EIMS | ENVIRONMENTAL IMPACT MANAGEMENT SERVICES

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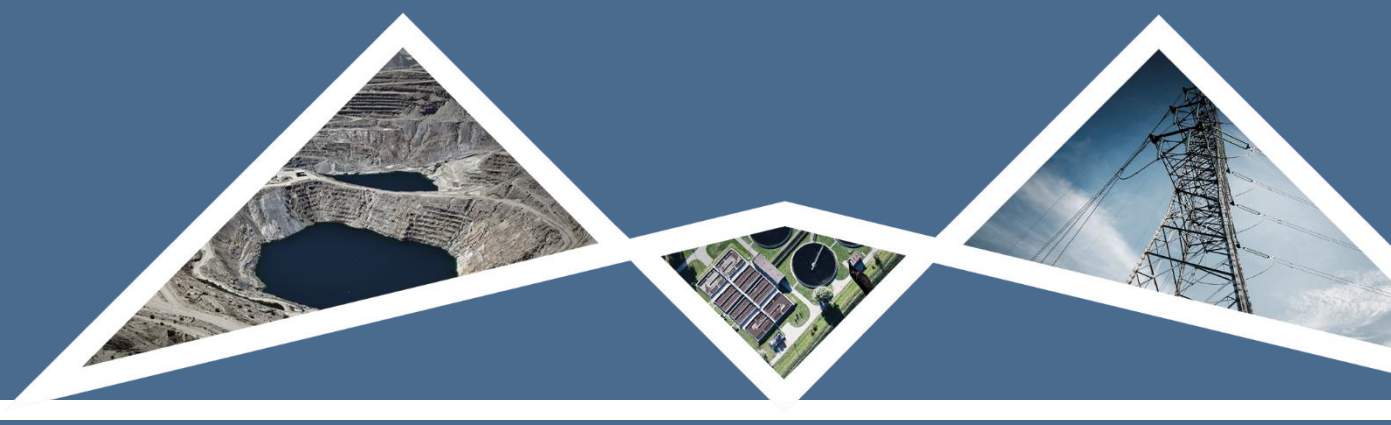
# PART II EA AMENDMENT REPORT

## THE PROPOSED EXPLORATION OF HYDROCARBONS AND ASSOCIATED GAS ON VARIOUS FARMS NEAR THE TOWN OF HENNENMAN, WITHIN FEZILE DABI DISTRICT AND LEJWELEPUTSWA DISTRICT MUNICIPALITIES, FREE STATE PROVINCE

EA REFERENCE NUMBER: 12/3/315

JULY 2024



## DOCUMENT DETAILS

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| **EIMS REFERENCE:** | 1596 |
| **DOCUMENT TITLE:** | Part II EA Amendment Report of an Environmental Authorisation for The Proposed Exploration of Hydrocarbons and Associated Gas on Various Farms Near the Town of Hennenman, within Fezile Dabi District and Lejweleputswa District Municipalities, Free State Province |

## DOCUMENT CONTROL

| | NAME | SIGNATURE | DATE |
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| **COMPILED:** | Vukosi Mabunda |  | 2024/06/21 |
| **CHECKED:** | Liam Whitlow | | 2024/07/15 |
| **AUTHORIZED:** | Liam Whitlow | | 2024/07/16 |

## REVISION AND AMENDMENTS

| **REVISION DATE:** | REV # | DESCRIPTION |
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| **2024/04/09** | ORIGINAL DOCUMENT | Report for Internal Review & Approval |
| **2024/05/13** | REVISION 1 | Report for Public Review & Comment |
| **2024/07/16** | REVISION 2 | Final for Submission to PASA |

**This report is a revised version to the report dated 13 May 2024 which was made available for public review and comment. Comments received during the review and comment period were captured, responded to and were considered in this final version. The minimal changes are indicated in blue.**

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# LIST OF ABBREVIATIONS / ACRONYMS

| | |
|---|---|
| 2D | Two-dimensional |
| BID | Background Information Document |
| CA | Competent Authority |
| CBA | Critical Biodiversity Area |
| CLO | Community Liaison Officer |
| CMA | Catchment Management Agency |
| CR | Critically Rare |
| CSIR | Council for Scientific and Industrial Research |
| DEA | Department of Environmental Affairs |
| DFFE | Department of Forestry, Fisheries and the Environment |
| DMRE | Department of Mineral Resources and Energy |
| DWA | Department of Water Affairs |
| DWAF | Department of Water Affairs and Forestry |
| DWS | Department of Water and Sanitation |
| EA | Environmental Authorisation |
| EAP | Environmental Assessment Practitioner |
| EC | Electrical Conductivity |
| EC | Environmental Coordinator |
| ECA | Environmental Conservation Act |
| ECA | Environmental Conservation Act |
| ECO | Environmental Control Officer |
| EIA | Environmental Impact Assessment |
| EIMS | Environmental Impact Management Services (Pty) Ltd. |
| ELWU | Existing Lawful Water Use |
| EMP | Environmental Management Plan |
| EMPR | Environmental Management Program |
| EMS | Environmental Management System |
| EN | Endangered |
| EPF | Exploration and Production Forum |
| ER | Environmental Risk |
| ESMS | Environmental and Social Management System |
| ESO | Environmental Site Officer |
| EWP | Exploration Work Programme |
| GA | General authorisation |
| GIS | Geographic Information Systems |
| GNR | Government Notice Regulation |
| GPS | Global Positioning System |
| Ha | Hectare |
| HIA | Heritage Impact Assessment |

| | |
|---|---|
| I&AP's | Interested and Affected Parties |
| IDP | Integrated Development Plan |
| IEP | Integrated Energy Plan |
| LC | Leachable Concentration |
| MAE | Mean Annual Evaporation |
| MAP | Mean Annual Precipitation |
| MPRDA: | Mineral and Petroleum Resources Development Act |
| NAAQS | National Ambient Air Quality Standards |
| NEMA | National Environmental Management Act |
| NEMAQA: | National Environmental Management: Air Quality Act |
| NEMBA | National Environmental Management: Biodiversity Act |
| NEMWA: | National Environmental Management: Waste Act |
| NGDB | National Groundwater Database |
| NHRA | National Heritage Resources Act |
| NHRA | National Heritage Resources Act |
| NT | Not threatened |
| PASA | Petroleum Agency South Africa |
| PPP | Public Participation Process |
| Pri. Sci. Nat. | Professional Natural Scientist |
| Ptn | Portion |
| RE | Remaining Extent |
| SAHRA | South African Heritage Resources Agency |
| SAHRIS: | South African Heritage Resources Information System |
| SANS | South African National Standards |
| TC | Total concentration |
| TDS | Total Dissolved Solids |
| TOPS | Threatened and Protected Species |
| VU | Vulnerable |
| WMA | Water Management Area |
| WRC | Water Research Commission |
| WUL | Water Use Licence |
| SAHRA | South African Heritage Resources Agency |
| SAHRIS | South African Heritage Resources Information System |
| SANBI | South African National Biodiversity Institute |
| SCC | Species of conservation concern |

# GLOSSARY OF TERMS

This section provides a catalogue of terms and definitions, which may be used in this report and, or other documents drafted for the project.

Table 1: Glossary of terms.

| Term | Definition | Reference |
|---|---|---|
| **Clearing/Clearance** | Clearing/Clearance refers to the removal of vegetation through permanent eradication and in turn no likelihood of regrowth. 'Burning of vegetation (e.g., fire- breaks), mowing grass or pruning does not constitute vegetation clearance, unless such burning, mowing or pruning would result in the vegetation being permanently eliminated, removed or eradicated'. | Department of Environmental Affairs, 2017. Clearance of Indigenous Vegetation Explanatory Document |
| **Competent Authority** | In respect of a listed activity or specified activity, means the organ of state charged by this Act with evaluating the environmental impact of that activity and, where appropriate, with granting or refusing an environmental authorisation in respect of that activity. | National Environmental Management Act (NEMA), 1998 (Act 107 of 1998) as amended, NEMA 1998 hereafter |
| **Construction** | According to the regulations this term is defined as – the building, erection or establishment of a facility, structure or infrastructure that is necessary for the undertaking of a listed or specified activity but excludes any modification, alteration or expansion of such a facility, structure or infrastructure and excluding the reconstruction of the same facility in the same location, with the same capacity and footprint'. In this application, construction refers to the site establishment, seismic surveys and drilling activities. | NEMA, EIA Regulations, 2014, as amended |
| **Critical Biodiversity Area** | Areas that are deemed important to conserve ecosystems and species. For this reason, these areas require protection. | SANBI |
| **Decommissioning** | means to take out of active service permanently or dismantle partly or wholly, or closure of a facility to the extent that it cannot be readily recommissioned; | NEMA, EIA Regulations, 2014, as amended |
| **Environment** | the surroundings within which humans exist and that are made up of— the land, water and atmosphere of the earth;<br>(ii) micro-organisms, plant and animal life;<br>(iii) any part or combination of (i) and (ii) and the interrelationships among and between them; and<br>(iv) the physical, chemical, aesthetic and cultural properties and conditions of the foregoing that influence human health and well-being. | National Environmental Management Act 1998 (Act No. 107 of 1998), as amended, NEMA hereafter |
| **Environmental Authorisation** | This is a decision by a Competent Authority to authorise a listed activity in terms of the National Environmental Management Act (NEMA). The authorisation means that a project, either in totality or partially, can commence subject to certain conditions. The Competent Authority has a right to refuse to grant authorisation for a project in totality or partially. | NEMA, EIA Regulations, 2014, as amended |
| **Environmental Assessment Practitioners** | The individual responsible for the planning, management, coordination or review of environmental impact assessments, strategic environmental assessments, environmental management programmers or any other appropriate environmental instruments introduced through regulations. | NEMA, 1998 |
| **Fatal Flaw** | An environmental or social negative impact that is not possible to mitigate and significant enough to prevent the scheme from being able to be implemented. | NEMA, 1998 |

| Term | Definition | Reference |
|---|---|---|
| **Fauna** | Animal life that occurs in a specific geographical region and/habitat. | SANBI |
| **Flora** | plant life that occurs in a specific geographical region and/habitat. | SANBI |
| **Indigenous vegetation** | Refers to vegetation consisting of indigenous plant species occurring naturally in an area, regardless of the level of alien infestation and where the topsoil has not been lawfully disturbed during the preceding ten years. | NEMA, EIA Regulations, 2014, as amended |
| **Interested and Affected Parties (IAPs)** | a) any person, group of persons or organisation interested in or affected by such operation or activity; and<br>(b) any organ of stale that may have jurisdiction over any aspect of the operation or activity. | NEMA, 1998 |
| **Protected Area** | A protected area is a clearly defined geographical space, recognised, dedicated and managed, through legal or other effective means, to achieve the long-term conservation of nature with associated ecosystem services and cultural values. | International Union for Conservation of Nature (IUCN) |
| | These are areas aimed at the protection and conservation of areas which are ecologically viable and have high biodiversity. Example of Protected Areas include but are not limited to National Parks, Nature Reserves, world heritage sites and marine protected areas | National Environmental Management: Protected Areas Act, 2003 (Act No. 57 of 2003) |
| **Public Participation Process** | In relation to the assessment of the environmental impact of any application for an environmental authorisation, means a process by which potential Interested and Affected Parties are given opportunity to comment on, or raise issues relevant to, the application. | NEMA, 1998, as amended |
| **Regulated Area of a watercourse** | An area for which a General Authorisation or a Water Use Licence would need to be obtained prior to undertaking any activities. | National Water Act 36 of 1998 |
| **Screening** | Screening determines whether or not a development proposal requires environmental assessment, and if so, what level of assessment is appropriate Screening is therefore a decision-making process that is initiated during the early stages of the development of a proposal. | NEMA, EIA Regulations, 2014, as amended |
| **Species of Conservation Concern** | IUCN Red List definition: Threatened species, and other species of significant conservation importance: Extinct, Extinct in the Wild, Near Threatened, Data Deficient. In South Africa, the following additional categories are added: Rare, Critically Rare. | SANBI |
| **Watercourse** | Watercourse refers to:<br>(a) a river or spring;<br>(b) a natural channel in which water flows regularly or intermittently;<br>(c) a wetland, lake or dam into which, or from which, water flows; and<br>(d) any collection of water which the Minister may, by notice in the Gazette, declare to be a watercourse, and a reference to a watercourse includes, where relevant, its bed and banks. | National Water Act 36 of 1998 |
| **Wetland** | land which is transitional between terrestrial and aquatic systems where the water table is usually at or near the surface, or the land is periodically covered with shallow water, and which land in normal circumstances supports or would support vegetation typically adapted to life in saturated soil | National Water Act 36 of 1998 |

# AFFIRMATION OF ENVIRONMENTAL ASSESSMENT PRACTITIONER (EAP)

I ***Vukosi Mabunda***, a Registered EAP (EAPASA Registration Number: 2019/867) employed by ***Environmental Impact Management Services (Pty) Ltd*** declare that the information provided in this report is correct and relevant to the activity / project, that comments from interested and affected parties have been incorporated into this report that the information was made available to interested and affected parties for their comments.

**SIGNATURE OF EAP**

16 July 2024

**DATE**

# EXECUTIVE SUMMARY

**Background**

Motuoane Energy (Pty) Ltd (Motuoane) is the holder of the Exploration Right (ER) for hydrocarbons, granted in terms of Section 80 of the Mineral and Petroleum Resources Development Act (Act 28 of 2002 – MPRDA, as amended) on 18 October 2018. The originally approved exploration area is located over an area of approximately 149 377 hectares (ha), covering various farms near Welkom, within the Free State Province, extending north from approximately Theunissen, northeast towards Kroonstad, and east of Virginia and Hennenman. It must be noted that as holder of the ER, Motuoane were required to relinquish part of their land position when renewing the ER (twice now), the revised ER footprint currently covers an area of 95 483ha, over 50 000ha less than the initially approved area. In accordance with the National Environmental Management Act (Act 107 of 1998, as amended) (NEMA) an application for Environmental Authorisation (EA) through a Scoping and EIA was submitted to PASA in 2016 in support of the application for the exploration right. The EA was issued in September 2017 (ref: 12/3/315). However, the EA was only for three (3) drilling wells, and it did not include the seismic aspects. As the applicant proposes to undertake an addition of ten (10) new exploration boreholes (13 drilling wells in total including the initial 3 which were approved), approximately 30 km of new onshore seismic transects, and amend the approved Environmental Management Programme (EMPr), an EA Amendment process has been initiated. The existing EA authorises the following listed activities:

- Listing Notice 1, Activity 27;
- Listing Notice 2, Activity 18; and
- Listing Notice 3, Activity 12.

It must be noted that onshore seismic surveys listing (Listing Notice 1, Activity 21C) was not listed at the time of the original EA, nor were onshore seismic's originally envisaged and included in the EIA. The applicant (Motuoane) proposes to expand their exploration activities to include 10 new additional drilling wells and also to undertake onshore seismic surveys within an area of approximately 30 km. All of the proposed additional activities fall within the existing approved Exploration Right area and EA extent. There will be no additional areas or petroleum resources added to the exploration right.

**Proposed Amendments**

The applicant wishes to amend the approved EA to include the following detailed in **Table 2**:

- Undertaking of 13 exploration boreholes;
- Undertaking of approximately 30 km seismic surveys; and
- Updating the approved EMPr.

Table 2: Detailed proposed changes to the Environmental Authorisation.

| EA Condition / Section | Current Condition / Statement | Amended / New Condition / Statement |
|---|---|---|
| 1 | **DETAILS OF THE HOLDER OF THIS ENVIRONMENTAL AUTHORISATION**<br><br>Motuoane Energy (Pty) Ltd<br><br>Contact Person: Mr Peter Dewdney Price<br>Tel: +27 11615 2954<br>Email: pdpeon@icon.co.za | **DETAILS OF THE HOLDER OF THIS ENVIRONMENTAL AUTHORISATION**<br><br>Motuoane Energy (Pty) Ltd<br><br>Contact Person: Mr. FJ Marx<br>Tel: +27 72 592 5025<br>Email: fj@d3energy.com.au |
| 2 | **DETAILS OF THE ENVIRONMENTAL ASSESSMENT PRACTITIONER**<br><br>Environmental Impact Management Services (Pty) Ltd | **DETAILS OF THE ENVIRONMENTAL ASSESSMENT PRACTITIONER**<br><br>Environmental Impact Management Services (Pty) Ltd |

| EA Condition / Section | Current Condition / Statement | Amended / New Condition / Statement |
|---|---|---|
| | Block 5 Fernridge Office Park<br>5 Hunter Avenue<br>Ferndale<br>Randburg<br><br>Contact Person: Mr Brian Whitfield<br>Tel: +27 11 789 7170<br>Fax: +27 86 571 9047<br>Email: brian@eims.co.za | 8 Dalmeny Road,<br>Pine Park,<br>Randburg,<br>2194<br><br>Contact Person: Mr Vukosi Mabunda<br>Tel: +27 11 789 7170<br>Fax: +27 86 571 9047<br>Email: vukosi@eims,co.za |
| 3.2.2 | Diamond core drilling:<br>Drilling of up to 3 wells: the first of the 3 wells will be drilled in the vicinity of the existing blower in the area of interest in order to obtain more data on the geology and potential hydrocarbons. The drilling of the two wells, including their locations will depend on the results of the first well. The surface footprint of each well pad is approximately 30 x 30 m in extent and the total footprint area for all 3 sites will be 0.27 ha. | Exploration well drilling:<br>Drilling of up to 13 wells: 3 drilling activities and construction as part of the original application and 10 additional drilling within the re-assessed 1 km buffers. The surface footprint of each well pad is approximately 50 x 50 m in extent and the total footprint area for all 13 drilling sites will be approximately 3.5 ha. |
| Nil | Nil | **New Condition 3.2.3**<br>Seismic Surveys: Undertaking of seismic surveys along nine (9) transects of approximately 30 km long and within the 50 m wide corridors. |
| 5.1.1.3 | Drilling of up to 3 diamond core wells. | Drilling of up to 13 exploration wells. |
| Nil | Nil | **New Condition 5.1.1.3**<br>Undertaking of seismic surveys along nine (9) transects of approximately 30 km long and within the 50 m wide corridors. |
| 5.1.3 | The holder of this environmental authorisation (hereafter referred to as the Holder) is responsible for ensuring compliance with the conditions of this environmental authorisation, and recommendations made in the Environmental Impact Assessment and Environmental Management Programme Report (EIR/EMPR) dated 30" of January 2017. | The holder of this environmental authorisation (hereafter referred to as the Holder) is responsible for ensuring compliance with the conditions of this environmental authorisation, and recommendations made in the Environmental Impact Assessment Report, Amendment Report and Environmental Management Programme Report as amended. |
| 5.4.1 | The Environmental Management Programme (EMPR) submitted with the Environmental Impact Assessment Report (EIR) is hereby approved. It is hence mandatory for the holder to implement all recommendations and management measures stipulated in the EMPR throughout all the phases of the proposed exploration activities. | The Environmental Management Programme (EMPr) as amended submitted with the Application is hereby approved. It is hence mandatory for the holder to implement all recommendations and management measures stipulated in the EMPr throughout all the phases of the proposed exploration activities. |
| 5.5.2 | The holder of the EA must ensure that any potential impact on the environment is avoided, minimized and prevented. In this regard, all mitigation measures specified in the EIR and EMPR aimed at protecting environmentally sensitive areas, surface and groundwater resources and surrounding communities during the undertaking of the proposed exploration activities must be implemented. Failure thereof may constitute non-compliance and an offence and may result in the implementation of | The holder of the EA must ensure that any potential impact on the environment is avoided, minimized and prevented. In this regard, all mitigation measures specified in the EIR, Amendment Report and EMPr as amended aimed at protecting environmentally sensitive areas, surface and groundwater resources and surrounding communities during the undertaking of the proposed exploration activities must be implemented. Failure thereof may constitute non-compliance and an offence and may result in the |

| EA Condition / Section | Current Condition / Statement | Amended / New Condition / Statement |
|---|---|---|
| | necessary enforcement measures provided for under the NEMA. | implementation of necessary enforcement measures provided for under the NEMA. |
| 5.5.16 | All recommended mitigation measures included in the EIR/EMPR dated 30 January 2017 are deemed to be the conditions of the EA and must therefore be adhered to. | All recommended mitigation measures included in the Amendment Report and EMPr as amended are deemed to be the conditions of the EA and must therefore be adhered to. |

In addition to the above, it must be noted that the surveying and exploration techniques to be employed as per the Exploration Works Programme (EWP) include approved and additional non-invasive and invasive exploration methods including:

- Non-invasive exploration:
    - Background Data Collection and Management;
    - Preparation for Seismic Surveys;
    - Geological and Geophysical Logging; and
    - Onshore Seismic surveys.
- Invasive Exploration:
    - Geotechnical Investigations; and
    - Well Drilling.

**Need and Desirability for the Amendment**

The Holder has undertaken two drilling activities (2 exploration boreholes) to date, however the information recorded (observations) is inadequate to make a conclusive detailed reporting on the quantity of hydrocarbons and/or suitable drilling locations for production purposes. Therefore, the Holder proposes to undertake an additional ten (10) new exploration boreholes and to acquire ground based seismic surveys (~30 km of new seismic transects). The seismic survey will be used to better understand the subsurface discontinuities, layering, and probable rocks/structures. Analysis of the seismic surveys and additional drilling wells will provide more precise information to determine the viability of the exploration project into the production phase. All of the proposed additional activities fall within the existing approved Exploration Right area and EA extent. There will be no additional areas or petroleum resources added to the exploration right.

The proposed amendments, if approved, will allow the applicant to determine if there is an economically viable resource available in the area. It is important to note that the exploration right will not provide the required authorisation for production activities to be undertaken. As such, any future intention to undertake production of hydrocarbons within the exploration right area would require a further application, investigation and public consultation process.

**Specialist Assessments**

The following specialist studies were conducted to inform this amendment report:

- Terrestrial Biodiversity Study;
- Wetland Baseline and Impact Assessment;
- Heritage Impact Assessment; and
- Palaeontology Impact Assessment

The specialist studies found that there are areas within the study area that possess a 'High' Site Ecological Importance, near natural habitats, sensitive and protected species as well as cultural heritage features. The aquatic specialist found that there are wetlands which are at risk of being impacted by the proposed activities. The archaeologist found a total of eleven heritage features and resources within the study area while no fossil

heritage / remains were found. No fatal flaws are evident for the proposed project. It is the opinion of the specialists that the proposed project, may be favourably considered on condition that all prescribed mitigation measures and supporting recommendations are implemented. The seismic activities are expected to have an overall low residual impact. If mitigation measures as described in the report are implemented, it will reduce the significance of the risk to an acceptable level.

**Impact Statement**

It is concluded that the proposed amendments will not result in significant changes to the assessed impacts within the 2017 EIA / EMPr. Mitigation measures described in the original EMPr, and the additional mitigation measures recommended in this report are adequate to manage the identified potential impacts. The EMPr has been updated to include all additional mitigation measures identified in this Amendment Report associated with the amendment activities. Although no fatal flaws were identified on the basis of the assessments done, consideration and best environmental practices should be given to the scale or extent of the activities in relation to the surrounding environmental sensitivities. Based on an assessment of information gathered from desktop studies, site environmental screening and a subsequent review of specialist's studies, it was determined that the site falls within a 'Low to Medium' relative environmental sensitivity with mitigations. It is the EAP's opinion that the proposed amendment activities should be authorised provided the mitigation measures and recommendations highlighted in this report and the updated EMPr are adhered to.

# 1. INTRODUCTION

## 1.1 PROJECT BACKGROUND

Motuoane Energy (Pty) Ltd (Motuoane) is the holder of the Exploration Right (ER) for hydrocarbons, granted in terms of Section 80 of the Mineral and Petroleum Resources Development Act (Act 28 of 2002 – MPRDA, as amended) on 18 October 2018. The originally approved exploration area is located over an area of approximately 149 377 hectares (ha), covering various farms near the city of Welkom, within the Free State Province, extending north from approximately Theunissen, northeast towards Kroonstad, and east of Virginia and Hennenman. It must be noted that as holder of the ER, Motuoane were required to relinquish part of their land position when renewing the ER (twice now), the revised ER footprint currently covers an area of 95 483ha, over 50 000ha less than the initially approved area. In accordance with the National Environmental Management Act (Act 107 of 1998, as amended) (NEMA) an application for Environmental Authorisation (EA) through a Scoping and EIA was submitted to PASA in 2016 in support of the application for the exploration right. The EA was issued in September 2017 (ref: 12/3/315) with the following approved activities indicated in **Table 3** and triggered listed activities in **Table 4** However, the EA was only for three (3) drilling wells, and it did not include the seismic aspects.

