



mineral resources

Department:
Mineral Resources
REPUBLIC OF SOUTH AFRICA

BASIC ASSESSMENT REPORT AND ENVIRONMENTAL MANAGEMENT PROGRAMME REPORT

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

NAME OF APPLICANT: Minerano Resources (Pty) Ltd

TEL NO: 011 594 9159

FAX NO: 011 594 1000

POSTAL ADDRESS: 4th Floor, Fredman Towers, 13 Fedman Drive, Sandton, Johannesburg, 2196

PHYSICAL ADDRESS: 4th Floor, Fredman Towers, 13 Fedman Drive, Sandton, Johannesburg, 2196

FILE REFERENCE NUMBER SAMRAD: NC 30/5/1/1/2/11790 EMP

1. IMPORTANT NOTICE

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

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

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

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

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

2. OBJECTIVE OF THE BASIC ASSESSMENT PROCESS

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

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

TABLE OF ACRONYMS

| Acronym | Expanded Name |
|----------------|--|
| AEL | Atmospheric Emission License in terms of NEM:AQA |
| BA | Basic Assessment (process or report) |
| BID | Background Information Documents |
| CARA | Conservation of Agricultural Resources Act (Act 43 of 1983) as amended |
| COP | Codes of Practice |
| DMR | Department of Mineral Resources |
| DWS | Department of Water Affairs and Sanitation |
| EA | Environmental Authorisation in terms of NEMA |
| EAP | Environmental Assessment Practitioner |
| ECA | Environmental Conservation Act (Act 73 of 1989) as amended |
| EIA | Environmental Impact Assessment (process or report) |
| EIA Regulation | Environmental Impact Assessment Regulation published under NEMA |
| EMPr | Environmental Management Programme report |
| GDP | Gross Domestic Product |
| GIS | Geographical Information Systems |
| GN | General Notice (issued under an Act, providing notice or information) |
| GNR | General Notice Regulation (issued under an Act, providing instruction) |
| I&AP | Interested and Affected Parties |
| IAIA SA | International Association of Impact Assessment South Africa |
| MHSA | Mine Health and Safety Act (Act 29 of 1996) as amended |
| MPRDA | Mineral and Petroleum Resources Development Act (Act 28 of 2002) as amended |
| MR | Mining Right in terms of the MPRDA |
| MRA | Mining Right Application in terms of the MPRDA |
| NAEIS | National Atmospheric Emissions Inventory System |
| NEM:AQA | National Environmental Management: Waste Act (Act 39 of 2004) as amended |
| NEM:BA | National Environmental Management: Biodiversity Act (Act 10 of 2004) as amended |
| NEM:PAA | National Environmental Management: Protected Areas Act (Act 57 of 2003) as amended |
| NEM:WA | National Environmental Management: Air Quality Act (act 59 of 2008) as amended |
| NEMA | National Environmental Management Act (Act 107 of 1998) as amended |
| NFEPA | National Freshwater Ecology Priority Areas |
| NHRA | National Heritage Resources Act (Act No. 25 of 1999) as amended |
| NPAES | National Protected Area Expansion Strategy |
| NWA | National Water Act (Act 35 of 1998) as amended |
| PPP | Public Participation Process |
| PRA | Prospecting Right Application in terms of the MPRDA |
| PR | Prospecting Right in terms of the MPRDA |
| PWP | Prospecting Work Programme |
| RoD | Record of Decision (for specific application) |
| S&LP | Social and Labour Plan |
| SACNASP | South African Council for Natural Scientific Professions |
| SAHRA | South African Heritage Resource Agency |
| SAMRAD | South African Mineral Resources Administration System |

| | |
|----------|--|
| SANBI | South African National Biodiversity Institute |
| SANS | South African National Standard (followed by standard number) |
| SAWIS | South African Waste Information System |
| SEMA | Specific Environmental Management Acts |
| SOP | Standard Operating Procedure |
| SPLUMA | Spatial Planning and Land Use Management Act (Act No.16 of 2013) |
| Stats SA | Statistics South Africa |
| WMA | Water Management Area |
| WML | Waste Management Licence in terms of NEM:WA |

TABLE OF CONTENTS

PART A:

| | |
|---|----|
| 1. IMPORTANT NOTICE | i |
| 2. Objective of the basic assessment process..... | ii |
| 3. Contact Person and correspondence address | 1 |
| a) Details of: | 1 |
| i) <i>Details of the EAP (author of the report)</i> | 1 |
| ii) <i>Details of the independent EAP (review of report)</i> | 2 |
| b) Location of the overall activity..... | 3 |
| (c) Description of the scope of the proposed overall activity. | 3 |
| (i) <i>Listed and specified activities</i> | 4 |
| (ii) <i>Description of the activities to be undertaken</i> | 5 |
| (d) Policy and Legislative Context | 5 |
| (e) Need and desirability of the proposed activities | 7 |
| (f) Motivation for the overall preferred site, activities and technology alternative. | 7 |
| (g) Full description of the process followed to reach the proposed preferred alternatives within the site..... | 8 |
| (i) <i>Details of the development footprint alternatives considered</i> | 8 |
| (ii) <i>Details of the Public Participation Process Followed</i> | 9 |
| (iii) <i>Summary of issues raised by I&APs</i> | 10 |
| (iv) <i>The Environmental attributes associated with the sites</i> | 12 |
| v. <i>Impacts and risks identified including the nature, significance, consequence, extent, duration and probability of the impacts, including the degree to which these impacts ..</i> | 20 |
| vi. <i>Methodology used in determining and ranking the nature, significance, consequences, extent, duration and probability of potential environmental impacts and risks;</i> | 22 |
| vii. <i>The positive and negative impacts that the proposed activity (in terms of the initial site layout) and alternatives will have on the environment and the community that may be affected</i> | 24 |
| viii. <i>The possible mitigation measures that could be applied and the level of risk</i> | 24 |
| ix. <i>Motivation where no alternative sites were considered</i> | 24 |

| | | |
|-----|---|----|
| x. | <i>Statement motivating the alternative development location within the overall site.</i> | 25 |
| (h) | Full description of the process undertaken to identify, assess and rank the impacts and risks the activity will impose on the preferred site (In respect of the final site layout plan) through the life of the activity. | 25 |
| (i) | Assessment of each identified potentially significant impact and risk | 27 |
| (j) | Summary of specialist reports | 29 |
| (k) | Environmental impact statement | 30 |
| | <i>i. Summary of the key findings of the environmental impact assessment;</i> | 30 |
| | <i>ii. Final Site Map</i> | 30 |
| | <i>iii. Summary of the positive and negative implications and risks of the proposed activity and identified alternatives;</i> | 30 |
| (l) | Proposed impact management objectives and the impact management outcomes for inclusion in the EMP;: | 30 |
| (m) | Aspects for inclusion as conditions of Authorisation | 31 |
| (n) | Description of any assumptions, uncertainties and gaps in knowledge. | 31 |
| (o) | Reasoned opinion as to whether the proposed activity should or should not be authorised | 32 |
| | <i>(i) Reasons why the activity should be authorized or not.</i> | 32 |
| | <i>(ii) Conditions that must be included in the authorisation.</i> | 32 |
| (p) | Period for which the Environmental Authorisation is required. | 32 |
| (q) | Undertaking | 33 |
| (r) | Financial Provision | 33 |
| | <i>(i) Explain how the aforesaid amount was derived.</i> | 33 |
| | <i>(ii) Confirm that this amount can be provided for from operating expenditure.</i> | 33 |
| (s) | Specific Information required by the competent Authority | 34 |
| | <i>(i) Compliance with the provisions of sections 24(4)(a) and (b) read with section 24 (3) (a) and (7) of the National Environmental Management Act (Act 107 of 1998). The EIA report must include the:-</i> | 34 |
| (t) | Other matters required in terms of sections 24(4)(a) and (b) of the Act | 35 |

PART B:

| | | |
|---|---|----|
| 1 | Draft environmental management programme. | 36 |
| | a) Details of the EAP, | 36 |

| | | |
|-------|---|----|
| b) | Description of the Aspects of the Activity | 36 |
| c) | Composite Map..... | 36 |
| d) | Description of Impact management objectives including management statements | 36 |
| (i) | <i>Determination of closure objectives</i> | 37 |
| (ii) | <i>Volumes and rate of water use required for the operation.</i> | 38 |
| (iii) | <i>Has a water use licence has been applied for?</i> | 38 |
| (iv) | <i>Impacts to be mitigated in their respective phases</i> | 39 |
| e) | Impact Management Outcomes | 41 |
| f) | Impact Management Actions..... | 43 |
| (i) | <i>Financial Provision</i> | 45 |
| g) | Monitoring of Impact Management Actions | 49 |
| h) | Monitoring and reporting frequency..... | 49 |
| i) | Responsible persons | 49 |
| j) | Time period for implementing impact management actions..... | 49 |
| k) | Mechanism for monitoring compliance | 49 |
| l) | Indicate the frequency of the submission of the performance assessment report.. | 51 |
| (i) | <i>Environmental Awareness Plan</i> | 51 |
| m) | Specific information required by the Competent Authority | 52 |
| 2. | UNDERTAKING..... | 53 |

PART A
SCOPE OF ASSESSMENT AND BASIC ASSESSMENT REPORT

3. CONTACT PERSON AND CORRESPONDENCE ADDRESS

a) Details of:

i) *Details of the EAP (author of the report)*

This reported was written by Lauren Flinders, Project Manager at Menar Holding (representing Minerano Resources (Pty) Ltd in the application). The document was then sent to an external, independent EAP for the purposes of review and sign off.

Name: **Lauren Flinders**

Tel No.: **011 594 9100 / 060 5085 065**

Fax No. : **011 594 9159**

E-mail address: l.flinders@menarholding.com

Summary of Qualifications:

- BSc in Ecology, Environment and Conservation (With Distinction)
- BSc Honours in Ecology, Environment and Conservation (With Distinction)
- Post-graduate certificate in Environmental Law;
 - Certificate 1: Environmental and Sustainability Law; and
 - Certificate 2: Land and Water Law.

Summary of Experience:

Lauren's experience includes the founding and management of a small environmental advisory company, leadership at the Executive Committee level for a JSE listed mining corporate operating in twelve countries across Africa, technical and project management of exploration programmes, stakeholder management, GIS mapping and analysis, environmental management and sustainability reporting. In addition, she has comprehensive knowledge and experience with mining and environmental legislation applicable in the International, South African and the African context, as well as of the ISO 9001, 14001 and OHSAS 18001 standards.

Projects she has been involved in include:

- Tweefontein Optimisation Project
- Blackhill Siding IWULA
- Flexilube EIA
- Leeufontein IWULA
- Nkomati Anthracite
- Coal Portfolio including Bankfontein Project, Goodvetroud Project and Schoongezicht Projects in South Africa , Mulungwa Project (Zambia), Tete Project (Mozambique).

- Strategic legal advisory and consulting on specific challenges relating to water management at the Zonnnebloem Colliery.
- Trollope Holdings (Pty) Ltd: Renewal application for a Mining Right.
- Eyethu Coal including Burgh Group and Iyanga Mining (Environmental and Technical Management)

CV attached as **Appendix 1**.

ii) Details of the independent EAP (review of report)

Name: **Jane Kennard**

Tel No.: **011 794 7534**

Fax No. : **011 794 6946**

e-mail address: jane@cabangaconcepts.co.za

Summary of Qualifications:

- BSc in Environmental Management: Botany Stream ;
- Certificate in Advanced Project Management;
- Certificate in Carbon Footprint Analysis;
- Member of IAIA SA;
- Member of the International Association for Public Participation;
- Member of the Environmental Law Society South Africa.
-

Summary of Experience:

Jane Kennard has ten years' experience in the environmental field, and has been involved in numerous projects ranging in scope from environmental compliance to environmental impact assessment and the management thereof.

The following is a short list of projects which she has been involved in over recent years (for a more comprehensive list please refer to Appendix 1 – Curriculum Vitae):

- G&W Base and Minerals, Koppies Bentonite Mine, Atmospheric Emissions License Application
- IG Chem, 24G Application for Rectification & Continuation Impact Assessment & Management Plan
- Homelands Mining & Energy, Kendal Colliery, 24G Application for Rectification & Continuation Impact Assessment & Management Plan
- Worldwide Coal Carolina, Road Deviation Basic Assessment and Environmental Management Plan
- Overlooked Colliery , Prospecting Environmental Management Plan
- Uitkyk Siding, Environmental Management Plan
- BVI Uitkomst Colliery Integrated Water Use License Application
- Pembani Coal Carolina, Water Use License Application and associated Integrated Water & Waste Management Plan
- Black Wattle, EMP Performance Assessment

- Eyethu Coal, Leeuwpoot Colliery, EMP Performance Assessment
- Eyethu Coal, Mooifontein Colliery, EMP Performance Assessment
- Eyethu Coal, Welgelegen Colliery, EMP Performance Assessment
- G&W Base Minerals, Benadeplaats Mine, EMP Performance Assessment
- Sudor Coal, Halfgewonnen Colliery, EMP Performance Assessment
- G&W Base Minerals, Koppies EMP Performance Assessment
- Shiva Uranium, Environmental Compliance Report
- Pembani Coal Carolina, Environmental Compliance Audit
- Droogvallei Rail Siding Company, Environmental Compliance Audit
- Vierfontein Colliery, Environmental Compliance Audit
- Miranda Coal, Sesikhona Colliery, Environmental Compliance Audit
- Miranda Coal, Burnside Colliery, Environmental Compliance Audit
- Droogvallei Rail Siding Company, Integrated Water Use License Compliance Audit
- Pembani Coal Carolina, Integrated Water Use License Compliance Audit
- Umcebo Mining, Kleinfontein Colliery, Integrated Water Use License Compliance Audit

CVs attached as **Appendix 1**.

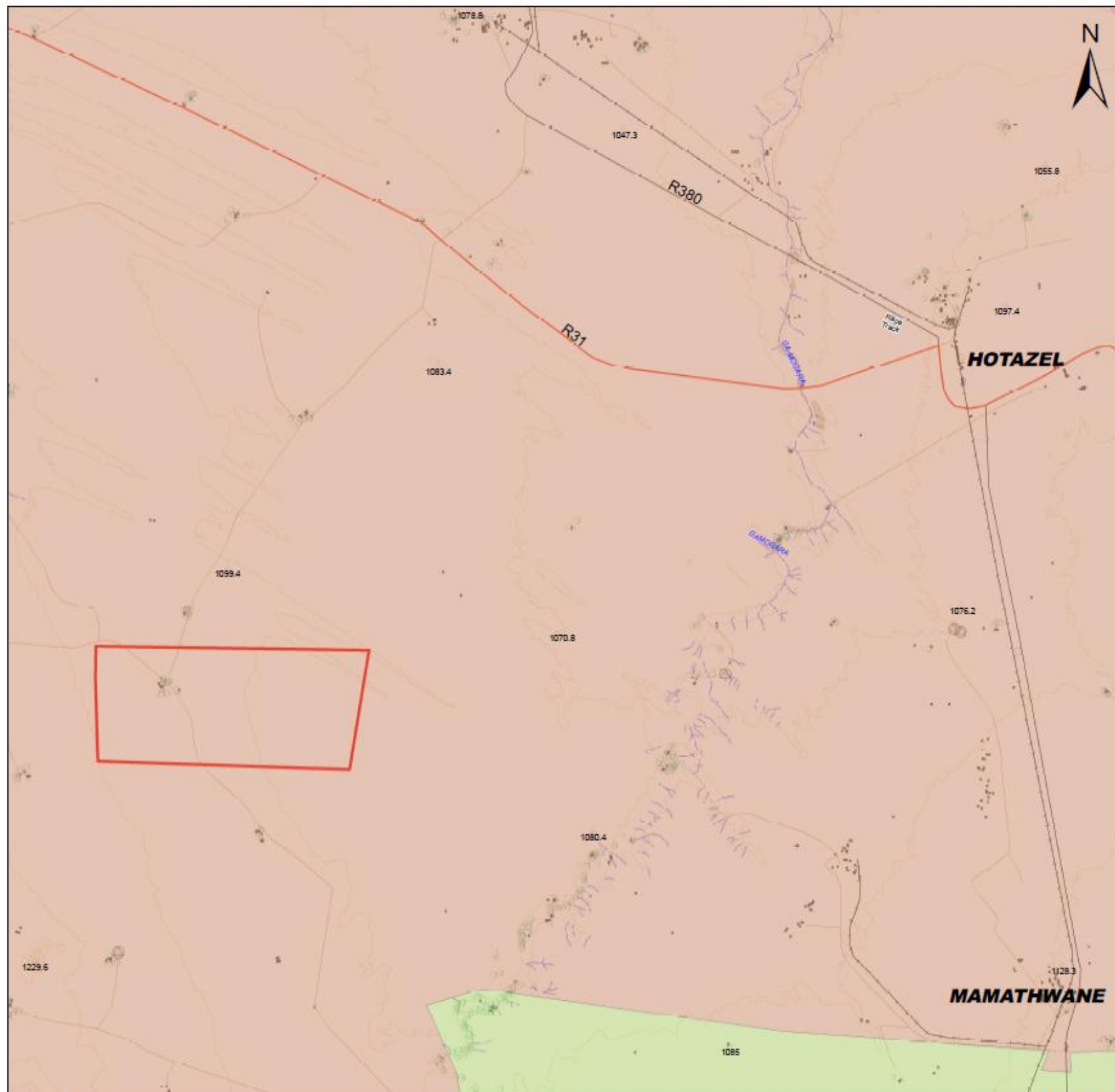
b) Location of the overall activity

The property of interest is located approximately 47km South of the town of Hotazel and 65km East of Kuruman, in the Northern Cape province. The total area affected is 2429.95 Ha.

The project area falls within the Savanna biome, specifically the Kalahari Thornveld, Kalahari Plains Bushveld/Shrubby Kalahari Dune Bushveld and Eastern Kalahari Bushveld.

Table 1: Farms included in the prospecting right application

| | |
|--|---------------------------------|
| Farm Name: | Riviera 335 |
| Application area (Ha) | 2429.952966 Ha |
| Magisterial district: | Joe Morolong Local Municipality |
| Distance and direction from nearest town | 47km S |
| 21 digit Surveyor General Code for each farm portion | C0410000000033500001 |



Coordinate System: GCS WGS 1984
 Datum: WGS 1984
 Units: Degree

1:80 000

TITLE: Locality
PROJECT: Riviera
LOCATION: Northern Cape
DRAWN BY: Sarah Wanless
 Jnr Environmental
 Officer
DATE: May 2016








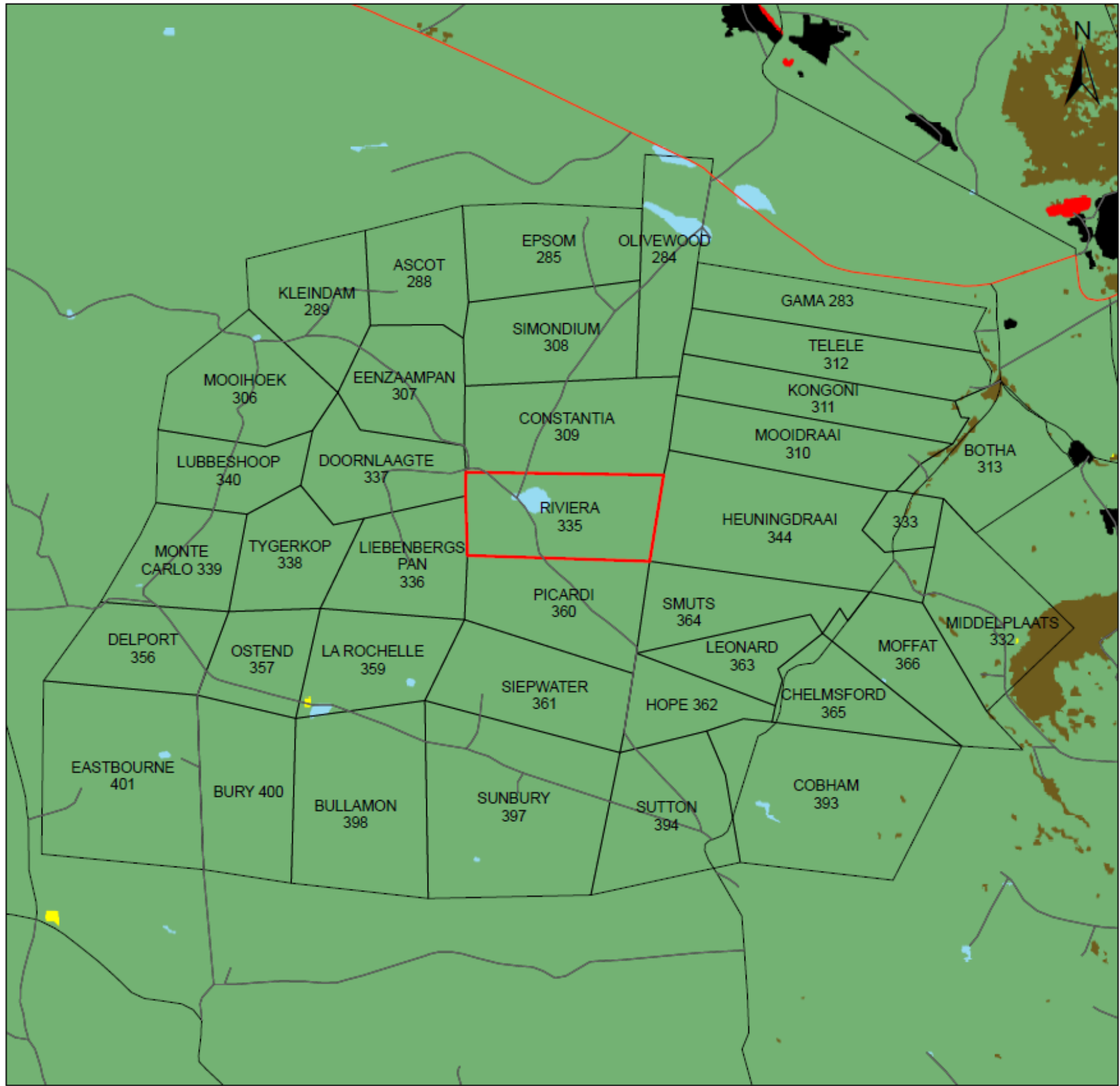
-  Gamagara Local Municipality
-  Joe Morolong Local Municipality
-  Riviera Prospecting Area
-  ARTERIAL ROAD
-  MAIN ROAD
-  OTHER ROAD
-  Railway



Figure 1: Regional Locality



TITLE: Locality Plan
 PROJECT: Riviera
 DRAWN BY: Sarah Wanless
 Jnr Environmental
 Officers
 DATE: May 2016

- Riviera
- landcover**
- Cultivation
- Degraded
- Mines
- Natural
- Urban Built-up
- Waterbodies



MENAR HOLDING

Coordinate System: GCS WGS 1984
 Datum: WGS 1984
 Units: Degree

1:110 000

Figure 2: Site Locality (Farm Boundaries)

(c) Description of the scope of the proposed overall activity.

