partly reversible (2)	Partly reversible (2)
Irreplaceable loss of resources	No loss of resource (1)	No loss of resource (1)
Cumulative impact	Medium cumulative impact (3) - An additional demand for landfill space could result in significant cumulative impacts if services become unstable or unavailable, which in turn would negatively impact on the local community.	
Significance	**Negative medium (26)**	**Negative low (13)**
Can impacts be mitigated?	Yes, it is therefore important that all management actions and mitigation measures included in section (f) of the EMPr are implemented.	

- **Impacts on heritage objects**

  Special attention will be given to the identification of possible cultural or heritage resources on site. Heritage resources including archaeological and paleontological sites over 100 years old, graves older than 60 years, structure older than 60 years are protected by the National Heritage Resources Act no 25 of 1999. Therefore, if such resources are found during the prospecting or development activities, they shall not be disturbed without a permit from the relevant heritage resource Authority, which means that before such sites are disturbed by development it is incumbent on the developer to ensure that a heritage impact assessment is done and the Provincial Heritage Resources Authority and SAHRA must be contacted immediately, and work must stop.

Impacts on heritage objects	**Pre-mitigation impact rating**	**Post mitigation impact rating**
Status (positive or negative)	Negative	Negative
Extent	Local (2)	Local (2)
Probability	Possible (2)	Possible (2)
Duration	Short term (1)	Short term (1)
Magnitude	Very high (4)	High (3)

Reversibility	Irreversible (4)	Irreversible (4)
Irreplaceable loss of resources	Significant loss of resources (3)	No loss of resource (1)
Cumulative impact	The impact would result in negligible to no cumulative effects (1).	
Significance	**Negative high (52)**	**Negative medium (33)**
Can impacts be mitigated?	If archaeological sites or graves are exposed during construction work, it should immediately be reported to a heritage practitioner so that an investigation and evaluation of the finds can be made.	

- **Increased risk of veld fires**

  The presence of construction workers and construction-related activities on the site poses an increased risk of grass fires that could in turn pose a threat to livestock, crops, wildlife, farmsteads, and the communities in the area. In the process, infrastructure may also be damaged or destroyed and human lives threatened. The potential risk of grass fires was heightened by the windy conditions in the area, especially during the dry, windy winter months from May to October. In terms of potential mitigation measures, a firebreak should be made available around the perimeter of the site prior to the commencement of the construction phase. In addition, fire-fighting equipment should be provided on site during the construction phase.

Increased risk of veld fires	**Pre-mitigation impact rating**	**Post mitigation impact rating**
Status (positive or negative)	Negative	Negative
Extent	Region (3)	Local (2)
Probability	Probable (3)	Possible (2)
Duration	Medium term (2)	Medium term (2)
Magnitude	Very high (4)	Low (1)
Reversibility	Partly reversible (2)	Completely reversible (1)
Irreplaceable loss of resources	Significant loss of resource (3)	Marginal loss of resource (2)
Cumulative impact	Negligible cumulative effects (1), provided losses are compensated for.	

Significance	Negative medium (56)	Negative low (10)
Can impacts be mitigated?	The mitigation measures include: • A firebreak should be constructed around the perimeter of the site prior to the commencement of the construction phase. • Contractor should ensure that open fires on the site for cooking or heating are not allowed except in designated areas. • Contractor to ensure that construction related activities that pose a potential fire risk, such as welding, are properly managed and are confined to areas where the risk of fires has been reduced. Measures to reduce the risk of fires include avoiding working in high wind conditions when the risk of fires is greater. In this regard special care should be taken during the high-risk dry, windy winter months. • Contractor to provide must adequate firefighting equipment on-site, including a fire fighting vehicle. • Contractor to provide fire-fighting training to selected construction staff. • No construction staff, with the exception of security staff, to be accommodated on site overnight. • As per the conditions of the Code of Conduct, in the advent of a fire being caused by construction workers and or construction activities, the appointed contractors must compensate farmers for any damage caused to their farms. The contractor should also compensate the firefighting costs borne by farmers and local authorities.	

Operational/construction Phase

Direct impacts: During the operational phase the study area will serve as prospecting area and the impacts are generally associated with soil erosion, change in land use, impacts associated with increase in storm water runoff, increased consumption of water and the generation of general waste, potential impact on tourism and noise disturbance. The operational phase will also have a direct positive impact through the provision of permanent employment opportunities and facilitating a positive economic growth. The abovementioned impacts are discussed in detail below:

- **Soil erosion**

  The largest risk factor for soil erosion will be during the operational phase when doing prospecting activities ensues and soil is left bare until rehabilitation is initiated. Erosion will be localized within the site. This exposes the top layer of the soil into runoff during the heavy winds and rainfall threatening to wash away more fertile soils. In turn such may ultimately lead to the irretrievable commitment of this resource. The measurable effect of reducing erosion by utilizing mitigation measures may reduce possible erosion significantly.

Soil erosion		**Pre-mitigation impact rating**	**Post mitigation impact rating**
Status (positive or negative)		Negative	Negative
Extent		Local (2)	Site (1)
Probability		Probable (3)	Possible (2)
Duration		Medium term (2)	Medium term (2)
Magnitude		Medium (2)	Low (1)
Reversibility		Partly reversible (2)	Partly reversible (2)
Irreplaceable loss of resources		Marginal loss of resource (2)	Marginal loss of resource (2)
Cumulative impact		Low cumulative effects (2) should these impacts occur, there will be a cumulative impact on the air and water resources in the study area in terms of pollution.	
Significance		**Negative medium (26)**	**Negative Low (11)**

Can impacts be mitigated?		Yes, to avoid soil erosion it will be a good practice to not remove all the vegetation at once but to only clear the area to be mined at the time, then remediated and move to another area. • The following mitigation or management measures are provided: Implement an effective system of run-off control, where it is required, that collects and safely disseminates run-off water from all hardened surfaces and prevents potential down slope erosion. • Monitor area frequently after heavy rainfall to determine where erosion may be initiated and mitigate by modifying the soil micro-topography and re-vegetation or soil erosion control efforts accordingly

- **<u>Change in land-use</u>**

  The proposed area will still be used for prospecting.

Change in land use	**Pre-mitigation impact rating**	**Post mitigation impact rating**
Status (positive or negative)	Negative	Negative
Extent	Local (2)	Local (2)
Probability	Possible (2)	Possible (2)
Duration	Medium term (2)	Medium term (2)
Magnitude	Medium (2)	Medium (2)
Reversibility	Completely reversible (1)	Completely reversible (1)
Irreplaceable loss of resources	Marginal loss of resource (2)	Marginal loss of resource (2)
Cumulative impact	Low cumulative effects (2)	
Significance	**Negative medium (22)**	**Negative low (22)**
Can impacts be mitigated?	The applicant should establish a Rehabilitation Fund to be used for rehabilitating the area once the proposed facility	

	has been decommissioned. The fund should be funded by revenue generated during the operational phase of the project.

- **Generation of alternative land use income**

  Income generated through the prospecting of Iron Ore, Manganese Ore and Gold ore will provide the subsistence farmers with increased cash flow and rural livelihood.

Generation of alternative land use income	**Pre-mitigation impact rating**	**Post mitigation impact rating**
Status (positive or negative)	Positive	Positive
Geographical extent	Site (1)	Local (2)
Probability	Definite (4)	Definite (4)
Duration	Long term (3)	Long term (3)
Magnitude	Medium (2)	Medium (2)
Reversibility	Completely reversible (1)	Completely reversible (1)
Irreplaceable loss of resources	No loss of resources (1)	No loss of resources (1)
Cumulative impact	Low cumulative impact (2).	
Significance	**Positive Low (24)**	**Positive Low (26)**
Can impacts be mitigated?	No mitigation required.	

- **Increase in storm water runoff**

  The development will potentially result in an increase in storm water run-off that needs to be managed to prevent soil erosion, especially where vegetation will be cleared. Not all the vegetation should be removed at once. Only the specific trench being excavated at the specific time should be cleared.

Increase in storm water runoff	**Pre-mitigation impact rating**	**Post mitigation impact rating**
Status (positive or negative)	Negative	Negative
Extent	Local (2)	Site (1)

Probability	Probable (3)	Unlikely (1)
Duration	Long term (3)	Medium term (2)
Magnitude	Medium (2)	Low (1)
Reversibility	Partly reversible (2)	Partly reversible (2)
Irreplaceable loss of resources	Significant loss of resource (3)	Marginal loss of resource (2)
Cumulative impact	Medium cumulative impact (3) - Should these impacts occur, there will be cumulative impacts on the wider area.	
Significance	**Negative medium (32)**	**Negative low (11)**
Can impacts be mitigated?	Yes. Not all the vegetation should be removed at once. Only the specific trench being excavated at the specific time should be cleared.	

- **Increased consumption of water**

Additional water requirements related to the portable water supply for employees and workers. Water will also be used for dust suppression.

Increased consumption of water	**Pre-mitigation impact rating**	**Post mitigation impact rating**
Status (positive or negative)	Negative	Negative
Extent	Region (3)	Region (3)
Probability	Definite (4)	Definite (4)
Duration	Long term (3)	Long term (3)
Magnitude	High (3)	Medium (2)
Reversibility	Irreversible (4)	Irreversible (4)
Irreplaceable loss of resources	Significant loss of resources (3)	Significant loss of resources (3)
Cumulative impact	High cumulative impacts (4) - An additional demand on water sources could result in a significant cumulative impact with regards to the availability of water.	
Significance	**Negative high (63)**	**Negative medium (42)**

Can impacts be mitigated?	Yes, management actions and mitigation measures related to the use of water must be implemented. Water must be used for dust suppression and human consumption.

- **Generation of waste**

Approximately 20 Workers sourced from the surrounding villages will be present on site from 6:00 – 17:30, Monday to Saturday. Sources of general waste will be waste food, packaging, paper, etc. General waste will be stored on the site and removed on a weekly basis by a contractor appointed by the applicant.

Generation of waste	**Pre-mitigation impact rating**	**Post mitigation impact rating**
Status (positive or negative)	Negative	Negative
Extent	Local (2)	Local (2)
Probability	Definite (4)	Definite (4)
Duration	Long term (3)	Long term (3)
Magnitude	Low (1)	Low (1)
Reversibility	Partly reversible (2)	Partly reversible (2)
Irreplaceable loss of resources	No loss of resource (1)	No loss of resource (1)
Cumulative impact	Medium cumulative impact (3) - An additional demand for landfill space could result in significant cumulative impacts with regards to the availability of landfill space.	
Significance	**Negative low (15)**	**Negative low (15)**
Can impacts be mitigated?	Yes, General waste will be stored on the site and removed on a weekly basis by a contractor appointed by the applicant.	

- **Noise disturbance**

The proposed prospecting activities will result in the generation of noise over a period of 2-3 years. Sources of noise are likely to include vehicles, the use of machinery such as back actors, crushers

and screeners and people working on the site; but the prospecting activities should be limited to normal working days and some Saturdays between hours (6:00 – 17:30).