Table 3: Authorized activities within the approved exploration area.

| Main Activity/Action/Process | Ancillary Activity |
|---|---|
| **Non-invasive exploration** | **Background data collection and data management which entails**:<br>Identification of existing boreholes, and where emitting boreholes are identified, gas pressure and flow rate will be measure, samples collected and analysed; analysis of existing geological data, magnetic data and cores; and consultation with directly affected landowners in preparation for invasive exploration activities. |
| | **Geological and geophysical logging which entails:**<br>Analysis of core samples for the presence of hydrocarbons as well as the determination of the physical properties of the rocks; and integration of geological logging and surface structures data into maps. |
| **Invasive exploration** | **Geotechnical and soil sampling:**<br>Soil sampling which entails the removal of small sections of the sail profile using a soil augur which is 75 mm in diameter, at depths of between 15 and 30 centimetres on average. The duration of the sampling will be short term, i.e. it may take days to weeks to complete. |
| | **Diamond core drilling:**<br>Drilling of up to 3 wells; the first of the 3 wells will be drilled in the vicinity of the existing blower in the area of interest in order to obtain more data on the geology and potential hydrocarbons. The drilling of the two wells, including their locations will depend on the results of the first well. The surface footprint of each well pad is approximately 50 x 50 m in extent and the total footprint area for all 3 sites will be 0.27 ha. |

Table 4: Authorized NEMA EIA listed activities within the approved exploration area.

| Authorised Listed Activity | Description of Activity |
|---|---|
| **Government Notice Regulations (GNR) 983 Activity 27** | The clearance of an area of 1 hectare or more, but less than 20 hectares of indigenous vegetation. |
| **GNR 984 Activity 18** | Any activity including the operation of that activity which requires an exploration right in terms of section 79 of the Mineral and Petroleum Resources Development Act, as well as any other applicable activity as contained in this Listing Notice, in Listing Notice 1 of 2014 or in Listing Notice 3 of 2014, required to exercise the exploration right. |

| Authorised Listed Activity | Description of Activity |
|---|---|
| **GNR 985 Activity 12** | The clearance of an area of 300 square meters or more of indigenous vegetation except where such clearance of indigenous vegetation is required for maintenance purposes undertaken in accordance with a maintenance management plan;<br>b. Free State<br>i. Within any critically endangered or endangered ecosystem listed in terms of section 52 of the NEMBA or prior to the publication of such a list, within an area that has been identified as critically endangered in the National Spatial Biodiversity Assessment 2004;<br>ii. Within critical biodiversity areas identified in bioregional plans;<br>iv. Areas within a watercourse or wetland; or within 100 metres from the edge of a watercourse or wetland.<br>v. Areas within a watercourse or wetland; or within 100 metres from the edge of a watercourse or wetland |

The EIA and subsequent EA was for only for three (3) drilling wells and it did not include the seismic activities. **The applicant proposes to undertake an addition of ten (10) new exploration boreholes and approximately 30 km of new seismic transects**. **The seismic surveys and additional drilling wells all fall within the approved exploration right footprint. The proposed seismic surveys are along nine (9) transects of approximately 30 km long and 50 m wide corridors and the drilling activities are proposed within ten (10) 1 km radius preliminary sites**. It must be noted that the proposed seismic transects and additional drilling sites are not definite and may change. However, should they change, seismic transect route will still fall within the assessed 50 m seismic transect corridors and the drilling wells will be within the assessed 1 km buffers. All of the proposed additional activities fall within the existing approved Exploration Right area and EA extent. There will be no additional areas or petroleum resources added to the exploration right. It must further be noted that onshore seismic surveys listing (Listing Notice 1, Activity 21 C) was not listed at the time of the original EA, nor were onshore seismic's originally envisaged and included in the EIA.

A review of the National Environmental Management Act, 1998 (Act No. 107 of 1998, NEMA), Environmental Impact Assessment (EIA) Regulations, 2014 as amended revealed that the proposed additional activities require an amendment to the existing EA through a Part II Amendment process. Regulation 31 (Part 2) of the 2014 NEMA EIA Regulations states that:

*"An environmental authorisation may be amended by following the process prescribed in this Part if the amendment will result in a change to the scope of a valid environmental authorisation where such change will result in an increased level or nature of impact where such level or nature of impact was not (a) assessed and included in the initial application for environmental authorisation; or (b) taken into consideration in the initial environmental authorisation; and the change does not, on its own, constitute a listed or specified activity."*

As per sub-regulation (a) and (b) the proposed seismic activities and the cumulative impact of the additional ten drilling wells were not considered as part in the initial EIA process undertaken nor taken into consideration in the EA, therefore these (potential) impacts need to be assessed according to the change in level or nature of impact. Due to the fact that the amendments result in a change of scope, a Part 2 Amendment Process in terms of Regulation 31 of NEMA EIA Regulations of 2014 (as amended) is applicable and required to be followed.

## 1.2 PURPOSE OF THE REPORT

The overarching objective of an Amendment Report is to provide a concise analysis of the potential environmental impacts of the changes to the proposed activity, including comments and issues raised by Interested and Affected Parties (I&APs). This report is being made available to all I&APs to review and provide comment, for a period of 30 days. **The report highlights the following proposed amendments to the EA**:

- **Amend the existing EA Conditions (number of authorised drilling wells) and EMPr;**
- **Add an addition of ten (10) new exploration boreholes (13 drilling wells in total including the initial 3 which were approved); and**
- **Undertake approximately 30 km of new seismic transects**.

This report presents the following:

- The details and relevant expertise of the EAP and specialists preparing the report;
- The project description and locality;
- The status quo of the environmental conditions of the site;
- Legislative framework governing the site;
- The outcome of the National Web-Based Environmental Screening Tool Report;
- The outcome of specialist studies;
- The potential impacts and recommendations; and
- The progress of public participation process.

The report provides a description of the pre-development environment, biophysical and socio-economic environment in terms of the study area. The report also assesses the significance of potential impacts, both positive and negative in relation to the proposed amendments. Mitigation measures are provided for potential negative impacts. The report also provides a comprehensive description of the activities as well as specialist studies that have been undertaken and the detailed Public Participation Process (PPP) for the project, as well as the way forward in the form of conclusions, recommendations and amendments to the Environmental Management Programme (EMPr).

## 1.3 REQUIREMENTS OF AN AMENDMENT REPORT

As indicated in **Sections 1.1 and 1.2** above, a Part 2 Amendment is required for the proposed additional activities for the Motuoane exploration project. As such, the amendment process prescribed by Part 2 of the EIA Regulations, 2014 will be followed. Section 32 of the EIA Regulations, 2014 (as amended) note the following in respect to Part 2 Amendments:

*The Applicant must within 90 days of receipt by the competent authority of the application made in terms of regulation 31, submit to the competent authority, (a.) a report, reflecting-*

*(i) an assessment of all impacts related to the proposed change;*

*(ii) advantages and disadvantages associated with the proposed change;*

*(iii) measures to ensure avoidance, management, and mitigation of impacts associated with such proposed change; and*

*(iv) any changes to the EMPr.*

which report-

(aa) had been subjected to a public participation process, which had been agreed to by the competent authority, and which was appropriate to bring the proposed change to the attention of potential and registered interested and affected parties, including organs of state, which have jurisdiction in respect of any aspect of the relevant activity, and the competent authority, and

(bb) reflects the incorporation of comments received, including any comments of the competent authority.

The Amendment Process for the Motuoane Exploration Project aims to ensure that the requirements described above are met. In line with this, an outline of the Amendment Report (and its relationship to the requirements of Section 32 of the 2014 EIA Regulations) is provided in **Table 5** below.

Table 5: Required contents of the Amendment Report.

| Section Name | Section of the Report | Requirements of Section 32 of the EIA Regulations, 2014 |
|---|---|---|
| Introduction | **Section 1** | No |

| Section Name | Section of the Report | Requirements of Section 32 of the EIA Regulations, 2014 |
|---|---|---|
| Environmental Assessment Practitioner | **Section 1.5** | No |
| Legislative Framework | **Section 3** | No |
| Proposed Amendments | **Section 2** | No |
| Motivation for the proposed amendments | **Section 2.7** | No |
| Public Participation | **Section 7** | No |
| Summary of Specialist Studies | **Section 8.1** | No |
| **Impact Assessment** | **Section 5** | Yes |
| **Advantages and Disadvantages of the Proposed Change** | **Section 6** | Yes |
| **Recommended Mitigation Measures** | **Section 5.3 and 8.3** | Yes |
| **Proposed Changes to the Construction Environmental Management Plan and Operational Environmental Management Plan** | **Section Appendix E** | Yes |
| Reasoned Opinion | **Section 8.2** | No |
| EAP Undertaking | **Page ix** | No |

## 1.4 ASSESSMENT METHODOLOGY AND APPROACH

The Amendment Report made use of available information background information from the original EA application phase in 2017, information received from the applicant, GIS-Desktop studies, National Web-Based Environmental Screening Tool Report (**Appendix B**), specialist assessments and site sensitivity verification undertaken by the EAP (**Appendix C1**: Approved Public Participation Plan

Appendix C2: Pre-Application Correspondence

Appendix C3: Initial Notification and Proof

Appendix C4: Site Notices

Appendix C5: Newspaper Adverts

Appendix C6: Report Availability Notification and Proof

Appendix C7: Public Meeting Document

Appendix C8: Interested and Affected Parties Database

Appendix C9: Table of Correspondence

Appendix C10: Correspondence Proof

Appendix D). With regards to the Screening Tool Report, it is important to mention that it is compulsory (effective from the 4th of October 2019), to use the tool when pre-screening a site and must be attached to all EA Applications.

### 1.4.1 PRE-APPLICATION PROCESS

Pre-application consultation with the Petroleum Agency South Africa (PASA) and the national Department of Forestry, Fisheries and the Environment (DFFE) was initiated on the 17th of October 2023 and completed on the 27th of March 2024. The intention of the pre-application consultation was to confirm the applicable process to be followed, the required specialist assessments and to ensure that all application aspects are met. It was the Environmental Assessment Practitioner's (EAP's) understanding that since all of the proposed additional activities fall within the existing approved Exploration Right area and EA extent. There will be no additional areas or petroleum resources added to the exploration right and considering that onshore seismic surveys listing

(Listing Notice 1, Activity 21 C) was not listed at the time of the original EA, nor were onshore seismic's originally envisaged and included in the EIA. A Part II EA Amendment process rather than a new EA Application is applicable to the proposed activities as per the National Environmental Management Act, 1998 (Act 107 of 1998 – NEMA) Environmental Impact Assessment (EIA) Regulations, 2014 as amended.

Through lengthy consultation with the Administrative Authority (PASA) and National Department (DFFE), it confirmed that no new listed activities are triggered by the additional ten (10) drilling wells and the seismic activities based on legislation. Furthermore, as the Exploration Right period in question was approaching its expiration period, Motuoane has applied for the renewal of the right (ER315 2nd renewal). A work program and budget has been submitted as part of the renewal as required and will be processed under **Section 81 of MPRDA**. Therefore, Section 102 of MPRDA cannot be applicable for the current amendment project as the work programme is being amended through Section 81 of the Act. Subsequently, GNR 983 Activity 21D cannot be then triggered and therefore, **no new listed activities are triggered**.

### 1.4.2 SPECIALIST STUDIES

Based on the proposed amendments, pre-identified environmental sensitivities of the area from the previous specialist assessments and current site sensitivities identified by the EAP, it was decided that the following relevant specialist assessments will be undertaken to inform the amendment application:

- Terrestrial Biodiversity Impact Assessment;
- Wetland and Risk Assessment;
- Heritage Impact Assessment; and
- Palaeontological Impact Assessment.

The summaries of the specialist Assessments are provided in **Section 8.1** and the detailed reports are provided in **Appendix C1**: Approved Public Participation Plan

Appendix C2: Pre-Application Correspondence

Appendix C3: Initial Notification and Proof

Appendix C4: Site Notices

Appendix C5: Newspaper Adverts

Appendix C6: Report Availability Notification and Proof

Appendix C7: Public Meeting Document

Appendix C8: Interested and Affected Parties Database

Appendix C9: Table of Correspondence

Appendix C10: Correspondence Proof

Appendix D.

### 1.4.3 PUBLIC PARTICIPATION

According to Section (32)(a)(iv) of NEMA, the applicant must within 90 days of receipt by the competent authority of the application made in terms of regulation 31, submit to the competent authority a report which has been subjected to a **public participation process**, **which had been agreed to by the competent authority**, and which was appropriate to bring the proposed change to the attention of potential and registered interested and affected parties, including organs of state, which have jurisdiction in respect of any aspect of the relevant activity, and the competent authority, and which reflects the incorporation of comments received, including any

comments of the competent authority. A Public Participation Plan was submitted to PASA on the 27th of March 2024 and approved on the 15th of April 2024 (refer to **Appendix C**).

The public participation was undertaken as per the approved public participation plan indicated as follows:

- A register of all I&APs was opened and maintained throughout the project. The I&AP database developed as part of the original EIA will also be incorporated in the Final I&AP Database;
- Written Notifications were circulated on the 10th of May 2024 to the following stakeholders:
    - Owners or person/s in control of the site;
    - Occupiers of land adjacent to the site;
    - Municipal councillor of the ward;
    - Municipality which has jurisdiction in the area; and
    - Any organ of state having jurisdiction in respect of any aspect of the activity.
- A newspaper advertisement in three most common languages in the area (Sesotho, English, and Afrikaans) and was placed in the relevant local/regional newspaper. The advert was placed on page 12 of Vista Newspaper circulated on the 9th of May 2024;
- On-site notices presenting the project were erected on site and within close proximity of the planned drill sites and seismic activities using A2 and A3 notice boards on the 9th of May 2024;
- The Draft Amendment Report was made available to the public and all registered IAPs electronically on the EIMS Website (https://www.eims.co.za/public-participation/) and hardcopies placed at the nearest Public Libraries (Virginia, Welkom and Kroonstad) on the 15th of May 2024;
- A public meeting / open day was held for the project during the 30-day public review and commenting period on the 15th of May 2024; and
- All I&APs on the database will receive an email and/or letter on the decision made by DMRE including a copy of the National Appeal Regulations 2014.

### 1.4.4 APPLICATION DETAILS

The applicant is the holder of the EA, Motuoane Energy (Pty) Ltd and the competent authority involved in the decision-making process with reference to the Part 2 Amendment application in terms of the NEMA EIA Regulations, 2014 (as amended) is the Department of Mineral resources and Energy (DMRE) while the Petroleum Agency of South Africa (PASA) is responsible for performing an administrative function. The independent Environmental Assessment Practitioner undertaking the application on behalf of the of the applicant is the Environmental Impact Management Systems (Pty) Ltd (EIMS).

## 1.5 DETAILS OF THE ENVIRONMENTAL ASSESSMENT PRACTITIONER

In terms of NEMA EIA Regulations, 2014 as amended, an independent EAP, must be appointed by the applicant to manage the application. EIMS is compliant with the definition of an EAP as defined in Regulations 1 and 13 of the EIA Regulations, as well as Section 1 of the NEMA. This includes, inter alia, the requirement that EIMS is:

- Objective and independent;
- Has expertise in conducting EIA's;
- Comply with the NEMA, the environmental regulations and all other applicable legislation;
- Considers all relevant factors relating to the application; and
- Provides full disclosure to the applicant and the relevant environmental authority.

EIMS was appointed by Motuoane to assist in preparing and submitting the Amendment Application for the Environmental Authorisation, compile an Amendment Report and to conduct the required public participation

process in support of the additional proposed activities for the Motuoane Exploration project. EIMS is a private and independent environmental management-consulting firm that was founded in 1993. EIMS is an independent specialised environmental consulting firm offering the full spectrum of environmental management services across all sectors within the African continent. EIMS has successfully completed many hundreds of assignments over the years with an excess of 30 years' experience in conducting EIA's for both the government and private sector. Please refer to the EIMS website (www.eims.co.za) for examples of EIA documentation currently available. In terms of Regulation 13 of the NEMA EIA Regulations (GNR 982) 2014 as amended, an independent EAP, must be appointed by the applicant to manage the application for an environmental authorisation. EIMS and the compiler of this report are compliant with the definition of an EAP as defined in Regulations 1 and 13 of the NEMA EIA Regulations, as well as Section 1 of the NEMA. This includes, inter alia, the requirement that EIMS is:

- Objective and independent;
- Has expertise in conducting EIA's;
- Comply with the NEMA, the environmental regulations and all other applicable legislation;
- Considers all relevant factors relating to the application; and
- Provides full disclosure to the applicant and the relevant environmental authority.

The contact details of the EIMS consultant (EAP) who compiled this Report are presented in **Table 6.**

*Table 6: Details of the Environmental Assessment Practitioner*

| EAP | Mr. Vukosi Mabunda |
|---|---|
| **Tel No:** | +27 11 789 7170 |
| **Fax No:** | +27 86 571 9047 |
| **E-mail:** | vukosi@eims.co.za |
| **Professional Registrations:** | • Registered Environmental Assessment Practitioner with Environmental Assessment Practitioner Association of South Africa – EAPASA (Reg. No: 134178)<br>• Professional Natural Scientist with the South African Council for Natural Scientific Professions – SACNASP (Reg. No: 2019/867). |

This Amendment Report was prepared by Vukosi Mabunda, a Registered Environmental Assessment Practitioner (EAP) employed by EIMS. His CV is included as **Appendix H** of this report. Mr Vukosi Mabunda is currently a Senior Environmental Assessment Practitioner and a Geographic Information Systems (GIS) Specialist with 6 years' working experience. Vukosi is a Registered Environmental Assessment Practitioner with the Environmental Assessment Practitioners Association of South Africa (EAPASA). He is one of the few dual registered professionals with SACNASP as a Professional Geospatial Scientist and Professional Environmental Scientist. Vukosi has dual professional background in Geographic and Environmental Sciences with a Master of Science Degree in Geography obtained in 2021 from the University of Johannesburg. In addition to his experience in Environmental Compliance Monitoring and applications for Water Use License Applications, Vukosi has successfully completed numerous environmental impacts assessments for both linear and footprint developments as indicated in his CV (**Appendix H**).

## 1.6 INFORMATION CONSIDERED IN REACHING RECOMMENDATIONS

Potential impacts associated with the amendment activities were identified by the EAP through literature reviews of existing specialist studies and environmental assessments, reports from appointed specialists dealing with the proposed amendment activities as well as a site visit by the EAP conducted on the 5th of April 2024. The following specialist information was considered in the conclusions and recommendations reached in this Amendment Report:

- The Biodiversity Company. 2024. Terrestrial Biodiversity Assessment – Motuoane Exploration Project, Free State Province.
- The Biodiversity Company. 2024. Wetland Baseline and Risk Assessment for The Proposed Motuoane Exploration Project, Free State Province.
- PGS Heritage. 2023. Heritage Impact Assessment for the Proposed Motuoane Exploration Project.
- Banzai Environmental. 2023. Palaeontological Impact Assessment for the Proposed Motuoane Exploration Project.

The main impact of the proposed amendment would be the loss/destruction of natural habitat, direct or indirect mortality of small flora and/or fauna species both on land and water. Terrestrial and aquatic ecologists were appointed to assess the potential impacts and provide additional mitigation measures not covered in the approved EMPr. The studies found that the natural habitat on site varies from having low biodiversity value to having relatively high biodiversity value in different parts of the study area. Protected flora and fauna and sensitive species were recorded present on the site within the different identified habitats and watercourses. The proposed development may have a controlled negative impact (minimal) on floral and faunal species recorded in the area arising from the Vibroseis process, clearing of vegetation for temporary access roads, site camp and laydown areas as well as the drilling of the additional wells. The proposed mitigation measures indicated in the approved EMPr are endorsed by the specialists with minor additions such as notification of the custodian for sensitive species 15 (Endangered Wildlife Trust (EWT)) of the presence of the species as well as a walkdown by a suitable specialist (EWT) in the area surrounding the drilling well prior to any activities, mainly to confirm that Species of Conservation Concern (SCCs) are not present or will be harmed.

## 1.7 ASSUMPTIONS, GAPS AND LIMITATIONS

The report must read with subject to the following assumptions, gaps and limitations:

- The assessment is limited to the proposed nine (9) transects within an area of 30 km and 50 m wide corridor as wells as the ten (10) 1 km radius drilling sites within the approved exploration right footprint;
- The proposed additional activities are limited to the seismic transects and additional drilling wells, no other activities are currently being proposed;
- The information presented in this report was the most relevant and accurate at the time of compilation;
- The information provided by the applicant is assumed to be accurate, adequate, unbiased, and no information that could change the outcome of the assessment has been withheld;
- The information obtained from the specialist studies is assumed to be accurate, adequate, unbiased, and no information that could change the outcome of the assessment has been withheld;
- The assumptions and limitations from the respective specialist studies are noted and upheld;
- In accordance with the Protection of Personal Information Act (Act 4 of 2013), personal information (names, emails, contact numbers, address, etc. of I&APs) were excluded during the Public Participation and only provided to the competent authority officials; and
- Personal information of I&APs made available to the competent authority shall only be used by the authorities to confirm or obtain information regarding this specific project.

# 2. PROPOSED AMENDMENTS AND PROJECT DESCRIPTION

## 2.1. PROJECT LOCALITY

The originally approved exploration area is located over an area of approximately 149 377 hectares (ha), covering various farms near Welkom, within the Free State Province, extending north from approximately Theunissen, northeast towards Kroonstad, and east of Virginia and Hennenman. It must be noted that as holder of the ER, Motuoane were required to relinquish part of their land position when renewing the ER (twice now), the revised ER footprint currently covers an area of 95 483ha, over 50 000ha less than the initially approved area. The Motuoane exploration right is situated within Matjhabeng and Masilonyana Local Municipalities which are part of the Lejweleputswa District Municipality, and Moqhaka which is part of the Fezile Dabi District Municipality (**Figure 1).** The application is an amendment of the existing and approved EA which covers the exploration right area (footprint) and therefore, landowners within the exploration right are affected (**Figure 2**). **However, the seismic survey and additional drilling wells are located within a defined area of the exploration right and not throughout the 95 483ha exploration right area. The proposed seismic survey and additional drilling sites are therefore referred to as the directly affected landowners and this study primarily focuses on these areas**. **Furthermore, it must be noted that although preliminary seismics transect and drilling locations are indicated on Figure 1, these are not entirely final exact seismic routes and/or drilling locations. There may be a need for localised realignment, or changes based on environmental, geological, and functional criteria and as such, a buffer has been defined and assessed within which these activities can be undertaken / limited to subject to compliance with the specific mitigation measures. Subsequently, a 50 m corridor from the preliminary seismic transect and 1 km buffer from the drilling locations to which these activities can be restricted to based on this assessment, has been assessed and relevant mitigation measures provided in this report and the EMPr.**

The amendment study area can be subdivided into three sections namely, the far south, the south-central section and far north section. The far south and south-central sections are approximately 20 km and 15 km south of Virginia and can be accessed from the R73. The far north section is approximately 20 km northeast of Welkom and can be accessed from the R34. The proposed seismic activities and majority of the proposed drilling wells (7 of 10) are concentrated within the south-central section with only one drilling activity proposed in the far south and two in the far north sections. Thirteen (13) farms and twenty-five (25) farms portions are directly affected by the proposed amendment. Refer to **Figure 1**, **Table 7 and Appendix C** for the site locality and property details for the proposed amendment activities sites.