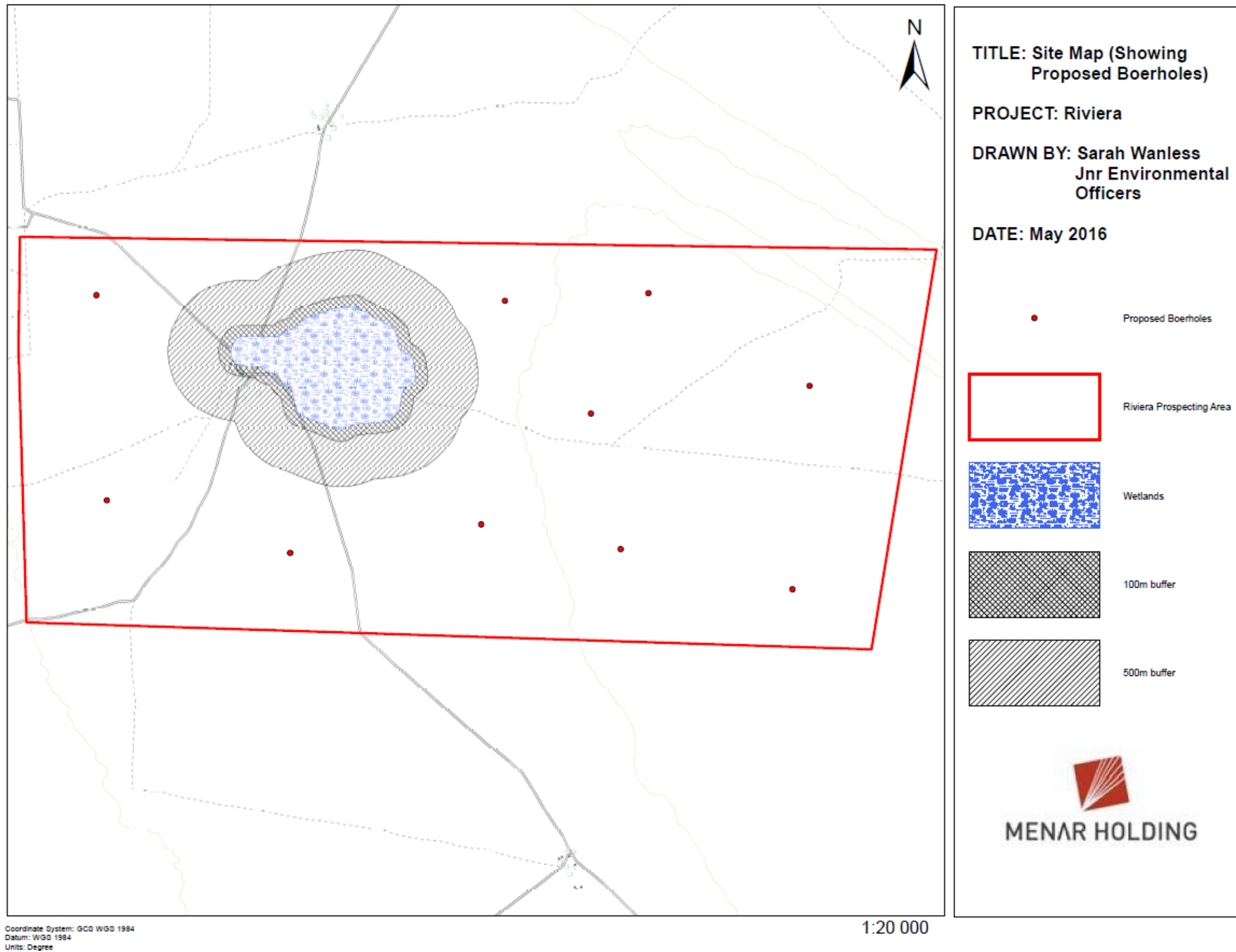


Figure 3: Prospecting Area, indicating preliminary position of prospecting boreholes in relation to wetland buffer zones

(i) Listed and specified activities

| <p>NAME OF ACTIVITY</p> <p>(E.g. For prospecting - drill site, site camp, ablution facility, accommodation, equipment storage, sample storage, site office, access route etc...etc...etc.</p> <p>E.g. for mining,- excavations, blasting, stockpiles, discard dumps or dams, Loading, hauling and transport, Water supply dams and boreholes, accommodation, offices, ablution, stores, workshops, processing plant, storm water control, berms, roads, pipelines, power lines, conveyors, etc...etc...etc.)</p> | <p>Aerial extent of the Activity</p> <p>Ha or m²</p> | <p>LISTED ACTIVITY</p> <p>Mark with an X where applicable or affected.</p> | <p>APPLICABLE LISTING NOTICE</p> <p>(GNR 544, GNR 545 or GNR 546)/NOT LISTED</p> |
|--|--|--|--|
| Access routes | Farm roads will be used as far as possible. No additional roads will be constructed. | | |
| Drilling | 4m ² per borehole. It is anticipated that 10 boreholes will be drilled. | X | GNR 983 Activity 20 |
| Casing of boreholes | 4m ² per borehole. It is anticipated that 10 boreholes will be drilled. | | |
| Ablution facility (portable toilets) | Portable toilets will be used | | |
| Temporary 'Camp site', core/equipment store and site office. Staff will be accommodated off site unless permission is given by landowners. A temporary site camp comprising of shade, equipment storage and seating for meals may be established | 0.05 Ha | | |
| Hydrocarbon Storage | Less than 80m ² | | |
| Rehabilitation of boreholes | See above | | |

(ii) Description of the activities to be undertaken

The proposed activities on site will include:

- Non-invasive prospecting, which will consist of:
 - A desktop study and literature review;
 - Obtaining historical borehole data and resource information;
 - Feasibility studies;
 - Geophysical site visit and survey will be conducted by a field geologist and a geophysics team; and
 - Data will be extracted and plotted into geological maps. Areas for invasive prospecting will be identified for resource determination.

- Invasive prospecting:

Core drilling will then be targeted for areas identified through the non-invasive techniques described above for reserve determination and mine planning. Each borehole will disturb an area of approximately 4m²; however the number of boreholes required can only be finalised once the non-invasive prospecting as detailed above is completed; however, preliminary positions have been proposed in Figure 3 above:

- Cores will be sampled and assessed by the on-site geologists and core logs will be maintained.
 - Casing will be removed from the borehole on completion thereof and the borehole sealed in accordance with “Standard Borehole Sealing Procedure” i.e.: each borehole certificated in terms of this procedure.
 - Existing farm roads and tracks will be utilised as far as possible.
 - The proposed timeframe associated with the invasive prospecting is expected to be no more than 5 years.
-
- Analytical assessment of prospecting data:
 - Data will be assessed in a pre-feasibility study to determine resource estimates to commence with prefeasibility and feasibility assessments for mine planning and Mining Right Application processes.

(d) Policy and Legislative Context

This prospecting application is being sought by Minerano Resources (Pty) Ltd as an initial application for exploration and any future mining activities on the one farm for the extraction of Iron. The legislative summary below is specific for the proposed prospecting activities to which this application relates.

Table 2: Summary of Applicable Legislation

| APPLICABLE LEGISLATION AND GUIDELINES USED TO COMPILE THE REPORT | REFERENCE WHERE APPLIED | HOW DOES THIS DEVELOPMENT COMPLY WITH AND RESPOND TO THE POLICY AND LEGISLATIVE CONTEXT |
|---|---|--|
| <p>National Environmental Management Act, Act 107 of 1998 (NEMA) NEMA Regulation GNR982 – EIA Regulations NEMA Regulation GNR983 – Listing Notice 1 NEMA Regulation GNR807 – PPP guideline NEMA Regulation –GNR 1147 – Financial Provision for Prospecting, Mining, Exploration and Production Operations</p> | <p>This entire report has been compiled in terms of NEMA Basic Assessment (BA) requirements as only GNR983 scheduled activities are triggered – Part A Section 3(d) (i). PPP completed in terms of NEMA regulation – Part A Section 3(h) (ii) and Table 1.</p> | <p>This report forms the BA and EMP Report as required for a BA process under NEMA for an EA.</p> |
| <p>Mineral and Petroleum Resources Development Act, Act 28 of 2002 (MPRDA) and associated Regulation GNR 527.</p> | <p>EMP section of this report (Part B) has included regulation requirements where relevant.</p> | <p>The application for EA is being done in terms of a Prospecting Right (PR) application already submitted to the DMR.</p> |
| <p>Mine Health and Safety Act, Act 29 of 1996 (MHSA) and associated Regulations</p> | <p>Although not directly addressed in the EMP section of the report, protecting the environment contributes to a safe working environment.</p> | <p>The company will employ a SHE officer to ensure regulation is enforced during prospecting as well as adherence to COP and SOPs. Where these procedures apply to prospecting contractors this will be communicated through induction training.</p> |
| <p>National Environmental Management: Waste Act (NEM:WA), Act 59 of 2008 as amended and its associated regulations In terms of the Act, all mine residues are listed under the hazardous category in schedule 3 of NEM:WA. NEM:WA Regulation GNR921 – List of Waste Management Activities – consulted but no activities relevant NEM:WA Regulation GN 1005 – Proposed regulations regarding the planning and management of residue stockpiles and residue deposits from a prospecting, mining, exploration or production operation</p> | <p>General waste management has been incorporated into Part B, the EMP report. No landfills will be established on site. No mine residue deposits are applicable to this application.</p> | <p>Implement management measures as per the EMP. No Waste Management License required.</p> |
| <p>National Water Act (NWA), Act 36 of 1998 as amended and its associated regulations GNR704 has been incorporated into storm water management on site where relevant.</p> | <p>The water management plan has been incorporated into Part B, the EMP report.</p> | <p>GN704 regulations will apply, including remaining outside wetlands and their 100m buffer zones and outside river and river buffer zones (100m or 1:100 year floodline, whichever is greatest). Applications will be made and approved prior to any activity in these areas.</p> |
| <p>National Environmental Management: Air Quality Act. Act 39 of 2004 (NEM:AQA) Also deals with noise levels – to be read with Environment Conservation Act, Act 73 of 1989 (ECA) South African National Standard: SANS 10103:2004 – The measurement and rating of environmental noise with respect to land use, health, annoyance and to speech communication</p> | <p>N/A. Prospecting does not trigger the need for an AEL. Noise management has been incorporated into Part B, the EMP report.</p> | <p>AEL is not applicable. Noise levels will be maintained within baseline levels in the area or to the SANS standards.</p> |
| <p>National Environmental Management: Biodiversity Act, Act 10 OF 2004 (NEM:BA)</p> | <p>SANBI maps were consulted and no</p> | <p>No listed activities under GNR 985 applicable – no EA required.</p> |

| APPLICABLE LEGISLATION AND GUIDELINES USED TO COMPILE THE REPORT | REFERENCE WHERE APPLIED | HOW DOES THIS DEVELOPMENT COMPLY WITH AND RESPOND TO THE POLICY AND LEGISLATIVE CONTEXT |
|---|--|---|
| Various regulations pertaining to protected species Various regulations pertaining to alien and invasive species – to be read with CARA and regulations NEM:BA Regulation GNR1002 – National list of ecosystems that are threatened and in need of protection | sensitive areas, other than surface water features exist on site). General management regarding protected species and alien and invasive species has been incorporated into Part B, the EMP report. | The company will implement alien invasive management with regards to preventing spread of alien invasive species over areas disturbed by prospecting activities. Protected species will be preserved <i>in situ</i> and invasive prospecting will maintain 50m buffer from protected species, or the relevant permits will be applied for destruction or relocation of said species. |

(e) Need and desirability of the proposed activities

Whilst the activity of prospecting itself will not specifically benefit the surrounding communities or create employment, it will confirm the geology and feasibility of future mining prospects in line with the MPRDA.

Combating unemployment is considered to be a high priority goal by the Joe Morolong Local Municipality and the establishment of any future mine would provide job opportunities for unskilled, and potentially skilled, labour from the surrounding areas.

During the prospecting activities, local services (drilling company, laboratory etc.) will be utilised as far as possible.

(f) Motivation for the overall preferred site, activities and technology alternative.

With regard to location, the prospecting activities are delimited by the properties available for prospecting (i.e. not held by another company) and the geology of the area. The preliminary positions of the proposed prospecting boreholes have been sited to give a representative sample for the project area. The positions of these have taken into account the various water resources and their applicable buffers. Alternatives may be considered based on the findings of the geotechnical investigations.

No activity alternatives are considered. Drilling is still the most effective way and an industry norm to complete resource evaluation as required for the mine works programme to be submitted in terms of a Mining Right Application (“MRA”).

The use of aerial geological mapping as an initial non-invasive technique to delimit areas for invasive drilling is seen as the most responsible method to reduce needless surface disturbance and reduce environmental impact footprint. Technology alternatives are therefore also not assessed further.

(g) Full description of the process followed to reach the proposed preferred alternatives within the site.

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

(i) Details of the development footprint alternatives considered.

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

Not applicable. Properties are delimited by the properties available for prospecting (i.e. not held by another company); and the geology of the area.

- b) the type of activity to be undertaken;

No activity alternatives are considered. Prospecting is a pre-requisite to mining and is governed by legislative requirements for mining.

- c) the design or layout of the activity;

Existing farm roads and tracks will be utilised. No additional roads will be constructed. The site camp is positioned near an existing road as it makes it more easily accessible as well as reducing any environmental disturbance created by needing to create new access roads. The site camp will consist of storage for drilling equipment and portable ablution facilities. Accommodation will be provided for in one of the surrounding towns.

- d) The preliminary positions of the proposed prospecting boreholes have been sited to give a representative sample for the project area. The positions of these have taken into account the various water resources and their applicable buffers. Alternatives may be considered based on the findings of the geotechnical investigations and the technology to be used in the activity;

The use of desktop studies and literature reviews are viewed as an initial non-invasive technique to delimit areas for invasive drilling prospecting and is seen as the most responsible method to reduce needless surface disturbance and reduce environmental impact footprint. Technology alternatives are therefore also not assessed further.

- e) the operational aspects of the activity; and

Drilling is still the most effective way as well as an industry norm to complete resource evaluation as required for the mine works programme to be submitted in terms of a MRA. No further alternatives are relevant.

- f) the option of not implementing the activity.

Should the prospecting activities not be granted to Minerano then the potential reserves may not be defined and ultimately utilised.

(ii) Details of the Public Participation Process Followed

Section 41 of NEMA Regulation 982 set out the Legal and Regulatory Requirement for Public Participation. The Public Participation Process (PPP) aims to involve the authorities and I&APs in the project process, and determines their needs, expectations and perceptions which in turn ensures a complete and comprehensive environmental study. An open and transparent process has and will be followed at all times and will be based on reciprocal dissemination of information.

The following was undertaken during the PPP:

1. Background Information Documents (BIDs) were circulated to all landowners / users included within and adjacent to the proposed prospecting right area;
2. Directly affected parties were visited in order to deliver Background Information Documents (BIDs) and were directly informed in this manner, unless they happened to not be available at the time;
3. Organs of state and other regulatory stakeholders were identified and notified by means of the BID;
4. Posters / Notices were erected on site as well as at numerous other public locations;
5. Advertisements were placed in the local newspaper; and
6. Registered Interested and Affected Parties (I&APs) were given the opportunity to review and comment on the BA and EMP.

The above process has been detailed in the PPP report attached as Appendix 2, copies of the BID, notices and correspondence received from the I&APs are included in the Appendix.

The table below summarises the issues and responses raised during the PPP to date.

(iii) Summary of issues raised by I&APs

| 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. | | Date | Issues raised | EAPs response to issues as mandated by the applicant | Section and paragraph reference in this report where the issues and or response were incorporated. |
|--|---|------------|-------------------------------|--|--|
| AFFECTED PARTIES | | | | | |
| Landowner/s | X | | | | |
| Clement William Penny | X | 19-05-2016 | No comments received to date | | |
| Allan J Penny | | 19-05-2016 | No comments received to date | | |
| Lawful occupier/s of the land | | | | | |
| Same as land owners | | | | | |
| Landowners or lawful occupiers on adjacent properties | | X | | | |
| Pieter Penny | X | 23-05-2016 | No comments received to date | | - |
| Municipal councillor | | X | | | |
| | X | 30-05-2016 | No comments received to date | | |
| Municipality | | X | | | |
| matshidisot@joemorolong.gov.za | X | 30-05-2016 | No comments received to date. | - | |
| eleshope@joemorolong.gov.za | | | | | |
| Organs of state (Responsible for infrastructure that may be affected Roads Department, Eskom, Telkom, DWA e | | | | | |
| Department of Water Affairs & Sanitation | X | 30-05-2016 | No comments received to date | - | |
| Lydia Forssmal – Department of roads, police and transport (Northern Cape Department) | X | 30-05-2016 | No comments received to date | - | |
| Department of Mineral Resources | | 30-05-2016 | No comments received to date | | |

| 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. | | Date | Issues raised | EAPs response to issues as mandated by the applicant | Section and paragraph reference in this report where the issues and or response were incorporated. |
|---|---|-------------|------------------------------|---|---|
| Department of Environment and Nature Conservation (Northern Cape) | | 30-05-2016 | No comments received to date | - | |
| South Africa Heritage Resources agency | X | 27-05-2016 | No comments received to date | - | |
| Communities | | | | | |
| N/A | X | | - | - | |
| Dept. Land Affairs | | | | | |
| Sydney Sikhosana | X | 30-05-2016 | No comments received to date | | |
| Hlumela Mantashe | | 30-05-2016 | No comments received to date | | |
| Max Ozinsky | | 30-05-2016 | No comments received to date | | |
| Kgalalelo Marintlhwane | | 30-05-2016 | No comments received to date | | |
| Traditional Leaders | | | | | |
| N/A | X | | | | |
| Dept. Environmental Affairs | | | | | |
| Other Competent Authorities affected | | | | | |
| None | | | | | |

(iv) The Environmental attributes associated with the sites

(1) Baseline Environment

The bulk of the information below was obtained from the existing Liebenburg Iron PWP, the Liebenburg NEMA Application, the Joe Morolong Infrastructure Development and Management Plan (2014/2015), The Northern Cape State of the Environment Report (2014), the SANBI GIS tools and associated information; and a general desktop assessment of the site. As this is a BA, no specialist studies are deemed necessary.

a) *Type of environment affected by the proposed activity.*

Geology:

The area identified for prospecting is generally underlain by the Kalahari Formation, which forms a sandy cover over the manganese. Kalahari Manganese Field is a 400 km² basin containing some 80% of the world's economic manganese ore resources. The base geology of the area is the Transvaal Supergroup which consists of a thick group of platform carbonates of Campbell Rand Subgroup which in turn is overlain by the Abestos Hills and Koegas Subgroup banded iron formations. These are overlain by the Manganese Formation, a glacially derived sequence of sediments and the lava of the Ongeluk Formation.

Overlying the Ongeluk lava is the 140 m thick Hotazel Formation, composed of mainly banded iron formations and manganese lites. The Mooidraai Formation limestones and dolomites conformably overlie the Hotazel Formation. These rocks are overlain by the shales, quartzites and conglomerates of the Mapedi Formation.

The Permian Dwyka Group of the Karoo Supergroup unconformably overlies the Mapedi Formation, which in turn is overlain by the Tertiary Kalahari Group, which are mainly calcretes, sand and gravel.

Climate:

The area falls within the Kalahari Desert and its climate is characterised as being semi-arid. The average annual precipitation in the region ranges from 500mm in the south-east to 200mm in the north-western part of the district and occurs almost exclusively as downpours towards the end of summer. The mean average daily maximum/minimum temperatures for the region range between 28°C to 8°C. As the area is characterised by low rainfall and high evaporation rates drought is a common occurrence.

Topography:

The topographical profile of the area is characterised by undulating slopes and flat sandy plains.

Soils & Land Capability:

The farm portion is situated in the Kalahari basin, which is located in a flat, sand-covered, semi-desert region of the province. Due to the geology of the area comprising of both the Kalahari Group and the Olifantshoek Supergroup the presence of clay, quartz and limestone is high.

The soil type within this biome are typified by sandy to loamy soils of Aeolian origin. The soils associated with the overlying area are likely to be freely drained, structureless soils, shallow with low water holding capacity and low natural fertility.

Due to the characteristics of the soil and the average-low rainfall characteristics of the area, the majority of the soils in the area are of poor arable agriculture or any other type of farming with small areas being suitable for forestry, grazing or arable agriculture where the climate permits it. Overgrazing and other land degrading activities in the area tend to further decrease the natural fertility levels and increase erosion via direct exposure to the elements, compaction and reducing precipitation infiltration and thus increasing overland flow.

Natural vegetation:

The area falls within the Savanna biome, specifically the Kalahari Thornveld, Kalahari Plains Bushveld/Shrubby, Kalahari Dune Bushveld and Eastern Kalahari Bushveld. As this is a semi-arid desert it supports more vegetation units than a normal desert and is characterised by low shrubs and bushes and select species of trees.

There are three protected species within the Local Municipality; *Acacia erioloba*, *Acacia haematoxylon* and *Boscia albitrunca* (They are protected according to Government Notice No. 1012 under Section 12(1) (d) of the National Forests Act, 1998 (Act No. 84 of 1998)).

A site visit confirmed that the majority of the vegetation within the prospecting area is natural indigenous vegetation with the presence of some invasive species (see **Appendix 6**). In certain areas the vegetation has been largely degraded or removed by overgrazing of cattle in the area.

Fauna:

The majority of the larger mammal species in the area are confined to nature reserves, lodges and hunting farms and cannot be considered to be free-roaming, this is due to much of the remaining natural open space being taken up for livestock grazing. A total of twenty-seven Red Data species have been recorded in the study area as both free-roaming mammals as well as within the nature reserves, lodges and hunting farms.

The only mammals noted on site during the site visit were ground squirrel, meerkat and warthog. However due to the predominantly natural condition of the area it is likely that there are smaller mammals living in and around the prospecting area.

In total there are 32 birds listed as being present in the JTGDM area that are considered conservation-worthy, of these 32 only six are Red Data species: Kori Bustard, Ludwig's Bustard, Secretary Bird, Martial Eagles, Lappet-faced Vulture, Lanner Falcon and the Black Stork. The remaining twenty-six species are still considered priority species due to (1) having special regional significance; (2) are raptors; and/or (3) have conservation status under the African-Eurasian Water bird Agreement. Threats to bird species are (1) habitat destruction/transformation by agriculture, urbanisation and mining activities; (2) collision with power lines; (3) electrocution of birds on pylons; and (4) poisoning. While these species have been identified in the general area the wetland on the Prospecting Area do not fall within close

proximity to disturb any threatened bird or Crane species. None of the 32 aforementioned bird species were noted on site, only a Yellow Billed Horn Bill and an abundance of other common species.

Amphibians are exceptionally sensitive to land degradation, modification and fragmentation which is rife in the area. While the full extent of these impacts is unknown it can be assumed that mining activities, urbanisation, overgrazing and roads lead to declining populations. The only Threatened Amphibian species in the general area is the Giant Bullfrog and the declining population numbers can be attributed to deteriorating water quality, human predation and habitat fragmentation. The wetlands on the Prospecting Area do not fall within a 500m radius of any IUCN listed species however a site visit will determine the presence of any amphibian species on site. Only one small pan remains of the NFEPA listed wetland, it has also been substantially degraded and as many amphibians are sensitive to these changes it is highly unlikely that there are any remaining amphibians remaining in the wetland on site.

Surface water:

The site is within the Orange Water Management Area within the Orange-Senqu river basin, which is shared with Namibia and Botswana.

Regionally drainage is determined by Kuruman Hill's ridge system which channels all streams northwards and then sharply westwards. If all farm portions are acquired there is one pan on the property and a tiny river portion crossing into the boundary on the south west.

The surface water resources within the Prospecting area consist of one NFEPA categorised wetland. The wetland is classified as Natural and as being in AB condition, indicating that it is $\geq 75\%$ natural land cover.

The desktop study indicates no other surface water in close proximity to the Prospecting Area, however a site visit will determine whether there are other water bodies in and around the Prospecting Area that are worth noting.

During a site visit only one small pan remains within the prospecting area. The wetland is all that remains of the large pan depicted in the map, the remaining pan (and the area where the pan used to be) has been drastically degraded.

Groundwater:

As the area is semi-arid with average-low rainfall generating little/no surface runoff and no perennial rivers the area is heavily reliant on groundwater for all aspects of agriculture, industry and human consumption. The surrounding cities get their water from underground eyes but none are close enough to the prospecting area to be of concern.

Groundwater quality in the area is indicated as generally being good quality water.

In addition to these 'eyes', water for human consumption and irrigation is sourced from boreholes throughout the district

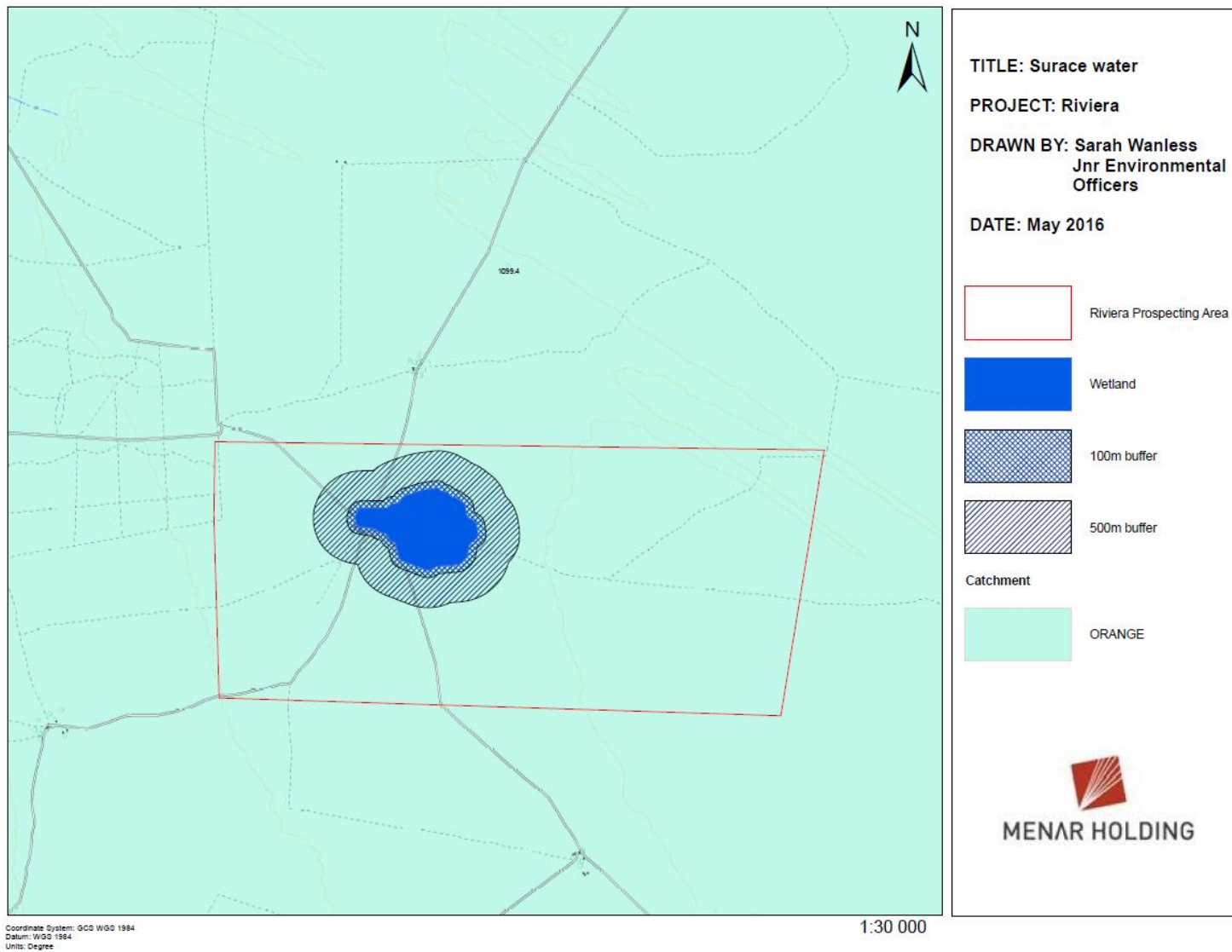


Figure 4: Surface water resources within the Prospecting Area and its location in relation to quaternary catchments

Air quality & noise:

The rural nature of the area should result in a good air quality, with dust during winter and dirt roads likely to have the greatest impact. Air quality and noise pollution may be slightly elevated during prospecting activities due to drilling activities. However these increases in noise pollution and dust production will be temporary and their significance will be moderate to low.

The prospecting area is in a rural area and the elevated noise and (potential) increase in dust should not be an issue to any of the community.