Temporary noise disturbance	Pre-mitigation impact rating	Post mitigation impact rating
Status (positive or negative)	Negative	Negative
Extent	Local (2)	Local (2)
Probability	Definite (4)	Possible (2)
Duration	Medium term (2)	Medium term (2)
Magnitude	Medium (2)	Medium (2)
Reversibility	Completely reversible (1)	Completely reversible (1)
Irreplaceable loss of resources	No loss of resource (1)	No loss of resource (1)
Cumulative impact	The impact would result in negligible to no cumulative effects (1).	
Significance	**Negative low (22)**	**Negative low (18)**
Can impacts be mitigated?	Yes	

- **Potential impact on tourism**

The tourism sector is regarded as an important economic sector in the North West Province. The tourism potential of the area is linked to the area's natural resources, including the relatively undisturbed scenery and landscape. The impact of the proposed prospecting of Iron Ore, Manganese Ore and Gold oreon the areas with mitigation is likely to be low.

Potential impacts on tourism	Pre-mitigation impact rating	Post mitigation impact rating
Status (positive or negative)	Negative	Negative
Extent	Site (1)	Site (1)
Probability	Possible (2)	Possible (2)

Duration	Medium term (2)	Medium term (2)
Magnitude	medium (2)	Low (1)
Reversibility	Completely reversible (1)	Completely reversible (1)
Irreplaceable loss of resources	N/A	N/A
Cumulative impact	N/A	
Significance	**Negative low (12)**	**Negative low (6)**
Can impacts be mitigated?	No mitigation required	

Decommissioning Phase (Mine Closure and Rehabilitation)

The physical environment will benefit from the closure of the prospecting area.

- **Rehabilitation of the physical environment**

The physical environment will benefit from the closure of the prospecting area. There is a slight chance to restore the site to its natural state, however rehabilitation will be done concurrently with all activities.

Rehabilitation of the physical environment	**Pre-mitigation impact rating**	**Post mitigation impact rating**
Status (positive or negative)	Positive	Positive
Extent	Site (1)	Site (1)
Probability	Definite (4)	Definite (4)
Duration	Long term (3)	Long term (3)
Magnitude	High (3)	High (3)

Reversibility	N/A	N/A
Irreplaceable loss of resources	N/A	N/A
Cumulative impact	The impact would result in negligible to no cumulative effects (1)	
Significance	**Negative low (27)**	**Negative low (27)**
Can impacts be mitigated?	No mitigation measures required.	

- **Loss of employment**

It is likely that number of workers employed during the construction and operational phase, will negatively impacted by the decommissioning of the facility.

Loss of employment	**Pre-mitigation impact rating**	**Post mitigation impact rating**
Status (positive or negative)	Negative	Negative
Extent	Local (2)	Local (2)
Probability	Possible (2)	Possible (2)
Duration	Medium term (2)	Short term (1)
Magnitude	High (3)	Medium (2)
Reversibility	Partly reversible (2)	Partly reversible (2)
Irreplaceable loss of resources	No loss of resource (1)	No loss of resource (1)
Cumulative impact	The impact would result in negligible to no cumulative effects (1)	
Significance	**Negative medium (30)**	**Negative low (18)**

Can impacts be mitigated?	The following mitigation measures are recommended: • Gono Africa Mining (Pty) Ltd should establish an Environmental Rehabilitation Trust Fund to cover the costs of decommissioning and rehabilitation of disturbed areas. • All structures and infrastructure associated with the proposed facility should be dismantled and transported off-site on decommissioning.

Indirect impacts: No indirect impacts are anticipated from the decommissioning phase of the proposed development.

vi) The methodology used in deter prospecting and ranking the nature, significance, consequences, extent, duration and probability of potential environmental impacts and risks associated with the alternatives;

Method of environmental assessment

The environmental assessment aims to identifying various possible environmental impacts which could results from the proposed prospecting activities. As a result, there is a need to evaluate such impacts in terms of its significance and by doing so it provides the opportunity for most critical issues to be addressed.

Significance-is determined through a synthesis of impact characteristics, which include context and intensity of an impact. Context- refers to the geographical scale i.e. site, local, national or global whereas intensity is defined by the severity of the impact e.g. the magnitude of deviation from background conditions, the size of the area affected, the duration of the impact and the overall probability of occurrence. Significance is calculated as shown in the Table below.

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 total number of points scored for each impact indicates the level of significance of the impact.

Impact Rating System

Impact assessment takes into consideration the nature, scale and duration of impacts on the environment whether such impacts are positive or negative. Impact assessed based on the following project phases:

- Construction
- Operation
- Decommissioning

Where necessary, the proposal for mitigation or optimization of an impact should be detailed. A brief discussion of the impact and the rationale behind the assessment of its significance should also be included. The rating system is applied to the potential impacts on the receiving environment and includes an objective evaluation of the mitigation of the impact. In assessing the significance of each impact, the following criteria is used:

The rating system

NATURE		
This covers brief description of the impact of environmental parameter that has to be assessed in the context of the project. It includes a brief written statement of the environmental aspect being impacted upon by a particular action or activity.		
PROBABILITY		
Defined as the chance of an impact to occur.		
1	Unlikely	Chance of the impact occurring is extremely low (Less than a 25% chance of occurrence).
2	Possible	The impact may occur (Between a 25% to 50% chance of occurrence).
3	Probable	The impact will likely occur (Between a 50% to 75% chance of occurrence).

4	Definite	Impact will certainly occur (Greater than a 75% chance of occurrence).
DURATION		
This describes the duration of the impacts. Duration indicates the lifetime of the impact as a result of the proposed activity.		
1	Short term	The impact will either disappear with mitigation or will be mitigated through natural processes in a span shorter than the construction phase (0 – 1 years), or the impact will last for the period of a relatively short construction period and a limited recovery time after construction, thereafter it will be entirely negated (0 – 2 years).
2	Medium term	The impact will continue or last for some time after the construction phase but will be mitigated by direct human action or by natural processes thereafter (2 – 10 years).
3	Long term	The impact and its effects will continue or last for the entire operational life of the development but will be mitigated by direct human action or by natural processes thereafter (10 – 30 years).
4	Permanent	The only class of impact that will be non-transitory. Mitigation either by man or natural process will not occur in such a way or such a time span that the impact can be considered indefinite.
INTENSITY/ MAGNITUDE		
This describes the severity of an impact.		
1	Low	Impact affects the quality, use and integrity of the system/component in a way that is barely perceptible.
2	Medium	Impact changes the quality, use and integrity of the system/component whereas system/component still continues to function in a moderately modified way and maintains general integrity (some impact on integrity).

3	High	Impact affects the continued viability of the system/ component, and the quality, use, integrity and functionality of the system or component is severely impaired and may temporarily cease. High costs of rehabilitation and remediation.
4	Very high	Impact affects the continued viability of the system/component, and the quality, use, integrity and functionality of the system or component permanently ceases and is irreversibly impaired. Rehabilitation and remediation often impossible. If possible, rehabilitation and remediation often unfeasible due to extremely high costs of rehabilitation and remediation.
IRREPLACEABLY		
This describes the degree to which resources will be irreplaceably lost as a result of a proposed activity.		
1	No loss of resource	The impact will not result in the loss of any resources.
2	Marginal loss of resource	The impact will result in marginal loss of resources.
3	Significant loss of resources	The impact will result in significant loss of resources.
4	Complete loss of resources	The impact is result in a complete loss of all resources.
REVERSIBILITY		
This describes the degree to which an impact can be successfully reversed upon completion of the proposed activity.		
1	Completely reversible	The impact is reversible with implementation of minor mitigation measures.

2	Partly reversible	The impact is partly reversible but more intense mitigation measures are required.
3	Barely reversible	The impact is unlikely to be reversed even with intense mitigation measures.
4	Irreversible	The impact is irreversible, and no mitigation measures exist.
CUMULATIVE EFFECT		
It describes the cumulative effect of the impacts. A cumulative impact is an effect which on its own may not be significant but become significant if added to other existing or potential impacts emanating from other similar or diverse activities as a result of the project activity in question.		
1	Negligible cumulative impact	The impact would result in negligible to no cumulative effects.
2	Low cumulative impact	The impact would result in insignificant cumulative effects.
3	Medium cumulative impact	The impact would result in minor cumulative effects.
4	High cumulative impact	The impact would result in significant cumulative effects
SIGNIFICANCE		
Significance is determined through a synthesis of impact characteristics. 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 calculation of the significance of an impact uses the following formula: (Extent + probability + reversibility + irreplaceability + duration + cumulative effect) x magnitude/intensity.		

The summation of the different criteria will produce a non-weighted value. By multiplying this value with the magnitude/intensity, the resultant value acquires a weighted characteristic which can be measured and assigned a significance rating.		
Points	Impact significance rating	Description
6 to 28	Negative low impact	The anticipated impact will have negligible negative effects and will require little to no mitigation.
6 to 28	Positive low impact	The anticipated impact will have minor positive effects.
29 to 50	Negative medium impact	The anticipated impact will have moderate negative effects and will require moderate mitigation measures.
29 to 50	Positive medium impact	The anticipated impact will have moderate positive effects.
51 to 73	Negative high impact	The anticipated impact will have significant effects and will require significant mitigation measures to achieve an acceptable level of impact.
51 to 73	Positive high impact	The anticipated impact will have significant positive effects.
74 to 96	Negative very high impact	The anticipated impact will have highly significant effects and are unlikely to be able to be mitigated adequately. These impacts could be considered "fatal flaws".
74 to 96	Positive very high impact	The anticipated impact will have highly significant positive effects.

(vii) Positive and negative impacts that the proposed activity and alternatives will have on the environment and on the community that may be affected focusing on the geographical, physical, biological, social, economic, heritage and cultural aspects;

- Increased noise levels resulting from prospecting activities and increased traffic movement during all operational phases.
- Potential water and soil pollution impacts resulting from hydrocarbon spills and soil erosion which may impact on environmental resources utilized by communities, landowners and other stakeholders.

- Potential water and soil pollution impacts resulting from hydrocarbon spills and soil erosion which may impact on ecosystem functioning.
- Increased vehicle activity within the area resulting in the possible minor destruction and disturbance of fauna and flora.
- Potential visual impacts caused by operational activities.
- Loss and fragmentation of the vegetation community (including portions of a Vulnerable vegetation type).
- Interference with existing land uses.

(viii) The possible mitigation measures that could be applied and level of residual risk.

Negative impacts on vegetation, soil and the water resources associated with the prospecting activity have been identified through the BAR & EMPr process. Mitigation measures are set out in the Environmental Management Programme (EMPr) and will be implemented in order to minimize these potential impacts.

- Noise

Site activities must take place during the day (06:00 – 17:30) to avoid nighttime noise disturbances and night time collisions with fauna.

- Visual impact

Dust suppression measures must be implemented.

- Soil

Disturbances to soil should be limited as far as possible.