Table 7: Site property details for the proposed amendment activities

| Item | Details |
|---|---|
| Farm Portion / Name / Erf | The originally approved exploration area is located over an area of approximately 95 483ha, covering various farms near Welkom, within the Free State Province. However, the seismic survey and additional drilling wells are located within a defined area of the exploration right and not throughout the 95 483ha exploration right area. Although the application is an amendment and therefore covers the existing approved footprint, the proposed amendment activities are located within the following farms:<br>• Blijdschap Farm 218: Remaining Extent;<br>• Blomskraal Farm 216: Remaining Extent<br>• Detente Farm 744: Remaining Extent, Ptn 1, Ptn 2 & Ptn 3<br>• Erfenis Farm 328: Remaining Extent<br>• Harmonia Farm 282: Remaining Extent<br>• Kriegers Kraal Farm 708: Remaining Extent & Ptn 1<br>• Le Roux Farm 717: Ptn 1<br>• Le Roux Farm 766: Remaining Extent, Ptn 1 & Ptn 2 |

| | |
|---|---|
| | • Nieuwjaarsbosch Farm 113: Remaining Extent<br>• Nooitgedacht Farm 245: Remaining Extent & Ptn 1<br>• Ongegund Farm 321: Remaining Extent & Ptn 1<br>• Palmiet Fontein Farm 229: Remaining Extent, Ptn 1, Ptn 2 & Ptn 3<br>• Siberiasfontein Farm 605: Remaining Extent & Ptn 1<br>• Eureka Farm 2101: Remaining Extent |
| Distance from closest town | The far south and south-central sections are approximately 20 km and 15 km south of Virginia while the far north section is approximately 20 km northeast of Welkom. |
| GPS coordinates | The amendment study area can be subdivided into three sections namely;<br>• Far south with central coordinates 28°16'9.84"S; 26°56'34.08"E;<br>• South-central with central coordinates 28°13'8.18"S; 26°56'26.95"E; and<br>• Far north with central coordinates 27°50'4.74"S; 26°52'50.24"E |
| Local Municipality | Matjhabeng, Masilonyana and Moqhaka Local Municipalities |
| District Municipality | Lejweleputswa and Fezile Dabi District Municipalities |

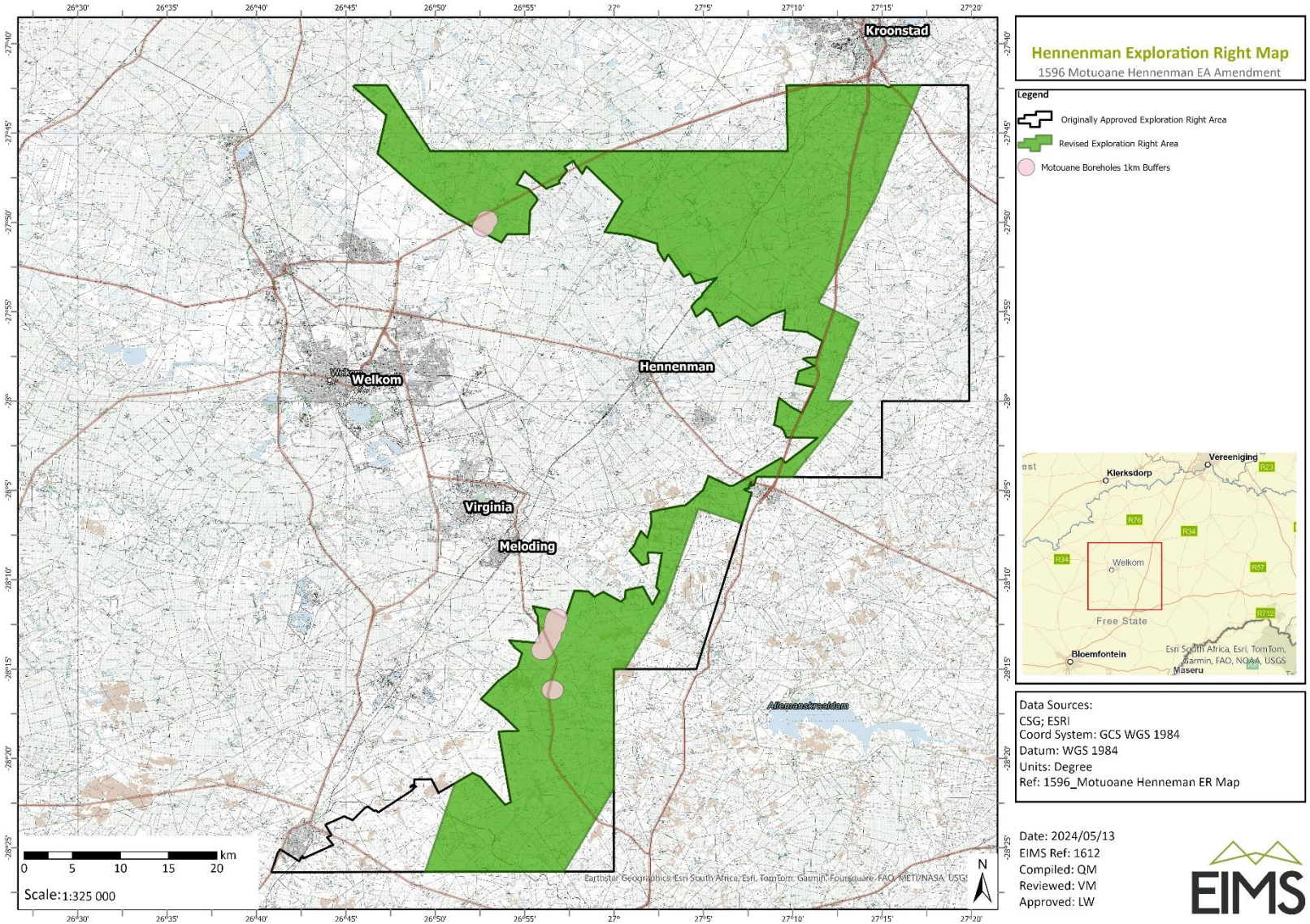



Figure 1: Approved Exploration Right map.

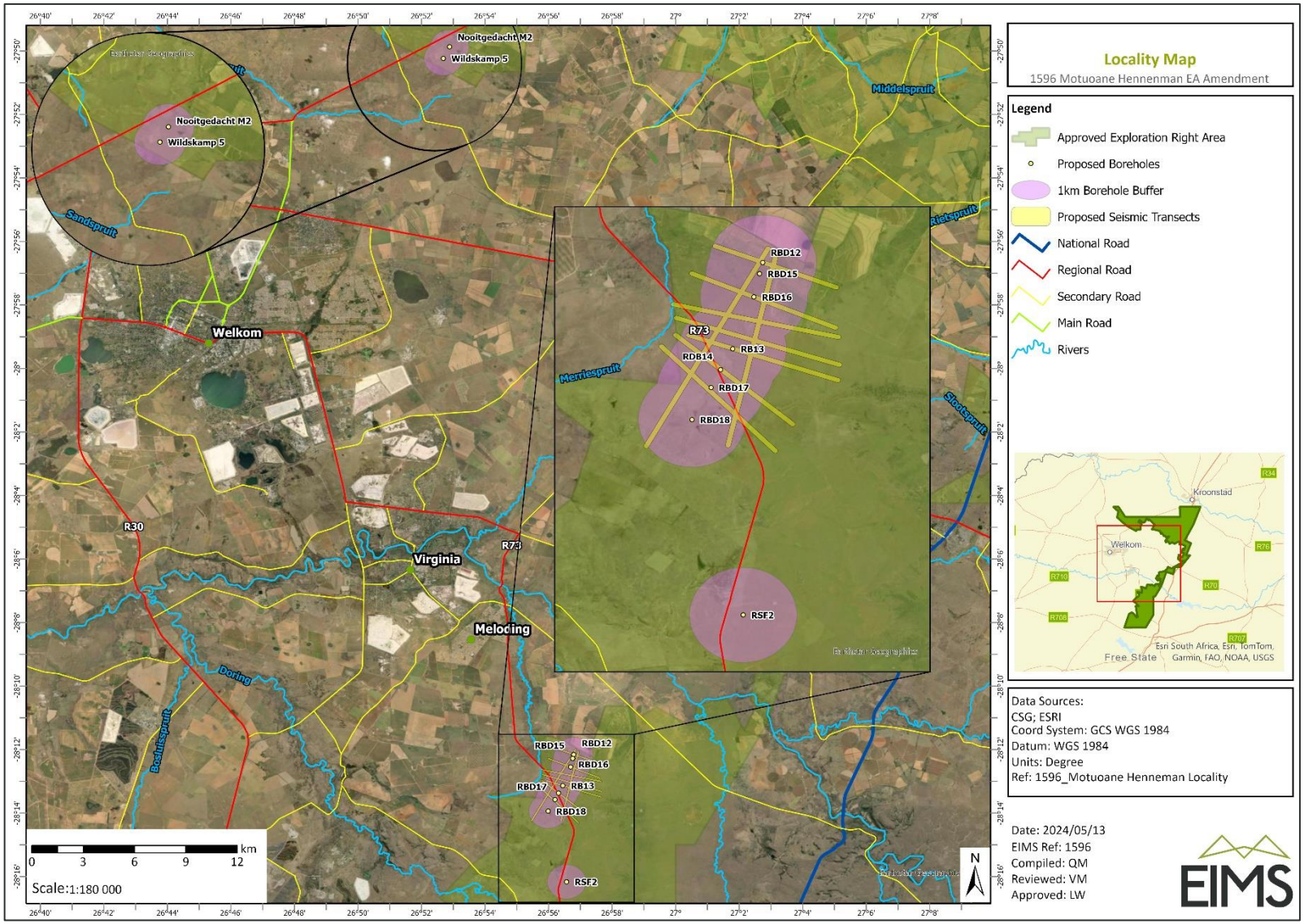



Figure 2: Amendment Activities Site Locality Map.

## 2.2. PROJECT DESCRIPTION

The project entails surveying and exploration for hydrocarbons and associated gas. Based on the information provided to EIMS, the applicant wishes to amend the approved EA to include the following:

- Undertaking of 13 exploration boreholes;
- Undertaking of 9 seismic transects of approximately 30 km long; and
- Updating the approved EMPr.

In addition to the above, information on each of the proposed amendments is provided below. It must be noted that the surveying and exploration techniques to be employed as per the Exploration Works Programme include approved and additional non-invasive and invasive exploration detailed below.

## 2.3. NON-INVASIVE EXPLORATION

### 2.3.1. BACKGROUND DATA COLLECTION AND DATA MANAGEMENT

Affected landowners will be identified and contacted in preparation for the ground exploration activities. Existing gas emitting boreholes undertaken as part of the project (3 authorised boreholes) and other boreholes will be sought if they exist, photographed, measured and analysed. Meetings will be set up with mining companies in the vicinity to see if they have had any experience with gas and gas emitting boreholes. Any gas emitting boreholes found will then be mapped and analysed.

In order to acquire information from the existing gas wells, wellhead control and measurement equipment will be designed and installed to measure pressure, flow rate and collect gas samples for analysis. In addition, existing gravity/magnetic data will be obtained and analysed, and new lines might be flown if required using a light aircraft or drone (this will comply with the necessary South African Civil Aviation Authority (SACAA) restrictions and requirements). Any available cores and cuttings from previous mining/exploration activities will also be analysed. The need to undertake additional aerial gravity/magnetic surveys can only be determined once all available existing data has been reviewed and analysed, however if required, a risk assessment is to be prepared prior to undertaking this activity and compliance with the mitigation measures put forward in the Environmental Management Programme (EMPr) will be binding on the applicant.

Geophysical data will be acquired and reprocessed where practical so as to analyse and interpret the data. Surface mapping (surface geological features and outcrops) of the various parts of the exploration area will also be undertaken during this phase. Data from surface mapping along with initial data gathered will be analysed and geological maps prepared. Reservoir studies using magnetic, geological and geophysical data will be conducted. In addition, analyses on gas samples taken will also be undertaken.

### 2.3.2. PREPARATIONS FOR SEISMIC SURVEYS

Background information from the drilling programme as well as existing wells where conditions permit, and geological maps will be used to identify the final transect routes within the approved area. A team will be assembled to effectively prepare and plan the transect routes. The team / applicant will identify and contact landowners in preparation for activities. The team's plan will detail the period of surveying, the access routes, transects path to be followed, temporary site camp and laydown area, among other aspects which will be used to inform and prepare the applicant for environmental compliance audits. Once approved by the applicant and team will mobilize to undertake the seismic surveys which should last for a couple of weeks if weather conditions permit.

### 2.3.3. GEOLOGICAL AND GEOPHYSICAL LOGGING

Geological and Geophysical logging, utilizing the samples obtained from the drilling programme as well as existing wells where conditions permit. The samples will be analysed for the presence of hydrocarbons as well

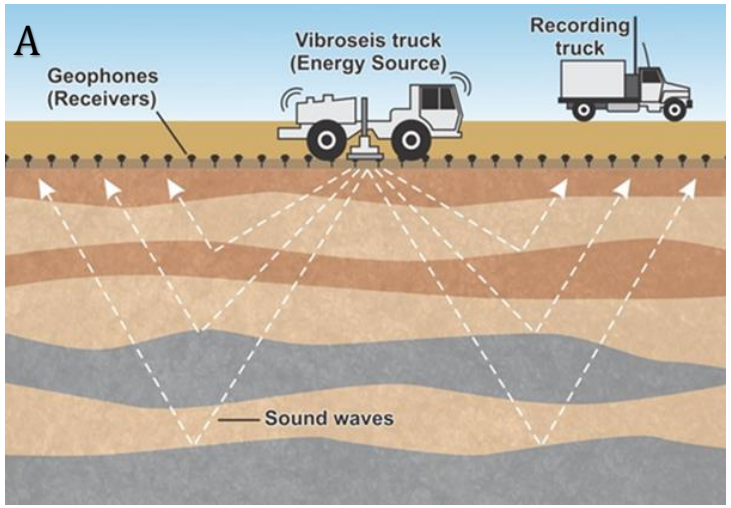
as to determine the physical properties of the rocks. This analysis will allow for the determination of the lithology and associated properties as well as the presence of hydrocarbons. Geophysical logging and surface structures data (surface geological features and outcrops) will be integrated into maps.

### 2.4.1. SEISMIC SURVEYS

Seismic surveying along the transects through a Vibroseis technique will be undertaken by a small team (approximately 15 personnel) by deploying an array of energy sources from a small-sized Seismic Vibrator and an array of sensors or receivers (geophones) on the identified area of interest (**Figure 3**). A single Seismic Vibrator consisting of a vibrating baseplate that is connected to the ground will be used. The vibrating plate emits a low frequency signal (4-80 Hz) into the ground, called a sweep. The vibrator vehicle moves slowly along the pre-determined lines (transects) using GPS for navigation. It stops, emits a signal 8-20 seconds long, moves approximately 10 meters ahead, stops, emits a signal and so on until all the transects have been traversed (**Figure 3**). Several small geophones will be used to convert the ground movements or seismic waves from the Seismic Vibrator into voltage, which will be recorded at a nearby recording station (**Figure 3**). The team will then generate and analyse the 2-D sub-surface geological network and identify areas of interest for further exploration. The outcome of the seismic survey will be used to inform preferable drilling locations.

Although the Vibroseis technique is the likely method to be undertaken for the seismic activities. There is also a potential alternative to the Vibroseis known as the Propelled Energy Generators (PEGs), more commonly referred to as the Accelerated Weight Drop Seismic (AWD) which Motuoane may consider over the Vibroseis. AWD are light weight, highly portable seismic energy sources designed for a multitude of applications within the fields of geology, geophysics, civil engineering, and more. AWD systems utilize simple and effective elastomer band technology to propel the hammer to a high velocity. The AWD is comprised of two easily manageable components for fast and efficient installation and de-installation in the field. The AWD's lightweight, streamlined design also affords its users economy in shipping. The AWD-40Kg is designed to easily mount on trucks, bakkie, trailers, and all-terrain vehicles (**Figure 3**).

AWD is a variant of seismic source of the “weight drop” type. The hammer is equipped with an inclined platform, allowing it to be installed at an angle of 45 degrees, and a special stop, adding stability in an upright position, what allows to perform survey on shear waves (**Figure 3**). The source AWD-40PS is mounted on a compact lightweight frame equipped with reliable wheel blocks. The source can be used on a rugged terrain. The total weight of the source without battery pack is less than 120 kg. The energy of a single impact reaches 1000J.



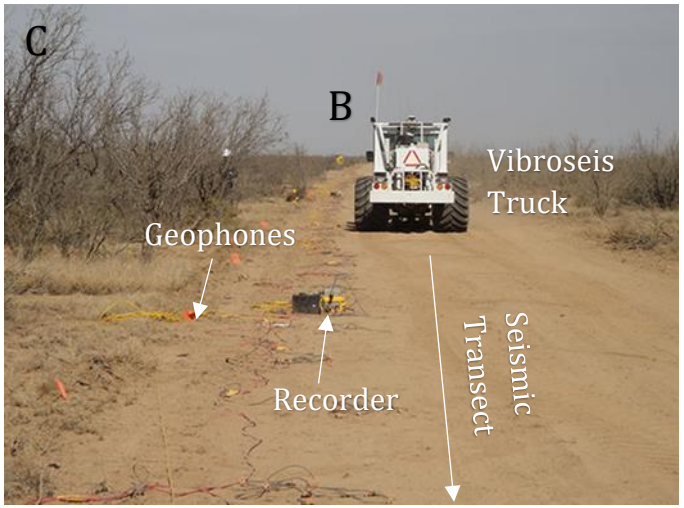







Figure 3: Seismic surveying process and potential impacts. (A) Showing an animated Vibroseis process, (B) Showing a real life Vibroseis process, (C) Showing minimal dust generated from the process, (D) Showing minimal vegetation impact associated with a new access path (transect route), and (E) Showing the weight drop alternative method.

## 2.4. INVASIVE EXPLORATION ACTIVITIES

### 2.4.2. GEOTECHNICAL INVESTIGATIONS

Once the seismic, geological and geophysical data has been analysed this information will delineate the areas susceptible for geotechnical investigations. The Motuoane Exploration Area is situated towards the east of de Bron fault. In the northern part of the ER, a major horst structure i.e. de Bron horst is present between the de Bron and Homestead faults respectively. No gold bearing sediments occur in the horst. Detailed drilling defined the eastern limit of this horst structure along the Homestead fault. East of the Homestead fault, gold bearing sediments were intersected again. Two major fault systems, i.e. the Virginia and Ventersdorp faults, occur in the eastern part of the MELA. The displacement again was towards the west. Despite this major north-south striking structures several east-west faults are also present or could be extended into the ER. The east-west structures are the oldest structures in the Witwatersrand basin. Many kimberlite fissures and Karoo age dolerite dykes intruded into the younger strata along these structures. The east-west structures were right laterally displaced by north-south striking structures resulting in a very complex tectonic environment. The Importance of these structures is vested in the presence of methane gas occurrence associated in or in proximity of the structures.

Drilled explorations wells will be evaluated based on gas flow, pressure and gas composition, prior to making a decision to either complete the well as a production well or to suspend or abandon it. Hydrocarbons has been reported from the Welkom Goldfields from conventional mineral exploration boreholes and mine workings since the early 1900's. Hydrocarbons are believed to be derived from the crustal microbial methanogens in fractures within the Witwatersrand that has migrated through the Witwatersrand/Ventersdorp and into the Karoo Dwyka and Ecca Group Vryheid Formations. The anticipated geology and stratigraphy are based on the lithographic log in 0. The underlying geology through which Motuoane Energy No 1 Bloemskraal will be drilled will consist of sedimentary rocks of the Karoo Supergroup followed by the lavas of the Ventersdorp Supergroup. The information from the seismic survey and drilling will be used for map the geology of the area.

### 2.4.3. WELL DRILLING

Using the data gathered during the preceding background review and surveying, ten (10) exploration boreholes will be sited. The proposed drilling process entails the construction of exploration well using a two-string telescopic casing design is outlined below and illustrated on **Figure 4**:

- The Spud casing will be set and cemented in to case off the unconsolidated material to approximately 6m True Vertical Depth (TVD).
- Drilling will be continued past the unconsolidated material to approximately 80mTVD, conductor casing will be cemented from shoe to surface;
- The hole is then percussion drilled ahead and into the Ventersdorp Lavas below the base of the Karoo at approximately 450 m TVD; Intermediate casing will be run and cemented to surface;
- Integrity of this section will be tested by running a Cement Bond Log (CBL) and the pressure tested prior to drilling out the casing shoe. A further Formation Integrity Test (FIT) is then performed on drilling out the casing shoe.
- The next section (open hole section) will be percussion drilled through the primary target, the Ventersdorp Supergroup, to a depth ± 650 m TVD. This section TVD maybe called earlier if significant gas flows are encountered

The project will involve the drilling of ten (10) wells within the assessed 1 km buffer drilling sites to a depth of approximately 700m, commencing with a 203mm hole cased with 152mm casing for the loose top material (conductor casing), followed by 122.6mm hole cased with 114mm casing to isolate ground water (surface/intermediate casing) and finally 96mm cased with 89mm casing for the target formation (production casing). The actual casing sizes and configurations will vary depending on the specific geological characteristics

and functional requirements. Each borehole will be steel cased and have cement barriers to prevent leaks as well as plugged at the end of exploration to prevent groundwater seepage (**Figure 5**). Drilling activities are estimated to be one to two weeks per hole during which time there will be a drill rig, a service truck and an LDV on site. Intermittent use of a TLB will be used during site establishment and demobilisation. In order to establish the gas contents a mobile desorption laboratory will be established.

The construction of each drill pad will disturb an area of up to 50 x 50 m (**Figure 5**). Within the disturbed area, the drill rig and drilling rods will be located. Impermeable, lined sumps will be used to circulate and store the drill fluid and mud consisting of drilling foams and Bentonite. Exploration trays, hazardous and general storage, waste storage, chemical toilets, and any site offices required will also be placed inside the drill pad (**Figure 5**). Each drill site will be suitably rehabilitated before drilling continues at the next drill site. Depending on the results of the sampling, each borehole will either be plugged entirely or left as is for future analysis. Regardless of which of these options is chosen, the borehole will be capped with a steel cap that is engraved with the borehole number according to industry specifications.