Sites of archaeological and cultural interest:

According to the desktop study and topographical map no archaeological sites or sites of cultural interest have been found. It is possible that some historical buildings or graves may occur in the area. Prospecting will have some flexibility in placement of drill holes to avoid these sites and associated buffer zones should they be observed. Should any sites be found or noted during the prospecting activities a 50m buffer will be applied and no invasive prospecting will occur within these buffer zones unless the permit is obtained to do so. A site visit will also determine whether there are any sites of archaeological or cultural interest.

Regional socio-economic structure:

The closest towns to the prospecting area are that of Hotazel and Kuruman. Hotazel serves the manganese mines in the near vicinity and Kuruman is a larger town, with higher population numbers and a higher economic output.

Joe Morolong Local Municipality serves 15 wards, the majority of which are rural, with 92.9% living in tribal/traditional dwellings, and only 2.4% living in urban areas.

Service provision in the area is poor, 10.3% have no access to toilet facilities with pit toilets being the main ablution facilities (40.3% having pit toilets with ventilation and 36.7% having pit toilets without ventilation). 79.8% have no refuse removal and as a result have created their own refuse dump as a means of 'removing' refuse, only 6.1% have their refuse collected at least once a week with 11.4% having no refuse removal at all. Electricity and water provision in the area is better, with 81.1% of households using electricity for lighting and 71.7% of people having water from a regional/local water scheme.

Location, Population and distribution: The Joe Morolong Local Municipality is situated within the John Taolo Gaetswe District Municipality. In the Northern Cape. It is a relatively small area of around 9477.45 square kilometres. 43.6% of the population in the John Taolo Gaetswe District Municipality resides in the Joe Morolong Local Municipality. The prospecting area is situated 47km south from Hotazel and 67 east of Kuruman.

For the Joe Morolong Local Municipality the following population information is available; the total population is 89 530 people. The main towns in the municipality are Hotazel, Santoy and Van Zylsrus. The area is predominantly rural with 60% virgin land surface.

Unemployment in the area is high, with the unemployment rate sitting at 42%, which is

higher than the national average and as a result population growth is declining at a rate of 0.9% due to migration to other areas in search of employment opportunities.

Major economic activities and sources of employment:

Mining and quarrying provide the largest employment opportunities in the Joe Morolong Municipality at 19.41% of those in the municipality being employed in this sector. The other employment sectors are as follows: “Skilled agricultural and fishery workers” (17.3%), “Elementary occupations” (15.5%) and “Craft and related trades workers” (13.2%).

Unemployment estimate for the area:

Unemployment for the district municipality is estimated at 42%.

Social infrastructure:

The Joe Morolong Local Municipality has a largely underdeveloped social infrastructure. There are no hospitals in the Joe Morolong Local Municipality, which constitutes approximately 72.6% of John Taolo Gaeswe Municipal District however there are 20 clinics that are spread throughout the Joe Morolong (these are not adequately equipped to deal with the number of community members as well as more serious health issues). There are a number of schools and four police stations within in Joe Morolong local municipality.

Water supply:

The majority of water for the area is supplied almost entirely by ground water from the five eyes or boreholes. While 91.83% have access to potable water only 22.96% of the population have access to water within their dwelling.

Power supply:

Power supply to the region is from the Eskom grid.

b) Description of the current land uses.

At present, the area is mostly undisturbed with the majority of the land surrounding the prospecting area is “natural”. Mining is a predominant activity in the area, and several mines are in the vicinity of the prospecting area. Figure 5 indicates the types of land cover in the area, the area is predominantly natural with areas of degradation of land degradation from human interference and from cattle farming on one portion of the farm.

The current land uses will not be altered, and these can continue alongside the prospecting activities.

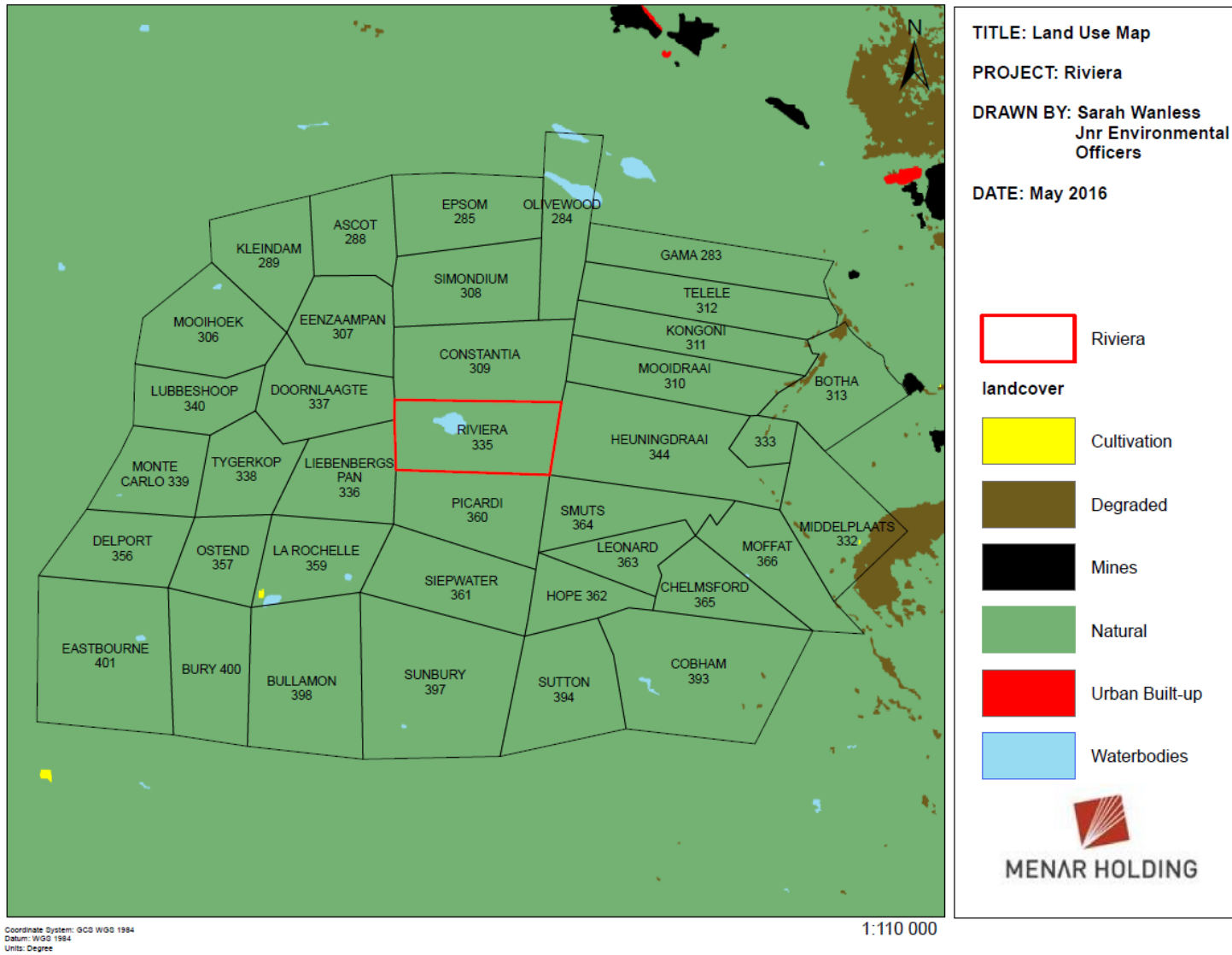


Figure 5: 2009 Municipal Land Use Map

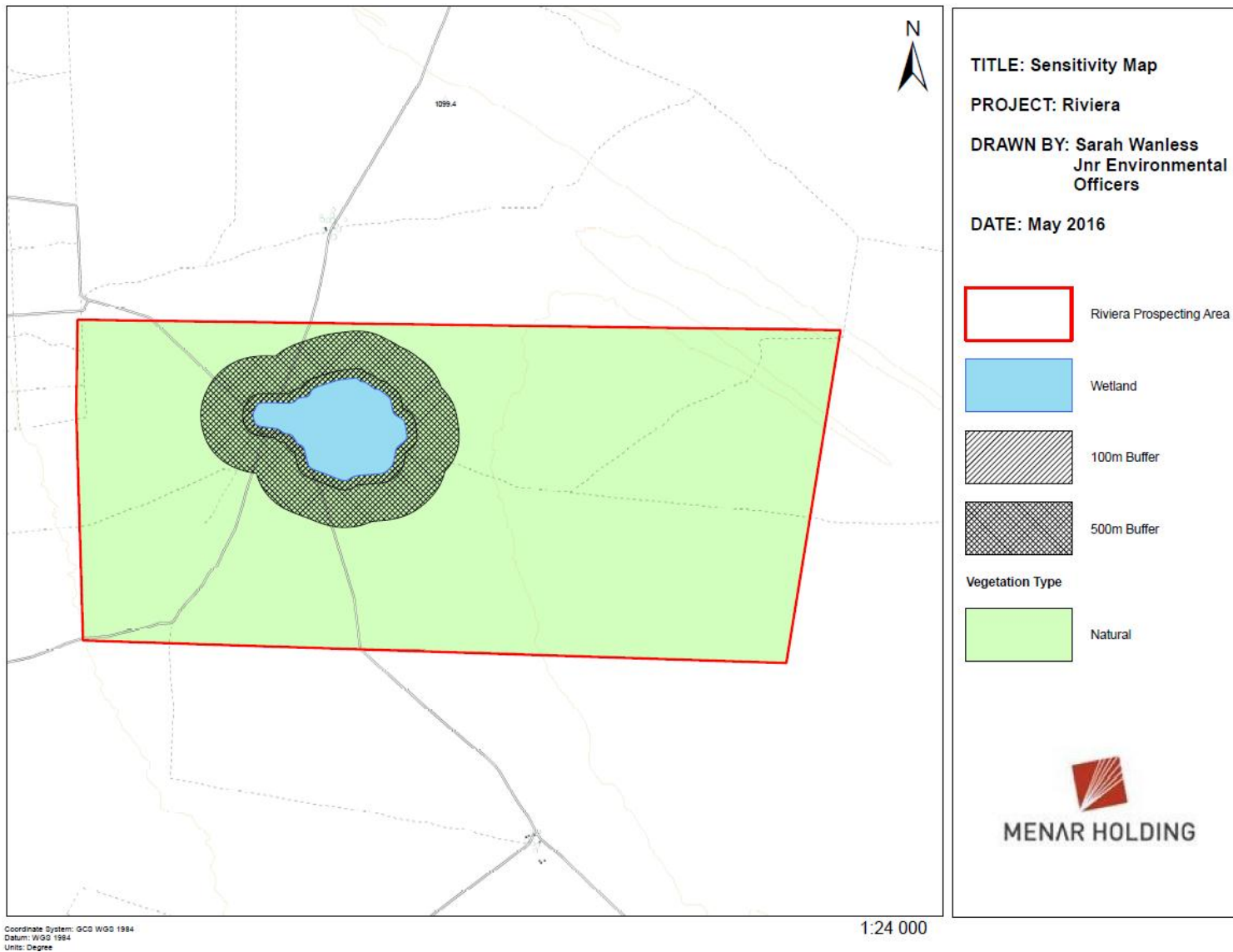


Figure 6: Land Sensitivity and natural and transformed land within the Prospecting Area

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

Prospecting will allow for enough flexibility in drilling and camp site location to avoid the wetland and associated buffer zones. If there is a need to conduct activities in any of these areas then the necessary applications will be sought and approved prior to conducting activities in these areas.

d) *Environmental and current land use map.*



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

A summary of impacts and their duration, probability and significance is provided below:

- Localised dips in topography if boreholes collapse after material is replaced. The impact is probable, of long-term duration if untreated and significance is moderate to low. The

impact can be reversed with rehabilitation.

- Cracks and disruption to geological layers. The impact is possible, of short- to medium-term duration and significance is moderate to low.
- Potential for compaction of soils. The impact is highly probable, of short- to medium-term duration and significance is moderate to low. The impact can be reversed with remediation. The degree of loss of resource is low.
- There is potential hydrocarbon contamination from vehicles and traffic to surface water, soils and groundwater. The impact is probable, of short- to medium-term duration and significance is moderate to low. The impact can be reversed with some remediation. The degree of loss of resource is low.
- Alteration to soil characteristics and potential loss of soil. The impact is probable, of short- to medium-term duration and significance is moderate to low. The impact can be reversed with some remediation. The degree of loss of resource is low.
- Potential contamination of soil with sewage from the portable toilets. The impact is possible, of short- to medium-term duration and significance is low. The impact will recover on its own. The degree of loss of resource is low.
- Potential contamination of soil with indiscriminately dumped waste or littering. The impact is possible, of short- to medium-term duration and significance is low. The impact will recover with remediation. The degree of loss of resource is low.
- Irresponsible use of water and water wastage. The impact is unlikely, of short- to medium-term duration and significance is low. The impact will recover with time. The degree of loss of resource is low.
- Potential contamination of surface water bodies with sewage from the portable toilets. The impact is possible, of short- to medium-term duration and significance is low. The impact will recover with time. The degree of loss of resource is low.
- Cracks and disruption to aquifers. The impact is unlikely, of short- to medium-term duration and significance is low. The impact will recover with time and some rehabilitation. The degree of loss of resource is low.
- Potential contamination of groundwater through seepage from indiscriminately dumped waste or litter. The impact is unlikely, of short- to medium-term duration and significance is low. The impact will recover with time and some rehabilitation. The degree of loss of resource is low.
- Alien invasive encroachment. . The impact is possible, of permanent duration and significance is moderate to low. The impact will recover with remediation. The degree of loss of resource is moderate.
- Alienation of, and disturbance to, animals. The impact is possible, of short- to medium-term duration and significance is low. The impact will recover with time and some rehabilitation. The degree of loss of resource is low.
- Generation of dust on gravel roads and prospecting sites. The impact is definite, of short- to medium-term duration and significance is moderate to low. The impact will recover with time. The degree of loss of resource is low.

- Emissions into the atmosphere through use of diesel powered equipment, machinery and vehicles. The impact is definite, of short- to medium-term duration and significance is moderate to low. The impact will recover with time. The degree of loss of resource is low.
- Increased noise levels. The impact is highly probable, of short- to medium-term duration and significance is moderate to low. The impact will recover on cessation of activities.
- Increased potential for road incidences and road degradation. The impact is probable, of short- to medium-term duration and significance is moderate to low. The impact is irreversible if road incident results in loss of life.

Positive Impacts:

- Topographical nature of the area will be restored through rehabilitation.
- Potential for more employment & associated multiplier effect.

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

The full methodology utilised is described below. Impact assessment methods were developed to: (1) identify the potential impacts of a proposed development on the social and natural environment; (2) predict the probability of these impacts and (3) evaluate the significance of the potential impacts. The methodology used is as follows:

| The status of the impact | | |
|----------------------------|---------------------------------------|--|
| Status | Description | |
| Positive: | a benefit to the holistic environment | |
| Negative: | a cost to the holistic environment | |
| Neutral: | no cost or benefit | |
| The duration of the impact | | |
| Score | Duration | Description |
| 1 | Short term | Less than 2 years |
| 2 | Short to medium term | 2 – 5 years |
| 3 | Medium term | 6 – 25 years |
| 4 | Long term | 26 – 45 years |
| 5 | Permanent | 46 years or more |
| The extent of the impact | | |
| Score | Extent | Description |
| 1 | Site specific | Within the site boundary |
| 2 | Local | Affects immediate surrounding areas |
| 3 | Regional | Extends substantially beyond the site boundary |
| 4 | Provincial | Extends to almost entire province or larger region |

| 5 | National | Affects country or possibly world |
|---|--------------------------|--|
| The reversibility of the impact | | |
| Score | Reversibility | Description |
| 1 | Completely reversible | Reverses with minimal rehabilitation & negligible residual affects |
| 3 | Reversible | Requires mitigation and rehabilitation to ensure reversibility |
| 5 | Irreversible | Cannot be rehabilitated completely/rehabilitation not viable |
| The magnitude (severe or beneficial) of the impact | | |
| Score | Severe/beneficial effect | Description |
| 1 | Slight | Little effect - negligible disturbance/benefit |
| 2 | Slight to moderate | Effects observable - environmental impacts reversible with time |
| 3 | Moderate | Effects observable - impacts reversible with rehabilitation |
| 4 | Moderate to high | Extensive effects - irreversible alteration to the environment |
| 5 | High | Extensive permanent effects with irreversible alteration |
| The probability of the impact | | |
| Score | Rating | Description |
| 1 | Unlikely | Less than 15% sure of an impact occurring |
| 2 | Possible | Between 15% and 40% sure of an impact occurring |
| 3 | Probable | Between 40% and 60% sure that the impact will occur |
| 4 | Highly Probable | Between 60% and 85% sure that the impact will occur |
| 5 | Definite | Over 85% sure that the impact will occur |
| The Consequence | | = Magnitude + Spatial Scale + Duration + Reversibility. |
| The Significance | | = Consequence x Probability. |

The rating is described as follows:

| Score out of 100 | Significance |
|------------------|------------------|
| 1 to 20 | Low |
| 21 to 40 | Moderate to Low |
| 41 to 60 | Moderate |
| 61 to 80 | Moderate to high |
| 81 to 100 | High |

Will mitigation be possible (yes or no)?

Finally the negative impacts are rated according to the degree of loss of a resource due to the particular impact. This is only assessed from the pre-mitigation perspective of the impact. The degree of loss of a resource is evaluated in terms of:

- Low degree of loss: where the resource will recover on its own with no/limited rehabilitation over an observable period of time;
- Moderate degree of loss: where the resource will recover over extended period or with rehabilitation or remedial measures to assist recovery of

resource; and

- High degree of loss: Where the resource cannot be recovered, or the resource will recover over extended time periods.

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

Table 3: Advantages and disadvantages of alternatives -

| Alternatives | Advantages | Disadvantages |
|---|------------|---------------|
| Final proposed project layout | | |
| No alternatives have been considered (please see alternatives discussion in Part A Section 3(h)(i)) | | |
| Other alternatives proposed by I&APs | | |
| No alternatives have been proposed by the I&APs to date. | - | - |

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

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

Table 4: Possible mitigation measures to issues raised by I&APs

| Issue raised | Mitigation measures considered including alternatives | Risks associated with proposed mitigation measure |
|--|---|---|
| No issues or mitigation measures were raised by the I&APs during the 30 day commentary period. | - | - |

ix. Motivation where no alternative sites were considered

With regard to location, the prospecting activities are delimited by the properties available for prospecting (i.e. not held by another company) and the geology of the surrounding area.

The preliminary positions of the proposed prospecting boreholes have been sited to give a

representative sample for the project area. The positions of these have taken into account the various water resources and their applicable buffers. Alternatives may be considered based on the findings of the geotechnical investigations.

No activity alternatives are considered. Drilling is still the most effective way and an industry norm to complete resource evaluation as required for the mine works programme to be submitted in terms of a MRA.

The use of desktop study and literature review as an initial non-invasive technique to delimit areas for invasive drilling is seen as the most responsible method to reduce needless surface disturbance and reduce environmental impact footprint. Technology alternatives are therefore also not assessed further.

x. *Statement motivating the alternative development location within the overall site*

The final layout of the drilling can only be completed once the non-invasive activities have been undertaken. It can only be stated that invasive prospecting (drilling) will avoid the wetlands and, rivers and 100m buffer zones / 1:100 year floodlines (whichever is greatest), and 50m buffer zones from potential historical sites, graves and identified protected plants.

(h) Full description of the process undertaken to identify, assess and rank the impacts and risks the activity will impose on the preferred site (In respect of the final site layout plan) through the life of the activity.

(Including (i) a description of all environmental issues and risks that 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.)

The impact identification process commenced by identifying all environmental aspects on site, whether sensitive or not. General environmental aspects that were considered include:

- Topography
- Geology
- Soil & Associated Land Capability
- Surface Water, Associated Wetlands and Aquatic Ecosystems
- Groundwater
- Floral and Faunal Ecosystems
- Air Quality
- Ambient Environmental Noise
- Archaeological and Cultural Sites
- Local Traffic and Safety
- Socio-Economics
- Health and Safety

All potential impacts that may occur to the various environmental aspects as a result of the activities listed in Part a Section 3(d)(i) of this report were listed for each of the aspects.

Through the PPP, any issues or potential impacts identified by the I&APs have been added to the list of potential impacts.

All these impacts were then assessed as per the methodology described above and their significance determined.

Impact identification has therefore been a consolidated approach based on professional experience and I&AP (including organs of state involved in the PPP) input.

The impacts are listed with their significance and possibility for mitigation under Part A Section 3(h) (v). Other impact details are also elaborated under Part A Section 3(j) below.

(i) **Assessment of each identified potentially significant impact and risk**

| ACTIVITY | POTENTIAL IMPACT | ASPECTS AFFECTED | PHASE In which impact is anticipated | SIGNIFICANCE if not mitigated | MITIGATION TYPE | SIGNIFICANCE if mitigated |
|--------------------------------------|---|--|---|---|--|---|
| Access routes | <p>Potential for compaction of soils.</p> <p>Potential hydrocarbon contamination of soil.</p> <p>Potential for damage of any red data flora or heritage sites via the use of unauthorised off road routes</p> <p>Potential for disturbance to wetlands and buffer zones if activity proceeds indiscriminately.</p> <p>Generation of dust on gravel roads.</p> <p>Emissions into the atmosphere through use of diesel powered equipment, machinery and vehicles.</p> <p>Increased noise levels.</p> <p>Increased potential for road incidences.</p> <p>Road degradation.</p> | <p>Soil & Land Capability</p> <p>Surface Water & Associated Wetlands & Aquatic Ecosystems</p> <p>Groundwater</p> <p>Air Quality</p> <p>Noise</p> <p>Traffic & Safety</p> <p>Flora</p> <p>Heritage sites</p> | Operation, Decommissioning | Mostly impacts are of moderate to low significance. Most significant impact would be to wetlands if routes are not properly planned and assessed. The impact is of moderate significance. | <p>REMEDY THROUGH:</p> <p>Ripping compacted soils.</p> <p>Clearing any spills.</p> <p>Ceasing and rehabilitating any illegal activity.</p> <p>Rehabilitating and repairing any damage.</p> <p>Inspection and immediate action.</p> <p>Surveying any off road routes prior to use to prevent damage to red data plants and heritage sites</p> <p>CONTROL THROUGH:</p> <p>Remaining in designated roads / routes / activity areas.</p> <p>Maintaining all vehicles, equipment, machinery and equipment and discontinuing use of faulty equipment.</p> <p>Using biodegradable lubrication</p> <p>Equipping vehicles on site with drip trays to place under leaky equipment.</p> <p>Dust alleviation by spraying and limiting speeds on dirt roads</p> <p>Noise buffering measures on noisy equipment.</p> <p>Regular communication with nearby I&APs.</p> <p>STOP THROUGH:</p> <p>Preventing activities within 100m of streams and wetlands unless authorisation is obtained to do so.</p> | Significance can mostly be reduced to low; or moderate to low through proposed mitigation measures. |
| Drilling | <p>Localised dips in topography if boreholes collapse after material is replaced.</p> <p>Cracks and disruption to geological layers and aquifers.</p> <p>Potential for compaction of soils, surface water (through runoff) and groundwater (seepage) environment.</p> <p>Potential hydrocarbon contamination of soils.</p> <p>Potential for disturbance to wetlands and buffer zones if activity proceeds indiscriminately.</p> <p>Irresponsible use of water and water wastage.</p> <p>Emissions into the atmosphere through use of diesel powered equipment, machinery and vehicles.</p> <p>Increased noise levels.</p> <p>Loss of and disturbance to archaeological / heritage / grave sites that may be encountered</p> | <p>Topography</p> <p>Geology</p> <p>Soil & Land Capability</p> <p>Surface Water & Associated Wetlands & Aquatic Ecosystems</p> <p>Groundwater</p> <p>Air Quality</p> <p>Noise</p> <p>Archaeological/Cultural Sites</p> | Operation, Decommissioning, Closure | Mostly impacts are of low significance. Most significant impact would be to heritage sites (high significance) and wetlands (moderate to high significance) if sites are not properly planned to avoid these sites. | <p>REMEDY THROUGH:</p> <p>Ripping compacted soils.</p> <p>Clearing any spills.</p> <p>Ceasing and rehabilitating any illegal activity.</p> <p>Rehabilitating and repairing any damage.</p> <p>Inspection and immediate action.</p> <p>CONTROL THROUGH:</p> <p>Planning invasive prospecting sites properly to avoid sensitive features.</p> <p>Remaining in designated roads / routes / prospecting areas.</p> <p>Maintaining all vehicles, machinery and equipment and discontinuing use of faulty equipment.</p> <p>Using biodegradable lubricant</p> <p>Placing drip trays under leaky equipment.</p> <p>Dust alleviation by spraying and limiting speeds on dirt roads.</p> <p>Noise buffering measures on noisy equipment or conducting activities during a convenient time of day when near to sensitive receptors.</p> <p>Responsible water use.</p> <p>Regular communication with nearby I&APs.</p> <p>Contracting necessary specialists as needed.</p> <p>STOP THROUGH:</p> <p>Preventing activities within 100m of streams and wetlands unless authorisation is obtained to do so.</p> <p>Preventing activities near potential heritage sites unless necessary permits are obtained to do so.</p> <p>Maintaining a buffer around the ruins/graves at all times during the prospecting activities</p> | Significance can mostly be reduced to low or moderate to low through proposed mitigation measures. |
| Casing of boreholes | Localised dips in topography if boreholes collapse after material is replaced. | Topography | Operation, | Impact significance is low. | <p>REMEDY THROUGH:</p> <p>Rehabilitating and repairing any damage.</p> <p>Inspection and immediate action.</p> | Impact significance is low. |
| Ablution facility (portable toilets) | <p>Potential contamination of soil with sewage.</p> <p>Potential contamination of surface water bodies with sewage.</p> | <p>Soil & Land Capability</p> <p>Surface Water & Associated Wetlands & Aquatic Ecosystems</p> | Operation | Impact significance is low. | <p>REMEDY THROUGH:</p> <p>Inspection and repair / replace damaged toilets.</p> <p>CONTROL THROUGH:</p> <p>Contracting necessary reputable contractor to manage portable toilets.</p> <p>Proper housekeeping and hygienic practices.</p> | Impact significance is low. |