- Topsoil should be stockpiled in a proper manor and no alien invasive species should be allowed to grow on the stockpiles. Should alien invasive species identified, remedial action must be undertaken to prevent further development of such species.
- Erosion control measures should be implemented where necessary.
- Oils and lubricants must be stored in lined containment structures.
- Drip trays should be used where necessary.
- Waste bins should be provided, and waste should be removed and disposed of at a licensed landfill site.

- Rehabilitation should be done concurrently.

➢ Water

- Erosion control measures should be implemented if necessary.
- Oils and lubricants must be stored in lined containment structures to avoid leakage which may results in water pollution.
- Drip trays should be used where necessary.

(ix) Matrix analysis

The matrix describes the relevant listed activities, the aspects of the development that will apply to the specific listed activity, a description of the environmental issues and potential impacts, the significance and magnitude of the potential impacts, and the mitigation of the potential impacts. The matrix also highlights areas of particular concern, which requires more in-depth assessment. Each cell is evaluated individually in terms of the nature of the impact, duration, and its significance – should no mitigation measures be applied. This is important since many impacts would not be considered insignificant if proper mitigation measures were implemented. The matrix also provides an indication if mitigation measures are available.

In order to conceptualize the different impacts, the matrix specify the following:

- **Stressor**: Indicates the aspect of the proposed activity, which initiates and cause impacts on elements of the environment.
- **Receptor**: Highlights the recipient and most important components of the environment affected by the stressor.
- **Impacts**: Indicates the net result of the cause-effect between the stressor and receptor.
- **Mitigation**: Impacts need to be mitigated to minimize the effect on the environment.

(x) Motivation where no alternative sites were considered

Based on the previous studies conducted within the vicinity of the site and desktop study, applicant conclude that there is availability of Iron Ore, Manganese Ore, and Gold ore. Furthermore, the probability is very high to encounter more Iron Ore, Manganese Ore, and Gold ore.

(xi) A concluding statement indicating the preferred alternatives, including preferred location of the activity.

The site is preferred due to its possibility of having the minerals applied for. This area is also suitable for agriculture and grazing due to the climatic conditions.

(i) Description of the process undertaken to identify, assess and rank the impacts the activity will impose on the preferred location through the life of the activity, including.

i) A description of all environmental issues and risks that were 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:

J. AN ASSESSMENT OF EACH IDENTIFIED POTENTIALLY SIGNIFICANT IMPACT AND RISK

LISTED ACTIVITY (The Stressor)	ASPECTS OF THE DEVELOPMENT /ACTIVITY	POTENTIAL IMPACTS			SIGNIFICANCE AND MAGNITUDE OF POTENTIAL IMPACTS			MITIGATION OF POTENTIAL IMPACTS	SPECIALIST STUDIES / INFORMATION
		Receptors		Impact description	Minor	Major	Duration	Possible Mitigation	
CONSTRUCTION PHASE									
GNR. No. 327 Activity 27 *The clearance of an area of 1hectares or more, but less than 20 hectares of indigenous vegetation, except where such clearance of indigenous vegetation is required for-* *(i) the undertaking of a linear activity; or* *(ii) Maintenance purposes undertaken in accordance with a maintenance management plan.* ***GNR. No. 327 Activity 20 as amended:*** *Any activity including the operation of that activity which requires a prospecting right in terms of section 16 of the Mineral*	Site clearing and preparation Areas earmarked for prospecting will need to be cleared, topsoil will be stockpiled separately.	BIOPHYSICAL ENVIRONMENT	Fauna & Flora	• Loss or fragmentation of indigenous natural vegetation. • Loss of sensitive species. • Loss or fragmentation of habitats.	-		L	Yes	-
			Air	• Air and dust pollution due to the increase of traffic of construction vehicles.	-		S	Yes	-
			Soil	• Soil degradation, including erosion. • Loss of topsoil. • Disturbance of soils and existing land use (soil compaction).		-	S	Yes	-
			Geology	• It is not foreseen that the removal of indigenous vegetation will impact on the geology or vice versa.	N/A	N/A	N/A	N/A	-
			Existing services infrastructure	• Generation of waste that need to be accommodated at a licensed landfill site. • Generation of sewage that need to be accommodated by the local sewage plant.	-		S	Yes	-
			Ground water	• Pollution due to construction vehicles.	-		S	Yes	-
			Surface water	• Increase in storm water run-off. • Pollution of water sources due to soil erosion. • Destruction of watercourses (pans/dams/streams).	-		S	Yes	-
		SOCIAL/ ECONOMIC ENVIRO	Local unemployment rate	• Job creation. • Business opportunities. • Skills development.		+	S	Yes	-

and Petroleum Resources Development Act, 2002 (Act No. 28 of 2002), including- *(a) associated infrastructure, structures and earthworks, directly related to prospecting of a mineral resource or 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)]* *(b) The primary processing of a mineral resource including winning, extraction, classifying, concentrating, crushing, screening or washing; but excluding the secondary processing of a mineral resource, including the smelting, beneficiation, reduction, refining, calcining or gasification of the mineral resource in which case activity 6 in Listing Notice 2 applies.*			Visual landscape	• Potential visual impact on residents of farmsteads and motorists in close proximity to proposed facility.		-	S	Yes	-
			Traffic volumes	• Increase in construction vehicles.	-		S	Yes	-
			Health & Safety	• Air/dust pollution. • Road safety. • Increased risk of veld fires.		-	S	Yes	-
			Noise levels	• The generation of noise as a result of construction vehicles, the use of machinery such as drills, excavators, rotary pans, dumper trucks and people working on the site.		-	S	Yes	-
			Tourism industry	• Since there are tourism facilities in close proximity to the site, the construction activities might have an impact on tourism in the area.	-		M	Yes	-
			Heritage resources	• Removal or destruction of archaeological and/or paleontological sites. • Removal or destruction of buildings, structures, places and equipment of cultural significance. • Removal or destruction of graves, cemeteries and burial grounds.	-		S	Yes	-

	Site clearing and preparation Areas earmarked for prospecting will need to be cleared, topsoil will be stockpiled separately. This will inevitably result in the removal of indigenous vegetation located on the site.	BIOPHYSICAL ENVIRONMENT	Fauna & Flora	• Loss or fragmentation of indigenous natural vegetation. • Loss of sensitive species. • Loss or fragmentation of habitats.	-	-	L	Yes	-
			Air quality	• Air and dust pollution due to the increase of traffic.	-		M	Yes	-
			Soil	• Soil degradation, including erosion. • Disturbance of soils and existing land use (soil compaction). • Loss of agricultural potential (low significance relative to agricultural potential of the site).	-		M	Yes	-
			Geology	• It is not foreseen that the removal of indigenous vegetation will impact on the geology or vice versa. • Blasting may affect the geology		-	L	Yes	-
			Existing services infrastructure	• Generation of waste that need to be accommodated at a licensed landfill site. • Generation of sewage that need to be accommodated by the local sewage plant.	-		M	Yes	-
			Ground water	• Pollution due to construction vehicles • Pollution due to blasting	-		S	Yes	-
			Surface water	• Increase in storm water run-off. • Pollution of water sources due to soil erosion. • Destruction of watercourses (pans/dams/streams).	-		M	Yes	-
		SOCIAL/ECONOMIC ENVIRONMENT	Local unemployment rate	• Job creation. • Skills development.		+	S	N/A	-
			Visual landscape	• Potential visual impact on visual receptors in close proximity to proposed facility.		-	M	Yes	-
			Traffic volumes	• Increase in construction vehicles.		-	S	Yes	-

			Health & Safety	• Air/dust pollution. • Road safety.		-	S	Yes	-
			Noise levels	• The generation of noise as a result of construction vehicles, and people working on the site.	-		S	Yes	-
			Tourism industry	• Since there are tourism facilities in close proximity to the site, the construction activities might have an impact on tourism in the area.	-		M	Yes	-
			Heritage resources	• Removal or destruction of archaeological and/or paleontological sites. • Removal or destruction of buildings, structures, places and equipment of cultural significance. • Removal or destruction of graves, cemeteries, and burial grounds.	-		S	Yes	-
OPERATIONAL PHASE									
	The key components of the proposed project are described below: • <u>Supporting Infrastructure</u> - A control facility with basic services such as water and electricity will be constructed on the site. Other supporting infrastructure includes a site office and workshop area.	BIOPHYSICAL ENVIRONMENT	Fauna & Flora	• Fragmentation of habitats. • Establishment and spread of declared weeds and alien invader plants (operations).		-	L	Yes	-
			Air quality	• Air pollution due to the prospecting activity, crusher plant, transport of the gravel to the designated areas and possible blasting.	-	-	M	Yes	-
			Soil	• Soil degradation, including erosion. • Disturbance of soils and existing land use (soil compaction). • Loss of agricultural potential (low significance relative to agricultural potential of the site).	-		M	Yes	-
			Geology	• Collapsible soil. • Seepage (shallow water table). • Active soil (high soil heave). • Erodible soil. • The presence of undermined ground. • Instability due to soluble rock. • Steep slopes or areas of unstable natural slopes. • Areas subject to seismic activity. • Areas subject to flooding. • Blasting		-	L	Yes	-

	• Roads – there will be usage of an existing access road • Fencing - For health, safety and security reasons, the facility will be required to be fenced off from the surrounding farm.		Existing services infrastructure	• Generation of waste that need to be accommodated at a licensed landfill site. • Generation of sewage that need to be accommodated by the municipal sewerage system and the local sewage plant. • Increased consumption of water.		-	M	Yes	-
			Ground water	• Leakage of hazardous materials. The machinery on site requires oils and fuel to function. Leakage of these oils and fuels can contaminate water supplies. • Pollution due to blasting	-		L	Yes	-
			Surface water	• Increase in storm water runoff. The development will potentially result in an increase in storm water run-off that needs to be managed to prevent soil erosion. • Destruction of watercourses (pans/dams/streams). • Leakage of hazardous materials. The machinery on site requires oils and fuel to function. Leakage of these oils and fuels can contaminate water supplies.	-		L	Yes	-
		SOCIAL/ECONOMIC ENVIRONMENT	Local unemployment rate	• Job creation. Security guards will be required for 24 hours every day of the week and general laborers will also be required for the cleaning of the panels. • Skills development.		+	L	Yes	-
			Visual landscape	• The proposed portions are used for livestock grazing which will still take place simultaneously with the prospecting activity, however this depends on the location of the activity.	-		L	Yes	-
			Traffic volumes	• Increase in vehicles collecting gravel for distribution.	-		S	Yes	-
			Health & Safety	• Air/dust pollution. • Road safety.		-	S	Yes	-
			Noise levels	• The proposed development will result in noise pollution during the operational phase.		-	M	Yes	-