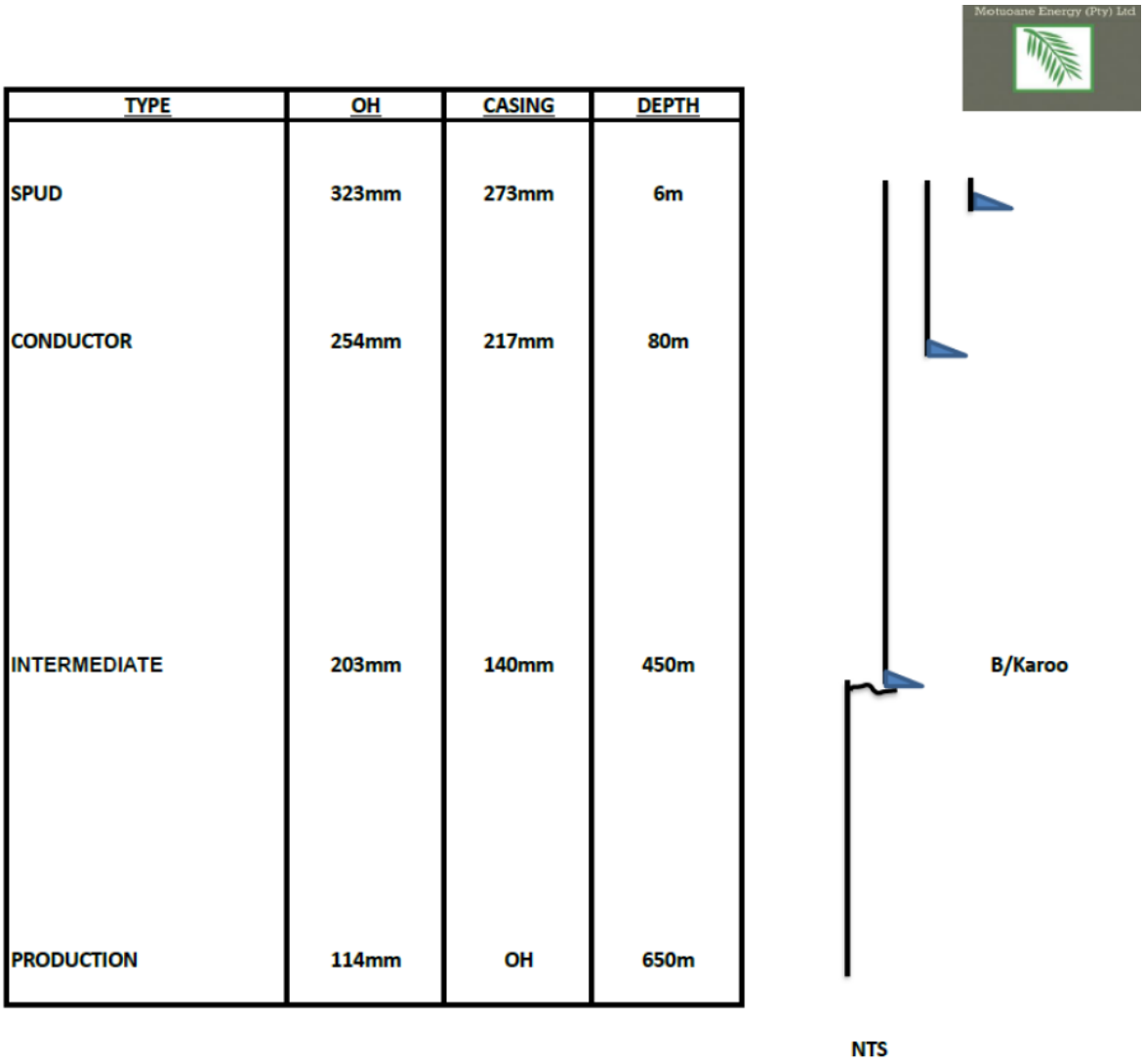



Figure 4: Vertical Well Plan (iKapa Resources, 2024)

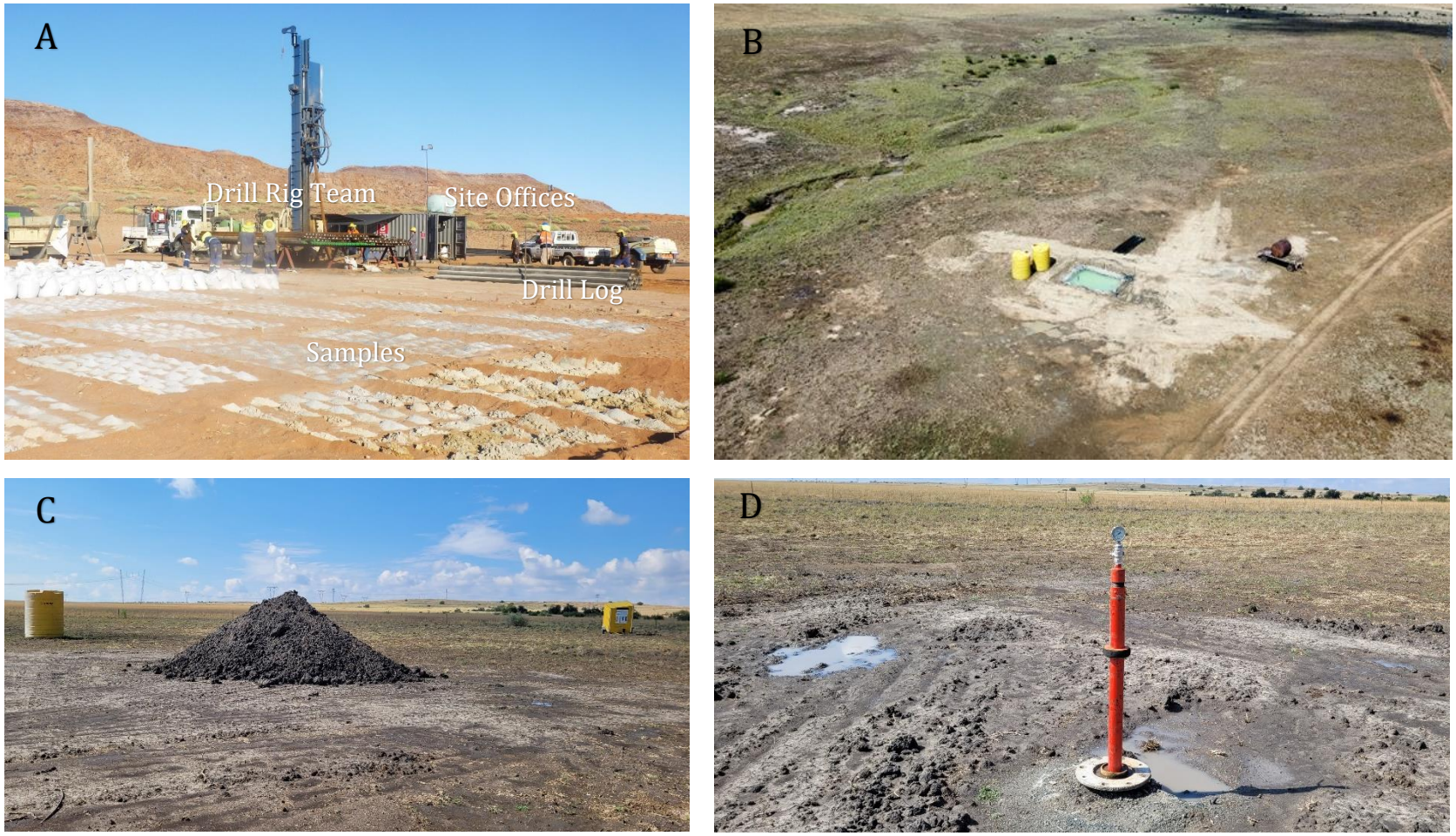



Figure 5: Exploration drilling and potential impacts. (A) Showing the drilling process and associated infrastructure, (B) Showing the drill pad footprint at one of the active Motuoane drilling sites, (C) Showing some of impacts associated with drilling activities including contained vegetation clearance and topsoil humps and (D) Showing the final borehole, steel cased and have cemented to prevent leaks.

## 2.5. SUPPORTING INFRASTRUCTURE

None of the proposed exploration activities require the establishment of any permanent infrastructure. Sites will be accessed on existing roads or farm tracks as available. Where access is not available access tracks, to accommodate a vehicle, approximately 3.5m wide will be created. These will be rehabilitated accordingly at the end of exploration. Existing accommodation in the area will be utilised for staff and not on site.

Equipment for seismic surveys and drilling will be provided by specialist contractors. The majority of equipment, consumables and even labour for these services is specialised. Contractors and suppliers will be encouraged to source locally as much as is feasible. Electricity, if required, will be provided by on-site generators which must be placed on impermeable surfaces. Water required for the operation of the drilling rig, as well as potable water will be obtained locally, by agreement with landowners or the local municipality. The daily water requirements for drilling operations will be a maximum of 5000 litres per day.

Chemical toilets will be provided for the personnel. The toilets will be supplied and managed by a specialist contractor and the sewage disposed of at the nearest wastewater management facility, or as required by the local authority. All general and hazardous waste generated at the survey and/or drilling site will be separated and stored in containers, before being removed from site and disposed at an appropriate waste disposal facility. The material recovered from the drilling will most likely be stored in a shed for analysis and record keeping. Mineral residues produced during drilling practices will be managed in terms of Government Notice Regulation 632 on the Planning and Management of Residue Stockpiles and Residue Deposits (July 2015) under the National Environmental Management Waste Act (Act 59 of 2008) (NEMWA). Water from the drilling operations will be disposed of in accordance with the provisions of the National Waster Act and the National Environmental Management Waste Act (as applicable).

## 2.6. DECOMMISSIONING AND CLOSURE

A rehabilitation plan is included in the approved EMPr, the approved EMPr will be adopted for the current project with minor changes. The EMPr shall outline the closure objectives that are aimed at re-instating the landform, land use and vegetation units to the same state as before exploration operations take place, unless a specific, reasonable alternate land use is requested by the landowner. As such, the intended end use for the disturbed exploration areas and the closure objectives will be defined in consultation with the relevant landowner. Proof of such consultation will be submitted together with the Application for Closure Certificate. The overall aim of the rehabilitation plan is to rehabilitate the environment to a condition as close as possible to that which existed prior to exploration. This shall be achieved with a number of specific objectives.

- Making the area safe. i.e.: Decommission exploration activities so as to ensure that the environment is safe for people and animals. This entails refilling excavations, sealing and grouting exploration wells where applicable, etc.
- Recreating a free draining landform. This entails earthworks infilling, reshaping, levelling, etc. to recreate as close as possible the original topography and to ensure a free draining landscape.
- Re-vegetation. This involves either reseeding or allowing natural succession depending on the area, climate etc.
- Storm water management and erosion control. Management of storm water and prevention of erosion during rehabilitation. E.g. cut off drains, berms, etc. and erosion control where required.
- Verification of rehabilitation success. Entails monitoring of rehabilitation.

Once exploration has been completed, all areas disturbed by exploration activities will be rehabilitated. This will be undertaken in accordance with the rehabilitation and closure plan as required by the Regulations Pertaining to the Financial Provision for Prospecting, Exploration, Mining or Production Operations, GNR 1147, gazetted in

November 2015. This includes the determination of the financial provision as well. A closure certification application will be applied for in accordance with section 43 of the Mineral and Petroleum Resources Development Act, 2002.

## 2.7. MOTIVATION FOR THE PROPOSED AMENDMENTS

Motuoane is the holder of an exploration right for hydrocarbons, issued in terms of the MPRDA. The approved exploration right is located over an area of approximately 149 377 hectares (ha), covering various farms near Welkom, within the Free State Province. An EA in terms of the NEMA was issued to Motuoane for the exploration activities in September 2017. The EA only made provision for three (3) drilling wells, and it did not include any seismic surveying. The Holder has undertaken two drilling activities to date, however the information recorded (observations) is inadequate to make a conclusive detailed reporting on the quantity of hydrocarbons and/or suitable drilling locations for production purposes. Therefore, the Holder proposes to undertake an additional ten (10) new exploration boreholes and to acquire ground based seismic surveys (~30 km of new seismic transects). The seismic survey will be used to better understand the subsurface discontinuities, layering, and probable rocks/structures. Analysis of the seismic surveys and additional drilling wells will provide more precise information to determine the viability of the exploration project into the production phase. All of the proposed additional activities fall within the existing approved Exploration Right area and EA extent. There will be no additional areas or petroleum resources added to the exploration right.

The proposed amendments, if approved, will allow the applicant to determine if there is an economically viable resource (natural gas including Helium) available in the area. It is important to note that the exploration right will not provide the required authorisation for production activities to be undertaken. As such, any future intention to undertake production of hydrocarbons within the exploration right area would require a further application, investigation and public consultation process.

Helium is a non-renewable natural resource that is mostly recovered from natural gas deposits. Thus, helium is typically a by-product of natural gas fields. It is important to note that helium is found in recoverable quantities in only a few locations around the world, many of which are being depleted. In the gas fields of Virginia in the Free State, the source of helium in recent studies indicated as being unique given the high helium content in the gas field. This makes this development a potential “game changer” in the helium industry in that Motouane could produce helium as its prime product, with methane potentially being a by-product. This is a different strategy to how helium is currently recovered worldwide. The uniqueness of this situation is that as pressure increases on reducing gas production worldwide, helium production will also decline. However, in the case of Motouane, this status quo is reversed, meaning that the Virginia Gas fields may well become a significant strategic helium resource in the world. The importance of the demand for helium is that an economic need and desirability would be low if a sufficient demand now, or in the future, could not be established. In this regard, all indications are that the demand for helium is strong and sustainable, thus contributing strongly to the economic need and desirability of this expansion.

The White Paper on the Energy Policy (1998) is the overarching policy document that guides future policy and planning in the energy sector. It states that the government will, inter alia, “promote the development of South Africa’s oil and gas resources…” and “ensure private sector investment and expertise in the exploitation and development of the country’s oil and gas resources”. The successful exploitation of these natural resources would contribute to the growth of the economy.

The National Development Plan (NDP) (2012) provides the context for all development in South Africa, with the overarching aim of eradicating poverty and inequality between people in South Africa. The NDP identifies the need to diversify the current energy mix and to reduce carbon emissions. Gas will play a more significant role in the energy mix and the exploration of gas as an alternative to coal for energy production has been recognised as a planning priority. The position of the NDP is reiterated in the Draft Integrated Energy Plan (IEP) (2013), which seeks to determine how current and future energy needs can be addressed efficiently. Main objectives

outlined in the plan include security of supply, increased access to energy, diversity in supply sources and primary sources of energy and minimising emissions. The plan indicates that projected demand for natural gas between 2010 and 2050 would be second only to petroleum products, primarily due to increased growth in the industrial sector. It also identifies significant potential for natural gas in terms of power generation and direct thermal uses.

An increase in domestic natural gas reserves would also contribute to security of supply in the gas to liquids industry, which currently relies on feedstock from coal, oil and gas reserves. The Draft IEP points out the vulnerability of the liquid fuels industry and its economy to fluctuations in the global oil market, given that South Africa is a net importer of oil. Furthermore, existing gas stocks in the domestic offshore are declining, and new sources of feedstock are required to support and increase production in the gas to liquids industry (NDP, 2012).

As such, exploration for additional domestic hydrocarbon reserves is considered important and any discoveries would be well received by the local market. The Department of Energy's Integrated Resource Plan (2010-2030) supports this view, stating that regional and domestic gas options should be pursued. The government's official position is that exploration and development of oil and gas fields should be encouraged.

The identification of potential geological structures or "prospects" within the proposed exploration licence area for future exploration and possible well-drilling provides an opportunity to develop a South African oil and gas industry resulting in long-term benefits consisting of access to new energy sources, improved security of supply, major in-country investments in a development project and reduced dependence on the importation of hydrocarbons. There is also potential in the long-term for local economic stimulation through direct employment, future business opportunities, royalties and tax revenues.

In summary, exploration success would result in long-term benefits for South Africa consisting of access to new energy sources, improved security of supply, major in-country investments in a development project and reduced dependence on the importation of hydrocarbons.

# 3. POLICY AND LEGISLATIVE REQUIREMENTS

This section provides an overview of the governing legislation identified which may relate to the proposed amendment process. Please note that only pertinent legislation related to the amendment is described below but is by no means an exhaustive list of the legal obligations of the applicant in respect of environmental management for the proposed activities. There are numerous other pieces of legislation governed by many acts, regulations, standards, guidelines and treaties on an international, national, provincial and local level, which should be considered in order to assess the potential applicability of these for the proposed activities.

## 3.1. CONSTITUTION OF THE REPUBLIC OF SOUTH AFRICA

The constitution of any country is the supreme law of that country. The Bill of Rights in chapter 2 section 24 of the Constitution of South Africa Act (Act No. 108 of 1996) makes provisions for environmental issues and declares that: *"Everyone has the right -*

*a) to an environment that is not harmful to their health or well-being; and*

*b) to have the environment protected, for the benefit of present and future generations, through reasonable legislative and other measures that:*

*i. prevent pollution and ecological degradation;*

*ii. promote conservation; and*

*iii. secure ecologically sustainable development and use of natural resources while promoting justifiable economic and social development".*

The State must therefore respect, protect, promote and fulfil the social, economic and environmental rights of everyone and strive to meet the basic needs of previously disadvantaged communities. The Constitution therefore recognises that the environment is a functional area of concurrent national and provincial legislative competence, and all spheres of government and all organs of state must cooperate with, consult and support one another if the State is to fulfil its constitutional mandate. The application for the additional activities for the Motuoane Exploration project will ensure that the environmental right enshrined in the Constitution contributes to the protection of the biophysical and social environment.

## 3.2. THE MINERAL AND PETROLEUM RESOURCES DEVELOPMENT ACT, 2002

The Mineral and Petroleum Resources Development Act, 2002 (MPRDA) aims to "make provision for equitable access to and sustainable development of the nation's mineral and petroleum resources". The MPRDA outlines the procedural requirements that need to be met to acquire mineral and hydrocarbon rights in South Africa.

In terms of the MPRDA an Exploration Right was required and issued prior to the commencement of any exploration activities. The MPRDA also requires adherence with related legislation, chief amongst them is the National Environmental Management Act (Act No. 107 of 1998, NEMA) and the National Water Act (Act No. 36 of 1998, NWA). In accordance with NEMA, an application for Environmental Authorisation (EA) through a Scoping and EIA was submitted to PASA in 2017 in support of the application for the exploration right. The EA was issued in July 2017 (ref: 12/3/315).

Several amendments have been made to the MPRDA. These include, but are not limited to, the amendment of Section 102, concerning amendment of rights, permits, programmes and plans, to requiring the written permission of the Minister for any amendment or alteration; and the section 5A(c) requirement that landowners or land occupiers receive twenty-one (21) days' written notice prior to any activities taking place on their properties. One of the most recent amendments requires all mining related activities to follow the full NEMA process as per the 2014 EIA Regulations, which came into effect on 8 December 2014.

An Exploration Right is exclusive, transferable, valid for 3 years, and renewable for a maximum of 3 periods of 2 years each. Exploration is very similar to prospecting, in that an Exploration Right only allows the holder of the right to conduct such activities as per the Exploration Works Programme to establish the presence of

economically viable hydrocarbon resources. An exploration right does not grant the holder the right to conduct any production related activities. As the ER period in question was approaching its expiration period, Motuoane applied for the 2nd renewal of the right in March 2024 inclusive of a work program and budget as required and will be processed under Section 81 of MPRDA. Therefore, Section 102 of MPRDA cannot be applicable in this case as the work programme is being amended through Section 81 of the Act. Subsequently, the proposed additional activities, do not trigger any new listed and an EA Part II Amendment Process is required in terms of NEMA EIA Regulations, 2014 as amended.

## 3.3. THE NATIONAL ENVIRONMENTAL MANAGEMENT ACT, 1998

The main aim of the National Environmental Management Act, 1998 (Act 107 of 1998 – NEMA) is to provide for co-operative governance by establishing decision-making principles on matters affecting the environment. In South Africa, EIAs became a legal requirement in 1997 with the promulgation of regulations under the Environment Conservation Act (ECA). Subsequently, NEMA was passed in 1998. Section 24(2) of NEMA empowers the Minister and any MEC, with the concurrence of the Minister, to identify activities which must be considered, investigated, assessed and reported on to the competent authority responsible for granting the relevant EA. On 21 April 2006, the Minister of Environmental Affairs and Tourism (now Department of Forestry, Fisheries and the Environment – DFFE) promulgated regulations in terms of Chapter 5 of the NEMA. These regulations, in terms of the NEMA, were amended several times between 2010 and 2022. The NEMA EIA Regulations, 2014, as amended, are the current regulations.

The objective of the EIA Regulations is to establish the procedures that must be followed in the consideration, investigation, assessment and reporting of the listed activities that are triggered by the proposed project. The purpose of these procedures is to provide the competent authority with adequate information to make informed decisions which ensure that activities which may impact negatively on the environment to an unacceptable degree are not authorised, and that activities which are authorised are undertaken in such a manner that the environmental impacts are managed to acceptable levels. In accordance with the provisions of Sections 24(5) and Section 44 of the NEMA the Minister has published Regulations (GN R. 982) pertaining to the required process for conducting EIAs in order to apply for, and be considered for, the issuing of an EA. These EIA Regulations provide a detailed description of the EIA process to be followed when applying for EA for any listed activity. Based on review on the NEMA EIA Regulations, 2014 as amended, the applicant is required to appoint an EAP to undertake a Part II Amendment Application process for the proposed project, which includes conducting the public participation process.

NEMA is the main Environmental Legislation in South Africa and other Specific Environmental Management Acts (SEMA's) support its objectives. Examples of SEMA's include the following:

- National Environmental Management: Waste Act, 2008 (Act No. 59 of 2008);
- National Water Act, 1998 (Act No. 36 of 1998);
- National Heritage Resources Act, 1999 (Act No. 25 of 1999);
- National Environmental Management: Biodiversity Act, 2004 (Act No. 10 of 2004); and
- National Environmental Management: Air Quality Act, 2004 (Act No. 39 of 2004).

Some specific Environmental Management Legislation is discussed in **Sections 3.5 to 3.19.** The key principles of NEMA as outlined in Chapter 3 can be summarised as follows:

- sustainability must be pursued in all developments to ensure that biophysical and socio-economic aspects are protected; or
- there must be equal access to environmental resources, services and benefits for all citizens including the disadvantaged and the vulnerable. Adverse environmental impacts shall be distributed fairly among all citizens;

- environmental governance must include the participation of all interested and affected parties who must be catered for to allow their effective participation; and
- Environmental management must place people and their needs at the forefront of its concern, and serve their physical, psychological, developmental, cultural and social interests equitably.

The polluter pays principle (Section 28 of NEMA) must be applied in all cases where any person has caused pollution or undertaken any action that led to the degradation of the environment.

## 3.4. NEMA ENVIRONMENTAL IMPACT ASSESSMENT REGULATIONS, 2014 AS AMENDED

In terms of section 24(2) of NEMA, the Minister and or any MEC in concurrence with the Minister may identify activities that require authorisation as these activities may negatively affect the environment. The Act requires that in such cases the impacts must be considered, investigated and assessed before their implementation, and reported to the organ of state charged by law with authorising, permitting, or otherwise allowing the implementation of an activity. The NEMA EIA Regulations guide the processes required for the assessment of impacts of Listed Activities.

The requirement for the undertaking of Environmental Impact Assessments and Basic Assessments began in 1997 with the promulgation of the EIA Regulations under the Environment Conservation Act, 1989 (ECA) (Act No. 73 of 1989). These were followed by the 2006, 2010 and 2014 regulations. **Table 8** is a summary of the progression of the EIA regulations to date.

Table 8: Summary of the South African EIA regulations from inception to date.

| EIA Regulations | Government Gazette |
|---|---|
| EIA Regulations promulgated in terms of the ECA, Act No 73 of 1989 | GNR 1182 & 1183: Government Gazette No 18261, 5 September 1997 |
| Amendment of the ECA EIA Regulations | GNR 670 and GNR 672 of 10 May 2002, Government Gazette No 23401 |
| 2006 EIA Regulations promulgated in terms of the NEMA, Act No 107 of 1998 | GNR 385, 386 and 387 Government Gazette No 28753, Pretoria, 21 April 2006 |
| 2010 EIA Regulations promulgated in terms of the NEMA, Act No 107 of 1998 | GNR 543, 544, 545 and 546 Government Gazette No 33306, Pretoria, 18 June 2010 |
| 2014 EIA Regulations promulgated in terms of the NEMA, Act No 107 of 1998 | GNR 982, 983, 984 and 985 Government Gazette No 38282, Pretoria, 04 December 2014 |
| Current<br>Amendment of the 2014 EIA Regulations promulgated in terms of the NEMA, Act No 107 of 1998 | GNR 982, 983, 984 and 985 Government Gazette No 44701, Pretoria, 2021 as amended |

Chapter 5 of the EIA Regulations (GN 982 of 4 December 2014) provides the process that must be followed in respect to amendment of authorisation authorisations. The Regulations provide for two types of amendments that may be undertaken. The type of amendment is dependent on the type of changes. The two types of amendments are as follows:

- Part 1 Amendments where there is no change of scope, or a change of ownership occurs; and
- Part 2: Amendments where a change in scope occurs.

As indicated in **Section 1.3**, a Part 2 Amendment is required for the proposed additional activities for the Motuoane exploration project as Regulation 31 (Part 2) of the 2014 NEMA EIA Regulations states that:

*"An environmental authorisation may be amended by following the process prescribed in this Part if the amendment will result in a change to the scope of a valid environmental authorisation where such change will result in an increased level or nature of impact where such level or nature of impact was not (a) assessed and*

*included in the initial application for environmental authorisation; or (b) taken into consideration in the initial environmental authorisation; and the change does not, on its own, constitute a listed or specified activity."*

As per sub-regulation (a) and (b) the proposed seismic activities and the cumulative impact of the additional ten drilling wells were not considered as part of the in the initial EIA process undertaken nor taken into consideration in the EA, therefore these (potential) impacts need to be assessed according to the change in level or nature of impact. Due to the fact that the amendments result in a change of scope, a Part 2 Amendment Process in terms of Regulation 31 of NEMA EIA Regulations of 2014 (as amended) is applicable and required to be followed.

## 3.5. THE NATIONAL WATER ACT, 1998

National Water Act, 1998 (Act 36 of 1998 – NWA) makes provision for two types of applications for water use licences, namely individual applications and compulsory applications. The NWA also provides that the responsible authority may require an assessment by the applicant of the likely effect of the proposed licence on the resource quality, and that such assessment be subject to the NEMA EIA Regulations. A person may use water if the use is –

- Permissible as a continuation of an existing lawful water use (ELWU);
- Permissible in terms of a general authorisation (GA);
- Permissible under Schedule 1; or
- Authorised by a licence.