| ACTIVITY | POTENTIAL IMPACT | ASPECTS AFFECTED | PHASE In which impact is anticipated | SIGNIFICANCE if not mitigated | MITIGATION TYPE | SIGNIFICANCE if mitigated |
|--|--|--|---|--|--|---|
| | | | | | Inspection and immediate action. | |
| Temporary 'Camp site', core/equipment store and site office. Staff will be accommodated off site unless permission is given by landowners. A temporary site camp comprising of shade, equipment storage and seating for meals may be established | <p>Potential of compaction of soils.</p> <p>Potential hydrocarbon contamination of soil, surface water (through runoff) and groundwater (seepage) environment.</p> <p>Alienation of, and disturbance to, animals.</p> <p>Potential contamination of soil and surface water features with indiscriminately dumped waste or littering.</p> <p>Potential contamination of groundwater through seepage from indiscriminately dumped waste or litter.</p> <p>Disturbance/damage to vegetation</p> | <p>Soil & Land Capability</p> <p>Surface Water & Associated Wetlands and Aquatic Ecosystems</p> <p>Groundwater</p> <p>Fauna</p> <p>Flora</p> | Operation, Decommissioning, Closure | Impact significance is generally moderate to low | <p>REMEDY THROUGH:</p> <p>Ripping up of compacted soils</p> <p>Clearing all litter and waste.</p> <p>Reporting any non-compliant incidences to the relevant authorities and following their requirements.</p> <p>Inspection and immediate action.</p> <p>CONTROL THROUGH:</p> <p>Collecting waste for disposal to the relevant waste stream at the PA.</p> <p>Clear all vehicles coming to site of any vegetative material.</p> <p>Maintaining wetlands and buffer zones as ecological corridors and refuges.</p> <p>Do not hinder, harm or trap animals.</p> <p>Noise control measures.</p> <p>Visually surveying prospecting sites for any protected species or heritage sites.</p> <p>STOP THROUGH:</p> <p>Preventing activities within 100m of streams and wetlands unless authorisation is obtained to do so.</p> <p>Preventing activities near potential heritage sites unless necessary permits are obtained to do so.</p> <p>Preventing activities within areas supporting protected species and preserve such species in situ, or obtain the necessary authorisation to remove / destroy such species if necessary.</p> | Impact significance is low |
| Hydrocarbon Storage | Potential hydrocarbon contamination of soil, surface water (through runoff) and groundwater (seepage) environment. | <p>Soil & Land Capability</p> <p>Surface Water & Associated Wetlands and Aquatic Ecosystems</p> <p>Groundwater</p> | Operation, Decommissioning, Closure | Mostly impacts are of low significance. Most significant impact would be to wetlands (moderate to high significance) if sites are not properly planned to avoid these sites. | <p>REMEDY THROUGH:</p> <p>Clearing any spills.</p> <p>Ceasing and rehabilitating any illegal activity.</p> <p>Rehabilitating and repairing any damage.</p> <p>Inspection and immediate action.</p> <p>CONTROL THROUGH:</p> <p>Maintaining all vehicles, machinery and equipment and discontinuing use of faulty equipment.</p> <p>Using biodegradable lubricant</p> <p>Placing drip trays under leaky equipment.</p> <p>The area is less than 80m²</p> <p>Plastic lining or mobile bonding will be used</p> <p>Spill kits will be on hand in the event of a spillage</p> <p>Safe work procedure will be adhered to when refuelling vehicles and machinery</p> | Impact significance is low |
| Rehabilitation of boreholes | Topographical nature of the area will be restored through rehabilitation. | <p>Topography</p> <p>Soil & Land Capability</p> <p>Surface Water & Associated Wetlands & Aquatic Ecosystems</p> | Operation, Decommissioning, Closure | Impact significance is moderate to low. | No mitigation necessary. Impact is positive. | Impact significance is moderate to low. |
| General overall prospecting activities | Alien invasive encroachment. | <p>Soil & Land Capability</p> <p>Surface Water & Associated Wetlands & Aquatic Ecosystems Flora & Fauna</p> | Operation, Decommissioning, Closure | Impact significance is generally low | <p>REMEDY THROUGH:</p> <p>Removal of alien and invasive species that may establish around prospecting sites.</p> <p>CONTROL THROUGH:</p> <p>Clear all vehicles coming to site of any vegetative material.</p> | Impact significance can be mitigated to be of low significance. |
| General overall prospecting activities | Potential for more employment & multiplier effect. | Socio-economic, Health & Safety | Operation | Impact significance is moderate to low. | No mitigation necessary. Impact is positive | Impact significance is moderate to low. |

(j) Summary of specialist reports

| LIST OF STUDIES UNDERTAKEN | RECOMMENDATIONS OF SPECIALIST REPORTS | SPECIALIST RECOMMENDATIONS THAT HAVE BEEN INCLUDED IN THE EIA REPORT (Mark with an X where applicable) | REFERENCE TO APPLICABLE SECTION OF REPORT WHERE SPECIALIST RECOMMENDATIONS HAVE BEEN INCLUDED. |
|--|---------------------------------------|---|--|
| No specialist reports were completed for this BA report. | | | |
| | | | |
| | | | |
| | | | |
| | | | |
| | | | |
| | | | |

(k) Environmental impact statement

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

Due to the location of the Prospecting Area the cumulative noise and visual impacts are rated with a moderate to low significance.

The significance of ground water contamination is low to moderate and overuse/irresponsible use of water and groundwater extractions would raise the significance of the impact to moderate to high.

Other impacts were rated to be of either moderate to low significance or of low significance.

All mitigation measures will maintain impacts to acceptable and recoverable levels and no impacts expected to exceed a significance of moderate to low with implementation of proposed mitigation measures.

ii. Final Site Map

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

Please see Figure 3.

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

The majority of the negative implications associated with the Prospecting Application are related to access roads and drilling, contamination from portable ablution facilities and general prospecting activities and their associated impacts on the surrounding environment.

Positive impact is associated with the brief creation of jobs and is considered of moderate to low significance. This has been assessed in terms of the prospecting operation on its own; however should this prospecting right be converted into a MR then the social benefits will be of moderate to high significance.

Positive impact is also associated with rehabilitation once the prospecting activity has been concluded. This is especially true for areas of land that have been degraded due to overgrazing and soil erosion.

(l) Proposed impact management objectives and the impact management outcomes for inclusion in the EMPr;

The objectives of impact mitigation and management are to:

- Primarily pre-empt impacts and prevent the realisation of these impacts – PREVENTION.

- To ensure activities that are expected to impact on the environment are undertaken and controlled in such a way so as to minimise their impacts – MODIFY and/or CONTROL.
- To ensure a system is in place for treating and/or rectifying any significant impacts that will occur due to the proposed activity – REMEDY.
- Implement an adequate monitoring programme to:
 - Ensure that mitigation and management measure are effective.
 - Allow quick detection of potential impacts, which in turn will allow for quick response to issue/impacts.
 - Reduce duration of any potential negative impacts.

Environmental impact management outcomes are:

- Conduct prospecting activities responsibly and ensure operation is compliant with legislative requirements.
- Protect the biophysical environment as far as possible, specifically wetlands and riverine areas and any protected species observed on site.
- Protect the water resources in the area as far as possible.
- Ensure atmospheric pollution is kept to a minimum:
- Ensure adequate rehabilitation to allow continued land use.
- Ensure socially responsible activities.
- Protect historical and cultural sites if they are observed on site.

(m) Aspects for inclusion as conditions of Authorisation

- No activity is to occur within wetlands and their 100m buffer zones, within rivers and their 100m buffer zone / 1:100 year flood line without the necessary authorisation under NEMA and NWA.
- Protected species must remain *in situ* until the necessary permits are obtained under NEM:BA.
- Heritage sites and 50m buffer zones will be preserved at all times unless the necessary permits are obtained under SAHRA.
- Planning before carrying out prospecting activities in a particular area, and surveying the area before conducting invasive prospecting, is critical to ensure any sensitive areas are preserved and to ensure prospecting proceeds in a manner compliant with national legislation.
- Rehabilitation must be applied on an on-going basis and no sites must be left exposed for more time than necessary to obtain the necessary data.

(n) Description of any assumptions, uncertainties and gaps in knowledge.

(Which relate to the assessment and mitigation measures proposed)

The preliminary positions of the proposed prospecting boreholes have been mapped, these

may however vary based on the findings of the geotechnical investigations. This is not seen as a major gap as the lack of this knowledge has been worked into the EMP as well as the proposed conditions stipulated above. In general, the approach will be as follows for invasive prospecting:

- As the Land Cover in the Prospecting area is entirely natural the whole area must be surveyed by a specialist for potential protected species relevant to the region prior to commencing invasive prospecting. Any protected identified must be avoided or the necessary permits applied for (to destroy / remove / relocate).
- Areas will be visually surveyed for heritage sites prior to commencing with invasive prospecting. These must then be avoided with appropriate buffer zones or the necessary permits applied for.
- Activities must remain outside all wetland areas until authorisation has been obtained under NEMA and NEM:WA.

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

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

Authorisation of the activity should be granted.

The risks of the particular prospecting activity are minimal and can be easily mitigated by following the EMP, which will reduce impacts significantly to acceptable levels and which will easily recover.

(ii) Conditions that must be included in the authorisation

No activity is to occur within wetlands and their 100m buffer zones, within rivers and their 100m buffer zone / 1:100 year flood line without the necessary authorisation under NEMA and NWA.

Protected species must remain in situ until the necessary permits are obtained under NEM:BA.

Heritage sites and 50m buffer zones will be preserved at all times unless the necessary permits are obtained under SAHRA.

Rehabilitation must be applied on an on-going basis and no sites must be left exposed for more time than necessary to obtain the necessary data.

(p) Period for which the Environmental Authorisation is required.

Prospecting activities are likely to require 3 years, including initial data assessment. The EA is requested for a period of 5 years in the event that additional permits or authorisations may

be required once invasive prospecting activities commence.

(q) Undertaking

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

Undertaking at the end of the BA and EMP has been fully completed and signed.

(r) Financial Provision

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

The financial provision required for the prospecting programme has been calculated at R65 736.91.

(i) Explain how the aforesaid amount was derived.

The financial provision was calculated using the DMR's rules based assessment.

Environmental management and monitoring, as per the EMP will be conducted by Minerano's environmental managers, where needed, and will form part of their operational running costs.

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

The amount of R6,706, 000.00 has been allocated to the prospecting programme over the three year period (this includes costing for the in-filling and rehabilitation of the boreholes and other disturbed areas). This will be provided in cash by Menar Holding. Please refer to Appendix C of the PWP for evidence of funding. The table below is an extract from the PWP and indicates overall costs estimated for the three year life of prospecting.

Remaining costs are part of Minerano Resources (Pty) Ltd running costs.

Table 4: Cost estimate as per the PWP

| ACTIVITY | YEAR 1 Expenditure (R') | YEAR 2 Expenditure (R') | YEAR 3 Expenditure (R') | YEAR 4 Expenditure (R') | YEAR 5 Expenditure (R') |
|---|-------------------------------|-------------------------------|-------------------------------|-------------------------------|-------------------------------|
| Phase 1 (0-12 months) | | | | | |
| Desktop Studies and Literature Review | 60 000 | | | | |
| Data/borehole acquisition | 100 000 | | | | |
| Geophysics surveys | 150 000 | | | | |
| | | | | | |
| PHASE 2 (12 - 24 months) | | | | | |
| Site establishment/de-establishment | | 50 000 | | | |
| Boreholes (including rehabilitation) for infill drilling if required | | 4 000 000 | | | |
| Laboratory and analysis | | 100 000 | | | |
| | | | | | |
| PHASE 3 (24 – 36 months) | | | | | |
| Resource Modelling | | | 300 000 | | |
| Pre-feasibility Studies | | | 500 000 | | |
| | | | | | |
| Phase 4 (36 – 60 months) | | | | | |
| Environmental Studies | | | | 1 500 000 | |
| Annual Total | | | | | |
| | | | | Total Budget | 6 760 000 |

(s) Specific Information required by the competent Authority

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

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

Impact is seen as minimal if EMP is applied to prospecting activities and prospecting sites. It is not anticipated that the drilling activities will impact on the socio-economic conditions of the landowner / occupier, as the current land use can continue alongside the prospecting.

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

No specialist studies were deemed necessary as the project sensitivity is seen to be low. The management plan has made allowance for mitigation measures to ensure avoidance of these sites should they be encountered, as the prospecting locations will have some degree of flexibility. Where unavoidable, the EMP stipulates that the permits must be obtained under SAHRA.

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

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

Section 24(4)(b)(i) of the Act specifies “investigation of the potential consequences or impacts of the alternatives to the activity on the environment and assessment of the significance of those potential consequences or impacts, including the option of not implementing the activity.”

This has been addressed in Part A Section 3(b) above. As stipulated, the site is delimited by the prospecting rights area and the extent of the resource. Invasive prospecting area will be delimited by the data from non-invasive techniques. The approach to prospecting is environmentally responsible (by completing non-invasive techniques first) and an industrial norm (drilling is still an acceptable means for resource evaluation as required for the MRA).

PART B
ENVIRONMENTAL MANAGEMENT PROGRAMME REPORT

1 DRAFT ENVIRONMENTAL MANAGEMENT PROGRAMME.

a) Details of the EAP,

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

Applicant has completed the application which was independently reviewed by an EAP. Please see PART A Section 3(a) and Appendix 1 and Appendix 2.

b) Description of the Aspects of the Activity

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

Please see PART A Section 3(h).

c) Composite Map

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

Please see Figure 3 above for a composite plan.

d) Description of Impact management objectives including management statements

The objectives of impact mitigation and management are to:

- Primarily pre-empt impacts and prevent the realisation of these impacts - PREVENTION.
 - Plan prospecting routes and sites to prevent impact to wetlands and rivers and the appropriate buffer zones, or obtain relevant authorisation / licence under NEMA / NWA.
 - Survey proposed routes and prospecting sites to prevent impact to heritage sites that may be discovered whilst prospecting on site, or obtain relevant permit under SAHRA.
 - Survey proposed routes and prospecting sites to prevent impact to protected species that may occur in prospecting areas, or obtain relevant permit under NEM:BA.
- To ensure activities that are expected to impact on the environment are undertaken and controlled in such a way so as to minimise their impacts – MODIFY and/or CONTROL.
 - Reduce risk of contamination to the environment from vehicles, machinery, drill rigs and equipment (emissions, hydrocarbon spills, and excessive noise) by ensuring regular maintenance and keeping drip pans available at all times.

- Collect all litter, sort and store according to the appropriate waste stream and dispose of at a licensed facility.
- Inspect and maintain portable toilets to reduce risk of contamination through sewage spills.
- Spray route and areas of activity with water when dry to reduce fugitive dust emissions.
- Regularly communicate prospecting intentions to local land owners / users.
- Keep vehicles and machinery free from plant matter to reduce risk of introduction and spread of alien and invasive species.
- Establish and enforce speed limits on all roads.
- To ensure a system is in place for treating and/or rectifying any significant impacts that will occur due to the proposed activity – REMEDY.
 - Keep hydrocarbon spill kits on site at all times to clear any spills that occur.
 - Implement the inspection and monitoring plan stipulated in the EMP and take the necessary action for any issues observed on site.
- Implement an adequate monitoring programme to:
 - Ensure that mitigation and management measure are effective.
 - Allow quick detection of potential impacts, which in turn will allow for quick response to issue/impacts.
 - Reduce duration of any potential negative impacts.

(i) Determination of closure objectives

(Ensure that the closure objectives are informed by the type of environment described in 2.4 herein)

Closure objectives must be met with regards to:

Topography:

- To ensure that the final elevation of drilled areas is free draining.

Soil and Land Capability:

- To ensure that top soil (with vegetation clods where applicable) is replaced to the surface of rehabilitated areas to restore vegetation growth and reduce risk of erosion.

Surface Water

- To ensure no sedimentation or contamination of the surrounding surface water systems.

Flora and Fauna:

- To ensure that alien invasive establishment and spread on areas disturbed by prospecting is prevented and controlled.
- To preserve protected species in situ as far as possible.

Wetlands

- To prevent disturbance to wetlands and maintain current wetland status and maintain ecological corridors associated with rivers and wetlands.

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

No processing water requirements.

Water will be brought onto site for potable use; this is estimated at 5 litres per person/day.

Groundwater will be used, where necessary, for any drilling requirements.

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

No application for water use has been made.

(iv) Impacts to be mitigated in their respective phases

| Impacts to be mitigated in their respective phases ACTIVITY Whether listed or not listed. | PHASE In which impact is anticipated | SIZE AND SCALE of disturbance | MITIGATION MEASURES | COMPLIANCE WITH STANDARDS | TIME PERIOD FOR IMPLEMENTATION |
|--|--|--|---|--|--|
| Access routes | Operation, construction Decommissioning | Farm roads will be used as far as possible. No additional roads will be constructed. | <p>REMEDY THROUGH: Ripping compacted soils. Clearing any spills. Ceasing and rehabilitating any illegal activity. Rehabilitating and repairing any damage. Inspection and immediate action. Surveying any off road routes prior to use to prevent damage to red data plants and heritage sites.</p> <p>CONTROL THROUGH: Remaining in designated roads / routes / activity areas. Maintaining all vehicles, equipment, machinery and equipment and discontinuing use of faulty equipment. Using biodegradable lubrication. Equipping vehicles on site with drip trays to place under leaky equipment. Dust alleviation by spraying and limiting speeds on dirt roads. Noise buffering measures on noisy equipment. Regular communication with nearby I&APs.</p> <p>STOP THROUGH: Preventing activities within 100m of streams and wetlands unless authorisation is obtained to do so.</p> | CARA, NEMA and MPRDA regulations regarding soil amelioration. General duty of care in terms of NEMA. | <ol style="list-style-type: none"> 1. Once-off sign-off of route plans or amendments to these plans before any activities take place for the duration of prospecting operations. 2. Once off inspection of routes and prospecting sites after activity in the area has ceased. |
| Drilling | Operation, Decommissioning, Closure | 4m ² per borehole. 10 boreholes have been provisionally sited | <p>REMEDY THROUGH: Ripping compacted soils. Clearing any spills. Ceasing and rehabilitating any illegal activity. Rehabilitating and repairing any damage. Inspection and immediate action.</p> <p>CONTROL THROUGH: Planning invasive prospecting sites properly to avoid sensitive features. Remaining in designated roads / routes / prospecting areas. Maintaining all vehicles, machinery and equipment and discontinuing use of faulty equipment. Using biodegradable lubricant. Placing drip trays under leaky equipment. Dust alleviation by spraying and limiting speeds on dirt roads. Noise buffering measures on noisy equipment or conducting activities during a convenient time of day when near to sensitive receptors.</p> <p>Responsible water use. Regular communication with nearby I&APs. Contracting necessary specialists as needed.</p> <p>STOP THROUGH: Preventing activities within 100m of streams and wetlands unless authorisation is obtained to do so. Preventing activities near potential heritage sites unless necessary permits are obtained to do so. Maintaining a buffer around the ruins/graves at all times during the prospecting activities.</p> | <p>NEMA & MPRDA principals and regulations regarding environmental protection and rehabilitation.</p> <p>SAHRA will be complied with regarding permits for destruction and relocation or management of heritage sites; and applicable buffers.</p> | <ol style="list-style-type: none"> 1. Once-off sign-off of route plans or amendments to these plans before any activities take place for the duration of prospecting operations. 2. Once off inspection of rehabilitated areas. |
| Casing of boreholes | Operation, Decommissioning, Closure | 4m ² per borehole. 10 boreholes have been provisionally sited | <p>REMEDY THROUGH: Rehabilitating and repairing any damage. Inspection and immediate action.</p> | NEMA & MPRDA principals and regulations regarding environmental protection and rehabilitation requirements. | 1. Once-off inspection of drilled boreholes after substantial rainfall |
| Ablution facility (portable toilets) | Operation | Portable toilets will be used | <p>REMEDY THROUGH: Inspection and repair / replace damaged toilets.</p> <p>CONTROL THROUGH: Contracting necessary reputable contractor to manage portable toilets.</p> | General duty of care in terms of NEMA & NWA. | 1. Weekly inspections of portable toilet facilities for the duration of prospecting activities. |

| Impacts to be mitigated in their respective phases ACTIVITY Whether listed or not listed. | PHASE In which impact is anticipated | SIZE AND SCALE of disturbance | MITIGATION MEASURES | COMPLIANCE WITH STANDARDS | TIME PERIOD FOR IMPLEMENTATION |
|--|--|--|---|--|--|
| | | | Proper housekeeping and hygienic practices. Inspection and immediate action. | | |
| Temporary 'Camp site', core/equipment store and site office. Staff will be accommodated off site unless permission is given by landowners. A temporary site camp comprising of shade, equipment storage and seating for meals may be established | Operation | 0.05 Ha | REMEDY THROUGH: Ripping up of compacted soils Clearing all litter and waste.. Reporting any non-compliant incidences to the relevant authorities and following their requirements. Inspection and immediate action. CONTROL THROUGH: Collecting waste for disposal to the relevant waste stream at the PA. Clear all vehicles coming to site of any vegetative material. Maintaining wetlands and buffer zones as ecological corridors and refuges. Do not hinder, harm or trap animals. Noise control measures. Visually surveying prospecting sites for any protected species or heritage sites. STOP THROUGH: Preventing activities within 100m of streams and wetlands unless authorisation is obtained to do so. Preventing activities near potential heritage sites unless necessary permits are obtained to do so. Preventing activities within areas supporting protected species and preserve such species in situ, or obtain the necessary authorisation to remove / destroy such species if necessary. | General duty of care in terms of NEMA & NWA. | 1. Weekly inspections of the site camp and surrounding area for the duration of prospecting activities. |
| Hydrocarbon Storage | Operation | 80m ² | REMEDY THROUGH: Clearing any spills. Ceasing and rehabilitating any illegal activity. Rehabilitating and repairing any damage. Inspection and immediate action. CONTROL THROUGH: Maintaining all vehicles, machinery and equipment and discontinuing use of faulty equipment. Using biodegradable lubricant. Placing drip trays under leaky equipment. The area is less than 80m ² Plastic lining or mobile bunding will be used. Spill kits will be on hand in the event of a spillage. Safe work procedure will be adhered to when refuelling vehicles and machinery. | General duty of care in terms of NEMA & NWA. | 1. Weekly inspections of the vehicles and storage area for the duration of prospecting activities. |
| Rehabilitation of boreholes | Operation, Decommissioning, Closure | 4m ² per borehole. 10 boreholes have been provisionally sited. | No mitigation necessary. Impact is positive. | General duty of care in terms of NEMA. MPRDA rehabilitation standards. | 1. Monthly once invasive prospecting commences for the duration of prospecting. 2. Once-off inspection of rehabilitated sites after substantial rainfall. |
| General overall prospecting activities | Operation, Decommissioning, Closure | The general prospecting activities will be 540m ² (the combined total of all the aforementioned activities) | REMEDY THROUGH: Removal of alien and invasive species that may establish around prospecting sites. CONTROL THROUGH: Clear all vehicles coming to site of any vegetative material. | MPRDA requirement and standards regarding prospecting and rehabilitation of prospecting areas. | 1. Monthly visual inspection of the active prospecting areas. 2. Once-off inspection of rehabilitated sites after substantial rainfall. |