			Tourism industry	• Since there are tourism facilities in close proximity to the site, the operational activities might have an impact on tourism in the area.		-	M	Yes	-
			Heritage resources	• It is not foreseen that the proposed activity will impact on heritage resources or vice versa.	-		S	Yes	-
DECOMMISSIONING PHASE									
	Mine closure During the mine closure the Mine and its associated infrastructure will be dismantled. Rehabilitation of biophysical environment The biophysical environment will be rehabilitated.	BIOPHYSICAL ENVIRONMENT	Fauna & Flora	• Re-vegetation of exposed soil surfaces to ensure no erosion in these areas.		+	L	Yes	-
			Air quality	• Air pollution due to the increase of traffic of construction vehicles.	-		S	Yes	-
			Soil	• Backfilling of all voids • Placing of topsoil on backfill		+	L	Yes	-
			Geology	• It is not foreseen that the decommissioning phase will impact on the geology of the site or vice versa.	N/A	N/A	N/A	N/A	-
			Existing services infrastructure	• Generation of waste that need to be accommodated at the local landfill site. • Generation of sewage that need to be accommodated by the municipal sewerage system and the local sewage plant. • Increase in construction vehicles.	-		S	Yes	-
			Ground water	• Pollution due to construction vehicles.	-		S	Yes	-
			Surface water	• Increase in storm water run-off. • Pollution of water sources due to soil erosion. • Destruction of watercourses (pans/dams/streams).	-		S	Yes	-
		SOCIAL/ECONOMIC ENVIRONMENT	Local unemployment rate	• Loss of employment.		-	L	Yes	-
			Visual landscape	• Potential visual impact on visual receptors in close proximity to proposed facility.	-		S	Yes	-
			Traffic volumes	• Increase in construction vehicles.	-		S	Yes	-

			Health & Safety	• Air/dust pollution. • Road safety. • Increased crime levels. The presence of mine workers on the site may increase security risks associated with an increase in crime levels as a result of influx of people in the rural area.	-		S	Yes	-
			Noise levels	• The generation of noise as a result of construction vehicles, the use of machinery and people working on the site.	-		S	Yes	-
			Tourism industry	• Since there are tourism facilities in close proximity to the site, the decommissioning activities might have an impact on tourism in the area.		+	M	Yes	-
			Heritage resources	• It is not foreseen that the decommissioning phase will impact on any heritage resources.	-		S	Yes	-

(N/A) No impact (+) Positive Impact (-) Negative Impact (S) Short Term (M) Medium Term (L) Long Term

K) Where applicable, a summary of the findings and impact management measures identified in any specialist report complying with Appendix 6 to these Regulations and an indication as to how these findings and recommendations have been included in the final report;

No specialist studies to be conducted on the proposed area. It must also be noted that the concurrent rehabilitation will be implemented immediately. Small area will be impacted and rehabilitated concurrently.

L) An environmental impact statement which contains:

i. Summary of the key findings of the environmental impact assessment

Upon the granting of environmental authorisation, the applicant must strictly adhere to the conditions outlined on the environmental authorisation and other relevant stakeholders due to the nature of the area.

ii. Final site map

The map of proposed area will be provided at an appropriate scale which superimposes the overall activity, and its associated structures and infrastructures. Refer to Map plan is attached in **Appendix 2**

iii. Summary of the positive and negative implications and risks of the proposed activity and identified alternatives

- Increased noise levels
- Potential water and soil pollution impacts.
- Potential loss of fauna and flora.
- Increased vehicle activities
- Increased dust levels.
- Minimal impact on biodiversity
- Increase in water consumption and possible depletion of groundwater resources.
- Potential visual impacts.

All possible negative impacts and risks that have been identified in this report can be effectively mitigated and managed by implementing the mitigation measures as set out in the Environmental Management Programme (EMPr) attached in Part B. Therefore, this section provides a summary of the assessment and conclusions drawn from the proposed prospecting of Iron Ore, Manganese

Ore and Gold ore on the area. No alternative was identified as the applicant has deep understanding of the minerals to be mined underneath.

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 authorisation*)

No specialist studies will be conducted; the boreholes activity will have minimal impact in the area.

N) Aspects for inclusion as conditions of Authorisation.

- The operational activities and relevant rehabilitation of disturbed areas should be monitored against the improved EMPr and all other relevant environmental legislation.
- A copy of the EMPr should be always made available onsite.
- Implementation of the proposed mitigation measures set out in the EMPr must be implemented.

O) Description of any assumptions, uncertainties, and gaps in knowledge. *(Which relate to the assessment and mitigation measures proposed).*

The EAP will ensure that sufficient information is provided to relevant parties to make an informed decision. Should the additional information needed to be provided to competent authority, such information will be provided by EAP and corresponded will be done to the applicant.

P) Reasons as to whether the proposed activity should or should not be authorised.

The reason not to approve the activities will result in a significant loss of valuable minerals and as well as many other economic benefits. There will also be creation of job opportunities for local people as a result of mining operations. Once when the operation commences, there will increase in the economy of the area, thereby improving the standard of living for the surrounding communities.

Q) Where the proposed activity does not include operational aspects, the period for which the Environmental Authorisation is required, date on which the activity will be concluded, and the post construction monitoring requirements finalised.

The prospecting activities will be conducted for a minimum of 3 years after the environmental authorization has been approved.

R) Undertaking

The undertaking required to meet the requirements of this section is provided at the end of the EMPr and is applicable to both the Environmental Impact Assessment report and the Environmental Management Programme report.

I, **Nepawe Mbavhalelo** (EAP) herewith confirm

I. the correctness of the information provided in the reports ☒
II. the inclusion of comments and inputs from stakeholders and I&APs ; ☒
III. the inclusion of inputs and recommendations from the specialist reports where relevant; ☒ and
IV. the acceptability of the project in relation to the finding of the assessment and level of mitigation proposed; ☒

Signature of the environmental assessment practitioner:

Murara Environmental Consultants (Pty) Ltd

Name of company:

Date: 27 January 2023

S) Where applicable, details of any financial provision for the rehabilitation, closure, and ongoing post decommissioning management of negative environmental impacts.

Attached as **appendix 4**

T) Any specific information that may be required by the competent authority; and

No information required

U) Any other matters required in terms of section 24(4)(a) and (b) of the Act.

No information required

PART B

ENVIRONMENTAL MANAGEMENT PROGRAMME REPORT

A. Details of the EAP

i) The EAP who prepared the report

ii) Expertise of the EAP

Name of Practitioner	Qualifications	Contact details
Mbavhalelo Nephawe	Masters in Environmental Sciences in University of Venda (Refer to **Appendix 1**)	064 954 8869
	National Diploma in Safety Management (UNISA) (Refer to **Appendix 1**)	

B) DESCRIPTION OF THE ASPECTS OF THE ACTIVITY

Prospecting right: Only 10 (Ten) boreholes with depth of 100m will be drilled and each borehole will cover the area of 10m X 20 square meters.

C) COMPOSITE MAP

The map is attached as **Appendix 2**

D) DESCRIPTION OF IMPACT MANAGEMENT OBJECTIVES INCLUDING MANAGEMENT STATEMENTS

A description of the impact management objectives, including management statements, identifying the impacts and risks that need to be avoided, managed, and mitigated as identified through the environmental impact assessment process for all phases of the development including:

i) Planning and design;

(ii) Pre-construction activities;

(iii) Construction activities;

(iv) Rehabilitation of the environment after construction and where applicable post closure; and

(v) Where relevant, operation activities;

- **Description of the impact management objectives**

Closure objectives for the proposed prospecting of Iron Ore, Manganese Ore and Gold ore will aim to ensure that the residual post-closure impacts be minimized and be acceptable to relevant parties. To achieve these closure objectives, the following will be implemented:

- To create a landscape that is self-sustaining and over time will evolve to the desired ecosystem structure, function, and composition.
- All prospecting related infrastructure, foundations and concrete areas will be decommissioned, removed from the site, and appropriately disposed. Reclaimable structures such as metal, electrical installations or equipment will be sold for re-use or as scrap.
- All disturbed areas within the site not already vegetated will be re-vegetated with appropriate indigenous, ecologically adapted species appropriate to the area and the final land use as soon as possible after operation ceases.
- To ensure that surface infrastructure and prospecting residue and/or disturbances that are present at processing plant decommissioning will be removed and/or stabilised in a manner that these will not compromise post-closure land use and be sustainable long-term landforms.
- Conducting soil clean-up/remediation to ensure that the planned land use could be implemented and maintained.
- Shaping of embankments and trenches to safe slopes and reintegrating of these into surrounding topography.
- To ensure that the overall rehabilitated prospecting site is free draining
- Transferring prospecting related surface infrastructure to third parties for beneficial use after closure.
- To ensure that the rehabilitated prospecting site will display, at a minimum, an acceptable aesthetic appearance that would not compromise the planned land use e.g., Rehabilitated prospecting residues that are suitably landscaped, blending with the surrounding environment as far as possible and shaped and rehabilitated terrace and hard stand areas, roughly emulating the local natural surface topography.

- **Impacts to be mitigated in their respective phases**

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

ACTIVITIES	**PHASE**	**SIZE AND SCALE of disturbance**	**MITIGATION MEASURES**	**COMPLIANCE WITH STANDARDS**	**TIME PERIOD FOR IMPLEMENTATION**
(E.g. prospecting of Magnesite- drill site, site camp, ablution facility, accommodation, equipment storage, sample storage, site office, access route **etc…etc…etc** **E.g. For prospecting**,- excavations, blasting, stockpiles, discard dumps or dams, Loading, hauling and	(Operation in which activity will take place. State; Planning and design, Pre-Construction' Construction, Operational,	(volumes, tonnages and hectares or m²)	(describe how each of the recommendations in herein will remedy the cause of pollution or degradation and migration of pollutants)	(A description of how each of the recommendations herein will comply with any prescribed environmental management standards or practices that have been identified by Competent Authorities)	Describe the time period when the measures in the environmental management programme must be implemented Measures must be implemented when required. With regard to Rehabilitation specifically this must take place at the earliest opportunity. .With regard to Rehabilitation, therefore state either:-

transport, Water supply dams and boreholes, accommodation, offices, ablution, stores, workshops, processing plant, storm water control, berms, roads, pipelines, power lines, conveyors, etc…etc…etc.)	Rehabilitation, Closure, Post closure).				Upon cessation of the individual activity Or. Upon the cessation of prospecting, bulk sampling or Magnesite prospecting as the case may be.
Clearance of vegetation for drilling boreholes	05 boreholes will be drilled during the phase construction and operation phase	0.2 ha of 3600.34 ha is the total areas that will be disturbed and where prospecting activities takes place, will be cleared.	1. Site clearing must take place in a phased manner, as and when required. 2. Areas which are not to be mined on within two months must not be cleared to reduce erosion risks. 3. The area to be cleared must be clearly demarcated and this footprint strictly maintained. 4. Spoil that is removed from the site must be removed to an approved spoil site or a licensed landfill site.	Compliance with Duty of Care as detailed within NEMA	Duration of operations on the prospecting activities.

Upgrading of the existing roads	There will be an upgrading and maintenance of the existing road.		1. Planning of access routes to the site for upgrading purposes shall be done in conjunction with the Contractor and the Landowner. All agreements reached should be documented and no verbal agreements should be made. The Contractor shall clearly mark all access roads. Roads not to be used shall be marked with a "NO ENTRY" sign, for prospecting vehicles. 2. Upgraded routes and required access roads must be clearly defined. 3. Damping down of the un-surfaced roads must be implemented to reduce dust and nuisance. 4. Soils compacted during the upgrading activities shall be deep ripped to loosen compacted layers and re-graded to even running levels.	Compliance with Duty of Care as detailed within NEMA	Duration of operations on the prospecting activities.