The water use processes are described in **Figure 6.**

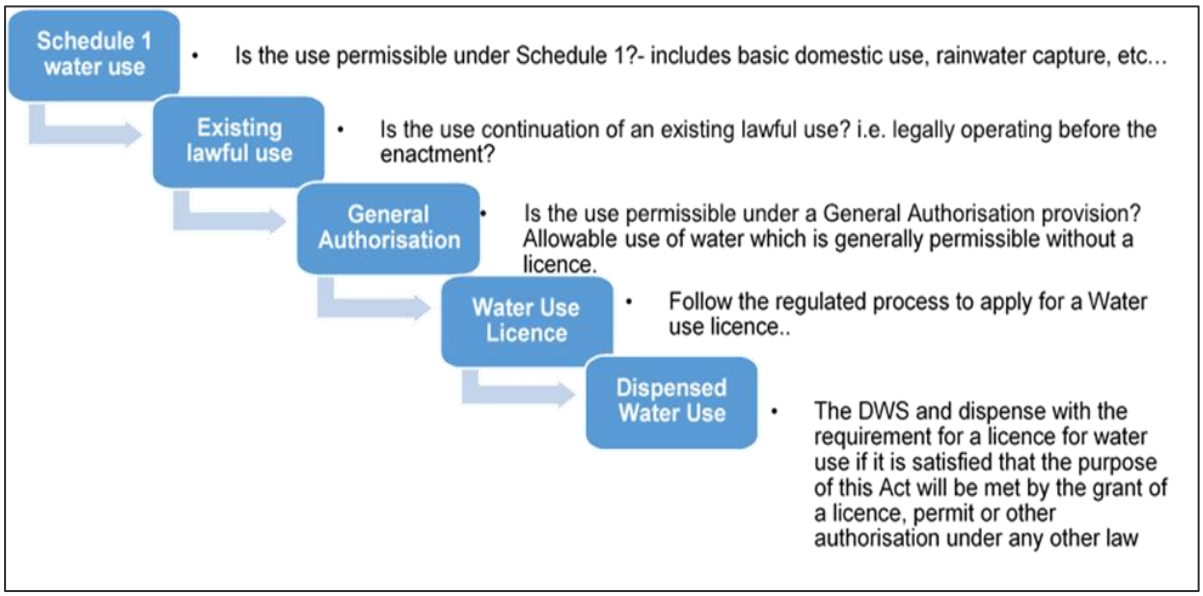



Figure 6: Authorisation processes for new water uses.

The purpose of the NWA is to ensure that the nation's water resources are protected, used, developed, conserved and managed in ways that take into account:

- Meeting basic human needs of present and future generations;
- Promoting equitable access to water;
- Redressing the results of past racial discrimination;
- Promoting the efficient, sustainable and beneficial use of water in the public interest; facilitation social and economic development;
- Providing for the growing demand for water use;

- Protecting aquatic and associated ecosystems and their biological diversity;
- Reducing and preventing pollution and degradation of water resources;
- Meeting international obligations;
- Promoting dam safety; and
- Managing floods and drought.

The NWA defines 11 water uses in Section 21 of the Act. A water use may only be undertaken if authorised by the Department of Water and Sanitation (DWS). The water uses for which an authorisation or licence can be issued include:

a) Taking water from a water resource;

b) Storing water;

c) Impeding or diverting the flow of water in a watercourse;

d) Engaging in a stream flow reduction activity contemplated in section 36;

e) Engaging in a controlled activity identified as such in section 37(1) or declared under section 38(1);

f) Discharging waste or water containing waste into a water resource through a pipe, canal, sewer, sea outfall or other conduits;

g) Disposing of waste in a manner which may detrimentally impact on a water resource;

h) Disposing in any manner of water which contains waste from, or which has been heated in, any industrial or power generation process;

i) Altering the bed, banks, course or characteristics of a watercourse;

j) Removing, discharging or disposing of water found underground if it is necessary for the efficient continuation of an activity or for the safety of people; and

k) Using water for recreational purposes.

The regulated area of a watercourse for section 21 activities of the Act water uses is similarly defined in terms of the Act as follows:

a) The outer edge of the 1 in 100-year flood line and/or delineated riparian habitat, whichever is the greatest distance, measured from the middle of the watercourse of a river, spring, natural channel, lake or dam;

b) In the absence of a determined 1 in 100-year flood line or riparian area the area within 100m from the edge of a watercourse where the edge of the watercourse is the first identifiable annual bank fill flood bench (subject to compliance to section 144 of the Act); or

c) A 500 m radius from the delineated boundary (extent) of any wetland or pan.

As part of the NWA, and with specific reference the GNR704 of 1999 has been published. These regulations impose specific restrictions on activities in terms of its locality. One of these restrictions are in terms of Regulation 4(c) saying that no person in control of a mine or activity, may place or dispose of any residue or substance which causes or is likely to cause pollution of water resources, prospecting diggings, pit or any other excavation. If the waste classification results reflect pollution potential, an applicant will therefore have to apply for exemption from GNR704 in order to undertaken concurrent rehabilitation. If no pollution potential is revealed by the classification results, no exemption is required. GNR704 also prescribes the design and construction of pollution control dams. There is currently a General Authorisation for the two existing drilling wells that have been undertaken as part of the three approved drilling wells. Based on specialist assessments, there may be a need for a General authorisation for the drilling wells within the south-central section which will be based on final drilling location. Therefore, **the applicant must ensure that the final seismic survey transect**

**and/or drilling locations either do not trigger the NWA or an authorisation is obtained prior to undertaking the activities**.

## 3.6. THE NATIONAL ENVIRONMENTAL MANAGEMENT LAWS AMENDMENT ACT, 2022

The National Environmental Laws Amendment Act, known as 'the NEMLA Bill' or 'NEMLAA4' (Act No. 2 of 2022), finally became an Act on 24 June 2022 and will introduce a major shift in South Africa's environmental legislation on a date to be fixed and proclaimed by the President. Act No. 2 of 2022 – undoubtedly the most significant piece of environmental legislation that has been published since the implementation of the One Environmental System (OES) in 2014 – has finally been signed into law (the Act). Many of the changes under NEMLA are intended to clean up a range of issues associated with the roll-out of the OES – which overhauled the manner in which environmental issues are regulated on mine sites, among other things. Overall, the changes imposed by the Act aim to deter non-compliance with environmental laws by, among other things, introducing new offences, increasing the quantum of fines and administrative penalties where laws or licenses have been contravened, and extending enforcement powers to enable more widespread enforcement of environmental laws. The applicant must ensure that the activities take into consideration the changes stipulated under NEMLA. A review of NEMLA and its impact on the development may be applicable should the developer fail to comply with the legislation discussed in this report, the EA and/or any other authorizations / licenses applicable to the development. The applicant (Motuoane) may face harsh penalty fines should they fail to comply with NEMA EIA Regulations, 2014 as amended and/or specific conditions which will be stipulated in the Environmental Authorization by the competent authority.

## 3.7. THE NATIONAL ENVIRONMENTAL MANAGEMENT WASTE ACT, 2008

On 2 June 2014, the National Environmental Management: Waste Amendment Act came into force. The Waste Act places a general duty on a holder of waste to avoid the generation of waste and where such generation cannot be avoided, to minimise the toxicity and amounts of waste that are generated; reduce, re-use, recycle and recover waste; where waste must be disposed of, ensure that the waste is treated and disposed of in an environmentally sound manner; manage the waste in such a manner that it does not endanger the health or the environment or cause a nuisance through noise, odour or visual impacts; prevent any employee or any person under his or her supervision from contravening the Act; and prevent the waste from being used for an unauthorised purpose. Waste is accordingly no longer governed by the MPRDA but is subject to all the provisions of the National Environmental Management: Waste Act, 2008 (NEMWA).

Section 16 of the NEMWA must also be considered which states as follows:

1. A holder of waste must, within the holder's power, take all reasonable measures to-

    a) "*Avoid the generation of waste and where such generation cannot be avoided, to minimise the toxicity and amounts of waste that are generated;*

    b) *Reduce, re-use, recycle and recover waste;*

    c) *Where waste must be disposed of, ensure that the waste is treated and disposed of in an environmentally sound manner;*

    d) *Manage the waste in such a manner that it does not endanger health or the environment or cause a nuisance through noise, odour, or visual impacts;*

    e) *Prevent any employee or any person under his or her supervision from contravening the Act; and*

    f) *Prevent the waste from being used for unauthorised purposes."*

These general principles of responsible waste management will be incorporated into the requirements in the EMPr to be implemented for this project. Waste can be defined as either hazardous or general in accordance

with Schedule 3 of the NEMWA (2014) as amended. "Schedule 3: Defined Wastes" has been broken down into two categories – Category A being hazardous waste; and Category B being general waste.

In order to attempt to understand the implications of these waste groups, it is important to ensure that the definitions of all the relevant terminologies are defined:

- Hazardous waste: means "*any waste that contains organic or inorganic elements or compounds that may, owning to the inherent physical, chemical or toxicological characteristic of that waste, have a detrimental impact on health and the environment and includes hazardous substances, materials or objects within business waste, residue deposits and residue stockpiles*."
- Residue deposits: means "*any residue stockpile remaining at the termination, cancellation or expiry of a prospecting right, mining right, mining permit, exploration right or production right*."
- Residue stockpile: means "*any debris, discard, tailings, slimes, screening, slurry, waste rock, foundry sand, mineral processing plant waste, ash or any other product derived from or incidental to a mining operation and which is stockpiled, stored or accumulated within the mining area for potential re-use, or which is disposed of, by the holder of a mining right, mining permit or, production right or an old order right, including historic mines and dumps created before the implementation of this Act*."
- General waste: means "*waste that does not pose an immediate hazard or threat to health or to the environment and includes – domestic waste; building and demolition waste; business waste; inert waste; or any waste classified as non-hazardous waste in terms of the regulations made under Section 69*."

Furthermore, the NEMWA provides for specific waste management measures to be implemented, as well as providing for the licensing and control of waste management activities. The Cluster 2 Gas Production Project triggers waste management activities in terms of Category A as well as Category B of GN 921, the latter of which states that "*a person who wishes to commence, undertake or conduct an activity listed under this Category, must conduct an environmental impact assessment process, as stipulated in the environmental impact assessment regulations made under section 24(5) of the National Environmental Management Act, 1998 (Act No. 107 of 1998) as part of a waste management licence application*."

The listed waste activities that are triggered by the project, and which form the basis of this integrated waste management licence application, are presented in **Section 2.2**.

The Waste Classification and Management Regulations (GNR 634) pertain to waste classification and management, including the management and control of residue stockpiles and residue deposits from a prospecting, mining, exploration or production operation which is relevant to the proposed project. The purpose of these Regulations is to –

- Regulate the classification and management of waste in a manner which supports and implements the provisions of the Act;
- Establish a mechanism and procedure for the listing of waste management activities that do not require a Waste Management Licence;
- Prescribe requirements for the disposal of waste to landfill;
- Prescribe requirements and timeframes for the management of certain wastes; and
- Prescribe general duties of waste generators, transporters and managers.

Waste classification, as presented in Chapter 4 of these regulations, entails the following:

- Wastes listed in Annexure 1 of these Regulations do not require classification in terms of SANS 10234;
- Subject to sub regulation (1), all waste generators must ensure that the waste they generate is classified in accordance with SANS 10234 within one hundred and eighty (180) days of generation;

- Waste must be kept separate for the purposes of classification in terms of sub regulation (2), and must not be mixed prior to classification;
- Waste-must be re-classified in terms of sub regulation (2) every five (5) years, or within 30 days of modification to the process or activity that generated the waste, changes in raw materials or other inputs, or any other variation of relevant factors;
- Waste that has been subjected to any form of treatment must be re-classified in terms of sub regulation (2), including any waste from the treatment process; and
- If the Minister reasonably believes that a waste has not been classified correctly in terms of sub regulation (2), he or she may require the waste generator to have the classification peer reviewed to confirm the classification.

Furthermore, Chapter 8 of the Regulations stipulates that unless otherwise directed by the Minister to ensure a better environmental outcome, or in response to an emergency so as to protect human health, property or the environment –

- Waste generators must ensure that their waste is assessed in accordance with the Norms and Standards for Assessment of Waste for Landfill Disposal set in terms of section 7(1) of the Act prior to the disposal of the waste to landfill;
- Waste generators must ensure that the disposal of their waste to landfill is done in accordance with the Norms and Standards for Disposal of Waste to Landfill set in terms of section 7(1) of the Act; and
- Waste managers disposing of waste to landfill must only do so in accordance with the Norms and Standards for Disposal of Waste to Landfill set in terms of section 7 (1) of the Act.

The waste generated during the drilling of two wells was noted to include hazardous waste as is to be disposed by a certified hazardous waste service provider at a registered hazardous landfill site. The anticipated waste to be generated from the proposed additional activities will be the same as the current hazardous waste and therefore, to be managed accordingly and disposed at a registered hazardous landfill such as the Holfontein Waste Disposal Facility. Although it is not anticipated that hazardous waste will be stored for prolonged periods on site (i.e. over 3 months), should for unforeseen reasons the hazardous waste be stored on site exceeding 3 months, the storage and disposal of the drill waste must be handled accordingly and therefore the relevant waste listed activities for storage must be applied for.

## 3.8. THE NATIONAL HERITAGE RESOURCES ACT, 1999

The National Heritage Resources Act (Act 25 of 1999 – NHRA) stipulates that cultural heritage resources may not be disturbed without authorisation from the relevant heritage authority. Section 34(1) of the NHRA states that, "*no person may alter or demolish any structure or part of a structure which is older than 60 years without a permit issued by the relevant provincial heritage resources authority…*" The NHRA is utilised as the basis for the identification, evaluation and management of heritage resources and in the case of Cultural Resource Management (CRM) those resources specifically impacted on by development as stipulated in Section 38 of NHRA, and those developments administered through the NEMA, the Mineral and Petroleum Resources Development Act 28 of 2002 (MPRDA) and the Development Facilitation Act (FDA) legislation. In the latter cases the feedback from the relevant heritage resources authority is required by the State and Provincial Departments managing these Acts before any authorisations are granted for a development. The last few years have seen a significant change towards the inclusion of heritage assessments as a major component of Environmental Impact Processes required by the NEMA and MPRDA.

The MPRDA defines 'environment' as it is in the NEMA and, therefore, acknowledges cultural resources as part of the environment. Section 39(3)(b) of this Act specifically refers to the evaluation, assessment and identification of impacts on all heritage resources as identified in Section 3(2) of the NHRA that are to be impacted on by activities governed by the MPRDA. Section 40 of the same Act requires the consultation with any State Department administering any law that has relevance on such an application through Section 39 of

the MPRDA. This implies the evaluation of Heritage Assessment Reports in Environmental Management Plans or Programmes by the relevant heritage authorities.

A Heritage Impact Assessment for the proposed activities was undertaken by PGS Heritage (2024). A total of five heritage features and resources were identified within the study area. These consist of two burial grounds, one foundation remains of a stone-built structure, one midden and one grinding stone. A summary of the findings, impacts and mitigation measures is provided in **Section 8.1** an in detail in the specialist report (**Appendix C1**: Approved Public Participation Plan

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Appendix D). The South African Heritage Resources Agency (SAHRA), the Free State Heritage Resources Authority (FSHRA) and Association of Southern African Professional Archaeologists (ASAPA) will be provided with a copy of the Amendment Report for review and comment.

## 3.9. THE NATIONAL ENVIRONMENTAL MANAGEMENT AIR QUALITY ACT, 2004

The National Environmental Management: Air Quality Act (Act No. 39 of 2004 as amended – NEMAQA) is the main legislative tool for the management of air pollution and related activities. The Object of the Act is:

To protect the environment by providing reasonable measures for –

i. the protection and enhancement of the quality of air in the republic;

ii. the prevention of air pollution and ecological degradation; and

iii. securing ecologically sustainable development while promoting justifiable economic and social development; and

Generally, to give effect to Section 24(b) of the constitution in order to enhance the quality of ambient air for the sake of securing an environment that is not harmful to the health and well-being of people. The NEMAQA mandates the Minister of Environment to publish a list of activities which result in atmospheric emissions and consequently cause significant detrimental effects on the environment, human health and social welfare. All scheduled processes as previously stipulated under the Air Pollution Prevention Act (APPA) are included as listed activities with additional activities being added to the list. The updated Listed Activities and Minimum National Emission Standards were published on the 22nd of November 2013 (Government Gazette No. 37054).

According to the NEMAQA, air quality management control and enforcement is in the hands of local government with District and Metropolitan Municipalities as the licensing authorities. Provincial government is primarily responsible for ambient monitoring and ensuring municipalities fulfil their legal obligations, with national government primarily as policy maker and co-ordinator. Each sphere of government must appoint an Air Quality Officer responsible for co-ordinating matters pertaining to air quality management. Given that air quality

management under the old Act was the sole responsibility of national government, local authorities have in the past only been responsible for smoke and vehicle tailpipe emission control.

Listed Activities and Associated Minimum Emission Standards Identified in terms of Section 21 of the NEMAQA Published under GN 893 in GG 37054 of 22 November 2013 were assessed to determine if the proposed development triggers any of the identified activities. Based on the assessment, the proposed amendment activities do not trigger listed activities under NEMAQA. Subsequently, there is no requirement to apply for an Atmospheric Emission Licences (AEL) for the proposed activities.

The National Pollution Prevention Plans Regulations were published in March 2014 (Government Gazette 37421) and tie in with the National Greenhouse Gas (GHG) Emission Reporting Regulations which took effect on 3 April 2017. In summary, the Regulations aim to prescribe the requirements that pollution prevention plans of greenhouse gases declared as priority air pollutants, need to comply with in terms of the NEMAQA. The Regulations specify who needs to comply, and by when, as well as prescribing the content requirements. Based on the proposed activities (exploration), the applicant does not trigger listed activities and therefore does not need to report GHG Emissions. However, should the activities proceed to production phase, the applicant will be obligated to report on the GHG emissions under these Regulations due to 1b2 listed activities. There will be a requirement to account for the amount of pollutants discharged into the atmosphere (total emissions for one or more specific GHG pollutants) by 31 March each year.

## 3.10. THE NATIONAL ENVIRONMENTAL MANAGEMENT BIODIVERSITY ACT, 2004

The objective of the National Environmental Management: Biodiversity Act, 2004 (Act No. 10 of 2004) (NEM:BA) is to provide for the management and conservation of South Africa's biodiversity within the framework of NEMA; the protection of species and ecosystems that warrant national protection; the sustainable use of indigenous biological resources; the fair and equitable sharing of benefits arising from bio-prospecting involving indigenous biological resources; the establishment and functions of a South African National Biodiversity Institute; and for matters connected therewith. The objectives of NEM: BA are within the framework of the National Environmental Management Act, to provide for:

- the management and conservation of biological diversity within the Republic and of the components of such biological diversity;
- the use of indigenous biological resources in a sustainable manner; and
- the fair and equitable sharing among stakeholders of benefits arising from bioprospecting involving indigenous biological resources;
- to give effect to ratified international agreements relating to biodiversity which are binding on the Republic;
- to provide for co-operative governance in biodiversity management and conservation; and
- to provide for a South African National Biodiversity Institute to assist in achieving the objectives of this Act.

### 3.10.1 THREATENED OR PROTECTED SPECIES REGULATIONS, 2015

Chapter 4, Part 2 of NEMBA provides for the listing of Threatened or Protected Species (TOPS). Species listed as such, in terms of the TOPS Regulations (2015) and the TOPS Lists of Species (2015), are further classified as Threatened (Critically Endangered, Endangered and Vulnerable) or Protected. The Act defines these classes as follows:

- Critically Endangered species: any indigenous species facing an extremely high risk of extinction in the wild in the immediate future;
- Endangered species: any indigenous species facing a high risk of extinction in the wild in the near future, although it is not a critically endangered species;

- Vulnerable species: any indigenous species facing an extremely high risk of extinction in the wild in the medium-term future; although it is not a critically endangered species or an endangered species; and
- Protected species: any species which is of such high conservation value or national importance that it requires national protection. Species listed in this category include, among others, species listed in terms of the Convention on International Trade in Endangered Species of Wild Fauna and Flora (CITES). However, according to the terrestrial biodiversity studies that were undertaken, the project area is not located within any protected areas or formal conservation areas.

The TOPS Regulations (2015) further regulate the permit system set out in NEMBA as it applies to restricted activities involving specimens of listed threatened or protected species, where restricted activities involve those activities that have a direct impact on listed species such as hunting, catching, collecting, picking, chopping off, damaging or destroying, importing and export from Republic, possessing, keeping or exercising physical control over, breeding or propagating, conveying or translocating, selling or buying, receiving or donating or any other prescribed activity involving a TOPS specimen.

According to the Terrestrial Biodiversity Impact Assessment Report (**Appendix C1**: Approved Public Participation Plan

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Appendix D) undertaken by The Biodiversity Company (2024), the project area is situated within the Grassland biome. The Grassland biome is centrally located in southern Africa, and adjoins all except the desert, fynbos and succulent Karoo biomes (Mucina & Rutherford, 2006). Grasslands are dominated by a single layer of grasses. The amount of cover depends on rainfall and the degree of grazing. The grassland biome experiences summer rainfall and dry winters with frost (and fire), which are unfavourable for tree growth. The project area overlaps with the Central Free State Grassland (Vulnerable), Highveld Alluvial Vegetation (Least Threatened) and Vaal-Vet Sandy Grassland (Endangered). One (1) amphibian, ten (10) mammals and two (2) avifauna Species of Conservation Concern (SCC) as well as several individuals of five protected plant species that are protected by the Free State Nature Conservation Ordinance 8 of 1969 were observed in various parts of the project area. According to the list of protected species under Schedule, if any individuals of these plant species are to be disturbed, permits must be obtained from the Free State Department of Economic, Small Business Development, Tourism and Environmental Affairs (FSDESTEA).

### 3.10.2 ALIEN AND INVASIVE SPECIES REGULATIONS, 2014

NEMBA is the most recent legislation pertaining to alien invasive plant (AIP) species. In August 2014, the list of Alien Invasive Species was published in terms of the NEMBA. The Alien and Invasive Species Regulations were published in the Government Gazette No. 44182, 24$^{th}$ of February 2021. The legislation calls for the removal and / or control of AIP species (Category 1 species). In addition, unless authorised thereto in terms of the NWA, no land user shall allow Category 2 plants to occur within 30 meters of the 1:50 year flood line of a river, stream,

spring, natural channel in which water flows regularly or intermittently, lake, dam or wetland. Category 3 plants are also prohibited from occurring within proximity to a watercourse. Below is a brief explanation of the three categories in terms of the NEMBA:

- Category 1a: Invasive species requiring compulsory control. Remove and destroy. Any specimens of Category 1a listed species need, by law, to be eradicated from the environment. No permits will be issued.
- Category 1b: Invasive species requiring compulsory control as part of an invasive species control programme. Remove and destroy. These plants are deemed to have such a high invasive potential that infestations can qualify to be placed under a government sponsored invasive species management programme. No permits will be issued.
- Category 2: Invasive species regulated by area. A demarcation permit is required to import, possess, grow, breed, move, sell, buy or accept as a gift any plants listed as Category 2 plants. No permits will be issued for Category 2 plants to exist in riparian zones.
- Category 3: Invasive species regulated by activity. An individual plant permit is required to undertake any of the following restricted activities (import, possess, grow, breed, move, sell, buy or accept as a gift) involving a Category 3 species. No permits will be issued for Category 3 plants to exist in riparian zones.

**Note that according to the Alien and Invasive Species Regulations, a person who has under his or her control a category 1b listed invasive species must immediately:**

- Notify the competent authority in writing.
- Take steps to manage the listed invasive species in compliance with:
    - Section 75 of the NEMBA; and
    - The relevant invasive species management programme developed in terms of regulation 4.