e) Impact Management Outcomes

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

| ACTIVITY Whether listed or not listed. | POTENTIAL IMPACT | ASPECTS AFFECTED | PHASE | MITIGATION TYPE | STANDARD TO BE ACHIEVED |
|---|---|--|-------------------------------------|--|--|
| Access routes | <p>Potential for compaction of soils.</p> <p>Potential hydrocarbon contamination of soil, surface water (through runoff) and groundwater (seepage) environment.</p> <p>Potential for damage of any red data flora or heritage sites via the use of unauthorised off road routes.</p> <p>Potential for disturbance to wetlands and buffer zones if activity proceeds indiscriminately.</p> <p>Potential for disturbance of heritage sites and graves if activity proceeds indiscriminately.</p> <p>Generation of dust on gravel roads.</p> <p>Emissions into the atmosphere through use of diesel powered equipment, machinery and vehicles.</p> <p>Increased noise levels.</p> <p>Increased potential for road incidences.</p> <p>Road degradation.</p> | <p>Soil & Land Capability</p> <p>Surface Water & Associated Wetlands & Aquatic Ecosystems</p> <p>Groundwater</p> <p>Air Quality</p> <p>Noise</p> <p>Traffic & Safety</p> <p>Flora</p> <p>Heritage sites</p> | Operation, Decommissioning | <p>REMEDY THROUGH:</p> <p>Ripping compacted soils.</p> <p>Clearing any spills.</p> <p>Ceasing and rehabilitating any illegal activity.</p> <p>Rehabilitating and repairing any damage.</p> <p>Inspection and immediate action.</p> <p>Surveying any off road routes prior to use to prevent damage to red data plants and heritage sites.</p> <p>CONTROL THROUGH:</p> <p>Remaining in designated roads / routes / activity areas.</p> <p>Maintaining all vehicles, equipment, machinery and equipment and discontinuing use of faulty equipment.</p> <p>Using biodegradable lubrication.</p> <p>Equipping vehicles on site with drip trays to place under leaky equipment.</p> <p>Dust alleviation by spraying and limiting speeds on dirt roads.</p> <p>Noise buffering measures on noisy equipment.</p> <p>Regular communication with nearby I&APs.</p> <p>STOP THROUGH:</p> <p>Preventing activities within 100m of streams and wetlands unless authorisation is obtained to do so.</p> | <p>Reduce compaction of soil and maintain existing land capability.</p> <p>Vehicles, machinery and equipment maintained within operational specification and legislative requirements.</p> <p>Prevent disturbance to surface water features.</p> <p>Dust fallout will be managed to not exceed 600mg/m²/day.</p> <p>Keep equipment, machinery and vehicles operating within their manufacturing specifications.</p> <p>Prevent nuisance noise to nearby land owners / users.</p> <p>High safety standards on site with reduced safety risks.</p> |
| Drilling | <p>Localised dips in topography if boreholes collapse after material is replaced.</p> <p>Cracks and disruption to geological layers and aquifers.</p> <p>Potential for compaction of soils.</p> <p>Potential hydrocarbon contamination of soils, surface water (through runoff) and groundwater (seepage) environment.</p> <p>Potential for disturbance to wetlands and buffer zones if activity proceeds indiscriminately.</p> <p>Irresponsible use of water and water wastage.</p> <p>Emissions into the atmosphere through use of diesel powered equipment, machinery and vehicles.</p> <p>Increased noise levels.</p> <p>Loss of and disturbance to archaeological / heritage / grave sites that may be encountered.</p> | <p>Topography</p> <p>Geology</p> <p>Soil & Land Capability</p> <p>Surface Water & Associated Wetlands & Aquatic Ecosystems</p> <p>Groundwater</p> <p>Air Quality</p> <p>Noise</p> <p>Archaeological/Cultural Sites</p> | Operation, Decommissioning, Closure | <p>REMEDY THROUGH:</p> <p>Ripping compacted soils.</p> <p>Clearing any spills.</p> <p>Ceasing and rehabilitating any illegal activity.</p> <p>Rehabilitating and repairing any damage.</p> <p>Inspection and immediate action.</p> <p>CONTROL THROUGH:</p> <p>Planning invasive prospecting sites properly to avoid sensitive features.</p> <p>Remaining in designated roads / routes / prospecting areas.</p> <p>Maintaining all vehicles, machinery and equipment and discontinuing use of faulty equipment.</p> <p>Using biodegradable lubricant.</p> <p>Placing drip trays under leaky equipment.</p> <p>Dust alleviation by spraying and limiting speeds on dirt roads.</p> <p>Noise buffering measures on noisy equipment or conducting activities during a convenient time of day when near to sensitive receptors.</p> <p>Responsible water use.</p> <p>Regular communication with nearby I&APs.</p> <p>Contracting necessary specialists as needed.</p> <p>STOP THROUGH:</p> <p>Preventing activities within 100m of streams and wetlands unless authorisation is obtained to do so.</p> <p>Preventing activities near potential heritage sites unless necessary permits are obtained to do so.</p> <p>Maintaining a buffer around the ruins/graves at all times during the prospecting activities.</p> | <p>Restore natural catchment drainage patterns as far as possible.</p> <p>Reduce compaction of soil and maintain existing arable land capability.</p> <p>Vehicles, machinery and equipment maintained within operational specification and legislative requirements.</p> <p>Prevent disturbance to surface water features.</p> <p>Utilise water responsibly.</p> <p>Keep equipment, machinery and vehicles operating within their manufacturing specifications.</p> <p>Prevent nuisance noise to nearby land owners / users</p> <p>Preservation of heritage sites.</p> |
| Casing of boreholes | Localised dips in topography if boreholes collapse after material is replaced. | Topography | Operation | <p>REMEDY THROUGH:</p> <p>Rehabilitating and repairing any damage.</p> <p>Inspection and immediate action.</p> | Restore natural catchment drainage patterns as far as possible. |

| ACTIVITY Whether listed or not listed. | POTENTIAL IMPACT | ASPECTS AFFECTED | PHASE | MITIGATION TYPE | STANDARD TO BE ACHIEVED |
|--|--|---|---|--|--|
| Ablution facility (portable toilets) | Potential contamination of soil with sewage. Potential contamination of surface water bodies with sewage. | Soil & Land Capability Surface Water & Associated Wetlands & Aquatic Ecosystems | Operation | REMEDY THROUGH: Inspection and repair / replace damaged toilets. CONTROL THROUGH: Contracting necessary reputable contractor to manage portable toilets. Proper housekeeping and hygienic practices. Inspection and immediate action. | Reduced bacterial contamination and associated health effects on neighbouring areas. |
| Temporary 'Camp site', core/equipment store and site office. Staff will be accommodated off site unless permission is given by landowners. A temporary site camp comprising of shade, equipment storage and seating for meals may be established | Potential of compaction of soils Potential hydrocarbon contamination of soil, surface water (through runoff) and groundwater (seepage) environment. Alienation of, and disturbance to, animals. Potential contamination of soil and surface water features with indiscriminately dumped waste or littering. Potential contamination of groundwater through seepage from indiscriminately dumped waste or litter. Disturbance/damage to vegetation | Soil & Land Capability Surface Water & Associated Wetlands and Aquatic Ecosystems Groundwater Fauna Flora | Operation, Decommissioning, Closure | REMEDY THROUGH: Ripping up of compacted soils Clearing all litter and waste. . Reporting any non-compliant incidences to the relevant authorities and following their requirements. Inspection and immediate action. CONTROL THROUGH: Collecting waste for disposal to the relevant waste stream at the PA. Clear all vehicles coming to site of any vegetative material. Maintaining wetlands and buffer zones as ecological corridors and refuges. Do not hinder, harm or trap animals. Noise control measures. Visually surveying prospecting sites for any protected species or heritage sites. STOP THROUGH: Preventing activities within 100m of streams and wetlands unless authorisation is obtained to do so. Preventing activities near potential heritage sites unless necessary permits are obtained to do so. Preventing activities within areas supporting protected species and preserve such species in situ, or obtain the necessary authorisation to remove / destroy such species if necessary. | Maintain existing land capability. Reduce impact to neighbouring areas and surface water features, which will provide refuge for animals and provide ecological corridors. Preservation of protected species. Attain "cradle to grave" management of waste on site. |
| Hydrocarbon Storage | Potential hydrocarbon contamination of soil, surface water (through runoff) and groundwater (seepage) environment. | Soil & Land Capability Surface Water & Associated Wetlands and Aquatic Ecosystems Groundwater | Operation, Decommissioning, Closure | REMEDY THROUGH: Clearing any spills. Ceasing and rehabilitating any illegal activity. Rehabilitating and repairing any damage. Inspection and immediate action. CONTROL THROUGH: Maintaining all vehicles, machinery and equipment and discontinuing use of faulty equipment. Using biodegradable lubricant. Placing drip trays under leaky equipment. The area is less than 80m ² Plastic lining or mobile bunding will be used. Spill kits will be on hand in the event of a spillage. Safe work procedure will be adhered to when refuelling vehicles and machinery. | SANS / SABS / SA legislative requirements regarding vehicle and equipment maintenance and operating requirements. General duty of care in terms of NEMA. |
| Rehabilitation of boreholes | Topographical nature of the area will be restored through rehabilitation. | Topography Soil & Land Capability Surface Water & Associated Wetlands & Aquatic Ecosystems | Operation, Decommissioning, Closure | No mitigation necessary. Impact is positive. | Restore natural catchment drainage patterns as far as possible. Restore land to arable land use. |
| General overall prospecting activities | Alien invasive encroachment. | Soil & Land Capability Surface Water & Associated Wetlands & Aquatic Ecosystems Flora & Fauna | Operation, Decommissioning, Closure | REMEDY THROUGH: Removal of alien and invasive species that may establish around prospecting sites. CONTROL THROUGH: Clear all vehicles coming to site of any vegetative material. | Alien and invasive species managed with the view to eradicate species in disturbed areas. |

f) Impact Management Actions

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

| ACTIVITY Whether listed or not listed. | POTENTIAL IMPACT | MITIGATION TYPE | TIME PERIOD FOR IMPLEMENTATION | COMPLIANCE WITH STANDARDS |
|---|---|--|---|---|
| Access routes | <p>Potential for compaction of soils.</p> <p>Potential hydrocarbon contamination of soil, surface water (through runoff) and groundwater (seepage) environment.</p> <p>Potential for damage of any red data flora or heritage sites via the use of unauthorised off road routes.</p> <p>Potential for disturbance to wetlands and buffer zones if activity proceeds indiscriminately.</p> <p>Potential for disturbance of heritage sites and graves if activity proceeds indiscriminately.</p> <p>Generation of dust on gravel roads.</p> <p>Emissions into the atmosphere through use of diesel powered equipment, machinery and vehicles.</p> <p>Increased noise levels.</p> <p>Increased potential for road incidences.</p> <p>Road degradation.</p> | <p>REMEDY THROUGH:</p> <p>Ripping compacted soils.</p> <p>Clearing any spills.</p> <p>Ceasing and rehabilitating any illegal activity.</p> <p>Rehabilitating and repairing any damage.</p> <p>Inspection and immediate action.</p> <p>Surveying any off road routes prior to use to prevent damage to red data plants and heritage sites.</p> <p>CONTROL THROUGH:</p> <p>Remaining in designated roads / routes / activity areas.</p> <p>Maintaining all vehicles, equipment, machinery and equipment and discontinuing use of faulty equipment.</p> <p>Using biodegradable lubrication.</p> <p>Equipping vehicles on site with drip trays to place under leaky equipment.</p> <p>Dust alleviation by spraying and limiting speeds on dirt roads.</p> <p>Noise buffering measures on noisy equipment.</p> <p>Regular communication with nearby I&APs.</p> <p>STOP THROUGH:</p> <p>Preventing activities within 100m of streams and wetlands unless authorisation is obtained to do so.</p> | <p>1. Once-off sign-off of route plans or amendments to these plans before any activities take place for the duration of prospecting operations.</p> <p>2. Once off inspection of routes and prospecting sites after activity in the area has ceased.</p> | <p>CARA, NEMA and MPRDA regulations regarding soil amelioration.</p> <p>General duty of care in terms of NEMA.</p> <p>SANS / SABS / SA legislative requirements regarding vehicle and equipment maintenance and operating requirements.</p> <p>General duty of care in terms of NEMA.</p> |
| Drilling | <p>Localised dips in topography if boreholes collapse after material is replaced.</p> <p>Cracks and disruption to geological layers and aquifers.</p> <p>Potential for compaction of soils.</p> <p>Potential hydrocarbon contamination of soils, surface water (through runoff) and groundwater (seepage) environment.</p> <p>Potential for disturbance to wetlands and buffer zones if activity proceeds indiscriminately.</p> <p>Irresponsible use of water and water wastage.</p> <p>Emissions into the atmosphere through use of diesel powered equipment, machinery and vehicles.</p> <p>Increased noise levels.</p> <p>Loss of and disturbance to archaeological / heritage / grave sites that may be encountered.</p> | <p>REMEDY THROUGH:</p> <p>Ripping compacted soils.</p> <p>Clearing any spills.</p> <p>Ceasing and rehabilitating any illegal activity.</p> <p>Rehabilitating and repairing any damage.</p> <p>Inspection and immediate action.</p> <p>CONTROL THROUGH:</p> <p>Planning invasive prospecting sites properly to avoid sensitive features.</p> <p>Remaining in designated roads / routes / prospecting areas.</p> <p>Maintaining all vehicles, machinery and equipment and discontinuing use of faulty equipment.</p> <p>Using biodegradable lubricant.</p> <p>Placing drip trays under leaky equipment.</p> <p>Dust alleviation by spraying and limiting speeds on dirt roads.</p> <p>Noise buffering measures on noisy equipment or conducting activities during a convenient time of day when near to sensitive receptors.</p> <p>Responsible water use.</p> <p>Regular communication with nearby I&APs.</p> <p>Contracting necessary specialists as needed.</p> <p>STOP THROUGH:</p> <p>Preventing activities within 100m of streams and wetlands unless authorisation is obtained to do so.</p> <p>Preventing activities near potential heritage sites unless necessary permits are obtained to do so.</p> <p>Maintaining a buffer around the ruins/graves at all times during the prospecting activities.</p> | <p>1. Once-off sign-off of route plans or amendments to these plans before any activities take place for the duration of prospecting operations.</p> <p>2. Once off inspection of rehabilitated areas.</p> | <p>NEMA & MPRDA principals and regulations regarding environmental protection and rehabilitation requirements.</p> |
| Casing of boreholes | <p>Localised dips in topography if boreholes collapse after material is replaced.</p> | <p>REMEDY THROUGH:</p> <p>Rehabilitating and repairing any damage.</p> <p>Inspection and immediate action.</p> | <p>1. Once-off inspection of drilled boreholes after substantial rainfall</p> | <p>NEMA & MPRDA principals and regulations regarding environmental protection and rehabilitation requirements.</p> |
| Ablution facility (portable toilets) | <p>Potential contamination of soil with sewage.</p> <p>Potential contamination of surface water bodies with sewage.</p> | <p>REMEDY THROUGH:</p> <p>Inspection and repair / replace damaged toilets.</p> <p>CONTROL THROUGH:</p> <p>Contracting necessary reputable contractor to manage portable toilets.</p> | <p>1. Weekly inspections of portable toilet facilities for the duration of prospecting activities.</p> | <p>General duty of care in terms of NEMA & NWA.</p> |

| ACTIVITY Whether listed or not listed. | POTENTIAL IMPACT | MITIGATION TYPE | TIME PERIOD FOR IMPLEMENTATION | COMPLIANCE WITH STANDARDS |
|--|--|---|---|---|
| | | Proper housekeeping and hygienic practices. Inspection and immediate action. | | |
| Temporary 'Camp site', core/equipment store and site office. Staff will be accommodated off site unless permission is given by landowners. A temporary site camp comprising of shade, equipment storage and seating for meals may be established | Potential of compaction of soils Potential hydrocarbon contamination of soil, surface water (through runoff) and groundwater (seepage) environment. Alienation of, and disturbance to, animals. Potential contamination of soil and surface water features with indiscriminately dumped waste or littering. Potential contamination of groundwater through seepage from indiscriminately dumped waste or litter. Disturbance/damage to vegetation | REMEDY THROUGH: Ripping up of compacted soils Clearing all litter and waste. Reporting any non-compliant incidences to the relevant authorities and following their requirements. Inspection and immediate action. CONTROL THROUGH: Collecting waste for disposal to the relevant waste stream at the PA. Clear all vehicles coming to site of any vegetative material. Maintaining wetlands and buffer zones as ecological corridors and refuges. Do not hinder, harm or trap animals. Noise control measures. Visually surveying prospecting sites for any protected species or heritage sites. STOP THROUGH: Preventing activities within 100m of streams and wetlands unless authorisation is obtained to do so. Preventing activities near potential heritage sites unless necessary permits are obtained to do so. Preventing activities within areas supporting protected species and preserve such species in situ, or obtain the necessary authorisation to remove / destroy such species if necessary. | 1. Weekly inspections of the site camp and surrounding area for the duration of prospecting activities. | General duty of care in terms of NEMA & NWA. |
| Hydrocarbon Storage | Potential hydrocarbon contamination of soil, surface water (through runoff) and groundwater (seepage) environment. | REMEDY THROUGH: Clearing any spills. Ceasing and rehabilitating any illegal activity. Rehabilitating and repairing any damage. Inspection and immediate action. CONTROL THROUGH: Maintaining all vehicles, machinery and equipment and discontinuing use of faulty equipment. Using biodegradable lubricant. Placing drip trays under leaky equipment. The area is less than 80m ² Plastic lining or mobile bunding will be used. Spill kits will be on hand in the event of a spillage. Safe work procedure will be adhered to when refuelling vehicles and machinery. | 1. Weekly inspections of the vehicles and storage area for the duration of prospecting activities. | General duty of care in terms of NEMA & NWA. SANS / SABS / SA legislative requirements regarding vehicle and equipment maintenance and operating requirements. General duty of care in terms of NEMA. |
| Rehabilitation of boreholes | Topographical nature of the area will be restored through rehabilitation. | No mitigation necessary. Impact is positive. | 1. Monthly once prospecting commences for the duration of prospecting. 2. Once-off inspection of rehabilitated sites after substantial rainfall. | Best Practice Guidelines Restore natural catchment drainage patterns as far as possible. Restore land to arable land use. |
| General overall prospecting activities | Alien invasive encroachment. | REMEDY THROUGH: Removal of alien and invasive species that may establish around prospecting sites. CONTROL THROUGH: Clear all vehicles coming to site of any vegetative material. | 1. Monthly visual inspection of the active prospecting areas. 2. Once-off inspection of rehabilitated sites after substantial rainfall. | Alien and invasive species managed with the view to eradicate species. |

(i) Financial Provision

(1) Determination of the amount of Financial Provision

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

Closure objectives identified include:

Topography

- To ensure that the final elevation of rehabilitated areas are free draining.
 - The localised nature of the prospecting activities means that attaining objective will result in restoration of baseline conditions.

Soil and Land Capability

- To ensure that top soil (with vegetation clods where applicable) are replaced to the surface of rehabilitated drilled sites to maintain arable land capability and reduce risk of erosion.
 - By removing soil clods with vegetation, the baseline conditions will be minimally altered and will recover fully to baseline condition over a short to medium term duration.

Surface Water

- To ensure no sedimentation of the surrounding surface water systems.
- To ensure no chemical contamination of any present surrounding surface water systems

Flora and Fauna

- To ensure that alien invasive establishment and spread in all disturbed areas is prevented and controlled.
 - The aim is to reduce introduction of new species or spread of existing species. The baseline conditions are not expected to vary greatly but EMP measures, inspection and action must be implemented.
- To preserve protected species in situ as far as possible.
 - Baseline conditions are not expected to change as prospecting locations will allow for some flexibility to avoid such species. Where unavoidable, EMP measures, inspection and action must be implemented.

Wetlands

- To prevent disturbance to wetlands and maintain current wetland status and maintain ecological corridors associated with rivers and wetlands.

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

These were included in the BID circulated to landowners and I&APs. Please refer to **Appendix 2 and 12** for a copy of the BIDs as well as all correspondence to and from I&APs.

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

This application is for a prospecting application. Please refer to Figure 3 for the preliminary position of the prospecting boreholes (please note that these are subject to change following the outcome of the Geophysics survey). Each individual drill site will impact a maximum footprint of 20m², which will be rehabilitated as soon as the necessary data is obtained.

The rehabilitation plan is as follows:

Drilling: Cores will be removed, logged and where necessary samples taken for laboratory analysis.

- On rehabilitation, cores will be replaced into boreholes, casings removed and area levelled.
- Area will be inspected and graded if dips in topography are noted from collapsed boreholes.

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

Rehabilitation plan has aimed to:

- Restore topography and drainage and prevent topographical dips and pooling of water.
- Retain topsoil and associated vegetative component to maintain the current land use.
- Prevent risk of sedimentation of downstream water bodies.
- Preserve local flora as vegetation with topsoil clods and reduce risk of alien infestation on disturbed areas.

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

The quantum for financial provision was calculated using the DMR's rule based assessment for financial provision (Table 6) and is estimated to be R65 736.91.

Currently it is expected that the total disturbed area will be limited to 540m² in total. A temporary storage and shade area will established on site; no staff will be housed on site.

Existing farm roads and tracks will be utilised as far as possible and it is not expected that any additional roads will be constructed. Thus the total disturbed area is not expected to exceed 0.5 Ha.

Minerano has two full time environmental managers in their employ. As such the day-to-day environmental management and monitoring will be conducted in-house and form part of the company's operational costs.

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

The financial provision (amounting to R 65 736.91) will be made by way of a bank guarantee and/or trust fund established in terms of the applicable legislation; and set out as per Appendix 1 of the NEMA Regulations pertaining to financial provision (Government Gazette 39425, 20 November 2015).

Table 6: Financial Provision for Rehabilitation

| No.: | Description: | Unit: | A Quantity | B Master rate | C Multiplication factor | D Weighing factor | E=A*B*C*D Amount (Rands) | |
|------|--------------------------------|---|------------------------------|------------------|-------------------------------|-------------------------|--------------------------------|-----------|
| | | | Step 4.5 | Step 4.3 | Step 4.3 | Step 4.4 | | |
| 3 | Access Roads | m ² | 0 | R17.00 | 1 | 1 | R0.00 | |
| 10 | General Surface Rehabilitation | ha | 0.5 | R99 851.00 | 1 | 1 | R49 925.50 | |
| | | | | | | | | |
| | Sub-total 1 | | Weighing factor 2 (step 4.4) | | | 1.05 | R52 421.78 | |
| | | | According to Peri-urban | | | | | |
| | | (Sum of total items 3 and 10 multiplied by weighing factor 2) | | | | | | |
| | | | 100.0% | | | | | |
| 1 | Contingency | 10% of Subtotal 1 | | | | | | R5 242.18 |
| | Sub-total 2 | | | | | | R57 663.96 | |
| | | VAT (14%) | | | | | R8072.95 | |
| | | (Subtotal plus VAT) | | | | GRAND TOTAL | <u>R65 736.91</u> | |

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

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

| 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 |
|---|--|---|--|---|
| Access routes | Increased potential for road incidences. Road degradation. | 1. Maintain roads and intersections with public roads to reduce road incidences. 2. Ensure that on-site speed limits are enforced to reduce dust generation and road incidences. | 1. Site manager 2. Site manager | 1. Monthly inspections of all farm roads and intersections from the onset of operations for the duration of prospecting operations. 2. Sporadic speed inspections for the duration of prospecting operations. |
| Access routes, Drilling | Cracks and disruption to geological layers. Potential for disturbance to wetlands and buffer zones if activity proceeds indiscriminately. | 1. Ensure sensitive sites are avoided or that necessary authorisations / permits are obtained where these cannot be avoided through sign-off of all onsite activity plans. | 1. Environmental manager and site manager | 1. Once-off sign-off of routes and drilling plans or amendments to these plans before any activities take place for the duration of prospecting operations. |
| Access routes, Drilling, camp site | Potential for compaction of soils, alteration to soil characteristics and potential loss of soil. Potential silt loading of surface water features. | 1. Ensure sensitive sites are avoided or that necessary authorisations / permits are obtained where these cannot be avoided through sign-off of all onsite activity plans. 2. Inspect all routes and prospecting sites for compacted soils. 3. Ensure responsible material and soil handling and replacement. 4. Inspect all routes and prospecting sites for soil erosion or degradation. | 1. Environmental manager and site manager 2. Environmental manager 3. Environmental manager with the contracting prospecting manager 4. Environmental manager | 1. Once-off sign-off of route and drilling plans or amendments to these plans before any activities take place for the duration of prospecting operations. 2. Once off inspection of rehabilitated areas after substantial rainfall. 3. Monthly inspection once invasive prospecting commences for the duration of prospecting. 4. Monthly inspection once invasive prospecting commences for the duration of prospecting. |
| Access routes, Drilling, camp site | Potential hydrocarbon contamination to soil, surface water and associated wetlands, and groundwater. | 1. Ensure vehicles are within operation specifications to prevent excessive noise, emission and reduce risks of leaks. 2. Ensure area is clear of hydrocarbon spills. | 1. Site manager in conjunction with prospecting manager 2. Site manager | 1. Weekly inspection of all vehicle and equipment service and maintenance log books for the duration of prospecting operations. 2. Daily inspection of active routes and drilling areas. |
| Access routes, Drilling | Generation of dust on gravel roads. | 1. Visual inspection for billowing dust clouds. | 1. Environmental manager | 1. Sporadic visual inspection of billowing dust clouds from prospecting areas throughout prospecting operations. |
| Access routes, Drilling | Emissions into the atmosphere through use of diesel powered equipment, machinery and vehicles. | 1. Ensure vehicles are within operation specifications to prevent excessive noise, emission and reduce risks of leaks. | 1. Site manager in conjunction with prospecting manager | 1. Weekly inspection of all vehicle and equipment service and maintenance log books for the duration of prospecting operations. |
| Drilling & borehole casings. | Dips in topography at prospecting sites and associated potential for pooling of water. | 1. Inspect drilled sites for localised dipping in topography or pooling of water. | 1. Environmental manager | 1. Once-off inspection of drilled boreholes after substantial rainfall. |
| Drilling | Irresponsible use of water and water wastage. | 1. Reduce water wastage. | 1. Environmental manager | 1. Include water conservation in the environmental awareness / induction training. |
| Access routes, Drilling, camp site | Loss of and disturbance to archaeological / heritage / grave sites that may be encountered | 1. Preserve any heritage and cultural sites encountered. | 1. Social manager | 1. Once-off survey for heritage sites on areas targeted for travel and / or drilling prior to activity in the area. |
| Ablution facility (portable toilets) | Potential contamination of soil, surface water and associated wetlands, and groundwater with sewage | 1. Ensure portable toilet facilities are in proper working condition, not overflowing or leaking and in a hygienic state. | 1. Prospecting manager | 1. Weekly inspections of portable toilet facilities for the duration of prospecting activities. |
| Temporary 'Camp site', core/equipment store and site office. Staff will be accommodated off site unless | Alienation of, and disturbance to, animals. Potential contamination of soil and surface water features with indiscriminately dumped waste or littering. Potential contamination of groundwater through seepage from indiscriminately dumped waste or litter. Disturbance/damage to vegetation | 1. Reduce overall impacts associated with the activities carried out at the temporary site camp | 1. Site Manager in conjunction with Environmental Manager | 1. Weekly inspections of the site camp and surrounding areas for the duration of the prospecting activities |

| 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 |
|--|--|---|--|--|
| permission is given by landowners. A temporary site camp comprising of shade, equipment storage and seating for meals may be established | | | | |
| Hydrocarbon Storage | Potential hydrocarbon contamination of soil, surface water (through runoff) and groundwater (seepage) environment. | Ensure that all machinery and vehicles are in proper working condition with no leaking and are fully equipped with portable bunding and drip trays with a spill kits on site. | Prospecting Manager in conjunction with Environmental Manager | 1. Weekly inspections will be conducted during the duration of the prospecting activities |

l) Indicate the frequency of the submission of the performance assessment report.