			5. The contractor must ensure that damage caused by related traffic during the construction is repaired continuously. The costs associated with the repair must be borne by the contractor; 6. Dust suppression measures must be implemented for heavy vehicles, for example wetting of gravel roads on a regular basis and ensuring that vehicles used to transport the gravel are fitted with tarpaulins or covers. 7. All vehicles must be road-worthy, and drivers must be qualified and made aware of the potential road safety issues and need for strict speed limits.		
Prospecting of Iron Ore, Manganese Ore and Gold Ore - Soils and geology	Prospecting, (construction and operation phase)	Only 0.2 ha of 3600 ha is the areas where proposed activities will take	1. The Contractor should, prior to the commencement of earthworks determine the average depth of topsoil (If topsoil exists) and agree on this with the ECO. The full depth of topsoil should be stripped	Compliance with Duty of Care as detailed within NEMA	Duration of operations on the proposed prospecting area.

		place and must be cleared.	from areas affected by construction and related activities prior to the commencement of major earthworks. This should include the building footprints, working areas and storage areas. Topsoil must be reused where possible to rehabilitate disturbed areas. 2. Care must be taken not to mix topsoil and subsoil or any other material, during stripping. 3. The topsoil must be conserved on site in and around the pit/trench area. 4. Subsoil and overburden in the prospecting area should be stockpiled separately to be returned for backfilling in the correct soil horizon order. 5. If stockpiles are exposed to windy conditions or heavy rain, they should be covered either by vegetation or geofabric,		

			depending on the duration of the project. Stockpiles may further be protected by the construction of berms, trenches or low brick walls around their bases. 6. Stockpiles should be kept clear of weeds and alien vegetation growth by regular weeding (to avoid wide spread of alien plants within the area).		

E) Impact Management Outcomes

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

ACTIVITY (Whether listed or not listed). **(e.g. Excavations, blasting, stockpiles, discard dumps or dams, Loading,**	**POTENTIAL IMPACT** **(e.g. dust, noise, drainage surface disturbance, fly rock, surface water contamination, groundwater**	**ASPECTS AFFECTED**	**PHASE** In which impact is anticipated **(e.g. Construction,**	**MITIGATION** **TYPE** **(modify, remedy, control, or stop)** **through** **(e.g. noise control measures, storm-water control, dust control,**	**STANDARD TO BE ACHIEVED** **(Impact avoided, noise levels, dust levels, rehabilitation standards, end use objectives) etc.**

hauling and transport, Water supply dams and boreholes, accommodation, offices, ablution, stores, workshops, processing plant, storm water control, berms, roads, pipelines, power lines, conveyors, etc…etc…etc.).	**contamination, air pollution etc….etc…)**		**commissioning, operational** **Decommissioning, closure, post-closure)**	**rehabilitation, design measures, blasting controls, avoidance, relocation, alternative activity etc. etc)** **E.g.** • **Modify through alternative method.** • **Control through noise control** • **Control through management and monitoring** • **Remedy through rehabilitation.**	
Clearance of vegetation	Loss or fragmentation of habitats	Fauna & flora	Drilling of boreholes phase(construction and operation phase)	**Existing vegetation** 1. Vegetation removal must be limited only to the prospecting area. 2. Vegetation to be removed as it becomes necessary rather than removal of all vegetation throughout the site in one step. 3. No vegetation to be used for firewood.	Minimisation of impacts to acceptable limits

				4. Exotic and invasive plant species should not be allowed to establish should the proposed project approved. 5. There should be a preconstruction walk-through of the development footprint/project site in order to locate individuals of plant species of conservation concern. A search and rescue exercise must be done to locate and relocate any protected species to a suitable and similar habitat where these plants can grow without any disturbance. **Rehabilitation** 6. All damaged areas shall be rehabilitated upon completion of the contract. 7. Re-vegetation of the disturbed site is aimed at approximating as near as possible the natural vegetative conditions prevailing prior to construction.	

				8. All natural areas impacted during the prospecting must be rehabilitated with locally indigenous plants typical of the representative botanical unit. 9. Rehabilitation must take place in a phased approach as soon as possible. 10. Rehabilitation process must make use of species indigenous to the area. Seeds from surrounding seed banks can be used for re-seeding. 11. Rehabilitation must be executed in such a way that ensures surface run-off will not cause erosion of disturbed areas. 12. Planting of indigenous tree species in areas not to be cultivated or built on must be encouraged. **Demarcation of prospecting area**	

				13. All plants not interfering with prospecting operations must be left undisturbed, clearly marked and indicated on the site plan. 14. The proposed area must be well demarcated, and no prospecting activities must be allowed outside of this demarcated footprint. 15. Vegetation removal must be phased in order to reduce impact of construction. 16. Site office and laydown areas must be clearly demarcated, and no encroachment must occur beyond demarcated areas. 17. Strict and regular auditing of the construction process to ensure containment of the construction and laydown areas. 18. Soils must be kept free of petrochemical solutions that may be kept on site during construction. Spillage can result in a loss of soil	

				functionality thus limiting the re-establishment of flora. **Utilization of resources** 19. Gathering of firewood, fruit, medicinal plants, or any other natural material onsite or in areas adjacent to the site is prohibited unless with prior approval of the ECO. **Exotic vegetation** 20. Alien vegetation on the site will need to be removed. 21. The Contractor should be responsible for implementing a programme of weed control (particularly in areas where soil has been disturbed); and grassing of any remaining stockpiles to prevent weed invasion.	

				22. The spread of exotic species occurring throughout the site should be controlled. 23. Weed control measures must be applied to eradicate any noxious weeds (category 1a &1b species) on disturbed areas. **Herbicides** 24. Herbicide use shall only be allowed according to contract specifications. The application shall be according to set specifications and under supervision of a qualified technician. The possibility of leaching into the surrounding environment shall be properly investigated and only environmentally friendly herbicides shall be used.	

				25. The use of pesticides and herbicides on the site must be discouraged as this impact on important pollinator species of indigenous vegetation. **Fauna** 26. Rehabilitation to be undertaken as soon as possible after the prospecting activities have been completed. 27. No trapping or snaring to fauna during construction on site should be allowed. 28. No faunal species must be disturbed, trapped, hunted or killed by maintenance staff during any routine maintenance at the development. 29. Any fauna threatened by the construction and operation activities should be removed to	

				safety by the ECO or appropriately qualified environmental officer. 30. All construction vehicles should adhere to a low-speed limit (<30km/h) to avoid collisions with susceptible species such as rabbits, snakes and tortoises. 31. If trenches need to be dug for electrical cabling or other purposes, these should not be left open for extended periods of time to avoid falling of fauna on the trenches and trapped inside. Trenches which are exposed should contain soil ramps allowing fauna to escape the trench.	
Prospecting of Iron Ore, Manganese Ore and Gold ore and the excavations	Loss of topsoil	Soil	Drilling of boreholes phase-(construction and operation phase)	1. The Contractor should, prior to the commencement of earthworks determine the average depth of topsoil and agree on this with the ECO. The full depth of topsoil should be stripped from areas affected by construction and related activities prior to the	Minimisation of impacts to acceptable limits

				commencement of major earthworks. This should include the building footprints, working areas and storage areas. Topsoil must be reused where possible to rehabilitate disturbed areas. 2. Care must be taken not to mix topsoil and subsoil or any other material, during stripping. 3. The topsoil must be conserved on site in and around the pit/trench area. 4. Subsoil and overburden in the prospecting area should be stockpiled separately to be returned for backfilling in the correct soil horizon order. 5. If stockpiles are exposed to windy conditions or heavy rain, they should be covered either by vegetation or geofabric, depending on the duration of the project. Stockpiles may further be protected by the construction of	

				berms or low brick walls around their bases. 6. Stockpiles should be kept clear of weeds and alien vegetation growth by regular weeding. 7. Where contamination of soil is expected, analysis must be done prior to disposal of soil to determine the appropriate disposal route. Proof from an approved waste disposal site where contaminated soils are dumped if and when a spillage/leakage occurs should be attained and given to the project manager. Establish an effective record keeping system for each area where soil is disturbed for prospecting purposes. These records should be included in environmental performance	

				reports and should include all the records below. • Record the GPS coordinates of each area. • Record the date of topsoil stripping. • Record the GPS coordinates of where the topsoil is stockpiled. • Record the date of cessation prospecting activities at the particular site. • Photograph the area on cessation of prospecting activities. • Record date and depth of re-spreading of topsoil. • Photograph the area on completion of rehabilitation and on an annual basis thereafter to show vegetation establishment and evaluate progress of restoration over time.	
	Erosion	Soil, Air and Water	-(construction and operation phase)	1. An effective system of run-off control should be implemented,	Minimisation of impacts to acceptable limits

				where it is required, that collects and safely disseminates run-off water from all hardened surfaces and prevents potential down slope erosion. 2. Periodical site inspection should be included in environmental performance reporting that inspects the effectiveness of the run-off control system and specifically records the occurrence of any erosion on site or downstream. 3. Implement an effective system of run-off control, where it is required, that collects and safely disseminates run-off water from all hardened surfaces and prevents potential down slope erosion. 4. Monitor the area regularly after larger rainfall events to determine where erosion may be initiated and then mitigate by modifying the soil micro-topography and re-	

				vegetation or soil erosion control efforts accordingly 5. Wind screening and storm water control should be undertaken to prevent soil loss from the site. 6. The use of silt fences and sand bags must be implemented in areas that are susceptible to erosion. 7. Other erosion control measures that can be implemented are as follows: • Brush packing with cleared vegetation • Mulch or chip packing • Planting of vegetation • Hydro seeding/hand sowing 8. Sensitive areas need to be identified prior to construction in order to implement necessary precautions can be implemented.	