Nine (9) IAP species were recorded within the project area as per the Terrestrial Biodiversity Impact Assessment undertaken by the Biodiversity Company 2024 (**Appendix C1**: Approved Public Participation Plan

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Appendix D). These species are listed under the Alien and Invasive Species List 2020, Government Gazette No. GN1003 as Category 1b and Not Indigenous (Exotic) respectively. **The three (3) species *Argemone ochroleuca*, *Cirsium vulgare* and *Verbena bonariensis* are NEMBA Category 1b IAP species that must be controlled by implementing an IAP Management Programme, in compliance of section 75 of the NEMBA.**

## 3.11. THE MINING AND BIODIVERSITY GUIDELINES

The Mining and Biodiversity Guidelines (2013) was developed by the Department of Mineral Resources, the Chamber of Mines, the SANBI and the South African Mining and Biodiversity Forum, with the intention to find a balance between economic growth and environmental sustainability. The Guideline is envisioned as a tool to "foster a strong relationship between biodiversity and mining, which will eventually translate into best practice within the mining sector. It provides a tool to facilitate the sustainable development of South Africa's mineral resources, in a way that enables regulators, industry and practitioners to minimise the impact of mining on the country's biodiversity and ecosystem services. It provides the mining sector with a practical, user- friendly manual for integrating biodiversity considerations into the planning processes and managing biodiversity during the operational phases of a mine, from exploration through to closure. The Guideline provides explicit direction in terms of where: mining-related impacts are legally prohibited; biodiversity priority areas may present high risks for mining projects; and biodiversity may limit the potential for mining."

In identifying biodiversity priority areas, which have different levels of risk against mining, the Guideline categorises biodiversity priority areas into four categories of biodiversity priority areas in relation to their importance from a biodiversity and ecosystem service point of view as well as the implications for mining in these areas:

A) Legally protected areas, where mining is prohibited;

B) Areas of highest biodiversity importance, which are at the highest risk for mining;

C) Areas of high biodiversity importance, which are at a high risk for mining; and

D) Areas of moderate biodiversity importance, which are at a moderate risk for mining.

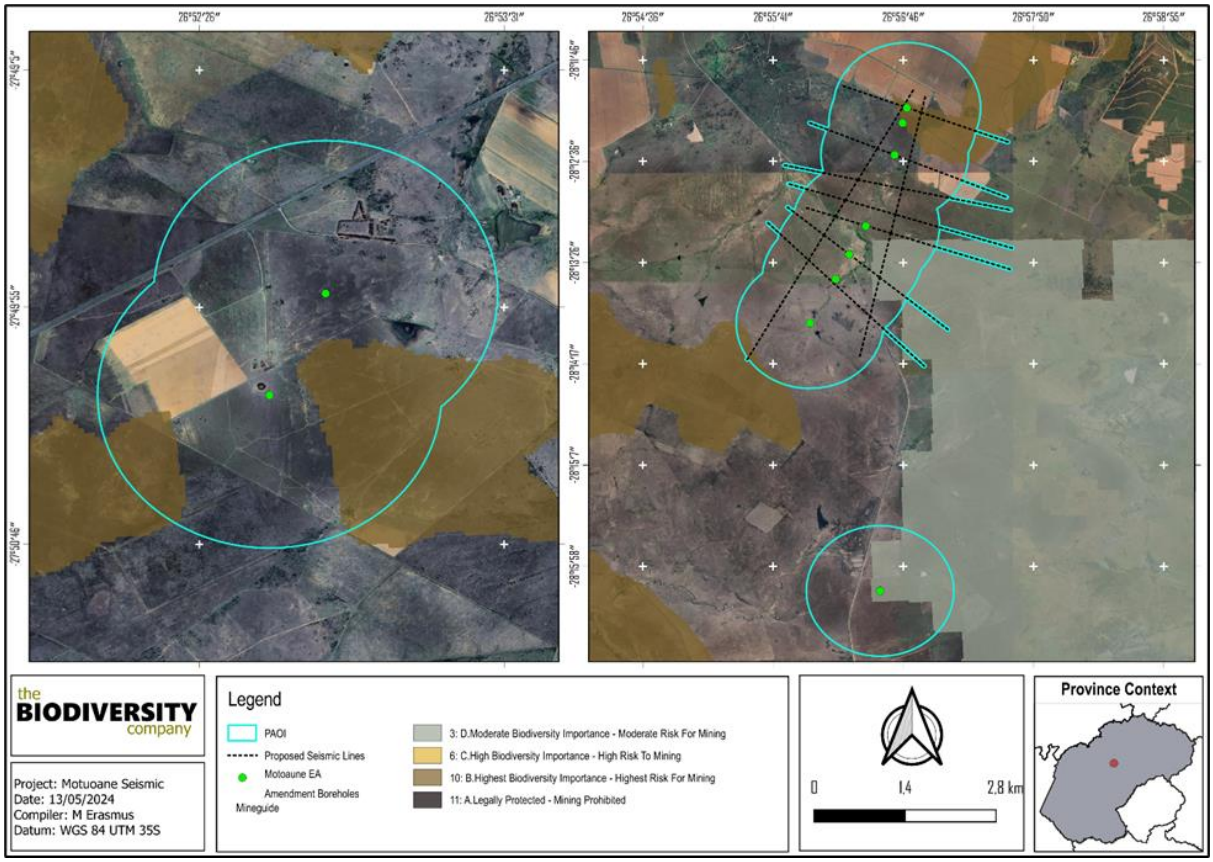


Figure 7: The project area in relation to the Mining and Biodiversity Guidelines (The Biodiversity Company, 2024).

The proposed activities are located with Category D (moderate risk) to Category B (highest risk), but importantly does not fall within Category A and therefore, not prohibited from mining activities (**Figure 7**). The implications for the proposed activity in terms of the risk categories implies that environmental screening, environmental

impact assessment (EIA) and their associated specialist studies should focus on confirming the presence and significance of these biodiversity features, and to provide site-specific basis on which to apply the mitigation hierarchy to inform regulatory decision-making for mining, water use licenses, and EAs. This assessment should fully consider the environmental sensitivity of the area, the overall environmental and socio-economic costs, and benefits of mining, as well as the potential strategic importance of the minerals to the country. Authorisations may well not be granted. If granted, the authorisation may set limits on allowed activities and impacts and may specify biodiversity offsets that would be written into license agreements and/or authorisations. Accordingly, this Amendment Report and associated specialist studies (**Appendix C1**: Approved Public Participation Plan

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Appendix D) were compiled and undertaken to identify the biodiversity type and relevant mitigation measures (**Appendix E**).

## 3.12. THE NATIONAL ENVIRONMENTAL MANAGEMENT PROTECTED AREAS ACT, 2003

The National Environmental Management: Protected Areas Act (Act 57 of 2003) serves to: "provide for the protection and conservation of ecologically viable areas representative of South Africa's biological biodiversity and its natural landscapes and seascape; for the establishment of a national register of all national, provincial and local protected areas; for the management of those areas in accordance with national norms and standards; for intergovernmental co-operation and public consultation in matters concerning protected areas; for the continued existence, governance and functions of South African National Parks; and for matters in connection therewith.

The objectives of this Act are –

a) to provide, within the framework of the national legislation, including the National Environmental Management Act, for the declaration and management of protected areas;

b) to provide for co-operation governance in the declaration and management of protected areas;

c) to effect a national system of protected areas in South Africa as part of a strategy to manage and conserve its biodiversity;

d) to provide for a diverse and representative network of protected areas on state land, private land, communal land and marine water;

e) to promote sustainable utilisation of protected areas for the benefit of people, in a manner that would preserve the ecological character of such areas;

f) to promote participation of local communities in the management of protected areas, when appropriate; and

g) to provide for the continued existence of South African National Parks

According to the Terrestrial Biodiversity Impact Assessment undertaken by the Biodiversity Company, 2024 (**Appendix C1**: Approved Public Participation Plan

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Appendix D), the project area is located approximately 3 km away from the nearest area protected area (The Bushybend Private Nature Reserve) but does overlap with Priority Focus Areas.

## 3.13. THE NATIONAL ENERGY ACT, 2008

The National Energy Act (Act 34 of 2008) provides to ensure that diverse energy resources are available, in sustainable quantities and at affordable prices, to the South African economy in support of economic growth and poverty alleviation, taking into account environmental management requirements and interactions amongst economic sectors; to provide for energy planning, increased generation and consumption of renewable energies, contingency energy supply, holding of strategic energy feedstock's and carriers, adequate investment in, appropriate upkeep and access to energy infrastructure; to provide measures for the furnishing of certain data and information regarding energy demand, supply and generation; to establish an institution to be responsible for promotion of efficient generation and consumption of energy and energy research; and to provide for all matters connected therewith. Importantly, the Department of Energy (DoE) is mandated to provide for energy planning and measures for the furnishing of certain data and information regarding energy demand, supply and generation. The objectives of this Act are to-

a) ensure uninterrupted supply of energy to the Republic;

b) promote diversity of supply of energy and its sources;

c) facilitate effective management of energy demand and its conservation;

d) promote energy research;

e) promote appropriate standards and specifications for the equipment, systems and processes used for producing, supplying and consuming energy;

f) ensure collection of data and information relating to energy supply, transportation and demand;

g) provide for optimal supply, transformation, transportation, storage and demand of energy that are planned, organised and implemented in accordance with a balanced consideration of security of supply, economics, consumer protection and a sustainable development;

h) provide for certain safety, health and environment matters that pertain to energy;

i) facilitate energy access for improvement of the quality of life of the people of Republic;

j) commercialise energy-related technologies;

k) ensure effective planning for energy supply, transportation and consumption; and

l) contribute to sustainable development of South Africa's economy.

The Act provides for the establishment of the South African National Energy Development Institution (SANEDI), whose functions include:

a) energy efficiency-

i. undertake energy efficiency measures as directed by the Minister;

ii. increase energy efficiency throughout the economy;

iii. increase the gross domestic product per unit of energy consumed; and

iv. optimise the utilisation of finite energy resources;

b) energy research and development-

i. direct, monitor, conduct and implement energy research and technology development in all fields of energy, other than nuclear energy; and

ii. promote energy research and technology innovation;

iii. provide for-

(aa) training and development in the field of energy research and technology development;

(bb) establishment and expansion of industries in the field of energy; and

(cc) commercialisation of energy technologies resulting from energy research and development programmes;

i. register patents and intellectual property in its name resulting from its activities;

ii. issue licences to other persons for the use of its patents and intellectual property;

iii. publish information concerning its objects and functions;

iv. establish facilities for the collection and dissemination of information in connection with research, development and innovation;

v. undertake any other energy technology development related activity as directed by the Minister, with the concurrence of the Minister of Science and Technology;

vi. promote relevant energy research through cooperation with any entity, institution or person equipped with the relevant skills and expertise within and outside the Republic;

vii. make grants to educational and scientific institutions in aid of research by their staff or for the establishment of facilities for such research;

viii. promote the training of research workers by granting bursaries or grants-in-aid for research;

ix. undertake the investigations or research that the Minister, after consultation with the Minister of Science and Technology, may assign to it; and

x. advise the Minister and the Minister of Science and Technology on research in the field of energy technology.

As indicated in **Section 2.7**, the White Paper on the Energy Policy (1998) is the overarching policy document that guides future policy and planning in the energy sector. It states that the government will, inter alia, "promote the development of South Africa's oil and gas resources…" and "ensure private sector investment and expertise in the exploitation and development of the country's oil and gas resources". The successful exploitation of these

natural resources would contribute to the growth of the economy. The applicant is line with the National Development Plan (NDP) and the Draft Integrated Energy Plan (IEP).

## 3.14. THE MINE HEALTH AND SAFETY ACT, 1996

The Mine Health and Safety Act, 1996 (Act No. 29 of 1996) provides for protection of the health and safety of employees and other persons at mines and, for that purpose-

- to promote a culture of health and safety;
- to provide for the enforcement of health and safety measures;
- to provide for appropriate systems of employee, employer and State participation in health and safety matters;
- to establish representative tripartite institutions to review legislation, promote health and enhance properly targeted research;
- to provide for effective monitoring systems and inspections, investigations and inquiries to improve health and safety;
- to promote training and human resources development;
- to regulate employers' and employees' duties to identify hazards and eliminate, control and minimise the risk to health and safety;
- to entrench the right to refuse to work in dangerous conditions; and
- to give effect to the public international law obligations of the Republic relating to mining health and safety;
- and to provide for matters connected therewith.

With specific reference to the Regulations (GN R93 of 1997) published under this Act, the following has reference to this proposed project:

*17(6) The employer must take reasonable measures to ensure that the competent person referred to in regulation 17(2)(a) in writing notifies the employer, which notification must be dated, of any workings being advanced to come within: -*

> *(a) a horizontal distance of 100 (one hundred) metres from reserve land, buildings, roads, railways, dams, waste dumps or any other structure whatsoever including structures beyond the mining boundaries, or from any surface, which it may be necessary to protect in order to prevent any significant risk;*
>
> *(b) 50 (fifty) metres from any excavation, workings, restricted area or any other place where there is, or is likely to be a dangerous accumulation of fluid material, noxious or flammable gas. Such notification must include a sketch plan giving the distance to such place from the nearest survey station.*

*17(7) The employer must take reasonable measures to ensure that: -*

> *(a) no mining operations are carried out within a horizontal distance of 100 (one hundred) metres from reserve land, buildings, roads, railways, dams, waste dumps, or any other structure whatsoever including such structures beyond the mining boundaries, or any surface, which it may be necessary to protect in order to prevent any significant risk, unless a lesser distance has been determined safe by risk assessment and all restrictions and conditions determined in terms of the risk assessment are complied with;*
>
> *(b) workings coming within 50 (fifty) metres, from any other excavation, workings, restricted area or any other place where there is, or is likely to be a dangerous accumulation of fluid material, noxious or flammable gas are mined subject to such restrictions and stopped at such positions as determined by risk assessment.*

*(c) where ground movement, as a result of mining operations, poses significant risk, an effective ground movement monitoring system is in place.*

*(d) survey records and plans relating to conditions described in paragraphs (a) and (b) above, are made available to the persons doing the risk assessment.*

*17(8) No person may erect, establish or construct any buildings, roads, railways, dams, waste dumps, reserve land, excavations or any other structures whatsoever within a horizontal distance of 100 (one hundred) metres from workings, unless a lesser distance has been determined safe:-*

*(a) in the case of the employer, by risk assessment and all restrictions and conditions determined in terms of the risk assessment are complied with; or*

*(b) in the case of any other person, by a professional geotechnical specialist and all restrictions and conditions determined by him or her or by the Chief Inspector of Mines are complied with.*

The Mine Health and Safety Act and associated Regulations will be applicable to the Motuoane Exploration Rights project.

## 3.15. THE CONSERVATION OF AGRICULTURAL RESOURCES ACT, 1983

The Conservation of Agricultural Resources (Act 43 of 1983) aims to provide for the conservation of the natural agricultural resources of the Republic by the maintenance of the production potential of land, by the combating and prevention of erosion and weakening or destruction of the water sources, and by the protection of the vegetation and the combating of weeds and invader plants. In order to achieve the objectives of this Act, control measures related to the following may be prescribed to land users to whom they apply:

- The cultivation of virgin soil;
- The utilisation and protection of land which is cultivated;
- The irrigation of land;
- The prevention or control of waterlogging or salination of land;
- The utilisation and protection of vleis, marshes, water sponges, water courses and water sources;
- The regulating of the flow pattern of run-off water;
- The utilisation and protection of the vegetation;
- The grazing capacity of veld, expressed as an area of veld per large stock unit;
- The maximum number and the kind of animals which may be kept on veld;
- The prevention and control of veld fires;
- The utilisation and protection of veld which has burned;
- The control of weeds and invader plants;
- The restoration or reclamation of eroded land or land which is otherwise disturbed or denuded;
- The protection of water sources against pollution on account of farming practices;
- The construction, maintenance, alteration or removal of soil conservation works or other structures on land; and
- Any other matter which the Minister may deem necessary or expedient in order that the objects of this Act may be achieved.

Further, different control measures may be prescribed in respect of different classes of land users or different areas or in such other respects as the Minister may determine. Preliminary impacts on the agriculture and soil,

biodiversity and water resources have been identified with regards to this project, and mitigation and management measures recommended.

## 3.16. THE NATIONAL WEB-BASED ENVIRONMENT SCREENING TOOL, 2019

On the 5th of July 2019, The Department of Forestry, Fisheries and the Environment (DFFE) issued a Notice of the requirement to submit a report generated by the National Web-based Environmental Screening Tool in terms of section 24(5)(h) of the NEMA, 1998 (Act No 107 of 1998) and Regulation 16(1)(b)(v) of the EIA regulations, 2014, as amended. The submission of this report is compulsory when applying for environmental authorisation in terms of Regulation 19 and Regulation 21 of the Environmental Impact Assessment Regulations, 2014 effective from the 4th of October 2019. The DFFE Screening Tool Report was generated on the 4th of April 2024. The Screening report is provided in **Appendix B** of this report. The main findings to be discussed from the screening report are listed below.

The following summary of the study area's environmental sensitivities were identified in the Environmental Screening Report. The environmental sensitivities for the proposed development footprint are indicated on **Table 9**.

Table 9: Environmental Sensitivity of Project Area.

| Theme | Very High sensitivity | High sensitivity | Medium sensitivity | Low sensitivity |
|---|---|---|---|---|
| Agriculture Theme | | X | | |
| Animal Species Theme | | X | | |
| Aquatic Biodiversity Theme | X | | | |
| Archaeological and Cultural Heritage Theme | X | | | |
| Civil Aviation Theme | | X | | |
| Defence Theme | X | | | |
| Palaeontology Theme | X | | | |
| Plant Species Theme | | | | X |
| Terrestrial Biodiversity Theme | X | | | |

The information collected by the specialists and EAP's assessment may be used to confirm or dispute (as may be applicable) the environmental sensitivity ratings identified by the National Screening Tool. The outcome of the verification process by the specialists' assessments &EAP's site sensitivity verification of the sensitivity ratings identified by the Screening Tool are summarized in **Table 10** below. Pages 63 and 64 on the DFFE Screening Report indicates that certain Specialist Assessments must be undertaken for the proposed development. There is however an allowance of the EAP to motivate for the reasons for not including certain assessments in the assessment report. **Table 11** presents these Specialist Assessments/Studies as well as the motivations behind the EAP's decision of recommending or not recommending the undertaking of certain Specialist Assessments.

Table 10: DFFE's Screening Tool Report Sensitivity Verification by Specialist Assessments.

| Assessment Theme | Sensitivity Rating as per Screening Report | Sensitivity Rating (Specialist Verification) | Specialist's Response |
|---|---|---|---|
| Agriculture Theme | High | **Medium** | Relative Agricultural Sensitivity was confirmed to be *Medium* by the Site Sensitivity Verification (SSV) attached as **Appendix C1:** Approved Public Participation Plan<br>Appendix C2: Pre-Application Correspondence<br>Appendix C3: Initial Notification and Proof<br>Appendix C4: Site Notices<br>Appendix C5: Newspaper Adverts<br>Appendix C6: Report Availability Notification and Proof<br>Appendix C7: Public Meeting Document<br>Appendix C8: Interested and Affected Parties Database<br>Appendix C9: Table of Correspondence<br>Appendix C10: Correspondence Proof<br>Appendix D. The SSV found that there are numerous agricultural activities within the application area with various agricultural activities being undertake especially in the far north section. However, the proposed seismic activities are limited to the south-central section where there were minimal agricultural activities, with only small-scale grazing noted. In addition, the proposed drilling activities will only affect an area of approximately 50 x 50 m which will have an acceptable overall impact on the soils and agricultural potential. |
| Animal Species Theme | High | **High** | According to the Terrestrial Biodiversity Compliance Statement (The Biodiversity Company, 2024), Certain habitats are generally intact, and SCC were recorded. Avifauna SCC may forage in specific areas. use. Sensitive species 15 recorded |
| Plant Species Theme | Low | **Low** | According to the Terrestrial Biodiversity Compliance Statement (The Biodiversity Company, 2024), certain habitats are generally intact, and SCC were recorded. The composition, species diversity and number of plant species recorded. |

| Assessment Theme | Sensitivity Rating as per Screening Report | Sensitivity Rating (Specialist Verification) | Specialist's Response |
|---|---|---|---|
| Terrestrial Biodiversity Theme | Very High | **Very Low-High** | According to the Terrestrial Biodiversity Compliance Statement (The Biodiversity Company, 2024), certain habitat sensitivities are regarded as high sensitivity due to the role of this intact habitat to biodiversity within an area being more fragmented locally, this is however not for the entire project area. |
| Aquatic Biodiversity Theme | Very High | **Medium** | According to the Wetland Baseline and Risk Assessment (The Biodiversity Company, 2024), during the site assessment, seven Hydrogeomorphic (HGM) units were identified and assessed within the project area. These comprise of a channelled valley bottom (HGM 1), multiple depression wetlands (HGM 2 and 6), a floodplain wetland (HGM 3) as well as multiple unchannelled valley bottoms (HGM 4, 5 and 7). These systems scored an overall Present Ecological Status (PES) scores ranging between D- "Largely Modified" and E – "Seriously Modified", due to the modifications arising from anthropogenic influences and surrounding agricultural activities. The Importance and Sensitivity (IS) for both the valley bottom and depression wetlands were calculated to be "Moderate", which combines the low protection status of the wet veg and the and the high threat status of the wetlands themselves. The floodplain wetland scored "High" sensitivities due to the High threat status of the wet veg and the High threat status of the wetlands themselves. The average ecosystem service score was determined to range between "Intermediate" and "Moderately High". |
| Archaeological and Cultural Heritage Theme | Very High | **Medium** | Five heritage features and resources were identified within the site by PGS Heritage (**Appendix C1**: Approved Public Participation Plan |

| Assessment Theme | Sensitivity Rating as per Screening Report | Sensitivity Rating (Specialist Verification) | Specialist's Response |
|---|---|---|---|
| | | | Appendix C2: Pre-Application Correspondence<br><br>Appendix C3: Initial Notification and Proof<br><br>Appendix C4: Site Notices<br><br>Appendix C5: Newspaper Adverts<br><br>Appendix C6: Report Availability Notification and Proof<br><br>Appendix C7: Public Meeting Document<br><br>Appendix C8: Interested and Affected Parties Database<br><br>Appendix C9: Table of Correspondence<br><br>Appendix C10: Correspondence Proof<br><br>Appendix D). These consist of two burial grounds, one foundation remains of a stone-built structure, one midden and one grinding stone. The stone-built remains of a structure is possibly related to the depicted structures on the 1945 maps and most likely older than 60 years. The structure remains itself are not conservation worthy. The midden and griding stone. Middens could contain still born burials. The grinding stone is not conservation-worthy. The heritage features are located within the extended 1 km assessment buffers, but further away from the proposed seismic transects and drilling locations. It is the opinion of the heritage specialist that the proposed project will not have a direct impact on the identified heritage resources as they are easily identifiable and distal from proposed sites, rated as being of low to high heritage significance |
| Civil Aviation Theme | High | **Low** | Relative Civil Aviation Theme Sensitivity was assessed to be *Low-Sensitive*. The closest airfield to the site is the Harmony Airport FAHA which is approximately 18 km northwest of the south-central section. The proposed activities do not interfere with surface and air transmission and therefore, no anticipated impacts on civil aviation emanating from the project. The proposed development does not entail the establishment of high-rise structures, use of aboveground high frequency electromagnetic radiation nor reflecting infrastructure. |

| Assessment Theme | Sensitivity Rating as per Screening Report | Sensitivity Rating (Specialist Verification) | Specialist's Response |
|---|---|---|---|
| Defence Theme | Very High | **Low** | Relative Defence Theme Sensitivity was assessed to be *Low-Sensitive* as there are no military bases / facilities present within the vicinity of the project site. The nearest defence facility is the military base in Kroonstad, approximately 60 km northeast of the site and there are no anticipated impacts on defence theme emanating from the proposed activities. |
| Palaeontology Theme | Very High | **Medium** | According to the Palaeontological Impact Assessment (Banzai Environmental, 2023), no fossiliferous outcrop was detected in the proposed development. This could be attributed to the lack of outcrops as well as the lush grassy vegetation in the area. Based on the site investigation as well as desktop research it is concluded that fossil heritage of scientific and conservational interest in the development footprint is rare. Therefore, there are no foreseen negative impacts on palaeontological features. |