An annual performance assessment (or at a frequency stipulated in the EA) will be conducted by an external consultant throughout the life of prospecting as required under NEMA. This is conducted to assess the adequacy and compliance to the EMP, EA and the relevant legislation.

(i) *Environmental Awareness Plan*

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

The Environmental Manager, Site Manager and Prospecting Manager must be conversant in environmental legislation, with special reference to the MPRDA, NEMA and the NWA.

The contractor / driller will be responsible for training its staff in terms of general environmental awareness. This will include basic training on the contents of this EMP; and will be conducted prior to commencement of prospecting activities. The aim of the environmental awareness training will be to highlight the potential impacts of the prospecting activities, and to highlight no-go areas.

The contractor / driller will ensure that records are kept of all training sessions / inductions. The Environmental Manager will monitor these records and undertake regular follow ups.

Appendix 4 includes a hand-out to be made available to all personnel / labourers on site.

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

Training, as detailed above, will address the specific measures and actions as listed in the EMP and also conditions of the EA. In this way the prospecting team will be provided the knowledge required to conduct the prospecting activities without resulting in environmental non-compliance, the liability of which would lie with Minerano Resources (Pty) Ltd. Secondly, informing the prospecting team of the EMP will also assist the team in identifying if an impact is likely to occur / has occurred and communicate this appropriately to the Environmental Manager.

In order for appropriate action to be taken, proper communications network and reporting protocol must be established, with the prospecting team and the site manager reporting all environmental and social issues to the Environmental.

m) Specific information required by the Competent Authority

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

Any requirements made by the authority or under the conditions of the EA will be attended to.

The financial provision will be reviewed annually.

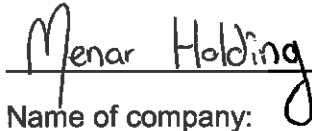
1 UNDERTAKING

The EAP compiling the report (applicant) herewith confirms

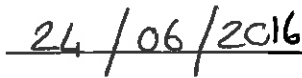
- a) the correctness of the information provided in the reports
- b) the inclusion of comments and inputs from stakeholders and I&APs ;
- c) the inclusion of inputs and recommendations from the specialist reports where relevant; and
- d) that the information provided by the EAP to interested and affected parties and any responses by the EAP to comments or inputs made by interested and affected parties are correctly reflected herein;



Signature of the environmental assessment practitioner:



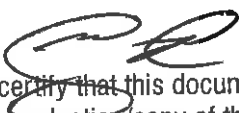
Name of company:



Date:



GAVIN MARC MYBURGH
Ex Officio – Professional Accountant (S.A.)
Commissioner of Oaths
Republic of South Africa
13 Fredman Drive, Sandown, Johannesburg
P.O. Box 2632, Saxonwold, 2132

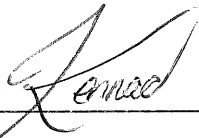


I certify that this document is a true reproduction/copy of the original which was examined by me and that from my observations the original has not been altered in any manner.

2016-06-24

The reviewing EAP herewith confirms to the best of his/her knowledge:

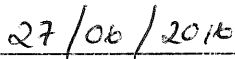
- the correctness of the information provided in the reports
- the inclusion of comments and inputs from stakeholders and I&APs ;
- the inclusion of inputs and recommendations from the specialist reports where relevant; and
- that the information provided by the applicant to interested and affected parties and any responses by the applicant to comments or inputs made by interested and affected parties are correctly reflected herein;



Signature of the reviewing environmental assessment practitioner:



Name of company:



Date:



JACOBUS ADRIAAN ENGELBRECHT
Commissioner of Oaths / Kommissaris van Ede
Unit 4, Beyers Office Park
4210 Bosbok Road, Randpark Ridge
Ex Officio Practising Attorney
Praktiserende Prokureur R.S.A

-END-

Tel: 011 794 6606

Appendix 1 : Curriculum Vitae

LAUREN ANN FLINDERS CURRICULUM VITAE

Contact: lauren.flinders@gmail.com or +27 60 508-5065

OVERVIEW

My experience includes the founding and management of a small environmental advisory company, leadership at the Executive Committee level for a JSE listed mining corporate operating in twelve countries across Africa, technical and project management of exploration programmes, stakeholder management, GIS mapping and analysis, environmental management and sustainability reporting. In addition, I have comprehensive knowledge and experience with mining and environmental legislation applicable in the International, South African and the African context, as well as of the ISO 9001, 14001 and OHSAS 18001 standards.

EXPERIENCE AND EMPLOYMENT

Company: Menar Holding (Pty) Ltd (July 2015 – current)

Position: Project Manager – Exploration and Environmental

Description: Team leader for the development of new and existing mining and exploration projects. GIS based evaluation of potential projects on a risk to benefit basis, management of mineral rights and environmental applications and project management for all technical aspects of planning and development.

Company: Biddulphia (Pty) Ltd

Position: CEO, Director and Co-Founder (March 2014 – current).

Description: The provision of integrated legal and environmental advisory services to the African mining, construction and allied industries. Clients include: Sentula Mining Limited, Roan Coal, Canyon Coal, Burgh Holdings, Eyethu Coal and Umbono Capital.

Company: Sentula Mining Ltd

Position: Group Sustainability Co-ordinator (January 2011- February 2014).

Description: Executive Committee representative for sustainability and health, safety and environment for a group which operates in the mining and mining services sector, both in South Africa and across the African continent. Responsibilities included strategic oversight, compliance, stakeholder-engagement and day-to-day management of the group's sustainability and environmental aspects. Additional responsibilities included project management of the group's coal exploration projects in South and Southern Africa as well as safety, health and environmental oversight for the group.

Company: Clean Stream Environmental Consultants

Position: Junior Environmental Scientist (May 2010 – December 2010).

Description: I was responsible for the compilation of EIA-type reports and environmental authorisations. Responsibilities included: report drafting, project management, GIS mapping and stakeholder management.

Company: Independent Newspapers - Cadet Programme 2010

Position: Intern/ Cadet Journalist – February-March 2010.

EDUCATION

TERTIARY EDUCATION: Post-graduate Certificate in Environmental Law

Mandela Institute at the University of the Witwatersrand (2012)

Certificate 1: Environmental and Sustainability Law

Certificate 2: Land and Water Law

Outcome: Passed with Distinction

**BSc Honours (Ecology, Environment and Conservation)
University of the Witwatersrand (2009)**

Project Title: An investigation into potential diet dynamics (diatoms) and post-larval growth in the cultured Abalone (*Haliotis midae*).

Outcome: Graduated with Distinction

BSc (Ecology, Environment & Conservation and Zoology)

University of the Witwatersrand (2005-2008)

Outcome: Graduated with Distinction.

SECONDARY EDUCATION: Parktown High School for Girls, Parktown, South Africa Grade 8-12 (2001-2005)

Matric Certificate with Exemption Contact: lauren@biddulphia.co.za or 060 508-5065

ACHIEVEMENTS

- Florence D Hancock Prize - Most meritorious current postgraduate research project on any aspect of phycology (April 2010).
- Presented poster of honours project: *An investigation into potential diet dynamics (diatoms) and post-larval growth in the cultured Abalone (Haliotis midae)* at Physiological Society of Southern Africa (PSSA) conference (January 2010).
- Achieved diamond rank in the Girl Guides movement 2006.

LAUREN FLINDERS PROJECT LIST

Clean Stream Environmental Consultants (Junior Environmental Scientist) 2010

1. Tweefontein Optimisation Project

- a. Assisted in drafting,
- b. GIS mapping
- c. Stakeholder management as part of a team.

2. Blackhill Siding IWULA

- a. IWULA drafting
- b. Project management
- c. GIS mapping
- d. stakeholder management

3. Flexilube EIA

- a. Scoping report Drafting
- b. Project Management
- c. GIS mapping
- d. Stakeholder management

4. Leeufontein IWULA

- a. Revision, Final Draft and Corrections for Submission

Sentula Mining Limited (Group Sustainability Coordinator)

1. Nkomati Anthracite (Small Anthracite Mine in Mpumalanga)

- a. Management of all Environmental Licencing Projects including the coordination of various consultants and engineers (Section 102 EMP, Section 24 NEMA applications, IWULA).
- b. On-site advisory and management of all environmental aspects including emergency remediation and regulator site-visits.
- c. Legal advisory and coordinator
- d. Compliance management.
- e. Merger and acquisition due diligence.

2. Coal Portfolio *including Bankfontein Project, Goodvetroud Project and Schoongezicht Projects in South Africa , Mulungwa Project (Zambia), Tete Project (Mozambique).*

Greenfields Coal Mines in Development

- a. Management of all Environmental Licencing Projects including the coordination of various consultants and engineers (EIA/EMP, NEMA applications, IWULAs and

equivalents in other jurisdictions).

- b. Management of all related applications and agreements including servitudes, power supply, community relocations, farmer's compensation etc.
- c. Responsible for all sustainability projects and information within the group, compliance with King III, as well as drafting of various sections of the companies integrated report.
- d. Management of all prospecting activities, retention and compliance with existing rights and mining right applications.
- e. Assisted in various due diligence projects, and sales transitions related to the coal portfolio.

3. Exploration Drilling and Contract Mining Projects in Africa (excluding South Africa)

- a. On-site advisory and management of all environmental aspects including emergency remediation and regulator site-visits.
- b. Legal advisory and coordinator.
- c. Compliance management (including SHEQ).

4. Merger, Acquisitions and Sales

- a. Shanduka Proposed Merger – 2011
- b. Sale of mineral assets to Fountain Capital in - 2013/2014
- c. Proposed asset transaction with Miranda Minerals- 2013/2014
- d. Various proposed acquisitions and sales relating to coal projects in Mpumalanga (confidentiality in place).

Biddulphia Environmental (Director and Founder)

1. Sentula Mining Limited (see above)

- a. A continuation of my role as above, in an outsourced retainer capacity. This enables me to act as the independent consultant on new applications, monitoring and amendments.

2. Roan Coal (Pty) Ltd

- a. Outsourced environmental management and advisory on a retainer basis. This includes geological and environmental Due Diligence assessments on various coal projects in Mpumalanga.

3. Fountain Capital/ Canyon Coal

- a. Strategic legal advisory and consulting on specific challenges relating to water management at the Zonnnebloem Colliery.

4. Trollope Holdings (Pty) Ltd

- a. Renewal application for a Mining Right.

5. Eyethu Coal including Burgh Group and Iyanga Mining (Environmental and Technical

Manager) – September 2014 –March 2015

- a. Day to day management of all environmental and technical team members (Business Development Manager, Geologist, Planner, Environmental Officer and Social and Labour Plan Coordinator),
- b. Responsible for compliance and development of governance policies for the group. I was also involved in a number of propose

Postal address: Postnet Suite 470, P/Bag X3, Northriding, 2162, South Africa

Phone: +27 11 794 7534 (w) 083 236 0169 (C)

E-mail: jane@cabangaconcepts.co.za

Nationality: South African

Languages: English, Afrikaans and South African Sign Language

Date of Birth: 01 September 1981

QUALIFICATIONS

- 2015** **University of Cape Town**
Certificate in Advanced Project Management
- 2015** **Terra Firma Academy**
Certificate in Carbon Footprint Analysis
- 2013** **University of South Africa (completed part time)**
Bachelor of Science Environmental Management: Botany Stream
- Majors: Environmental Management and Botany
Minors: Archaeology, Chemistry, Geology, Statistics, Terrestrial & Aquatic Ecology,
Hydrology, GIS, Computer Skills, Environmental Law and Ethics
** All practical components were undertaken through the North-West University*
- 2001** **The Estate Agency Affairs Board South Africa**
South African Property and Real Estate Law (Certified Estate Agent)
- 1999** **John Ross College, Richards Bay, Kwa-Zulu Natal**
Matric with exemption

AFFILIATIONS AND REGISTRATIONS:

Member of the Environmental Law Association, South Africa

Member of the International Association for Impact Assessment, South Africa

Member of the International Association for Public Participation, Southern Africa

SHORT COURSES AND WORKSHOPS

| | |
|------|--|
| 2015 | NEMA: One Environmental System Imbewu Sustainability Legal Specialists |
| 2015 | NEMA: Environmental Impact Assessment Regulations Imbewu Sustainability Legal Specialists |
| 2014 | NEMA: Environmental Impact Assessment Regime Gauteng Department of Agriculture and Rural Development |
| 2014 | Waste Management Act Amendments Mac Roberts Attorneys |
| 2013 | Environmental and Mining Law Mac Roberts Attorneys |
| 2012 | Practical Implementation of BEE EconoBEE |
| 2011 | Practical Understanding of South African Waste Legislation, Integrated Waste Management Planning & Waste Classification CBS Solution |
| 2011 | National Environmental Management Act & NEM:Waste Act EcoLaw |

WORK EXPERIENCE

| | |
|-------------------|---|
| 2006 - Current | Cabanga Concepts Environmental Consultants <u>Environmental Professional / Project Manager</u> |
| | <ul style="list-style-type: none">• Project and account management• Budget management• Proposals• Client liaison• Undertake site investigations (greenfields and operational areas)• Review of specialist studies• Document quality control• Compilation of environmental legal registers• Environmental compliance audits specifically with regards to industry and mining• Due diligence investigations in support of business merges and/or acquisitions within the mining industry• Fatal Flaws Analysis for proposed projects• Compilation of mining right and prospecting right applications in terms of the Mineral and Petroleum Resources Development Act |

- Environmental licensing and permitting:
 - Section 102 applications (MPRDA)
 - General Authorisations & Water Use Licensing (NWA)
 - Integrated Water and Waste Management Plans
 - Atmospheric Emission License Applications (NEM:AQA)
 - Waste Management License (NEM:WA)
- Compilation of Scoping Reports, Impacts assessments and Management Plans
- Assisting with the compilation of documents for World Bank Projects (IFC Standards / Equator Principles)
- Compilation of emergency response and environmental handbooks
- Taking of water samples
- Undertaking the Public Participation Process for proposed and existing operations in industry and mining
- Liaison and follow up with licensing authorities
- Collaborating with mineral and environmental lawyers in responding to corrective notices and directives issued in terms of the various legislation
- Applications for permits in terms of the National Heritage Resources Act

2002 – **Digby Wells & Associates Environmental Consultants**
 2006 PA to the Executive Committee

- Assist EXCO board with administration duties, review and formatting of reports, general office management, authorities liaison, assist with public participation and other general ad hoc duties.

2000 – **Realty Executives**
 2002 Candidate Estate Agent

- Management of rental properties, general office management and administration

OTHER

- Proficient in Microsoft Office Suite (Excel, Word, Outlook etc.)
- Familiar with SANBI GIS and Land Use Decision Support Tool (LUDS)
- Proficient in the following South Africa Legislation:
 - The Constitution of South Africa, 1996 (Act 108 of 1996)
 - The Minerals and Petroleum Resources Development Act (Act 28 of 2002)
 - The National Environmental Management Act, 1998 (Act 107 of 1998)
 - The Environmental Conservation Act, 1989 (Act 73 of 1989)
 - The Conservation of Agricultural Resources Act (Act 43 of 1983)
 - The National Environmental Management: Biodiversity Act, 2004 (Act No. 10 of 2004)
 - The National Environmental Management: Protected Areas Act, 2004 (Act 31 of 2004)
 - The National Environmental Management: Air Quality Act (Act 39 of 2004)
 - The National Environmental Management: Waste Management Act (Act 59 of 2008)
 - The National Heritage Act, 1999 (Act 25 of 1999)
 - The National Water Act, 1998 (Act 36 of 1998)

- The Water Services Act, 1997 (Act 108 of 1997)
- The National Veld & Forest Fire Act, 1998 (Act No 101 of 1998)
- The National Road Traffic Act, 1996 (Act 93 of 1996)
- The Hazardous Substances Act, 1973 (Act 15 of 1973)
- The Petroleum Products Act, 1977 (Act 120 of 1977)
- The National Nuclear Reactor Act, 1999 (Act 47 of 1999)
- The Explosives Act, 1956 (Act 73 of 1989)
- The Fencing Act, 1963 (Act 31 of 1963)
- Fertilizers, Farm Feeds, Agricultural Remedies and Stock Remedies Act, 1947 (Act 36 of 1947)
- The Occupational Health & Safety Act, 1993 (Act 85 of 1993)
- The Mine Health & Safety Act, 1996 (Act 29 of 1996)
- The Consumer Protection Act, 2008 (Act 68 of 2008)
- The Second Hands Good Act, 2009 (Act 6 of 2009)

LIST OF PROJECTS:

The following is a short list of a sample of projects which I have managed over the last few years:

- Eyethu Coal, T&DB Colliery, IWUL Audit, 2016.
- G&W Base Minerals, Benadeplaats EMP Audit, 2016.
- Eyethu Coal, Welgelegen Colliery, IWUL Audit, 2015.
- Eyethu Coal, Leeuwoort Colliery, IWUL Audit, 2015.
- Shiva Uranium, Environmental Compliance Report, 2015.
- Exxaro, Tumelo Colliery, Water Balance Report, 2015.
- G&W Base Minerals, Prospect & Sahara Bentonite Prospecting, Basic Assessment and Environmental Management Plan, 2015.
- G&W Base Minerals, Prospect & Sahara Bentonite Prospecting, Prospecting Right Application and Prospecting Works Programme, 2015.
- IG Chem, Olifantsfontein Plant, 24G Application for Rectification & Continuation Impact Assessment & Management Plan, 2015.
- Pembani Coal Carolina, Water Use License Application and associated Integrated Water & Waste Management Plan, 2015.
- G&W Base Minerals, Koppies Bentonite Mine, Atmospheric Emission License Application, 2015.
- Eyethu Coal, Leeuwoort Colliery, EMP Performance Assessment, 2014.
- Eyethu Coal, Mooifontein Colliery, EMP Performance Assessment, 2014.
- Eyethu Coal, Welgelegen Colliery, EMP Performance Assessment, 2014.
- G&W Base Minerals, Benadeplaats Limestone Mine, EMP Performance Assessment, 2014.
- G&W Base Minerals, Koppies Bentonite Mine EMP Performance Assessment, 2014.
- Vantage Goldfields, Barbrook & Lilly, Assessment on the Environmental Status, 2014.
- Transasia, Malonjeni Colliery, Water Use License Application, 2014.
- Pembani Coal Carolina, Environmental Compliance Audit, 2011 - 2014
- Sudor Coal, Halfgewonnen Colliery, NEMA Post Construction Audit, 2013.
- Droogvallei Rail Siding Company, Environmental Compliance Audit, 2013.
- Droogvallei Rail Siding Company, IWUL Audit, 2013.

- Overlooked Colliery, Section 8: Prospecting Progress Report, 2013.
- Umcebo, Kleinfontein Colliery, IWUL Audit, 2013.
- Overlooked Colliery, Monthly Monitoring & Inspections, 2012 – 2013.
- Sudor Coal, Halfgewonnen Colliery, IWUL Audit, 2012.
- Idwala, Vierfontein Colliery, Environmental Compliance Audit, 2012.
- Homelands Mining & Energy, Kendal Colliery, 24G Application for Rectification & Continuation Impact Assessment & Management Plan, 2012.
- Shanduka Coal, Kendal Siding, EMP Performance Assessment, 2012.
- Worldwide Coal Carolina, Road Deviation Basic Assessment and Environmental Management Plan, 2012.
- Norwesco Mining, Brakfontein Colliery, Environmental Compliance Audit, 2011.
- Miranda Coal, Sesikhona Colliery, Environmental Compliance Audit, 2011.
- Miranda Coal, Burnside Colliery, Environmental Compliance Audit, 2011.
- Homelands Mining & Energy, Northfields Slurry Dump, EMP Compliance Audit, 2011.
- Droogvallei Rail Siding Company, Integrated Water Use License Compliance Audit, 2011
- Worldwide Coal Carolina, Quarterly Report to the Board on the Environmental Issues, 2010 - 2011.
- Overlooked Colliery, Prospecting Environmental Management Plan, 2010.
- Homelands Mining & Energy, Kendal Colliery, EMP Compliance Audit, 2010.
- Worldwide Coal Carolina, Environmental Handbook & Training, 2010.
- Shanduka Coal, EMP Performance Assessment – *annually for various operations*, 2009 – 2012.
- Worldwide Coal Carolina, Environmental Compliance Audit and Performance Assessment, 2009 – 2012.
- Black Wattle Colliery, EMP Performance Assessment, 2009.
- Worldwide Coal Carolina, Water Use License Application and associated Integrated Water & Waste Management Plan, 2009.
- Galvrite Galvanising, Randfontein Plant, Environmental Audit, 2009.
- Droogvallei Rail Siding Company, Integrated Water Use License Application, 2009.
- Shanduka Coal, Monitoring & Compliance – *monthly for various operations*, 2008 – 2012
- Shanduka Coal, Uitkyk Siding, Environmental Management Plan, 2008.
- Shanduka Coal, Graspan Colliery, NEMA Authorisation & Basic Assessment for fuel storage, 2008.
- Badger Mining, Kiepersol Colliery, Liability Assessment, 2007.
- PMG, Postmasburg Manganese, Section 8: Prospecting Progress Report, 2007.
- Umcebo, Due Diligence Investigation, 2007.
- Harmony Gold, Randfontein, Rehabilitation and Liability Assessment, 2006.
- Mandarin Investments, Duration Projects Zimbabwe, Environmental Risk Assessment, 2006.
- Badger Mining, Maamba Collieries, Environmental Risk Assessment, 2006.
- BVI, Uitkomst Colliery Integrated Water Use License Application, 2006.
- Mashala Resources, Delta Colliery, Environmental Audit, 2006.
- *Confidential*: various due diligence investigations, 2006 – current.

In addition to the above, I have been involved in a long list of projects where I was the project manager involved with the planning, management and review of the reports and various specialists; but was not directly responsible for the compilation of the various reports/studies.

REFERENCES

1. **Ken van Rooyen, Geologist and Environmental Scientist:** kenvr@telkomsa.net
2. **Dr. Barbara Kasl, Entomologist:** barbs@cabangaconcepts.co.za

Appendix 2: Supporting Public Participation Documents

Appendix 2(a) Proof of newspaper advertisement

10 24 May / Motshégang 2016 • KATHU GAZETTE

OLIFANTSHOEK

'n Vrolike omgewing maak dit lekker om te leer!

Die Oliebouts op Olifantshoek se klasie was so bietjie vaal en Maxim en Pop Kruger het besluit om te kom help.

Die kaste is geverf. Die tafeltjies is verskoonde Kkuru geverf en het plastiek oor. Die boeke is nuut en vrolik geverf. Alles is mooi en netjies gepek. Nou is die Oliebouts weer baie trots op hul klas. Al die kinders wou dadelik help toe hulle sien hier gaan geverf word.

Die Oliebouts wil net baie dankie sê vir om Maxim en tannie Pop Kruger wat so hard gewerk het om ons klas mooi te maak. Dankie ook aan Juf Adri wat die aand kom help het om ons klas te kry vir die volgende dag.

Kathu se nuwe Presidentsverkener

Dis is met groot vreugde dat Kathu Voortrekkers bekend kan maak dat Jeuglid Magiel van der Merwe sy Presidentsverkener toetsfase 'vraestel' geslaag het (verwys na berg in Kathu Gazette, 23 April 2016).

Magiel sal vanaf 8 – 12 Julie 2016 'n Presidentsverkener-aftoningskamp bywoon by Hartbeespoortdam naby Pretoria en sy Presidentsverkener-toekenning sal amptelik op 13 Augustus 2016 aan hom oorhandig word tydens die Noord-Kaapse oorhandigings-luncheon.

Namens die Kommando-bestuur van Kathu Voortrekkers wil ons vir Magiel en sy ouers, Santie en Krogh, hartlik gewikwens met hierdie uitsonderlike prestasie! Magiel sal volke ereleure Kultuur by sy Hoërskool ontvang.

Links: Magiel van der Merwe, Kathu se nuwe Presidentsverkener.

PUBLIC PARTICIPATION PROCESS
Reference NC 385/11/02/ 11786 PR

Miranzo Resources (Pty) Ltd - Prospecting Right Applications (Manganese and Iron Ore)

Location: Miranzo Resources (Pty) Ltd has applied for a Prospecting Right on the farms Riviers. The proposed Prospecting Right area is approximately 2425 Ha and is located 47 km South of Hobots and 65 km East of Kuruman.

Notice is hereby given of a public participation process in terms of: the National Environmental Management Act, 1998 (Act No. 107 of 1998) ("NEMA"); and the Mineral and Petroleum Resources Development Act, 2002 (Act No. 28 of 2002) ("MPRDA").

Application for environmental authorisation for undertakes the following listed activities: NEMA GN 983 Activity Number 20: Any activity including the operation of that activity which requires a prospecting right in terms of section 16 of the MPRDA, including associated infrastructure, structures and earthworks, directly related to the prospecting of a mineral resource, including activities for which an exemption has been issued in terms of section 106 of the MPRDA.

The Draft BA and EMP Report will be available for review from 19th May 2016 at the Deben Prinsloo Skool. An electronic copy can also be made available for download on request. SAP's are invited to review the report and kindly submit any comments to reach Ms. Lauren Filander by no later than Monday the 28th of June 2016 using the contact details provided below.

Interested or Affected Parties ("SAPs") are invited to participate. SAPs are invited to provide written comments. SAPs should refer to the Department of Mineral Resources ("DMR") Reference number above and must provide their comments together with their name, contact details (preferred method of notification e.g. e-mail address or fax number) and an indication of any direct business, financial, personal or other interests in which they have in the application to the contact person indicated below within 40 days from the date of this notice.

For more information contact: Ms. Lauren Filander, Mineral Holdings, on 011 994 8100 or lauren@mineralholdings.com

PROSES VAN OPENBARE DEELNAME
Verwysing NC 385/11/02/ 11786 PR

Miranzo Resources (Pty) Ltd - Prospektierreg Aansoek (Mangan en Ystererts)

Plaas: Miranzo Resources (Pty) Ltd het aansoek gedoen vir 'n prospektierreg op die plaas Riviers. Die voorgestelde prospektierreg gebied is ongeveer 2425 Ha en is 47 km suid van Hobots en 65 km oos van Kuruman.