				9. All erosion control mechanisms need to be regularly maintained. 10. Seeding of topsoil and subsoil stockpiles must be done to prevent wind and water erosion of soil surfaces. 11. Retention of vegetation where possible to avoid soil erosion. 12. Vegetation clearance should be phased to ensure that the minimum area of soil is exposed to potential erosion at any one time. 13. Re-vegetation of disturbed surfaces should occur immediately after prospecting activities are completed. This should be done through seeding with indigenous grasses. 14. No impediment to the natural water flow other than approved erosion control works is permitted. 15. To prevent stormwater damage, the increase in stormwater run-off resulting from construction	

				activities must be estimated and the drainage system assessed accordingly. 16. Stockpiles not used in three (3) months after stripping must be seeded or backfilled to prevent dust and erosion.	
	Air Pollution	Air	(Construction and operation phase)	**Dust control** 1. Wheel washing and damping down of un-surfaced and un-vegetated areas. 2. Retention of vegetation where possible will reduce dust travel. 3. Clearing activities must only be done during agreed working times and permitting weather conditions to avoid drifting of sand and dust into neighboring areas. 4. Damping down of all exposed soil surfaces with a water bowser or sprinklers when necessary to reduce dust.	Minimisation of impacts to acceptable limits

				5. The Contractor shall be responsible for dust control on site to ensure no nuisance is caused to the neighboring communities. 6. A speed limit of 30km/h must not be exceeded on site. 7. Any complaints or claims emanating from the lack of dust control shall be attended to immediately by the Contractor. 8. Any dirt roads that are utilized by the workers must be regularly maintained to ensure that dust levels are controlled. **Odour control** 9. Regular servicing of vehicles in order to limit gaseous emissions. 10. Regular servicing of onsite toilets to avoid potential odours. **Rehabilitation**	

				11. The Contractor should commence rehabilitation of exposed soil surfaces as soon as practical after completion of earthworks. **Fire prevention** 12. No open fires shall be allowed on site under any circumstance. All cooking shall be done in demarcated areas that are safe and cannot cause runaway fires. 13. The Contractor shall have operational fire-fighting equipment available on site at all times. The level of firefighting equipment must be assessed and evaluated through a typical risk assessment process.	
	Noise		(Construction and operation phase)	1. The prospecting activities must aim to adhere to the relevant noise regulations and limit noise to within standard working hours in order to reduce disturbance of dwellings in	Minimisation of impacts to acceptable limits

				close proximity to the development. 2. Mine, crushers, workshops, and other noisy fixed facilities should be located well away from noise sensitive areas. Once the proposed final layouts are made available by the Contractor(s), the sites must be evaluated in detail and specific measures designed into the system. 3. Truck traffic should be routed away from noise sensitive areas, where possible. 4. Noise levels must be kept within acceptable limits. 5. Noisy operations should be combined so that they occur where possible at the same time. 6. Mine workers to wear necessary ear protection gear. 7. Noisy activities to take place during allocated hours.	

				8. Noise from laborers must be controlled. 9. Noise suppression measures must be applied to all equipment. Equipment must be kept in good working order and where appropriate fitted with silencers which are kept in good working order. Should the vehicles or equipment not be in good working order, the Contractor may be instructed to remove the offending vehicle or machinery from the site. 10. The Contractor must take measures to discourage laborers from loitering in the area and causing noise disturbance. Where possible laborers shall be transported to and from the site by the Contractor or his Sub-Contractors by the Contractors own transport. 11. Implementation of enclosure and cladding of processing plants.	

				12. Applying regular and thorough maintenance schedules to equipment and processes. An increase in noise emission levels very often is a sign of the imminent mechanical failure of a machine.	
	Impact on potential cultural, heritage artefacts and fossils.	Heritage and Paleontology	(Construction and operation phase)	1. Any discovery of artefacts must be reported to the nearest National Monuments office to comply with the National Heritage Resources Act (Act No 25 of 1999) and to DEFF. 2. Local museums as well as the South African Heritage Resource Agency (SAHRA) should be informed if any artefacts/ fossils are uncovered in the affected area. 3. The Contractor must ensure that his workforce is aware of the necessity of reporting any possible historical, archaeological or palaeontological finds to the ECO so that appropriate action can be taken.	Minimisation of impacts to acceptable limits

				4. Known sites should be clearly marked in order that they can be avoided. The work force should also be informed that fenced-off areas are no-go areas. 5. The ECO must also survey for heritage and palaeontological artefacts during groundbreaking and digging or drilling. He/she should familiarise themselves with formations and its fossils or a palaeontologist should be appointed during the digging and excavation phase of the development. 6. All digging, excavating, drilling, or blasting activities must be stopped if heritage and/or Palaeontological artefacts are uncovered and a specialist should be called in to determine proper management, mitigation, excavation and/or collecting measures.	

				7. Any discovered artefacts or fossils shall not be removed under any circumstances. Any destruction of a site can only be allowed once a permit is obtained, and the site has been mapped and noted. Permits shall be obtained from SAHRA should the proposed site affect any world heritage/paleontology sites or if any heritage/palaeontology sites are to be destroyed or altered. 8. Under no circumstances shall any artefacts be removed, destroyed, or interfered with by anyone on the site; and contractors and workers shall be advised of the penalties associated with the unlawful removal of cultural, historical, archaeological or paleontological artefacts, as set out in the NHRA (Act No. 25 of 1999), Section 51. (1).	

Waste management		Pollution	(Construction and operation phase)	**Litter management** 1. Refuse bins must be placed at strategic positions to ensure that litter does not accumulate within the construction site. 2. The Contractor shall supply waste collection bins where such is not available, and all solid waste collected shall be disposed of at registered/licensed landfill. 3. Good housekeeping practices should be implemented to regularly maintain the litter and rubble situation on the construction site. 4. If possible and feasible, all waste generated on site must be separated into glass, plastic, paper, metal and wood and recycled. An independent contractor can be appointed to conduct this recycling. 5. Littering by the employees of the Contractor shall not be allowed	Minimisation of impacts to acceptable limits

				under any circumstances. The ECO shall monitor the neatness of the work sites as well as the Contractor campsite. 6. Skip waste containers should be maintained on site. These should be kept covered and arrangements made for them to be collected regularly. 7. All waste must be removed from the site and transported to a landfill site promptly to ensure that it does not attract vermin or produce odours. 8. Where a registered waste site is not available close to the construction site, the Contractor shall provide a method statement with regard to waste management. 9. A certificate of disposal shall be obtained by the Contractor and kept on file, if relevant. 10. Under no circumstances may solid waste be burnt on site.	

				11. All waste must be removed promptly to ensure that it does not attract vermin or produce odours. **Hazardous waste** 12. All waste hazardous materials must be carefully stored as advised by the ECO, and then disposed of offsite at a licensed landfill site, where practical. Incineration may be used where relevant. 13. Contaminants to be stored safely to avoid spillage. 14. Machinery must be properly maintained to keep oil leaks in check. 15. All necessary precaution measures shall be taken to prevent soil or surface water pollution from hazardous materials used during construction and any spills shall immediately be cleaned	

				up and all affected areas rehabilitated. **Sanitation** 16. The Contractor shall install mobile chemical toilets on the site. 17. Staff shall be informed to the fact that they should use these facilities at all times. No indiscriminate sanitary activities on site shall be allowed. 18. Toilets shall be serviced regularly, and the ECO shall inspect toilets regularly. 19. Toilets should be no closer than 50m or above the 1:100-year flood line from any natural or manmade water bodies or drainage lines or alternatively located in a place approved of by the Engineer. 20. Under no circumstances may open areas, neighbor's fences or the surrounding bush be used as a toilet facility.	

				21. The construction of “Long Drop” toilets is forbidden, but rather toilets connected to the sewage treatment plant. 22. Potable water must be provided for all construction staff. **Remedial actions** 23. Depending on the nature and extent of the spill, contaminated soil must be either excavated or treated on-site. 24. Excavation of contaminated soil must involve careful removal of soil using appropriate tools/machinery to storage containers until treated or disposed of at a licensed hazardous landfill site. 25. The ECO must determine the precise method of treatment for polluted soil. This could involve the	

				application of soil absorbent materials as well as oil-digestive powders to the contaminated soil. 26. If a spill occurs on an impermeable surface such as cement or concrete, the surface spill must be contained using oil absorbent material. 27. If necessary, oil absorbent sheets or pads must be attached to leaky machinery or infrastructure. 28. Materials used for the remediation of petrochemical spills must be used according to product specifications and guidance for use. 29. Contaminated remediation materials must be carefully removed from the area of the spill so as to prevent further release of petrochemicals to the environment and stored in adequate containers until appropriate disposal.	

Water Use and Quality	Water pollution	Water	(Construction and operation phase)	**Water Use** 1. Develop a sustainable water supply management plan to minimize the impact to natural systems by managing water use, avoiding depletion of aquifers, and minimizing impacts to water users. 2. Water must be reused, recycled, or treated where possible. **Water Quality** 3. The quality and quantity of effluent streams discharged to the environment including stormwater should be managed and treated to meet applicable effluent discharge guidelines. 4. Discharge to surface water should not result in contaminant concentrations in excess of local ambient water quality criteria outside a scientifically established mixing zone.	

				5. Efficient oil and grease traps or sumps should be installed and maintained at refueling facilities, workshops, fuel storage depots, and containment areas and spill kits should be available with emergency response plans. **Stormwater** 6. The site must be managed in order to prevent pollution of drains, downstream watercourses or groundwater, due to suspended solids and silt or chemical pollutants. 7. Silt fences should be used to prevent any soil entering the stormwater drains. 8. Temporary cut off drains and berms may be required to capture stormwater and promote infiltration. 9. Promote a water saving mind set with construction workers in order	

				to Contractor ensure less water wastage. 10. Hazardous substances must be stored at least 100m from any water bodies on site to avoid pollution. 11. The installation of the stormwater system must take place as soon as possible to attenuate stormwater from the construction phase as well as the operation phase. 12. Earth, stone and rubble is to be properly disposed of, or utilized on site so as not to obstruct natural water pathways over the site. i.e. these materials must not be placed in stormwater channels, drainage lines or rivers. 13. There should be a periodic checking of the site's drainage system to ensure that the water flow is unobstructed. 14. If a batching plant is necessary, run-off should be managed	

				effectively to avoid contamination of other areas of the site. Untreated runoff from the batch plant must not be allowed to get into the storm water system or nearby streams, rivers or erosion channels or dongas. **Sanitation** 15. Adequate sanitary facilities and ablutions must be provided for construction workers (1 toilet per every 15 workers). 16. The facilities must be regularly serviced to reduce the risk of surface or groundwater pollution. **Concrete mixing** 17. Concrete contaminated water must not enter soil or any natural drainage system as this disturbs the natural acidity of the soil and affects plant growth.	

				Public areas 18. Food preparation areas should be provided with adequate washing facilities and food refuse should be stored in sealed refuse bins which should be removed from site on a regular basis the steps to ensure that littering by construction workers does not occur and persons should be employed on site to collect litter from the site and immediate surroundings, including litter accumulating at fence lines. 19. No washing of cars at the site.	