Table 11: Summary of discussions regarding the undertaking of specialist Assessments.

| SPECIALIST ASSESSMENT | DICUSSION AND MOTIVATION |
|---|---|
| Agricultural Impact Assessment | Although the DFFE Screening tool indicated that the proposed development is located within a *High* Agricultural Sensitivity theme. Relative Agricultural Sensitivity was confirmed to be *Medium* by the SSV. The SSV found that although there are numerous agricultural activities within the application area several agricultural activities being undertake especially in the far north section, the proposed activities are seismic surveys and drilling within a confined area especially concentrated within the south-central section. The proposed seismic activities are limited to the south-central section where there were minimal agricultural activities, with only small-scale grazing noted. In addition, the proposed drilling activities will only affect an area of approximately 50 x 50 m which will have an acceptable overall impact on the soils and agricultural potential. Therefore, the EAP does not recommend and Agricultural Impact Assessment. |
| Landscape/Visual Impact Assessment | A Landscape/Visual Impact Assessment is recommended by the EAP as the proposed project seismic and drilling activities within the approved exploration area will have no visual intrusion in the area. The project and its locality do not trigger the need for this specialist study based on the triggers as identified by Oberholzer (2005) and presented in **Figure 8**. Visual sensitivities would arise from receptors living in and visiting the study area and observing changes to the aesthetic baseline, currently rated low within the context of the sub-region. |
| Archaeological and Cultural Heritage Impact Assessment | The National Web-Based Screening Tool Report found that the Relative Archaeological and Cultural Heritage Theme Sensitivity is *High-Sensitive*. The protocols required that a Compliance Statement as a minimum be undertaken to verify the archaeological heritage sensitivity of the area. The EAP recommended the undertaking of a Heritage Impact Assessment due to the known heritage features (graves) within the site. An Archaeological and Cultural Heritage Impact Assessment was undertaken and attached as **Appendix C1:** Approved Public Participation Plan |

| SPECIALIST ASSESSMENT | DICUSSION AND MOTIVATION |
|---|---|
| | Appendix C2: Pre-Application Correspondence<br>Appendix C3: Initial Notification and Proof<br>Appendix C4: Site Notices<br>Appendix C5: Newspaper Adverts<br>Appendix C6: Report Availability Notification and Proof<br>Appendix C7: Public Meeting Document<br>Appendix C8: Interested and Affected Parties Database<br>Appendix C9: Table of Correspondence<br>Appendix C10: Correspondence Proof<br>Appendix D. |
| **Palaeontology Impact Assessment** | Based on the 1:250 000 SAHRIS PalaeoMap and the National Web-Based Screening Tool Report, the study area is located within a *Very-High Palaeo-Sensitivity* area. The protocols required that a Compliance Statement as a minimum be undertaken to verify the palaeontological sensitivity of the area. Due to the known cultural heritage features on site and the high possibility of palaeontological finds, a Palaeontological Impact Assessment was recommended to identify palaeontological heritage features and provided mitigation measures. A Palaeontological Impact Assessment was undertaken and attached as **Appendix C1**: Approved Public Participation Plan |

| SPECIALIST ASSESSMENT | DICUSSION AND MOTIVATION |
|---|---|
| | Appendix C2: Pre-Application Correspondence<br>Appendix C3: Initial Notification and Proof<br>Appendix C4: Site Notices<br>Appendix C5: Newspaper Adverts<br>Appendix C6: Report Availability Notification and Proof<br>Appendix C7: Public Meeting Document<br>Appendix C8: Interested and Affected Parties Database<br>Appendix C9: Table of Correspondence<br>Appendix C10: Correspondence Proof<br>Appendix D. |
| **Terrestrial Biodiversity Impact Assessment** | The National Web-Based Screening Tool Report found that the Relative Terrestrial Biodiversity Impact Assessment Theme Sensitivity is *Very High-Sensitive*. Based on known occurrence of sensitive terrestrial biodiversity ecosystems from the previous study undertaken during the original EA Application, the EAP recommended that a Terrestrial Biodiversity Impact Assessment be undertaken to confirm presence of Flora or Fauna, Avifauna, SCC, or protected species within the development site, verify site terrestrial biodiversity sensitivity and provide necessary mitigation measures. The Terrestrial Biodiversity Compliance Statement is attached as **Appendix C1**: Approved Public Participation Plan |

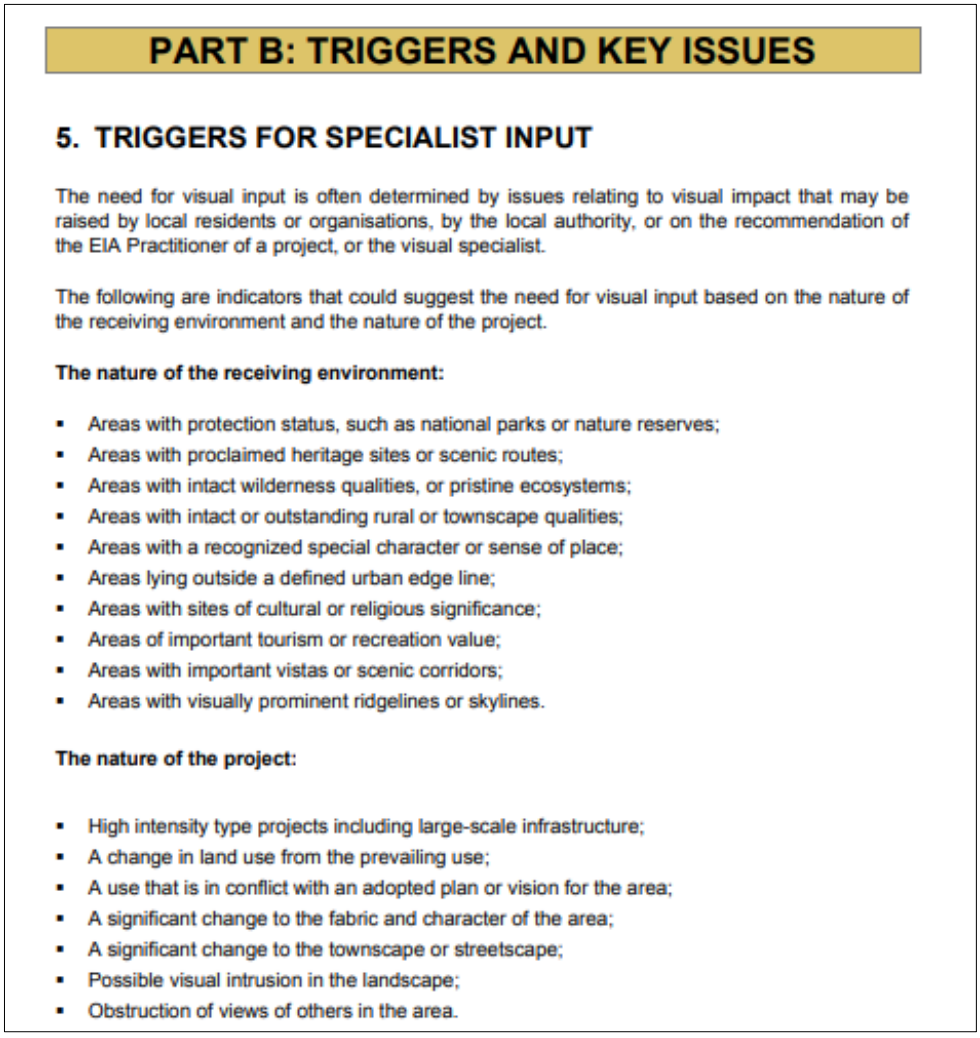
| SPECIALIST ASSESSMENT | DICUSSION AND MOTIVATION |
|---|---|
| | Appendix C2: Pre-Application Correspondence<br>Appendix C3: Initial Notification and Proof<br>Appendix C4: Site Notices<br>Appendix C5: Newspaper Adverts<br>Appendix C6: Report Availability Notification and Proof<br>Appendix C7: Public Meeting Document<br>Appendix C8: Interested and Affected Parties Database<br>Appendix C9: Table of Correspondence<br>Appendix C10: Correspondence Proof<br>Appendix D. |
| **Plant Species Assessment** | Similarly, to the findings and rationale for Terrestrial Biodiversity Impact Assessment in this table above, this study was recommended by the EAP and forms part of the Terrestrial Biodiversity Compliance Statement. |
| **Animal Species Assessment** | Similarly, to the findings and rationale for Terrestrial Biodiversity Impact Assessment in this table above, this study was recommended by the EAP and forms part of the Terrestrial Biodiversity Compliance Statement. |
| **Aquatic Biodiversity Impact Assessment** | The Relative Aquatic Biodiversity Theme Sensitivity was assessed to be *Very High-Sensitive* by the National Web-Based Screening Tool Report. The study area was noticed to be within close proximity of watercourses and wetlands from desktop studies and site sensitivity verification. The protocols require that a Compliance Statement as a minimum be undertaken to verify the aquatic biodiversity sensitivity of the area. The EAP recommended for a Full Aquatic Biodiversity Impact Assessment (attached as **Appendix C1**: Approved Public Participation Plan |

| SPECIALIST ASSESSMENT | DICUSSION AND MOTIVATION |
|---|---|
| | Appendix C2: Pre-Application Correspondence<br><br>Appendix C3: Initial Notification and Proof<br><br>Appendix C4: Site Notices<br><br>Appendix C5: Newspaper Adverts<br><br>Appendix C6: Report Availability Notification and Proof<br><br>Appendix C7: Public Meeting Document<br><br>Appendix C8: Interested and Affected Parties Database<br><br>Appendix C9: Table of Correspondence<br><br>Appendix C10: Correspondence Proof<br><br>Appendix D) due to the known aquatic biodiversity sensitivities from the previous assessment. |
| Hydrology Assessment | In engineering, a hydrological assessment is carried out to quantify the flow or volume of water in a river or stream, over land, in soils, in a pond or in a reservoir. A hydrological study is usually undertaken for projects with potential contamination to groundwater such mining and surface deposition (Tailings Storage Facilities). The proposed activity will entail the drilling and sampling at depth using a two-string telescopic casing design is outlined in **Section 2.4.3**. Each borehole will be steel cased and have cement barriers to prevent leaks as well as plugged at the end of exploration to prevent groundwater seepage. In addition, it is noted and well acknowledged by DWS that water quality and quantity monitoring of water containment facilities on site, and quality and quantity monitoring of boreholes, streams and natural drainage lines with flowing water within the catchment of the site and Bi-annual monitoring of perennial streams near to the exploration drill-sites will be conducted. Furthermore, an Aquatic Biodiversity and Wetland Baseline Risk Assessment (**Appendix C1:** Approved Public Participation Plan |

| SPECIALIST ASSESSMENT | DICUSSION AND MOTIVATION |
|---|---|
| | Appendix C2: Pre-Application Correspondence<br><br>Appendix C3: Initial Notification and Proof<br><br>Appendix C4: Site Notices<br><br>Appendix C5: Newspaper Adverts<br><br>Appendix C6: Report Availability Notification and Proof<br><br>Appendix C7: Public Meeting Document<br><br>Appendix C8: Interested and Affected Parties Database<br><br>Appendix C9: Table of Correspondence<br><br>Appendix C10: Correspondence Proof<br><br>Appendix D2) was undertaken to understand the hydrological conditions within the extended seismic transects and drilling site buffer zones and to provide relevant mitigation measures. |
| **RFI Assessment** | The project site falls outside of the Karoo Central Astronomy Advantage Area (KCAAA). AAAs that have been declared to date are:<br>• The Northern Cape Province, excluding Sol Plaatje Municipality;<br>• The Karoo Core AAA (consisting of 13 406 hectares of land owned by the National Research Foundation, 90 km north of Carnarvon); and<br>• The Karoo Central AAAs, as published in the Government Gazette on 12 March 2014.<br>The protocols require that a Site Sensitivity Verification (SSV) Requirements be undertaken where a Specialist Assessment is required, but no specific assessment protocol has been prescribed, gazetted on 20 March 2020. A SSV was undertaken by the EAP in April 2024 and attached as **Appendix C1**: Approved Public Participation Plan |

| SPECIALIST ASSESSMENT | DICUSSION AND MOTIVATION |
|---|---|
| | Appendix C2: Pre-Application Correspondence<br>Appendix C3: Initial Notification and Proof<br>Appendix C4: Site Notices<br>Appendix C5: Newspaper Adverts<br>Appendix C6: Report Availability Notification and Proof<br>Appendix C7: Public Meeting Document<br>Appendix C8: Interested and Affected Parties Database<br>Appendix C9: Table of Correspondence<br>Appendix C10: Correspondence Proof<br>Appendix D. |
| Noise Impact Assessment | A noise impact assessment (NIA) predicts the impact that noise, from a proposed development, is likely to have on the surrounding area. An NIA is usually associated with large industries or developments with excessive noise generation such engineering companies, printing presses, textile mills, and metal works which immensely generate noise pollution. The noise from the machine's mechanical pneumatic drills, saws, and rotating belts usually produces intolerable sounds and are a nuisance to the public. Considering that the proposed activity and site setting, the EAP does not recommend a Noise Impact Assessment be undertaken for the project. |
| Geotechnical Assessment | When evaluating a site for development, a geotechnical assessment is often needed to identify the type of earth that exists below the ground. The proposed activity is an exploration project which entails the undertaking of seismic surveys with the intention of understanding the geological conditions for hydrocarbons. Therefore, the proposed activity forms part of Geotechnical Assessment. |
| Health Impact Assessment | Health impact assessment (HIA) is a tool that can help communities, decision makers, and practitioners make choices that improve public health. HIA can be used to evaluate objectively the potential health effects of a project or policy before it is built or implemented. HIA is usually undertaken for projects which can have health impacts on the surrounding communities. Based on the proposed project description, there are no foreseen associated health impacts. Therefore, the EAP does not recommend a Health Impact Assessment for the project. |
| Ambient Air Quality Impact Assessment | Air Quality Impact Assessment (AQIA) is an evaluation, using approved computer models, of the ambient air quality impacts that the public may be expected to be exposed to due to air pollution emissions from one or more facilities. AQIA is an important technique for determining the relative contribution to ground level pollutant concentrations of specific current or future source emissions at receptor sites. AIQA is usually undertaken is for projects which will potentially emit and/or increase pollutant concentrations during construction and/or |

| SPECIALIST ASSESSMENT | DICUSSION AND MOTIVATION |
|---|---|
| | operational phases. Based on the project information, the does not EAP recommend an Air Quality Impact Assessment for the project as the project does not entail the potential of emitting and/or increase pollutant concentrations. |



## PART B: TRIGGERS AND KEY ISSUES

### 5. TRIGGERS FOR SPECIALIST INPUT

The need for visual input is often determined by issues relating to visual impact that may be raised by local residents or organisations, by the local authority, or on the recommendation of the EIA Practitioner of a project, or the visual specialist.

The following are indicators that could suggest the need for visual input based on the nature of the receiving environment and the nature of the project.

**The nature of the receiving environment:**

- Areas with protection status, such as national parks or nature reserves;
- Areas with proclaimed heritage sites or scenic routes;
- Areas with intact wilderness qualities, or pristine ecosystems;
- Areas with intact or outstanding rural or townscape qualities;
- Areas with a recognized special character or sense of place;
- Areas lying outside a defined urban edge line;
- Areas with sites of cultural or religious significance;
- Areas of important tourism or recreation value;
- Areas with important vistas or scenic corridors;
- Areas with visually prominent ridgelines or skylines.

**The nature of the project:**

- High intensity type projects including large-scale infrastructure;
- A change in land use from the prevailing use;
- A use that is in conflict with an adopted plan or vision for the area;
- A significant change to the fabric and character of the area;
- A significant change to the townscape or streetscape;
- Possible visual intrusion in the landscape;
- Obstruction of views of others in the area.

Figure 8: Triggers for Visual Impact Assessment (Oberholzer, 2005).

## 3.17. FREE STATE NATURE CONSERVATION ORDINANCE 8 OF 1969

This Ordinance makes provision with respect to the protection and conservation of wildlife in the Free State Province. It makes provision for, among other things, hunting and the protection of wild animals, fishing and the protection of aquatic resources, the protection of indigenous plants and the establishment and management of nature reserves. The Ordinance defines, in Schedule1, protected game and, in Schedule 2, ordinary game and sets out specific rules relating to hunting of each class of game. It also defines prohibited acts in respect of wild or exotic game and rules regarding the importation and exportation of endangered or exotic animals. According to the list of protected species under the Schedule, if any individuals of these plant species are to be disturbed, permits must be obtained from the Free State Department of Economic, Small Business Development, Tourism and Environmental Affairs (FSDESTEA). An assessment of floral species within the study area is covered by the Terrestrial Biodiversity Assessment and discussed in detail in **Section 4.5**.

## 3.18. FREE STATE PROVINCIAL SPATIAL DEVELOPMENT PLAN

The Free State Provincial Spatial Development Framework (PSDF) is a policy document that promotes a 'developmental state' in accordance with national and provincial legislation and directives. It aligns with the Free State Provincial Growth and Development Strategy which has committed the Free State to 'building a prosperous, sustainable and growing provincial economy which reduces poverty and improves social development'. The PSDF includes comprehensive plans and strategies that collectively indicate which type of land-use should be promoted in the Free State Province, where such land-use should take place, and how it

should be implemented and managed. The proposed exploration activities are within an approved exploration right.

## 3.19. FREE STATE BIODIVERSITY PLAN, 2015

The development of provincial biodiversity plans is a key component of the systematic biodiversity planning in South Africa and therefore a strong focus of the Biodiversity Planning Forum. Many of the innovative approaches and methodologies have been initiated and established through the development of these provincial biodiversity plans. A key objective of the Provincial Spatial Development Framework (PSDF) is to integrate and standardize planning at all spheres of government in the province with specific reference to amongst others facilitating land-use classification of the entire land surface of the province. To this extent a set of dedicated Spatial Planning Categories (SPCs) were developed which provide a spatial framework to guide decision-making regarding land-use at all levels of planning. The SPCs represent a classification system that indicates the most suitable, or a range of, land use options for a certain piece of land. Associated with each SPC category is land use guidelines which when implemented ensures a balance between development and conservation. Mainstreaming of the biodiversity plan into spatial planning process will be achieved by aligning the biodiversity plan categories with those of the SPCs so that planning according to SPC will then automatically also adopt the biodiversity plan categories and their associated land use guidelines. Various biodiversity layers were overlaid to the study area and used to determine the sensitivity and/or certain requirements thereof. The results are provided in various sections in this report such as **Sections 3.10 and 4.5**.

# 4. DESCRIPTION OF THE EXISTING ENVIRONMENT

As the proposed amendment falls within the Motuoane exploration right footprint previously assessed in detail as part of the original EA application, the site description and attributes associated with this amendment remain unchanged from what was presented in the original environmental assessment. However, although a detailed site condition analysis is not a requirement for an amendment report, the initial study and analysis of site conditions were undertaken in 2017 and there may have been changes to the site environmental conditions. Subsequently, the site environmental conditions are discussed in this Section of the Report. This Chapter describes the environmental conditions of the study area and the surrounding environment. A description of the environment that may be affected by the activities proposed and the way the biophysical, social, economic and cultural aspects of the environment may be affected by the proposed development is presented in this chapter. The information provided in this section was compiled in consultation with specialists that were undertaken to support the amendment application process.

## 4.1. GENERAL SITE CONDITIONS

The amendment study area can be subdivided into three sections namely, the far south, the south-central section and far north section. The far south and south-central sections are approximately 20 km and 15 km south of Virginia and can be accessed from the R73. The far north section is approximately 20 km northeast of Welkom and can be accessed from the R34. The proposed seismic activities and majority of the proposed drilling wells (7 of 10) are concentrated within the south-central section with only one drilling activity proposed in the far south and two in the far north sections. Refer to **Figure 1** for the site locality.

In general, the far south section is of low-medium ecological sensitivity due to anthropogenic activities which are mainly agricultural activities which caused degradation to the site areas to certain site areas (**Figure 9**). The south-central area has been minimally disturbed through the grazing activities and authorized exploration activities such as minimal clearance of vegetation (**Figure 10**). The northern section land use is generally agricultural grazing area and game farming with the area largely consisting of low laying grassland with watercourses and dams to support the wildlife (**Figure 11**). Several flora and fauna species were noted in the area, especially in central and northern area along the un-named watercourses these included a variety of bird species and mammals such as game animals noted in the northern area. A heritage feature (grave) was noted within proximity of one of the farmhouses in the northern section of the proposed area near the existing boreholes. It can be concluded that overall, the study area has medium - high ecological sensitivity and can have a good site ecological importance due to the near natural areas within the proposed area.


Figure 9: General site conditions in the far south section showing the low laying grasslands with isolated medium-tall shrubs (A – C) and a watercourse and wetland area in the northeast (D).

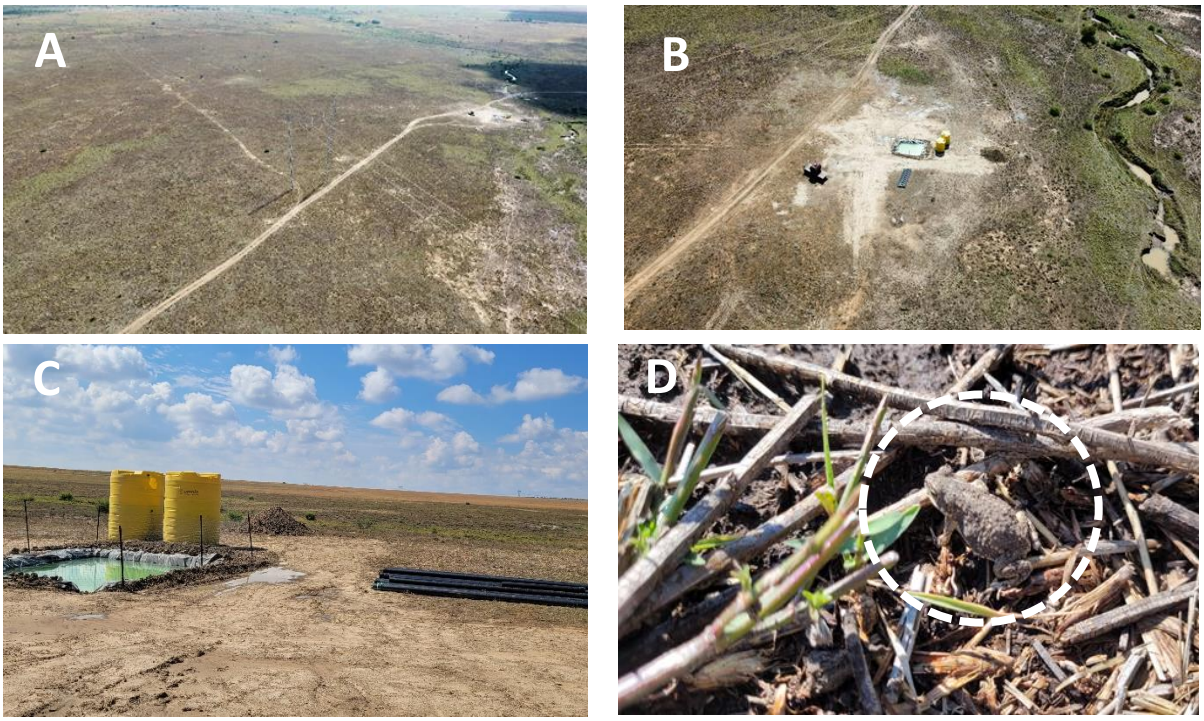



Figure 10: General site conditions in the south-central section showing: (A) the low laying grasslands, Eskom powerline, internal gravel roads; (B) and (C) disturbed grassland by establishment of authorised exploration drill and nearby drainage (B); and (D) some of the identified species including amphibian species.

Figure 11: General site conditions in the far north section showing: (A) the low laying grasslands, grazing and agricultural fields; (B) a large watercourse, birds and variety of game; (C) grazing activities and farmhouses; and (D) heritage feature in the form of a grave.

## 4.2. CLIMATE

Climate can be defined as weather conditions that have occurred over a long period of time in an area. Dominant climatic features that climate is centred around are temperature, rainfall, wind and evaporation. These climatic features can affect the exploration environment in a number of ways:

- Influence erosion;
- Influence vegetation growth, which affects rehabilitation planning;
- System monitoring of ground water availability;
- Air temperature can influence air dispersion through atmospheric stability and mixing layers; and
- Wind speed & direction can influence erosion and the dispersion of potential atmospheric pollutants.