Kenmerkingsreg van 'n gesamentlike proses van openbare deelname (in ooreenstemming met die Wet op Nasionale Omgewingsake, 1998 (Wet No 107 van 1998) ("NEMA"), en die Mineral en Petroleum hulpbronne ontwikkelings wet, 2002 (Wet No.28 van 2002) ("MPRDA").

Verzoek vir omgewingsake toetsfase op die volgende geliste aktiwiteite te onderneem: NEMA GN 983 aktiwiteit nommer 20: enige aktiwiteit insluitende die vestiging van daardie aktiwiteit wat 'n prospektierreg versie in terme van artikel 16 van die MPRDA, insluitende gepaardgaande infrastruktuur, strukture en grondwerke, wat direk verband hou met die prospektierreg van 'n minerale hulpbronne, insluitende aktiwiteite wanneer 'n eksplisiet gelyktydig is in ooreenstemming met artikel 106 van die MPRDA.

Die Konsep BA en OEP-verslag sal beskikbaar wees vir inspeksie vanaf die 19de Mei 2016 by die Deben Prinsloo Skool. 'n Elektroniese kopies is ook beskikbaar op aanvraag. SAP's word uitgenooi om die verslag te sien en kommentaar te lewer. SAP's moet kommentaar sê op die verslag en kommentaar moet saamgestel word deur die kontakpersoon wat hierbo genoem is. SAP's moet kommentaar sê op die verslag en kommentaar moet saamgestel word deur die kontakpersoon wat hierbo genoem is. SAP's moet kommentaar sê op die verslag en kommentaar moet saamgestel word deur die kontakpersoon wat hierbo genoem is.

Betroegde of Affekteerde Partye ("SAP's") word uitgenooi om deel te neem. SAP's word uitgenooi om skriftelike kommentaar te lewer. SAP's moet kommentaar sê op die verslag en kommentaar moet saamgestel word deur die kontakpersoon wat hierbo genoem is. SAP's moet kommentaar sê op die verslag en kommentaar moet saamgestel word deur die kontakpersoon wat hierbo genoem is.

Verzoekingsreg kontak: Ms. Lauren Filander, Mineral Holdings, op 011 994 8100 of lauren@mineralholdings.com

KURUMAN / WRENCHVILLE

VLV bederf gestremdes

Die leiers van Immanuel Sorgesentrum vir gestremde leiers op Wrenchville is Vrydagoggend 13 Mei 2016 met kleurvolle jellie-gevulde lemoene bederf toe dames van VLV Kuruman se bestuur hulle besoek het. Die lemoene die deur die Openbare Sake-groep gemaak en het baie die kinders se dag opgevul.

KATHU Rooikatte speel gasheer

Jeuglede Nie Oliebouts, Dank van Rooikatte en Oliebouts Lemoene sloop op! Slegs Die Oliebouts en beoordeelers eet lekker!

Die Graad 4 Voortrekkerspan, die Rooikatte het op Saterdag, 14 Mei 2016 'n Jeuglede-heer spesialisasie voel.

Die spesialisasie behels korfbal, wat Jeuglede 'n eie moet beplan en voorberei, die uitnodigingskaartjies maak en ooproepe as geswou-heer tydens die ete. Die Jeuglede was vroeg oggend aan die gang om die voedsel voor te berei, die tafels te dek en seker te maak dat die gaste 'n warm koppie tee of koffie kry. Die Oliebouts het om 10:00 aangemeld vir die herelike bederf en kon agteroor sit terwyl die Jeuglede hul 'n bord kos voorberei het, sowel as 'n glimlagte vroegesap. Ter tyde van die voorbereiding en selfs daarna het Patro de Klark (as eksistensiële beoordeelaar) en Santie van der Merwe (as Voortrekkers beoordeelaar) die Jeuglede dopgehou en kon hulle aan die einde van die ete die toekenning van die spesialisasie gegee.

Appendix 2(b) SAHRA Application

Heritage Cases NC 30/5/1/1/3/2/ 11790PR has been created.

Heritage Cases

VIEW EDIT

NC 30/5/1/1/3/2/ 11790PR

Add new comment Subscribe to: This post

CaseHeader LocationInfo Admin

Status: DRAFT

HeritageAuthority(s): SAHRA

Case Type: Section 38 (8) - Statutory Comment Required

Development Type: Minerals

ProposalDescription:
 The Prospecting Right application has been submitted to prospect for Manganese and Iron Ore on the farm Riviera. The proposed Prospecting Right area is approximately 9708.58Ha and is located 47 km South of Hotazel and 65 km East of Kuruman, Northern Cape.

ApplicationDate: Friday, May 27, 2016 - 08:15

CaseID: 9639

Applicants: Minerano Resources (Pty) Ltd

Consultants/Experts: Lauren Flinders

OtherReferences:

| Dept | CaseReference | DueDate | FinalDecision |
|----------|--------------------------|------------|---------------|
| DMR - NC | NC 30/5/1/1/3/2/ 11790PR | 27/06/2016 | |

ReferenceList:

AdditionalDocuments

1. Riviera English BID.pdf

Back to Top

South African Heritage Resources Agency (SAHRA)
 Head Office
 111 Harrington Street
 CAPE TOWN
 8001

PO Box 4637
 Cape Town, 8000
 Tel 021 462 4502/Fax 021 462 4509
 Email info@sahra.org.za
 Web www.sahra.org.za

An agency of the Department of Arts & Culture

Powered by Drupal

Site best viewed using Google Chrome
 Disclaimer

08:18 AM
 2016/05/27

Appendix 2(c): Background Information Documents

Appendix 2(d): Report on Results of Consultation

Appendix 2(e): Correspondence with I&APs

Appendix 3: Full impact assessment table

| Activity | Impact | Scheduled Activities | Applicable Mine Phase | STATUS | Magnitude | Extent | Duration | Reversibility | CONSEQUENCE | PROBABILITY | SIGNIFICANCE (pre-mitigation) | Mitigation | Degree of loss of resource | Mitigation | Standard to be achieved | Magnitude | Extent | Duration | Reversibility | CONSEQUENCE | PROBABILITY | SIGNIFICANCE (post-mitigation) | Compliance with standards | Time periods for implementation | Functional requirements for monitoring | Roles & responsibilities | Frequency for monitoring and reporting |
|---|--|----------------------|----------------------------|--------|-----------|--------|----------|---------------|-------------|-------------|-------------------------------|------------|----------------------------|--|--|-----------|--------|----------|---------------|-------------|-------------|--------------------------------|---|---|--|---|--|
| Aspect: Topography | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| Drilling & borehole casings | Localised dips in topography if boreholes collapse after material is replaced. | GNR983 – Activity 20 | Decommissioning, Closure | Neg | 1 | 1 | 5 | 3 | 10 | 3 | 30 | Y | - | REMEDY Drilling areas should be inspected and if dips are observed the areas should be levelled and graded to prevent pooling. | Restore natural catchment drainage patterns as far as possible. | 1 | 1 | 2 | 3 | 7 | 1 | 7 | NEMA & MPRDA principals and regulations regarding environmental protection and rehabilitation requirements. | 1. Drilled sites will be inspected once after substantial rainfall has occurred in the area. | 1. Inspect drilled sites for localised dipping in topography or pooling of water. | 1. Environmental manager | 1. Once-off inspection of drilled boreholes after substantial rainfall. |
| Rehabilitation of boreholes | Topographical nature of the area restored. | | Operation, Decommissioning | Pos | 2 | 1 | 5 | 1 | 9 | 4 | 36 | N | - | REMEDY Rehabilitation must be on-going as soon as drilling results are completed. | Restore natural catchment drainage patterns as far as possible. Restore land to arable land use. | 2 | 1 | 5 | 1 | 9 | 4 | 36 | NEMA & MPRDA principals and regulations regarding environmental protection and rehabilitation requirements. | 1. Drilled sites will be inspected once after substantial rainfall has occurred in the area. | 1. Inspect drilled sites for localised dipping in topography or pooling of water. | 1. Environmental manager | 1. Once-off inspection of drilled borehole sites after substantial rainfall. |
| Aspect: Geology | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| Drilling | Cracks and disruption to geological layers. | GNR983 – Activity 20 | Operation, Decommissioning | Neg | 1 | 1 | 2 | 1 | 5 | 5 | 25 | N | Low | Nature of prospecting activities. CONTROL Invasive prospecting must only be undertaken once data from non-invasive techniques has been assessed. Then, it should proceed as per standard industry practice with initially fewer boreholes to verify non-invasive prospecting data, and then only completing more extensive drilling in areas indicating adequate resources. | Necessary to obtain resource data required for a MRA. | 1 | 1 | 2 | 1 | 5 | 5 | 25 | Prospecting will be carried out in line with MPRDA regulations. General duty of care in terms of NEMA. | 1. Sign-off of drilling plans or amendments to these plans must be obtained from the environmental manager before any activities or changes to activities takes place for the duration of prospecting operations. | 1. Ensure sensitive sites are avoided or that necessary authorisations / permits are obtained where these cannot be avoided through sign-off of all onsite activity plans. | 1. Environmental manager and site manager | 1. Once-off sign-off of drilling plans or amendments to these plans before any activities take place for the duration of prospecting operations. |
| Aspect: Soil & Land Capability | | | | | | | | | | | | | | | | | | | | | | | | | | | |

| Activity | Impact | Scheduled Activities | Applicable Mine Phase | STATUS | Magnitude | Extent | Duration | Reversibility | CONSEQUENCE | PROBABILITY | SIGNIFICANCE (pre-mitigation) | Mitigation | Degree of loss of resource | Mitigation | Standard to be achieved | Magnitude | Extent | Duration | Reversibility | CONSEQUENCE | PROBABILITY | SIGNIFICANCE (post-mitigation) | Compliance with standards | Time periods for implementation | Functional requirements for monitoring | Roles & responsibilities | Frequency for monitoring and reporting |
|--------------------------|--------------------------------------|----------------------|----------------------------|--------|-----------|--------|----------|---------------|-------------|-------------|-------------------------------|------------|----------------------------|---|---|-----------|--------|----------|---------------|-------------|-------------|--------------------------------|--|--|--|--|--|
| Access routes & Drilling | Potential for compaction of soils. | | Operation, Decommissioning | Neg | 1 | 1 | 2 | 3 | 7 | 4 | 28 | Y | Low | REMEDY Rip any compacted soils. CONTROL Vehicles, machinery & equipment must remain on roads and farm tracks as far as possible. Where not possible, routes must be properly planned to reduce disruption to soil as far as possible. | Reduce compaction of soil and retain existing arable land capability. | 1 | 1 | 1 | 1 | 4 | 3 | 12 | CARA, NEMA and MPRDA regulations regarding soil amelioration. General duty of care in terms of NEMA. | 1. Sign-off of off-road route plans or amendments to these plans must be obtained from the environmental manager before off-road activities take place for the duration of prospecting operations. 2. Once off inspection will be completed of routes and prospecting sites immediately after activity in the area has ceased and area is rehabilitated for the duration of prospecting operations. | 1. Ensure sensitive sites are avoided or that necessary authorisations / permits are obtained where these cannot be avoided through sign-off of all onsite activity plans. 2. Inspect all routes and prospecting sites for compacted soils. | 1. Environmental manager and site manager 2. Environmental manager | 1. Once-off sign-off of route plans or amendments to these plans before any activities take place for the duration of prospecting operations. 2. Once off inspection of routes and prospecting sites after activity in the area has ceased. |
| Access routes | Potential hydrocarbon contamination. | | Operation, Decommissioning | Neg | 1 | 2 | 2 | 3 | 8 | 3 | 24 | Y | Low | REMEDY Spill kits must be available on site and personnel trained to utilise these to clear spills immediately. CONTROL All vehicles on site will be up-to-date with their service and maintenance plans. The use of persistently leaky vehicles will be discontinued until repairs are made. Vehicles will not be parked over bare ground; where unavoidable, drip trays will be placed under the equipment to collect potential leaks. | Vehicles, machinery and equipment maintained within operational specification and legislative requirements. | 1 | 2 | 1 | 3 | 7 | 2 | 14 | SANS / SABS / SA legislative requirements regarding vehicle and equipment maintenance and operating requirements. General duty of care in terms of NEMA. | 1. Weekly inspection of all service and maintenance plans for all vehicles as soon as prospecting operations commence for the duration of prospecting operations to ensure maintenance is scheduled in time. 2. Daily inspection of the active routes and drilling areas will be conducted as long as vehicles and machinery are active in these areas. | 1. Ensure vehicles are within operation specifications to prevent excessive noise, emission and reduce risks of leaks. 2. Ensure area is clear of hydrocarbon spills. | 1. Site manager in conjunction with prospecting manager 2. Site manager | 1. Weekly inspection of all vehicle and equipment service and maintenance log books for the duration of prospecting operations. 2. Daily inspection of active routes and drilling areas. |

| Activity | Impact | Scheduled Activities | Applicable Mine Phase | STATUS | Magnitude | Extent | Duration | Reversibility | CONSEQUENCE | PROBABILITY | SIGNIFICANCE (pre-mitigation) | Mitigation | Degree of loss of resource | Mitigation | Standard to be achieved | Magnitude | Extent | Duration | Reversibility | CONSEQUENCE | PROBABILITY | SIGNIFICANCE (post-mitigation) | Compliance with standards | Time periods for implementation | Functional requirements for monitoring | Roles & responsibilities | Frequency for monitoring and reporting |
|--------------------------------------|---|----------------------|-------------------------------------|--------|-----------|--------|----------|---------------|-------------|-------------|-------------------------------|------------|----------------------------|--|---|-----------|--------|----------|---------------|-------------|-------------|--------------------------------|--|--|--|---|---|
| Drilling | Potential hydrocarbon contamination. | GNR983 – Activity 20 | Operation Decommissioning | Neg | 3 | 2 | 2 | 3 | 10 | 3 | 30 | Y | Low | <p>REMEDY Spill kits must be available on site and personnel trained to utilise these to clear spills immediately.</p> <p>CONTROL All vehicles on site will be up-to-date with their service and maintenance plans. The use of persistently leaky vehicles will be discontinued until repairs are made. Vehicles will not be parked over bare ground; where unavoidable, drip trays will be placed under the equipment to collect potential leaks.</p> | Vehicles, machinery and equipment maintained within operational specification and legislative requirements. | 2 | 2 | 2 | 3 | 9 | 2 | 18 | SANS / SABS / SA legislative requirements regarding vehicle and equipment maintenance and operating requirements. General duty of care in terms of NEMA. | 1. Weekly inspection of all service and maintenance plans for all vehicles as soon as prospecting operations commence for the duration of prospecting operations to ensure maintenance is scheduled in time. 2. Daily inspection of the active routes and drilling areas will be conducted as long as vehicles and machinery are active in these areas. | 1. Ensure vehicles are within operation specifications to prevent excessive noise, emission and reduce risks of leaks. 2. Ensure area is clear of hydrocarbon spills. | 1. Site manager in conjunction with prospecting manager 2. Site manager | 1. Weekly inspection of all vehicle and equipment service and maintenance log books for the duration of prospecting operations. 2. Daily inspection of active routes and drilling areas. |
| Ablution facility (portable toilets) | Potential contamination of soil with sewage | | Operation | Neg | 2 | 2 | 1 | 1 | 6 | 2 | 12 | Y | Low | <p>REMEDY Inspect and repair / replace damaged toilets as needed, and ensure no leaks are occurring.</p> <p>CONTROL The portable toilets will be managed by a reputable contractor, emptied on a regular basis as needed. Toilets will be maintained in hygienic state.</p> | Reduced bacterial contamination on neighbouring areas. | 1 | 1 | 1 | 1 | 4 | 1 | 4 | General duty of care in terms of NEMA & NWA. | 1. Weekly inspections of portable toilet facilities for the duration of prospecting activities. | 1. Ensure portable toilet facilities are in proper working condition, not overflowing or leaking and hygienic. | 1. Prospecting manager | 1. Weekly inspections of portable toilet facilities for the duration of prospecting activities. |
| Rehabilitation of boreholes | Soil replacement and revegetation. | | Operation, Decommissioning, Closure | Pos | 2 | 1 | 5 | 1 | 9 | 4 | 36 | N | - | <p>REMEDY Rehabilitation must be ongoing as soon as drilling results are completed.</p> | Restore natural catchment drainage patterns as far as possible. Restore land to arable land use. | 2 | 1 | 5 | 1 | 9 | 4 | 36 | NEMA & MPRDA principals and regulations regarding environmental protection and rehabilitation requirements. | 1. Soil will be preserved in its natural state as far as possible or treated where necessary. 2. Drilled sites will be inspected once after | 1. Ensure responsible material and soil handling and replacement. 2. Inspect drilled sites for localised dipping in topography or pooling of | 1. Environmental manager along with the contracting prospecting manager 2. Environmental manager | 1. Monthly once invasive prospecting commences for the duration of prospecting. 2. Once-off for drilled borehole sites after |

| Activity | Impact | Scheduled Activities | Applicable Mine Phase | STATUS | Magnitude | Extent | Duration | Reversibility | CONSEQUENCE | PROBABILITY | SIGNIFICANCE (pre-mitigation) | Mitigation | Degree of loss of resource | Mitigation | Standard to be achieved | Magnitude | Extent | Duration | Reversibility | CONSEQUENCE | PROBABILITY | SIGNIFICANCE (post-mitigation) | Compliance with standards | Time periods for implementation | Functional requirements for monitoring | Roles & responsibilities | Frequency for monitoring and reporting |
|--|--|----------------------|-------------------------------|--------|-----------|--------|----------|---------------|-------------|-------------|-------------------------------|------------|----------------------------|--|---|-----------|--------|----------|---------------|-------------|-------------|--------------------------------|--|---|---|--|---|
| | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| General prospecting activities | Potential contamination of soil with indiscriminately dumped waste or littering. | GNR983 – Activity 20 | Operation | Neg | 3 | 1 | 2 | 3 | 9 | 2 | 18 | Y | Low | REMEDY Inspect and clear all litter and waste. CONTROL Waste should be collected and report to the relevant waste stream at the PA. | Attain "cradle to grave" management of waste on site. | 1 | 1 | 2 | 1 | 5 | 2 | 10 | General duty of care in terms of NEMA. Littering and dumping is prohibited in terms of NEM: WA and CARA. | 1. Monthly visual inspection of the active prospecting areas for illegal dumping of waste and littering will commence as soon as any prospecting contractors comes to site and continue for the life of prospecting operations. | 1. Ensure no illegal littering and dumping of waste. | 1. Environmental manager | 1. Monthly visual inspection of the active prospecting areas for littering for the duration of prospecting operations. |
| Temporary 'Camp site', core/equipment store and site office. Staff will be accommodated off site unless permission is given by landowners. A temporary site camp comprising of shade, equipment storage and seating for meals may be established | Potential for compaction of soil | | Operation and Decommissioning | | 2 | 1 | 2 | 1 | 6 | 2 | 12 | Y | low | REMEDY Ripping up compaction of soil | Reduce compaction of soil and retain existing grazing land capability. | 1 | 1 | 2 | 1 | 4 | 2 | 8 | CARA, NEMA and MPRDA regulations regarding soil amelioration. General duty of care in terms of NEMA. | 1. Once off inspection will be completed after activity in the area has ceased and area is rehabilitated for the duration of prospecting operations. | 1. Ensure sensitive sites are avoided or that necessary authorisations / permits are obtained where these cannot be avoided through sign-off of all onsite activity plans. 2. Inspect all sites for compacted soils. | 1. Environmental manager and site manager 2. Environmental manager | 1. Once off inspection will be completed after activity in the area has ceased and area is rehabilitated for the duration of prospecting operations. |
| Hydrocarbon Storage | Potential hydrocarbon contamination of soil. | GNR983 – Activity 20 | Operation, Decommissioning | | 3 | 1 | 2 | 2 | 8 | 2 | 16 | Y | low | REMEDY Spill kits must be available on site and personnel trained to utilise these to clear spills immediately. CONTROL All vehicles on site will be up-to-date with their service and maintenance plans. The use of persistently leaky vehicles will be discontinued until repairs are made. Vehicles will | Vehicles, machinery and equipment maintained within operational specification and legislative requirements. | 2 | 1 | 1 | 1 | 5 | 2 | 10 | General duty of care in terms of NEMA | SANS / SABS / SA legislative requirements regarding vehicle and equipment maintenance and operating requirements. General duty of care in terms of NEMA. | 1. Weekly inspection of all service and maintenance plans for all vehicles as soon as prospecting operations commence for the duration of prospecting operations to ensure maintenance is scheduled in time. 2. Daily inspection of the storage area | 1. Site manager in conjunction with prospecting manager 2. Site manager | 1. Weekly inspection of all service and maintenance plans for all vehicles as soon as prospecting operations commence for the duration of prospecting operations to ensure maintenance is scheduled in time. 2. Daily inspection of the storage area |

| Activity | Impact | Scheduled Activities | Applicable Mine Phase | STATUS | Magnitude | Extent | Duration | Reversibility | CONSEQUENCE | PROBABILITY | SIGNIFICANCE (pre-mitigation) | Mitigation | Degree of loss of resource | Mitigation | Standard to be achieved | Magnitude | Extent | Duration | Reversibility | CONSEQUENCE | PROBABILITY | SIGNIFICANCE (post-mitigation) | Compliance with standards | Time periods for implementation | Functional requirements for monitoring | Roles & responsibilities | Frequency for monitoring and reporting |
|--|--|----------------------|----------------------------|--------|-----------|--------|----------|---------------|-------------|-------------|-------------------------------|------------|----------------------------|--|---|-----------|--------|----------|---------------|-------------|-------------|--------------------------------|--|--|--|--|---|
| | | | | | | | | | | | | | | not be parked over bare ground; where unavoidable, drip trays will be placed under the equipment to collect potential leaks. | | | | | | | | | | | | | |
| Aspect: Surface Water & Associated Wetlands & Aquatic Ecosystems | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| Access routes | Potential hydrocarbon contamination through contaminated runoff. | | Operation, Decommissioning | Neg | 5 | 2 | 2 | 3 | 12 | 3 | 36 | Y | Low | <p>REMEDY Spill kits must be available on site and personnel trained to utilise these to clear spills immediately.</p> <p>CONTROL All vehicles on site will be up-to-date with their service and maintenance plans. The use of persistently leaky vehicles will be discontinued until repairs are made. Vehicles will not be parked over bare ground; where unavoidable, drip trays will be placed under the equipment to collect potential leaks.</p> | Vehicles, machinery and equipment maintained within operational specification and legislative requirements. | 2 | 2 | 2 | 3 | 9 | 1 | 9 | SANS / SABS / SA legislative requirements regarding vehicle and equipment maintenance and operating requirements. General duty of care in terms of NEMA. | 1. Weekly inspection of all service and maintenance plans for all vehicles as soon as prospecting operations commence for the duration of prospecting operations to ensure maintenance is scheduled in time. 2. Daily inspection of the active routes and drilling areas will be conducted as long as vehicles and machinery are active in these areas. | 1. Ensure vehicles are within operation specifications to prevent excessive noise, emission and reduce risks of leaks. 2. Ensure area is clear of hydrocarbon spills. | 1. Site manager in conjunction with prospecting manager 2. Site manager | 1. Weekly inspection of all vehicle and equipment service and maintenance log books for the duration of prospecting operations. 2. Daily inspection of active routes and drilling areas. |
| Drilling | Potential hydrocarbon contamination through contaminated runoff. | GNR983 – Activity 20 | Operation Decommissioning | Neg | 5 | 2 | 2 | 3 | 12 | 3 | 36 | Y | Low | <p>REMEDY Spill kits must be available on site and personnel trained to utilise these to clear spills immediately.</p> <p>CONTROL All vehicles on site will be up-to-date with their service and maintenance plans. The use of persistently</p> | Vehicles, machinery and equipment maintained within operational specification and legislative requirements. | 4 | 2 | 2 | 3 | 11 | 1 | 11 | SANS / SABS / SA legislative requirements regarding vehicle and equipment maintenance and operating requirements. General duty of care in terms of NEMA. | 1. Weekly inspection of all service and maintenance plans for all vehicles as soon as prospecting operations commence for the duration of prospecting operations to ensure maintenance is scheduled in time. 2. Daily inspection of | 1. Ensure vehicles are within operation specifications to prevent excessive noise, emission and reduce risks of leaks. 2. Ensure area is clear of hydrocarbon spills. | 1. Site manager in conjunction with prospecting manager 2. Site manager | 1. Weekly inspection of all vehicle and equipment service and maintenance log books for the duration of prospecting operations. 2. Daily inspection of active routes and drilling areas. |