F) Impact Management Actions

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

ACTIVITY	**POTENTIAL IMPACT**	**MITIGATION TYPE**	**TIME PERIOD FOR IMPLEMENTATION**	**COMPLIANCE WITH STANDARDS**
Whether listed or not listed. **(E.g. Excavations, blasting, stockpiles, discard dumps or dams, Loading, hauling and transport, Water supply dams and boreholes, accommodation, offices, ablution, stores, workshops, processing plant, storm water control, berms, roads, pipelines, power lines, conveyors, etc.)**.	**(e.g. dust, noise, drainage surface disturbance, fly rock, surface water contamination, groundwater contamination, air pollution etc….etc…)**	**(modify, remedy, control, or stop) through (e.g. noise control measures, storm-water control, dust control, rehabilitation, design measures, blasting controls, avoidance, relocation, alternative activity etc.)** • **Modify through alternative method.** • **Control through noise control** • **Control through management and monitoring** • **Remedy through rehabilitation.**	Describe the time period when the measures in the environmental management programme must be implemented Measures must be implemented when required. With regard to Rehabilitation specifically this must take place at the earliest opportunity. .With regard to Rehabilitation, therefore state either: Upon cessation of the individual activity or upon the cessation of prospecting, bulk sampling	A description of how each of the recommendations in 2.11.6 read with 2.12 and 2.15.2 herein will comply with any prescribed environmental management standards or practices that have been identified by Competent Authorities

			or Magnesite prospecting as the case may be.	
Clearance of vegetation	Loss or fragmentation of habitats	**Existing vegetation** 1. Vegetation removal must be limited to the prospecting site. 2. Vegetation to be removed as it becomes necessary rather than removal of all vegetation throughout the site in one step. 3. No vegetation to be used for firewood. 4. Exotic and invasive plant species should not be allowed to establish should the proposed project approved. 5. There should be a preconstruction walk-through of the development footprint/project site in order to locate individuals of plant species of conservation concern. A search and rescue exercise must be done to locate and relocate any protected species to a suitable and	Duration of operation	The implementation of the recommended mitigation measures will result in the minimisation of impacts to acceptable standards, thereby ensuring compliance with NEMA and Duty of Care as prescribed by NEMA.

		similar habitat where these plants can grow without any disturbance. **Rehabilitation** 6. All damaged areas shall be rehabilitated upon completion of the contract. 7. Re-vegetation of the disturbed site is aimed at approximating as near as possible the natural vegetative conditions prevailing prior to construction. 8. All natural areas impacted during prospecting activities must be rehabilitated with locally indigenous grasses typical of the representative botanical unit. 9. Rehabilitation must take place in a phased approach as soon as possible. 10. Rehabilitation process must make use of species indigenous to the area. Seeds from surrounding		

		seed banks can be used for re-seeding. 11. Rehabilitation must be executed in such a manner that surface run-off will not cause erosion of disturbed areas. 12. Planting of indigenous tree species in areas not to be cultivated or built on must be encouraged. **Demarcation of prospecting area** 13. All plants not interfering with prospecting operations shall be left undisturbed clearly marked and indicated on the site plan. 14. The prospecting area must be well demarcated, and no construction activities must be allowed outside of this demarcated footprint. 15. Vegetation removal must be phased in order to reduce impact of construction/prospecting. 16. Site office and laydown areas must be clearly demarcated, and no		

		encroachment must occur beyond demarcated areas. 17. Strict and regular auditing of the prospecting process to ensure containment of the prospecting and laydown areas. 18. Soils must be kept free of petrochemical solutions that may be kept on site during construction. Spillage can result in a loss of soil functionality thus limiting the re-establishment of flora. **Utilization of resources** 19. Gathering of firewood, fruit, medicinal plants, or any other natural material onsite or in areas adjacent to the site is prohibited unless with prior approval of the ECO.		

		Exotic vegetation 20. Alien vegetation on the site will need to be controlled. 21. The Contractor should be responsible for implementing a programme of weed control (particularly in areas where soil has been disturbed); and grassing of any remaining stockpiles to prevent weed invasion. 22. The spread of exotic species occurring throughout the site should be controlled. 23. Weed control measures must be applied to eradicate any noxious weeds (category 1a &1b species) on disturbed areas. **Herbicides** 24. Herbicide use shall only be allowed according to contract specifications. The application shall be according to set		

		specifications and under supervision of a qualified technician. The possibility of leaching into the surrounding environment shall be properly investigated and only environmentally friendly herbicides shall be used. 25. The use of pesticides and herbicides on the site must be discouraged as these impacts on important pollinator species of indigenous vegetation. **Fauna** 26. Rehabilitation to be undertaken as soon as possible after prospecting has been completed. 27. No trapping or snaring to fauna on the construction/prospecting site should be allowed. 28. No faunal species must be disturbed, trapped, hunted or killed by maintenance staff during any		

		routine maintenance at the development. 29. Any fauna threatened by the construction and operation activities should be removed to safety by the ECO or appropriately qualified environmental officer. 30. All construction vehicles should adhere to a low-speed limit (<30km/h) to avoid collisions with susceptible species such as snakes and tortoises. 31. If trenches need to be dug for electrical cabling or other purposes, these should not be left open for extended periods of time as fauna may fall in and become trapped in them. Trenches which are exposed should contain soil ramps allowing fauna to escape the trench.		
Prospecting of Iron Ore, Manganese Ore and	Loss of top soil	1. The Contractor should, prior to the commencement of earthworks determine the average depth of	Duration of operation	The implementation of the recommended mitigation measures will result in the

Gold ore and excavations		topsoil and agree on this with the ECO. The full depth of topsoil should be stripped from areas affected by construction/prospecting and related activities prior to the commencement of major earthworks. This should include the building footprints, working areas and storage areas. Topsoil must be reused where possible to rehabilitate disturbed areas. 2. Care must be taken not to mix topsoil and subsoil or any other material, during stripping. 3. The topsoil must be conserved on site in and around the pit/trench area. 4. Subsoil and overburden in the prospecting area should be stockpiled separately to be returned for backfilling in the correct soil horizon order.		minimisation of impacts to acceptable standards, thereby ensuring compliance with NEMA and Duty of Care as prescribed by NEMA.

		5. If stockpiles are exposed to windy conditions or heavy rain, they should be covered either by vegetation or geofabric, depending on the duration of the project. Stockpiles may further be protected by the construction of berms or low brick walls around their bases. 6. Stockpiles should be kept clear of weeds and alien vegetation growth by regular weeding. 7. Where contamination of soil is expected, analysis must be done prior to disposal of soil to determine the appropriate disposal route. Proof from an approved waste disposal site where contaminated soils are dumped if and when a spillage/leakage occurs should be attained and given to the project manager. Establish an effective record keeping system for each area where soil is		

		disturbed for prospecting purposes. These records should be included in environmental performance reports and should include all the records below. • Record the GPS coordinates of each area. • Record the date of topsoil stripping. • Record the GPS coordinates of where the topsoil is stockpiled. • Record the date of cessation of prospecting activities at the particular site. • Photograph the area on cessation of prospecting activities. • Record date and depth of re-spreading of topsoil. • Photograph the area on completion of rehabilitation and on an annual basis thereafter to show vegetation establishment and		

		evaluate progress of restoration over time.		
	Erosion	1. An effective system of run-off control should be implemented, where it is required, that collects and safely disseminates run-off water from all hardened surfaces and prevents potential down slope erosion. 2. Periodical site inspection should be included in environmental performance reporting that inspects the effectiveness of the run-off control system and specifically records the occurrence of any erosion on site or downstream. 3. Implement an effective system of run-off control, where it is required, that collects and safely disseminates run-off water from all hardened surfaces and prevents potential down slope erosion.	Duration of operation	The implementation of the recommended mitigation measures will result in the minimisation of impacts to acceptable standards, thereby ensuring compliance with NEMA and Duty of Care as prescribed by NEMA.

		4. Monitor the area regularly after larger rainfall events to determine where erosion may be initiated and then mitigate by modifying the soil micro-topography and re-vegetation or soil erosion control efforts accordingly 5. Wind screening and stormwater control should be undertaken to prevent soil loss from the site. 6. The use of silt fences and sand bags must be implemented in areas that are susceptible to erosion. 7. Other erosion control measures that can be implemented are as follows: • Brush packing with cleared vegetation • Mulch or chip packing • Planting of vegetation • Hydroseeding/hand sowing		

		8. Sensitive areas need to be identified prior to construction so that the necessary precautions can be implemented. 9. All erosion control mechanisms need to be regularly maintained. 10. Seeding of topsoil and subsoil stockpiles to prevent wind and water erosion of soil surfaces. 11. Retention of vegetation where possible to avoid soil erosion. 12. Vegetation clearance should be phased to ensure that the minimum area of soil is exposed to potential erosion at any one time. 13. Re-vegetation of disturbed surfaces should occur immediately after construction/prospecting activities are completed. This should be done through seeding with indigenous grasses. 14. No impediment to the natural water flow other than approved erosion control works is permitted.		

		15. To prevent stormwater damage, the increase in stormwater run-off resulting from construction activities must be estimated and the drainage system assessed accordingly. A drainage plan must be submitted to the Engineer for approval and must include the location and design criteria of any temporary stream crossings. 16. Stockpiles not used in three (3) months after stripping must be seeded /backfilled to prevent dust and erosion.		
.	Air Pollution	**Dust control** 1. Wheel washing and damping down of un-surfaced and un-vegetated areas. 2. Retention of vegetation where possible will reduce dust travel. 3. Clearing activities must only be done during agreed working times and permitting weather conditions	Duration of operation	The implementation of the recommended mitigation measures will result in the minimisation of impacts to acceptable standards, thereby ensuring compliance with NEMA and Duty of Care as prescribed by NEMA.

		to avoid drifting of sand and dust into neighbouring areas. 4. Damping down of all exposed soil surfaces with a water bowser or sprinklers when necessary to reduce dust. 5. The Contractor shall be responsible for dust control on site to ensure no nuisance is caused to the neighbouring communities. 6. A speed limit of 30km/h must not be exceeded on site. 7. Any complaints or claims emanating from the lack of dust control shall be attended to immediately by the Contractor. 8. Any dirt roads that are utilised by the workers must be regularly maintained to ensure that dust levels are controlled. **Odour control** 9. Regular servicing of vehicles in order to limit gaseous emissions.		

		10. Regular servicing of onsite toilets to avoid potential odours. **Rehabilitation** 1. The Contractor should commence rehabilitation of exposed soil surfaces as soon as practical after completion of earthworks. **Fire prevention** 2. No open fires shall be allowed on site under any circumstance. All cooking shall be done in demarcated areas that are safe and cannot cause runaway fires. 3. The Contractor shall have operational fire-fighting equipment available on site at all times. The level of firefighting equipment must be assessed and evaluated through a typical risk assessment process.		
	Noise	1. The prospecting activities must aim to adhere to the relevant noise	Duration of operation	The implementation of the recommended mitigation

		regulations and limit noise to within standard working hours in order to reduce disturbance of dwellings near the development. 2. Pans, power plants, crushers, workshops, and other noisy fixed facilities should be located well away from noise sensitive areas. 3. Truck traffic should be routed away from noise sensitive areas, where possible. 4. Noise levels must be kept within acceptable limits. 5. Noisy operations should be combined so that they occur where possible at the same time. 6. Mine workers to wear necessary ear protection gear. 7. Noisy activities should take place during allocated hours. 8. Noise from laborers to be controlled. 9. Noise suppression measures should be applied to all equipment.		measures will result in the minimisation of impacts to acceptable standards, thereby ensuring compliance with NEMA and Duty of Care as prescribed by NEMA.

		Equipment should be kept orderly and where appropriate fitted with silencers which are kept in good working order. Should the vehicles or equipment not be in good working order, the Contractor may be instructed to remove the offending vehicle or machinery from the site 10. The Contractor must take measures to discourage laborers from loitering in the area and causing noise disturbance. Where possible laborers shall be transported to and from the site by the Contractor using contractors' vehicles. 11. Implementation of enclosure and cladding of processing plants. 12. Applying regular and thorough maintenance schedules to equipment and processes. An increase in noise emission levels		

		very often is a sign of the imminent mechanical failure of a machine.		
	Impact on potential cultural, heritage artefacts and fossils.	4. Any discovery artefacts should be reported to the nearest National Monuments office to comply with the National Heritage Resources Act (Act No 25 of 1999) and to DEFF. G) Local museums as well as the South African Heritage Resource Agency (SAHRA) should be informed if any artefacts/ fossils are uncovered in the affected area. H) The Contractor must ensure that his workforce is aware of the necessity of reporting any possible historical, archaeological or palaeontological finds to the ECO so that appropriate action can be taken. I) Known sites should be clearly marked in order that they can be avoided. The workforce should	Duration of operation	The implementation of the recommended mitigation measures will result in the minimisation of impacts to acceptable standards, thereby ensuring compliance with NEMA and Duty of Care as prescribed by NEMA.

		also be informed that fenced-off areas are no-go areas. J) The ECO must also survey for heritage and paleontological artefacts during ground breaking and digging or drilling. He/she should familiarise themselves with formations and its fossils or a palaeontologist should be appointed during the digging and excavation phase of the development. K) All activities which include excavating, drilling or blasting must immediately cease should heritage and/or paleontological artefacts uncovered, and a specialist should be called in to determine proper management, mitigation, excavation and/or collecting measures. L) Any discovered artefacts or fossils shall not be removed under any circumstances. Any destruction of		

		a site can only be allowed once a permit is obtained, and the site has been mapped and noted. Permits shall be obtained from SAHRA should the proposed site affect any world heritage/palaeontology sites or if any heritage/palaeontology sites are to be destroyed or altered. M) Under no circumstances shall any artefacts be removed, destroyed, or interfered with by anyone on the site; and contractors and workers shall be advised of the penalties associated with the unlawful removal of cultural, historical, archaeological or paleontological artefacts, as set out in the NHRA (Act No. 25 of 1999), Section 51. (1).		

Waste Management		**Litter management** 1. Refuse bins should be made available and placed strategically to ensure that litter does not accumulate within the construction/prospecting site. 2. The Contractor must supply waste collection bins where such is not available, and all solid waste collected shall be disposed of at registered/licensed landfill. 3. Good housekeeping practices should be implemented to regularly maintain the litter and rubble situation on the construction/prospecting site. 4. Where possible, all waste generated on site must be separated into glass, plastic, paper, metal, and wood and recycled. An independent contractor can be appointed to conduct this recycling.	Duration of operation	The implementation of the recommended mitigation measures will result in the minimisation of impacts to acceptable standards, thereby ensuring compliance with NEMA and Duty of Care as prescribed by NEMA.

		5. Littering by the employees must at all costs be avoided and where possible, contractor to put in place measures to prevent littering e.g., penalties for those that will be found littering. The ECO shall monitor the neatness of the work sites as well as the Contractor campsite. 6. Skip waste containers should be maintained on site. These should be kept covered and arrangements made for them to be collected regularly. 7. All waste must be removed from the site and transported to a landfill site promptly to ensure that it does not attract vermin or produce odours. 8. Where a registered waste site is not available close to the construction/prospecting site, the Contractor shall provide a method		

		statement with regard to waste management. 9. A certificate of disposal shall be obtained by the Contractor and kept on file, if relevant. 10. Under no circumstances may solid waste be burnt on site. 11. All waste must be removed promptly to ensure that it does not attract vermin or produce odours. **Hazardous waste** 12. All waste containing hazardous materials must be carefully stored as advised by the ECO, and then disposed of offsite at a licensed landfill site, where practical. Incineration may be used where relevant. 13. Contaminants to be stored safely to avoid spillage. 14. Machinery must be properly maintained to keep oil leaks in check.		

		15. All necessary precaution measures shall be taken to prevent soil or surface water pollution from hazardous materials used during construction/prospecting activities and any spills shall immediately be cleaned up and all affected areas rehabilitated. **Sanitation** 16. The Contractor shall install mobile chemical toilets on the site. 17. Staff shall be informed to the fact that they should use these facilities at all times. No indiscriminate sanitary activities on site shall be allowed. 18. Toilets shall be serviced regularly, and the ECO shall inspect toilets regularly. 19. Toilets should be no closer than 50m or above the 1:100-year flood line from any natural or manmade water bodies or drainage lines or		

		alternatively located in a place approved of by the Engineer. 20. Under no circumstances may open areas, neighbor's fences or the surrounding bush be used as a toilet facility. 21. The contractor must ensure that long drop toilets not used, instead toilets connected to the sewage treatment plant must be used. 22. Potable water should be provided for all construction staff. **Remedial actions** 23. Contaminated soil must be either excavated or treated on-site, this must depend on the nature and extent the spills. 24. Excavation of contaminated soil must involve careful removal of soil using appropriate tools/machinery to storage containers until treated		

		or disposed of at a licensed hazardous landfill site. 25. The ECO must determine the precise method of treatment for polluted soil. This could involve the application of soil absorbent materials as well as oil-digestive powders to the contaminated soil. 26. In case spill occurs on an impermeable surface such as cement or concrete, the surface spill must be contained using oil absorbent material. 27. Where necessary, oil absorbent sheets or pads must be attached to leaky machinery or infrastructure. 28. Materials used for the remediation of petrochemical spills must be used according to product specifications and guidance for use. 29. Contaminated remediation materials must be carefully removed from the area of the spill		

		so as to prevent further release of petrochemicals to the environment and stored in adequate containers until appropriate disposal.		
Water Use and Quality	Water pollution	**Water Use** 1. Develop a sustainable water supply management plan to minimize the impact to natural systems by managing water use, avoiding depletion of aquifers and minimizing impacts to water users. 2. Water must be reused, recycled or treated where possible. **Water Quality** 3. The quality and quantity of effluent streams discharged to the		

		environment including storm water should be managed and treated to meet applicable effluent discharge guidelines. 4. Discharge to surface water should not result in contaminant concentrations in excess of local ambient water quality criteria outside a scientifically established mixing zone. 5. Efficient oil and grease traps or sumps should be installed and maintained at refueling facilities, workshops, fuel storage depots, and containment areas and spill kits should be available with emergency response plans. **Storm water** 6. The site must be managed in order to prevent pollution of drains, downstream watercourses or groundwater, due to suspended		

		solids and silt or chemical pollutants. 7. Silt fences should be used to prevent any soil entering the storm water drains. 8. Temporary cut off drains and berms may be required to capture storm water and promote infiltration. 9. Promote a water saving mind set with construction/prospecting workers in order to Contractor ensure less water wastage. 10. New storm water construction must be developed strictly according to specifications from engineers in order to ensure efficiency. 11. Hazardous substances must be stored at least 20m from any water bodies on site to avoid pollution. 12. The installation of the storm water system must take place as soon as possible to attenuate storm water		

		from the construction phase as well as the operation phase. 13. There should be a periodic checking of the site's drainage system to ensure that the water flow is unobstructed. 14. If a batching plant is necessary, run-off should be managed effectively to avoid contamination of other areas of the site. Untreated runoff from the batch plant must not be allowed to get into the storm water system or nearby streams, rivers or erosion channels or dongas. **Groundwater resource protection** 15. Process solution storage ponds and other impoundments designed to hold non fresh water or un-treated process effluents should be lined and be equipped with sufficient wells to enable		

		monitoring of water levels and quality. **Sanitation** 16. Adequate sanitary facilities and ablutions must be provided for construction workers (1 toilet per every 10 workers). 17. The facilities must be regularly serviced to reduce the risk of surface or groundwater pollution. **Concrete mixing** 18. Concrete contaminated water must not enter soil or any natural drainage system as this disturbs the natural acidity of the soil and affects plant growth. **Public areas** 19. Food preparation areas should be provided with adequate washing facilities and food refuse should be		

		stored in sealed refuse bins which should be removed from site on a regular basis. 20. The Contractor should take steps to ensure that littering by construction workers does not occur and persons should be employed on site to collect litter from the site and immediate surroundings, including litter accumulating at fence lines. 21. No washing or servicing of vehicles on site.		

G) The method of monitoring the implementation of the impact management actions contemplated in paragraph (f);

H) Monitoring and reporting frequency;

I) An indication of the persons who will be responsible for the implementation of the impact management actions;

J) The time periods within which the impact management actions contemplated in paragraph (f) must be implemented;

K) The mechanism for monitoring compliance with the impact management actions contemplated in paragraph (f);

L) A program for reporting on compliance, taking into account the requirements as prescribed by the Regulations;

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
Clearance of vegetation	Loss or fragmentation of habitats	• Conduct regular internal audits • Conduct regular external audits	• Environmental Manager • Suitable qualified environmental auditor	Monitoring should be undertaken for duration of operations. Internal audits should be undertaken at least every 6 months. External audits should be undertaken by a suitably qualified auditor on an annual basis. Reports should be made available to the competent authority if required.
Prospecting of Iron Ore, Manganese Ore and Gold ore and excavations	> Loss of top soil > Erosion > Air Pollution >Noise	• Conduct regular internal audits • Conduct regular external audits	• Environmental Manager • Suitable qualified environmental auditor	Monitoring should be undertaken for duration of operations. Internal audits should be undertaken at least every 6 months. External audits should be undertaken by a suitably qualified auditor on an annual basis. Reports should be made available to the competent

	> Impact on potential cultural-, heritage artefacts and fossils			authority if required. Any archeological artifacts will be reported if found during construction phase
Waste management	Pollution	• Conduct regular internal audits • Conduct regular external audits	• Environmental Manager • Suitable qualified environmental auditor	Monitoring should be undertaken for duration of operations. Internal audits should be undertaken at least every 6 months. External audits should be undertaken by a suitably qualified auditor on an annual basis. Reports should be made available to the competent authority if required.
Water Use and Quality	Water pollution	• Conduct regular internal audits • Conduct regular external audits	• Environmental Manager • Suitable qualified environmental auditor	Monitoring should be undertaken for duration of operations. Internal audits should be undertaken at least every 6 months. External audits should be undertaken by a suitably qualified auditor on an annual basis. Reports should be made available to the competent authority if required.

M. ENVIRONMENTAL AWARENESS PLAN

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

Murara Environmental Consultants will implement an Environmental Awareness Plan which will include various mechanisms for informing employees of environmental risks resulting from their work, including:

- Induction training for full –time staff and contractors.
- Training and skills development
- On the job training regarding environmental issues
- In-house training sessions to be held with relevant employees.

The above measures will be implemented through an Environmental Communication Strategy to be implemented.

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

Murara Environmental Consultants will implement an incident reporting and reporting procedure in order to identify risks timeously and implement actions to avoid or minimize environmental impacts.

N) Specific information required by the Competent Authority

No other requirements have been specified by competent authority and financial provisions will be submitted to the Department of Minerals and Energy and it will be reviewed annually.