| Activity | Impact | Scheduled Activities | Applicable Mine Phase | STATUS | Magnitude | Extent | Duration | Reversibility | CONSEQUENCE | PROBABILITY | SIGNIFICANCE (pre-mitigation) | Mitigation | Degree of loss of resource | Mitigation | Standard to be achieved | Magnitude | Extent | Duration | Reversibility | CONSEQUENCE | PROBABILITY | SIGNIFICANCE (post-mitigation) | Compliance with standards | Time periods for implementation | Functional requirements for monitoring | Roles & responsibilities | Frequency for monitoring and reporting |
|--------------------------------------|---|----------------------|-------------------------------------|--------|-----------|--------|----------|---------------|-------------|-------------|-------------------------------|------------|----------------------------|--|--|-----------|--------|----------|---------------|-------------|-------------|--------------------------------|---|---|--|---|---|
| | | | | | | | | | | | | | | leaky vehicles will be discontinued until repairs are made. Vehicles will not be parked over bare ground; where unavoidable, drip trays will be placed under the equipment to collect potential leaks. | | | | | | | | | | the active routes and drilling areas will be conducted as long as vehicles and machinery are active in these areas. | | | |
| Drilling | Irresponsible use of water and water wastage. | GNR983 – Activity 9 | Operation | Neg | 4 | 1 | 2 | 1 | 8 | 1 | 8 | Y | Low | CONTROL Saving water initiatives will be included in environmental awareness training and induction. Utilise water on site responsibly. | Utilise water responsibly. | 2 | 1 | 2 | 1 | 6 | 1 | 6 | NWA General duty of care in terms of NEMA. | 1. Include water conservation in all environmental awareness training / induction. | 1. Reduce water wastage. | 1. Environmental manager | 1. Include water conservation in all environmental awareness training / induction. |
| Ablution facility (portable toilets) | Potential contamination of surface water bodies with sewage. | | Operation | Neg | 2 | 2 | 1 | 1 | 6 | 2 | 12 | Y | Low | REMEDY Inspect and repair / replace damaged toilets as needed, and ensure no leaks are occurring. CONTROL The portable toilets will be managed by a reputable contractor, emptied on a regular basis as needed. Toilets will be maintained in hygienic state. | Reduced bacterial contamination on neighbouring areas. | 1 | 1 | 1 | 1 | 4 | 1 | 4 | General duty of care in terms of NEMA & NWA. | 1. Weekly inspections of portable toilet facilities. | 1. Ensure portable toilet facilities are in proper working condition, not overflowing or leaking and hygienic. | 1. Prospecting manager | 1. Weekly inspections of portable toilet facilities for the duration of prospecting activities. |
| Rehabilitation of boreholes | Soil replacement and revegetation will reduce potential silt loading. | | Operation, Decommissioning, Closure | Pos | 2 | 2 | 2 | 3 | 9 | 2 | 18 | N | - | REMEDY Rehabilitation must be on-going as soon as drilling results are completed. | Restore natural catchment drainage patterns as far as possible. Restore land to arable land use. | 2 | 2 | 2 | 3 | 9 | 2 | 18 | NEMA & MPRDA principals and regulations regarding environmental protection and rehabilitation requirements. | 1. Soil will be preserved in its natural state as far as possible or treated where necessary. 2. Drilled sites will be inspected once after substantial rainfall has occurred in the area. | 1. Ensure responsible material and soil handling and replacement. 2. Inspect drilled sites for localised dipping in topography or pooling of water. | 1. Environmental manager along with the contracting prospecting manager 2. Environmental manager | 1. Monthly once invasive prospecting commences for the duration of prospecting. 2. Once-off for drilled borehole sites after substantial rainfall. |

| Activity | Impact | Scheduled Activities | Applicable Mine Phase | STATUS | Magnitude | Extent | Duration | Reversibility | CONSEQUENCE | PROBABILITY | SIGNIFICANCE (pre-mitigation) | Mitigation | Degree of loss of resource | Mitigation | Standard to be achieved | Magnitude | Extent | Duration | Reversibility | CONSEQUENCE | PROBABILITY | SIGNIFICANCE (post-mitigation) | Compliance with standards | Time periods for implementation | Functional requirements for monitoring | Roles responsibilities & | Frequency for monitoring and reporting |
|--------------------------------|--|----------------------|----------------------------|--------|-----------|--------|----------|---------------|-------------|-------------|-------------------------------|------------|----------------------------|---|---|-----------|--------|----------|---------------|-------------|-------------|--------------------------------|--|--|--|--|--|
| General prospecting activities | Potential contamination of surface water features with indiscriminately dumped waste or littering. | GNR983 – Activity 20 | Operation | Neg | 3 | 1 | 2 | 3 | 9 | 2 | 18 | Y | Low | REMEDY Inspect and clear all litter and waste. CONTROL Waste should be collected and report to the relevant waste stream at the PA. | Attain "cradle to grave" management of waste on site. | 1 | 1 | 2 | 1 | 5 | 2 | 10 | General duty of care in terms of NEMA. Littering and dumping is prohibited in terms of NEM: WA and CARA. | 1. Monthly visual inspection of the active prospecting areas for illegal dumping of waste and littering will commence as soon as any prospecting contractors comes to site and continue for the life of prospecting operations. | 1. Ensure no illegal littering and dumping of waste. | 1. Environmental manager | 1. Monthly visual inspection of the active prospecting areas for littering for the duration of prospecting operations. |
| Hydrocarbon Storage | Potential hydrocarbon contamination through contaminated runoff. | GNR983 – Activity 20 | Operation, Decommissioning | Neg | 3 | 1 | 2 | 2 | 8 | 16 | 16 | Y | low | REMEDY Clearing any spills. Ceasing and rehabilitating any illegal activity. Rehabilitating and repairing any damage. Inspection and immediate action. | Vehicles, machinery and equipment maintained within operational specification and legislative requirements. | 2 | 1 | 1 | 1 | 5 | 2 | 10 | SANS / SABS / SA legislative requirements regarding vehicle and equipment maintenance and operating requirements. General duty of care in terms of NEMA. | 1. Weekly inspection of all service and maintenance plans for all vehicles as soon as prospecting operations commence for the duration of prospecting operations to ensure maintenance is scheduled in time. 2. Daily inspection of the storage area. | 1. Ensure vehicles are within operation specifications to prevent excessive noise, emission and reduce risks of leaks. 2. Ensure area is clear of hydrocarbon spills. | 1. Site manager in conjunction with prospecting manager 2. Site manager | 1. Weekly inspection of all vehicle and equipment service and maintenance log books for the duration of prospecting operations. 2. Daily inspection of storage area |
| Aspect: Groundwater | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| Drilling | Cracks and disruption to aquifers. | GNR983 – Activity 20 | Operation, Decommissioning | Neg | 3 | 2 | 2 | 3 | 10 | 1 | 10 | N | Low | Nature of prospecting activities. CONTROL Invasive prospecting must only be undertaken once data from non-invasive techniques has been assessed. Then, it should proceed as per standard industry practice with initially fewer boreholes to verify non-invasive prospecting data, and then only completing | Necessary to obtain resource data necessary for a MRA. | 2 | 2 | 2 | 3 | 9 | 1 | 9 | Prospecting will be carried out in line with MPRDA regulations. General duty of care in terms of NEMA. | - | No monitoring required | - | - |

| Activity | Impact | Scheduled Activities | Applicable Mine Phase | STATUS | Magnitude | Extent | Duration | Reversibility | CONSEQUENCE | PROBABILITY | SIGNIFICANCE (pre-mitigation) | Mitigation | Degree of loss of resource | Mitigation | Standard to be achieved | Magnitude | Extent | Duration | Reversibility | CONSEQUENCE | PROBABILITY | SIGNIFICANCE (post-mitigation) | Compliance with standards | Time periods for implementation | Functional requirements for monitoring | Roles & responsibilities | Frequency for monitoring and reporting |
|--------------------------------|--|----------------------|----------------------------|--------|-----------|--------|----------|---------------|-------------|-------------|-------------------------------|------------|----------------------------|--|---|-----------|--------|----------|---------------|-------------|-------------|--------------------------------|--|--|--|--|---|
| | | | | | | | | | | | | | | more extensive drilling in areas indicating adequate resources. | | | | | | | | | | | | | |
| Access routes & Drilling | Potential hydrocarbon contamination seeping to the groundwater environment. | GNR983 – Activity 20 | Operation, Decommissioning | Neg | 3 | 2 | 2 | 3 | 10 | 1 | 10 | Y | Low | <p>REMEDY Spill kits must be available on site and personnel trained to utilise these to clear spills immediately.</p> <p>CONTROL All vehicles on site will be up-to-date with their service and maintenance plans. The use of persistently leaky vehicles will be discontinued until repairs are made. Vehicles will not be parked over bare ground; where unavoidable, drip trays will be placed under the equipment to collect potential leaks.</p> | Vehicles, machinery and equipment maintained within operational specification and legislative requirements. | 1 | 1 | 1 | 1 | 4 | 1 | 4 | SANS / SABS / SA legislative requirements regarding vehicle and equipment maintenance and operating requirements. General duty of care in terms of NEMA. | 1. Weekly inspection of all service and maintenance plans for all vehicles as soon as prospecting operations commence for the duration of prospecting operations to ensure maintenance is scheduled in time. 2. Daily inspection of the active routes and drilling areas will be conducted as long as vehicles and machinery are active in these areas. | 1. Ensure vehicles are within operation specifications to prevent excessive noise, emission and reduce risks of leaks. 2. Ensure area is clear of hydrocarbon spills. | 1. Site manager in conjunction with prospecting manager 2. Site manager | 1. Weekly inspection of all vehicle and equipment service and maintenance log books for the duration of prospecting operations. 2. Daily inspection of active routes and drilling areas. |
| General prospecting activities | Potential contamination of groundwater through seepage from indiscriminately dumped waste or litter. | GNR983 – Activity 20 | Operation | Neg | 3 | 1 | 2 | 1 | 7 | 2 | 14 | Y | Low | <p>REMEDY Inspect and clear all litter and waste.</p> <p>CONTROL Waste should be collected and report to the relevant waste stream at the PA.</p> | Attain "cradle to grave" management of waste on site. | 1 | 1 | 2 | 1 | 5 | 2 | 10 | General duty of care in terms of NEMA. Littering and dumping is prohibited in terms of NEM: WA and CARA. | 1. Monthly visual inspection of the active prospecting areas for illegal dumping of waste and littering will commence as soon as any prospecting contractors come to site and continue for the life of prospecting operations. | 1. Ensure no illegal littering and dumping of waste. | 1. Environmental manager | 1. Monthly visual inspection of the active prospecting areas for littering for the duration of prospecting operations. |

| Activity | Impact | Scheduled Activities | Applicable Mine Phase | STATUS | Magnitude | Extent | Duration | Reversibility | CONSEQUENCE | PROBABILITY | SIGNIFICANCE (pre-mitigation) | Mitigation | Standard to be achieved | Magnitude | Extent | Duration | Reversibility | CONSEQUENCE | PROBABILITY | SIGNIFICANCE (post-mitigation) | Compliance with standards | Time periods for implementation | Functional requirements for monitoring | Roles & responsibilities | Frequency for monitoring and reporting | | |
|----------------------------------|--|----------------------|-------------------------------------|--------|-----------|--------|----------|---------------|-------------|-------------|-------------------------------|------------|-------------------------|--|---|----------|---------------|-------------|-------------|--------------------------------|---------------------------|---------------------------------|--|---|--|--|--|
| Hydrocarbon Storage | Potential hydrocarbon contamination to groundwater | GNR983 – Activity 20 | Operation, Decommissioning | | 3 | 2 | 3 | 2 | 10 | | 20 | Y | Low | REMEDY Spill kits must be available on site and personnel trained to utilise these to clear spills immediately. CONTROL All vehicles on site will be up-to-date with their service and maintenance plans. The use of persistently leaky vehicles will be | Vehicles, machinery and equipment maintained within operational specification and legislative requirements. | 2 | 1 | 2 | 1 | 6 | 2 | 12 | SANS / SABS / SA legislative requirements regarding vehicle and equipment maintenance and operating requirements. General duty of care in terms of NEMA. | 1. Weekly inspection of all service and maintenance plans for all vehicles as soon as prospecting operations commence for the duration of prospecting operations to ensure maintenance is scheduled in time. | 1. Ensure vehicles are within operation specifications to prevent excessive noise, emission and reduce risks of leaks. 2. Ensure area is clear of hydrocarbon spills. | 1. Site manager in conjunction with prospecting manager 2. Site manager | 1. Weekly inspection of all vehicle and equipment service and maintenance log books for the duration of prospecting operations. 2. Daily inspection of hydrocarbon storage area |
| Aspect: Flora & Fauna | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| General prospecting activities | Alien invasive encroachment | GNR983 – Activity 20 | Operation, Decommissioning, Closure | Neg | 4 | 2 | 5 | 3 | 14 | 2 | 28 | Y | Mod | REMEDY Remove alien and invasive species that may establish around prospecting sites, using mechanical methods in preference to chemical methods where viable. CONTROL Clear all vehicles coming to site of any vegetative material to prevent introduction and spread of potential alien and invasive species. Compile and implement an alien and invasive species management plan for areas disturbed by prospecting. | Alien and invasive species managed with the view to eradicate species. | 3 | 1 | 5 | 3 | 12 | 1 | 12 | Alien and invasive species managed in terms of CARA and NEM: BA. | 1. Removal of alien and invasive species should commence during operation and be on-going for the life of prospecting. Area must be generally inspected every 6 months and areas where plants were removed must also be revisited to remove any new saplings. The frequency will depend on the type of species. | 1. Control alien and invasive species listed under CARA and NEM: BA. | 1. Environmental manager | 1. Alien and invasive management to commence during operation for the duration of prospecting. Area must be generally inspected every 6 months but will depend on the type of species. |
| General prospecting activities | Alienation of, and disturbance to, animals. | | Operation, Decommissioning | Neg | 3 | 2 | 2 | 1 | 8 | 2 | 16 | Y | Low | CONTROL By maintaining wetlands and buffer zones, ecological corridors are maintained for animals to take refuge. | Reduce impact to neighbouring areas, which will provide refuge for animals. | 2 | 2 | 2 | 1 | 7 | 1 | 7 | General duty of care in terms of NEMA. | 1. Monthly inspections will be made of nearby wetlands, rivers and associated buffer zones to ensure | 1. Ensure surrounding flora and fauna are undisturbed. | 1. Environmental manager | 1. Monthly inspections of wetlands, rivers and associated buffer zones for the duration of prospecting. |

| Activity | Impact | Scheduled Activities | Applicable Mine Phase | STATUS | Magnitude | Extent | Duration | Reversibility | CONSEQUENCE | PROBABILITY | SIGNIFICANCE (pre-mitigation) | Mitigation | Degree of loss of resource | Mitigation | Standard to be achieved | Magnitude | Extent | Duration | Reversibility | CONSEQUENCE | PROBABILITY | SIGNIFICANCE (post-mitigation) | Compliance with standards | Time periods for implementation | Functional requirements for monitoring | Roles & responsibilities | Frequency for monitoring and reporting |
|--------------------------------|--|----------------------|-----------------------|--------|-----------|--------|----------|---------------|-------------|-------------|-------------------------------|------------|----------------------------|---|------------------------------------|-----------|--------|----------|---------------|-------------|-------------|--------------------------------|--|--|---|--|---|
| | | | | | | | | | | | | | | Do not hinder, harm, or trap animals. Noise control measures will be considered. | | | | | | | | | | these are not degraded or impacted by prospecting activities. | | | |
| General prospecting activities | Destruction of natural vegetation and protected species. | | Operation | Neg | 5 | 2 | 5 | 3 | 15 | 2 | | Y | High | <p>REMEDY Report any incidences regarding damage to protected species to the relevant authority.</p> <p>CONTROL Maintain wetlands, rivers and associated buffer zones where such species are most likely to occur. Survey prospecting sites in areas with natural vegetation for any protected species known in the region and either keep species in situ with 50m buffer zone to prevent inadvertent damage to these species or obtain permits to remove / destroy protected species.</p> <p>STOP Protected species must not be removed or destroyed without the necessary permits under NEM:BA.</p> | Preservation of protected species. | 4 | 1 | 5 | 3 | 13 | 1 | 13 | Protected species will be managed in accordance with NEM:BA and associated regulations. General duty of care in terms of NEMA. | 1. Permits and relocation of species will occur once-off before any invasive prospecting activity commences in the area where needed. 2. Monthly inspections of wetland and riverine buffer zones and demarcations of these zones where they are near to prospecting sites for the life of prospecting activities. 3. Flora surveys will be completed once off in prospecting sites in areas with natural vegetation prior to any invasive prospecting in these areas. | 1. Ensure permits are in place before destroying or relocating protected species if needed where needed. 2. Maintain wetland and riverine no-go areas to maintain ecological corridors. 3. Survey prospecting sites in areas with natural vegetation for protected species. | 1. Environmental manager 2. Environmental manager 3. Environmental manager | 1. Once-off relocation of protected species before any invasive prospecting once the permits are obtained. 2. Monthly inspections of wetlands, rivers and associated buffer zones for the duration of prospecting. 3. Once-off survey for protected species prior to any invasive prospecting activities. |
| Aspect: Air Quality | | | | | | | | | | | | | | | | | | | | | | | | | | | |

| Activity | Impact | Scheduled Activities | Applicable Mine Phase | STATUS | Magnitude | Extent | Duration | Reversibility | CONSEQUENCE | PROBABILITY | SIGNIFICANCE (pre-mitigation) | Mitigation | Degree of loss of resource | Mitigation | Standard to be achieved | Magnitude | Extent | Duration | Reversibility | CONSEQUENCE | PROBABILITY | SIGNIFICANCE (post-mitigation) | Compliance with standards | Time periods for implementation | Functional requirements for monitoring | Roles & responsibilities | Frequency for monitoring and reporting |
|--------------------------|---|----------------------|--|--------|-----------|--------|----------|---------------|-------------|-------------|-------------------------------|------------|----------------------------|--|---|-----------|--------|----------|---------------|-------------|-------------|--------------------------------|--|--|--|---|---|
| Access routes | Generation of dust on gravel roads. | | Operation, Decommissioning | Neg | 4 | 2 | 2 | 1 | 9 | 5 | 45 | Y | Low | CONTROL Manage dust through water carts and wetting of gravel roads if and when required. Establish speed limits that will effectively reduce dust generation on roads. | Dust fallout will be managed to not exceed 600mg/m2/day. | 2 | 1 | 2 | 1 | 6 | 3 | 18 | Dust fallout will be managed to not exceed 600mg/m2/day. Dust regulations as per NEM:AQA. | 1. Sporadic visual inspection of billowing dust clouds from prospecting areas throughout prospecting operations. | 1. Visual inspection for billowing dust clouds. | 1. Environmental manager | 1. Sporadic visual inspection of billowing dust clouds from prospecting areas throughout prospecting operations. |
| Access routes & Drilling | Emissions into the atmosphere through use of diesel powered equipment, machinery and vehicles. | | Operation, Decommissioning | Neg | 2 | 2 | 2 | 1 | 7 | 5 | 35 | Y | Low | CONTROL Machinery and equipment will be regularly serviced to ensure they are in proper working condition and to reduce risk of excessive emissions. | Keep equipment, machinery and vehicles operating within their manufacturing specifications. | 1 | 1 | 2 | 1 | 5 | 5 | 25 | SANS / SABS / SA legislative requirements regarding vehicle and equipment maintenance and operating requirements. General duty of care in terms of NEMA. | 1. Weekly inspection of all service and maintenance plans for all equipment and machinery as soon as equipment is brought to site for the duration of prospecting operations to ensure maintenance is scheduled in time. | 1. Ensure vehicles are within operation specifications to prevent excessive noise, emission and reduce risks of leaks. | 1. Site manager in conjunction with prospecting manager | 1. Weekly inspection of all vehicle and equipment maintenance log books for the duration of prospecting operations. |
| | Potential disturbance to vegetation Potential Alienation of, and disturbance to, animals | | Operation, Decommissioning and Closure | Neg | 2 | 1 | 3 | 2 | 8 | 2 | 16 | Y | Low | REMEDY Relocating protected species for which permits are obtained rather than destroying species. CONTROL Maintaining wetlands and buffer zones as ecological corridors and refuges. Do not hinder, harm or trap animals. | Reduce impact to neighbouring areas, which will provide refuge for animals. | 2 | 1 | 2 | 1 | 6 | 2 | 12 | General duty of care in terms of NEMA. | 1. Monthly inspections will be made of wetlands, rivers and associated buffer zones to ensure these are not degraded or impacted by prospecting activities. | 1. Ensure surrounding flora and fauna are undisturbed. | 1. Environmental Manager | 1. Monthly inspections of wetlands, rivers and associated buffer zones for the duration of prospecting. |
| Aspect: Noise | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| Access routes & Drilling | Increased noise levels. | | Operation, Decommissioning | Neg | 4 | 2 | 2 | 1 | 9 | 4 | 36 | Y | - | CONTROL Machinery and equipment will be regularly serviced. Noise control measures will be considered such as | Prevent nuisance noise to nearby land owners / users | 2 | 2 | 2 | 1 | 7 | 4 | 28 | Environmental noise managed to SANS 10103:2004 levels. | - | - | - | - |

| Activity | Impact | Scheduled Activities | Applicable Mine Phase | STATUS | Magnitude | Extent | Duration | Reversibility | CONSEQUENCE | PROBABILITY | SIGNIFICANCE (pre-mitigation) | Mitigation | Degree of loss of resource | Mitigation | Standard to be achieved | Magnitude | Extent | Duration | Reversibility | CONSEQUENCE | PROBABILITY | SIGNIFICANCE (post-mitigation) | Compliance with standards | Time periods for implementation | Functional requirements for monitoring | Roles & responsibilities | Frequency for monitoring and reporting |
|--|--|----------------------|----------------------------|--------|-----------|--------|----------|---------------|-------------|-------------|-------------------------------|------------|----------------------------|---|---|-----------|--------|----------|---------------|-------------|-------------|--------------------------------|--|---|--|------------------------------------|--|
| | | | | | | | | | | | | | | soundproofing of point sources, use of silencers, using strobe lights rather than beepers where feasible and where this won't compromise safety of people on site. Ensure regular communication with nearby I&APs to ensure work schedules are communicated to them and that they are aware that noise will be generated and over what period this may affect them. | | | | | | | | | | | | | |
| Aspect: Archaeological/Cultural Sites | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| Drilling | Loss of and disturbance to archaeological / heritage / grave sites that may be encountered | | Operation Decommissioning | Neg | 5 | 3 | 5 | 5 | 18 | 2 | 36 | Y | High | CONTROL Should heritage sites / graves be discovered on site during activity progress then all sites should be demarcated with 50m buffer zone and sites be preserved in situ. A specialist will need to be consulted if areas need to be affected. STOP Sites must remain in situ until necessary permits are obtained. | Preservation of heritage sites. | 2 | 3 | 5 | 3 | 13 | 2 | 26 | SAHRA will be complied with regarding permits for destruction and relocation or management of sites in situ. Conditions in permits will be adhered to. | 1. Areas will be inspected once off for heritage sites prior to invasive prospecting occurring on such sites. | 1. Preserve any heritage and cultural sites encountered. | 1. Social manager | 1. Once-off survey for heritage sites on areas targeted for travel and invasive prospecting prior to activity in the area. |
| Aspect: Visual Aesthetic | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| | No visual impact expected | | | Neut | | | | | | | | | | | | | | | | | | | | | | | |
| Aspect: Land Use | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| | Existing land uses may continue | | | Neut | | | | | | | | | | | | | | | | | | | | | | | |
| Aspect: Traffic & Safety | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| Access routes | Increased potential for road | | Operation, Decommissioning | Neg | 3 | 2 | 1 | 5 | 11 | 3 | 33 | Y | - | REMEDY Grade farm roads that | High safety standards on site with reduced safety | 2 | 2 | 1 | 5 | 10 | 2 | 20 | Operations will comply with MHSA | 1. Monthly inspections will be | 1. Maintain roads and intersections | 1. Site manager 2. Site manager | 1. Monthly inspections of all farm |

| Activity | Impact | Scheduled Activities | Applicable Mine Phase | STATUS | Magnitude | Extent | Duration | Reversibility | CONSEQUENCE | PROBABILITY | SIGNIFICANCE (pre-mitigation) | Mitigation | Degree of loss of resource | Mitigation | Standard to be achieved | Magnitude | Extent | Duration | Reversibility | CONSEQUENCE | PROBABILITY | SIGNIFICANCE (post-mitigation) | Compliance with standards | Time periods for implementation | Functional requirements for monitoring | Roles & responsibilities | Frequency for monitoring and reporting | |
|--|--|----------------------|-----------------------|--------|-----------|--------|----------|---------------|-------------|-------------|-------------------------------|---|----------------------------|--|--------------------------------|-----------|--------|----------|---------------|-------------|-------------|--------------------------------|---|---|---|---|--|---|
| | incidences. Road degradation. | | | | | | | | | | | have been extensively damaged due to use by prospecting team. CONTROL Speed limits will be established on the dirt road. Drivers, contractors and visitors will enforce speed limits. Intersections with main tarred roads will be clearly sign-posted. Vehicles. Machinery will be in road-worthy condition with reflective strips and clean and visible to other road users. | | risks. | | | | | | | | | | and Regulations. Vehicles will be serviced and maintained in road worthy condition. | undertaken of all farm roads and intersections with public roads from the onset of operations throughout the prospecting operations. 2. Speed inspections will be undertaken sporadically on site throughout prospecting operations. | with public roads to reduce road incidences. 2. Ensure that on-site speed limits are enforced to reduce dust generation and road incidences. | | roads and intersections from the onset of operations for the duration of prospecting operations. 2. Sporadic speed inspections for the duration of prospecting operations. |
| Aspect: Socio-economic, Health & Safety | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| General prospecting activities | Potential for more employment & multiplier effect. | | Operation | Pos | 3 | 2 | 2 | 1 | 8 | 5 | 40 | N | - | CONTROL Contractors, service providers should initially be sought locally and only regionally if skills are not available. | Fair and equitable employment. | 3 | 2 | 2 | 1 | 8 | 5 | 40 | Operations will comply with MHSA and Regulations. | - | No monitoring required | - | - | |

Appendix 4: Environmental Awareness Hand-out



PROTECT THE ENVIRONMENT BY:

- Following the rules in the EMP
- Report any problems to your supervisor
- Stay within the demarcated areas
- Use the toilets provided
- Report full or leaky toilets
- Report any oil spills
- Use the spill kits to clean any spills noted
- Use drip trays under vehicles and machinery
- Do **not** injure, harm or kill any animals
- Do **not** damage or cut down any plants
- Use the dustbins provided
- Do **not** litter / dump waste
- Do **not** waste water
- Do **not** light any fires or flick any lit cigarettes into the bushes / veldt
- Do **not** damage any graves or heritage sites
- Close all gates behind you
- Keep to the speed limit