The study area has warm summers and cold winters. Frost is a common phenomenon and the coldest periods (usually from June to August) are exacerbated by seasonal aridity. The daily minima for the coldest months are below freezing. The monthly distribution of average daily maximum temperatures shows midday temperatures ranging from 17°C in June to 29°C in January. The region is the coldest during July when the temperatures drop to 0°C on average during the night. Winter frost and cold is therefore a potentially limiting factor for plant growth. The study area is situated in a summer rainfall area, with rainfall peaking in January and at a lowest during July. Rainfall data was obtained from rainfall station 0365058 (Hennenman) and the Mean Annual Precipitation (MAP) was calculated at 612 millimetres per annum (mm/a) over a 36-year period. The 95th percentile is 884 mm/a and the 5$^{th}$ percentile 408 mm/a. Annual rainfall is approximately 450 mm/a, which is considered to be relatively dry for an area of grassland.

## 4.3. SOILS AND AGRICULTURAL LAND POTENTIAL

According to the land type database (Land Type Survey Staff, 1972 - 2006), the site is characterised by three different landtypes, these are Bd 20, Dc 8 and Dc12 land types. The Bd landtype consists of plinthic catena. Upland duplex and margalitic soils are rare and eutrophic and/or mesotrophic red soils are not widespread. The Dc land types is characterised with duplex, transitional young alluvial soil deposits with occasional red soils, some saturated profiles, shallow soils, and intrusive hard rocks.

Agricultural Potential Areas are based on four main pillars which are Agricultural Hubs, Important Agricultural Sites, Existing Agriculture and Remaining high Potential Agricultural Land. According to the Free State Department of Agriculture & Rural Development Annual Performance Plan 2019/22, agriculture dominates the Free State landscape, with cultivated land covering 32,000 km$^2$, and natural veld and grazing a further 87,000 km$^2$ of the province. Field crops account for almost two-thirds of the gross agricultural income of the province. Animal products contribute a further 30%, with the balance generated by horticulture. The Free State has, on average, medium-potential arable land. The soils and agricultural land potential are indicated in **Figure 12**.

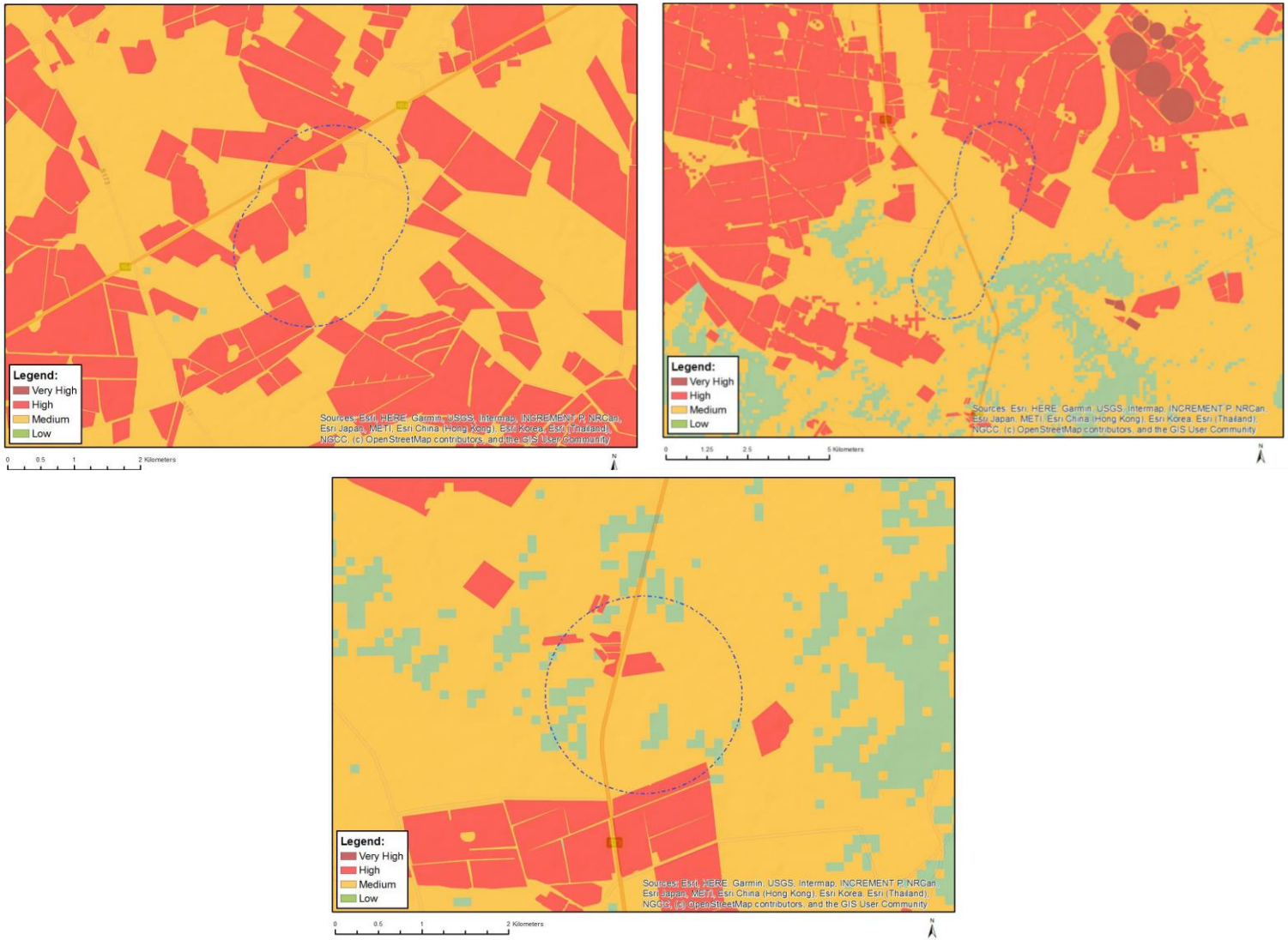



Figure 12: The land capability sensitivity for the proposed project area. Top left showing far northern section, top right showing south-central section and bottom map showing far south section (DFFE, 2024).

Based on the National Web-Based Environmental Screening Tool Report also known as the DFFE Screening Tool Report (**Appendix B**), the proposed activities are located within areas of *Low to High* agricultural potential (**Figure 12**). However, it must be noted that the proposed new 10 exploration boreholes will approximately have a 50 x 50 m footprint each and the ~30 km of new seismic transects will have minimal impact on the soils and agriculture. It is anticipated that there will be minimal impact on soils and agricultural potential.

## 4.4. GEOLOGY

The study area is generally flat to gently undulating and supporting short grassland. There are some low hills in various parts of the study area. The regional geology consists of sedimentary rocks belonging to the Karoo Supergroup with a stable floor comprising the Kaapvaal Craton. The Karoo Supergroup ranges in age from Late Carboniferous to Middle Jurassic and attains a total cumulative thickness of approximately 12 km. The proposed exploration area is underlain by the Beaufort Group and comprises a lower Adelaide Subgroup and an upper Tarkastad Subgroup, with the latter subgroup eroded away to expose sandstones and mudrocks. Several post-Karoo dyke intrusions and faults give rise to the development of linear structures developed through the Karoo Supergroup. These dykes are composed of dolerite and porphyritic dolerite and occur as tabular bodies with a thickness of 2 to 20m. In depth, the Karoo Supergroup is underlain by lavas of the Ventersdorp Supergroup and sediments of the Witwatersrand Supergroup.

KAROO SUPERGROUP

Deposition of sediments of the Karoo Supergroup commenced approximately 2400Ma after the deposition of Ventersdorp Supergroup. In the Hennenman area the Karoo Supergroup comprises the Dwyka Group (Tillite), Ecca and Beaufort Groups respectively. The Adelaide Sub Group of the Beaufort Group and the Volksrust formation of the Ecca Group outcrop in the Hennenman area. Large areas of the Karoo Supergroup were intruded by dolerite sills and dykes.

VENTERSDORP SUPERGROUP

The intense uplift in the final stages of the Witwatersrand Supergroup sedimentation culminated in the rupturing of the Kaapvaal craton resulted from a collition between the Kaapvaal craton and a younger Zimbabwe craton. Huge fractures developed, up which basaltic magma from the mantle flowed. This volcanic event commenced approximately 2700Ma ago and represents the volcanic rocks of the Ventersdorp Supergroup. Basaltic and andesitic lavas were deposited in grabens and half grabens directly on top of Witwatersrand Supergroup sediments.

WITWATERSRAND SUPERGROUP

The Witwatersrand Supergroup is representative of deposition in an early intracratonic basin about 2800Ma ago. The sequence with a thickness of about 6900m is generally poorly exposed and information pertaining to the stratigraphy is mainly derived from borehole data and mining activities. The rocks of the Witwatersrand Supergroup were originally widely distributed over the Kaapvaal Craton but much has been removed by erosion, leaving only scattered remnants. The major Goldfields in the Witwatersrand basin occur in an arc around the western and northern parts of the basin. The location of the known Goldfields was determined by earth movements along faults such as the Thabazimbi-Murchison line, the Rietfontein Fault, the Sugarbush fault and the Border fault (Free State).

Many of these fractures developed along the old suture lines where island arcs had amalgamated during the growth of the Kaapvaal Craton. Movement on these fractures involved lateral sliding, as well as vertical slip. The overall effect of these movements was to cause some sections of the crust to rise relative to others, producing mountainous terrain within and around the formerly extensive West Rand Group depression. This depression became fragmented into a number of sub-basins, separated by uplands. River systems eroded these rising uplands. Sediments were transported to the subsiding regions and were deposited on wide pediments and further downstream on extensive alluvial plains. Continued uplift and subsidence of the low-lying areas resulted in the accumulation of thick fluvial deposits in the depressions. The resulting sedimentary deposits are known collectively as the Central Rand Group. Refer to **Figure 13** for the geology map of the site.

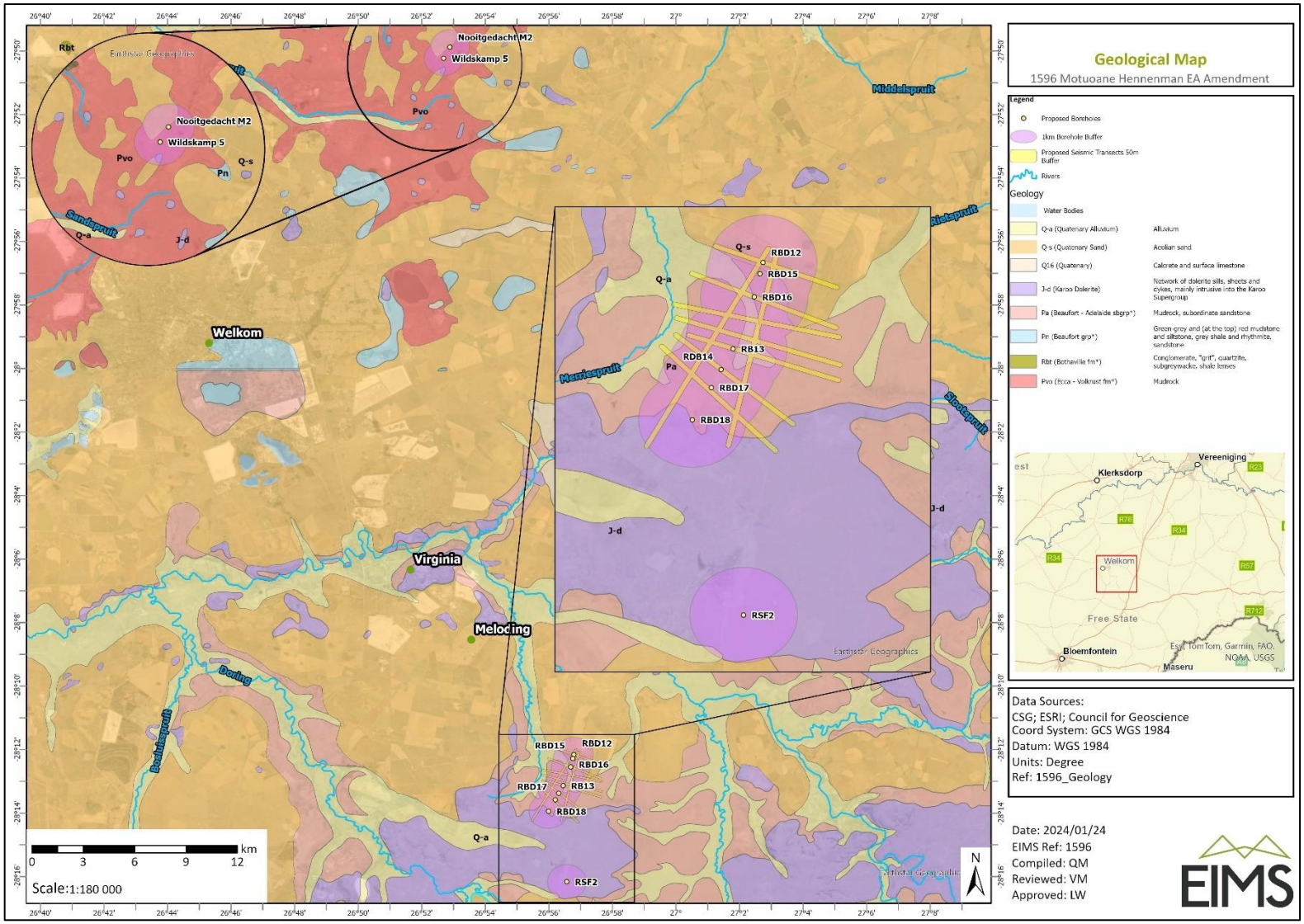



Figure 13: The geology of the proposed development site.

## 4.5. TERRESTRIAL BIODIVERSITY

Terrestrial biodiversity is the variety of life forms on the land surface of the Earth. High biodiversity is an indicator of a healthy ecosystem, which is directly linked to human health. Animals and plants are responsible for many vital services our lives depend on, including:

- oxygen production;
- water regulation;
- soil retaining; and
- providing flood protection.

Biodiversity is both a part of nature and affected by it. Some biodiversity loss is because of events such as seasonal changes or ecological disturbances (wildfires, floods, etc.), but these effects are usually temporary, and ecosystems have managed to adapt to these threats. Human-driven biodiversity loss, in contrast, tends to be more severe and long-lasting. The human-made climate crisis is leading to environmental destruction, habitat loss, and species extinction. Terrestrial biodiversity is decreasing rapidly through habitat loss: a process where a natural habitat becomes incapable of supporting its native species, which are consequently displaced or killed. In the recent past, there have Increased efforts implemented to prevent further loss of terrestrial biodiversity and the ecosystem services they provide. The characteristics and implications of the terrestrial biodiversity within the development site are discussed below.

### 4.5.1. ECOLOGICALLY IMPORTANT LANDSCAPE FEATURES

The following features describe the general area and habitat, this assessment is based on the Terrestrial Biodiversity Impact Statement and Wetland and Baseline Risk Assessment Report undertaken by the Biodiversity Company (2024).

Table 12: Spatial relevance of the Project Area to local ecologically important landscape features (The Biodiversity Company, 2024).

| Desktop Information Considered | Relevant/Irrelevant | Section in the Report |
|---|---|---|
| Ecosystem Threat Status | Relevant – Project Area overlaps with LC and EN ecosystems. | **Section 4.5.3.1** |
| Ecosystem Protection Level | Relevant – Project Area overlaps with PP and NP areas. | **Section 4.5.3.2** |
| Critical Biodiversity Area | Relevant – Project Area overlaps with CBA1 & 2, ESA1, ONA and degraded areas. | **Section 4.5.3.3** |
| South African Inventory of Inland Aquatic Ecosystems | Relevant – CR River occurs in close proximity to the PAOI and LC wetland occurs in the vicinity | **Section 4.5.2** |
| National Freshwater Ecosystem Priority Areas | Relevant – Non-FEPA wetlands occur in close proximity to the Project Area, with the Merriespruit River in close proximity to the western side of the Project Area | **Section 4.6** |
| National Protected Areas Expansion Strategy | Relevant – The Project Area overlaps with a NPAES Priority Focus Area. | **Section 3.12** |
| Mine guide | Relevant – Sections of the Project Area overlaps with areas of moderate and highest BU | **Section 3.11** |
| Strategic Water Source Areas | Irrelevant – Not located within a SWSA, closest SWSA is more than 100 km away. | **Section 4.6** |
| Protected Areas | Irrelevant – The project area occurs 3 km from the nearest area, The Bushybend Private Nature Reserve. | **Section 3.12** |
| IBA | Irrelevant – Not located within an IBA. | **Section 4.5.3.5** |

### 4.5.2. THE FREE STATE BIODIVERSITY SECTOR PLAN

The Bioregional plans are one of a range of decision support tools provided for in the Biodiversity Act that can be used to enable biodiversity conservation in priority areas. The purpose of a bioregional plan is to inform land-use planning, environmental assessment and authorisations, and natural resource management, by a range of sectors whose policies and decisions impact on biodiversity (Desmet et al., 2013). The purpose of the conservation plans is to inform land-use planning and development on a provincial scale and to aid in natural resource management, with one of the outputs being a map of Critical Biodiversity Areas (CBAs) and Ecological Support Areas (ESAs). These are classified into different categories, namely Protected Areas, CBA1 areas, CBA2 areas, ESA1 areas, ESA2 areas, Other Natural Areas (ONAs) and areas with No Natural Habitat Remaining (NNR) based on biodiversity characteristics, spatial configuration and requirements for meeting targets for both biodiversity patterns and ecological processes.

Critical Biodiversity Areas (CBAs) – Areas considered critical for meeting biodiversity targets and thresholds, and which are required to ensure the persistence of viable populations of species and the functionality of ecosystems. Ecological Support Areas (ESAs) - Areas are required to support and sustain the ecological functioning of Critical Biodiversity Areas (CBAs). For terrestrial and aquatic environments, these areas are functional but are not necessarily pristine natural areas. They are however required to ensure the persistence and maintenance of biodiversity patterns and ecological processes within the CBAs, and which also contributes significantly to the maintenance of Ecological Infrastructure.

The Free State Department of Environment and Nature Conservation has developed a Free State Biodiversity Sector Plan, called Critical Biodiversity Areas (CBAs) and Ecological Support Areas (ESAs). These biodiversity priority areas, together with protected areas, are important for the persistence of a viable representative sample of all ecosystem types and species as well as the long-term ecological functioning of the landscape. The identification of Critical Biodiversity Areas for the Free State was undertaken using a Systematic Conservation Planning approach. Available data on biodiversity features (incorporating both pattern and process, and covering terrestrial and inland aquatic realms), their condition, current Protected Areas and Conservation Areas, and opportunities and constraints for effective conservation were collated. Based on the Free State Biodiversity Sector Plan, the proposed study area is located within CBA1 & 2 and ESA 1&2 as well as other Natural Areas and Degraded Areas (**Figure 14**).

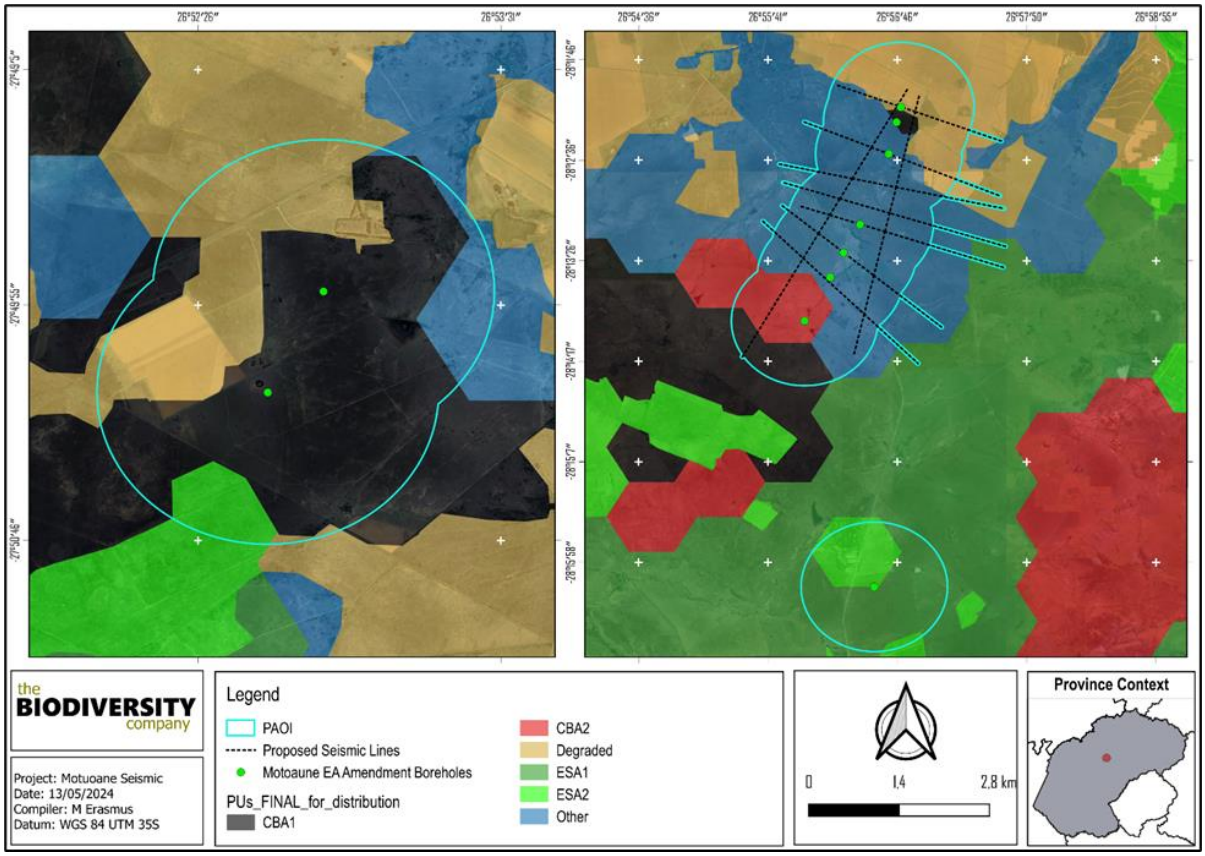



Figure 14: Site Conservation Plan Map (The Biodiversity Company, 2024).

Other Natural Areas (ONAs) are areas that have not been identified as a priority in the latest systematic biodiversity plan, but they do retain most of their natural character and perform a range of biodiversity and ecological infrastructural functions. The overall management objective should be to ensure ecosystem functionality and minimise the loss of natural habitat and species through strategic landscape planning. Whereas Moderately or Heavily Modified Areas are areas that have been heavily modified by human activity such that they are no longer natural, and no longer contribute to biodiversity targets. Some of these areas may still provide limited biodiversity and ecological infrastructural functions but their biodiversity value has been significantly or sometimes irreversibly compromised. Land-use should be managed in a biodiversity-friendly manner, aiming to maximise ecological functionality where possible.

### 4.5.3. NATIONAL BIODIVERSITY ASSESSMENT

The National Biodiversity Assessment (NBA) was completed as a collaboration between the SANBI, the DEA and other stakeholders, including scientists and biodiversity management experts throughout the country over a three-year period. The purpose of the NBA is to assess the state of South Africa's biodiversity with a view to understanding trends over time and informing policy and decision-making across a range of sectors. The two headline indicators assessed in the NBA are ecosystem threat status and ecosystem protection level which are discussed in more detail in the sub-sections below.

#### 4.5.3.1 ECOSYSTEM THREAT STATUS

Ecosystem threat status outlines the degree to which ecosystems are still intact or alternatively losing vital aspects of their structure, function and composition, on which their ability to provide ecosystem services ultimately depends. Ecosystem types are categorised as Critically Endangered (CR), Endangered (EN), Vulnerable (VU) or Least Threatened (LT), based on the proportion of each ecosystem type that remains in good ecological condition. The proposed area overlaps within the Grassland Biome (Mucina & Rutherford, 2006). According to the spatial dataset, the proposed project area mainly overlaps with a LC ecosystem, with limited portions of EN ecosystem areas (**Figure 15**).

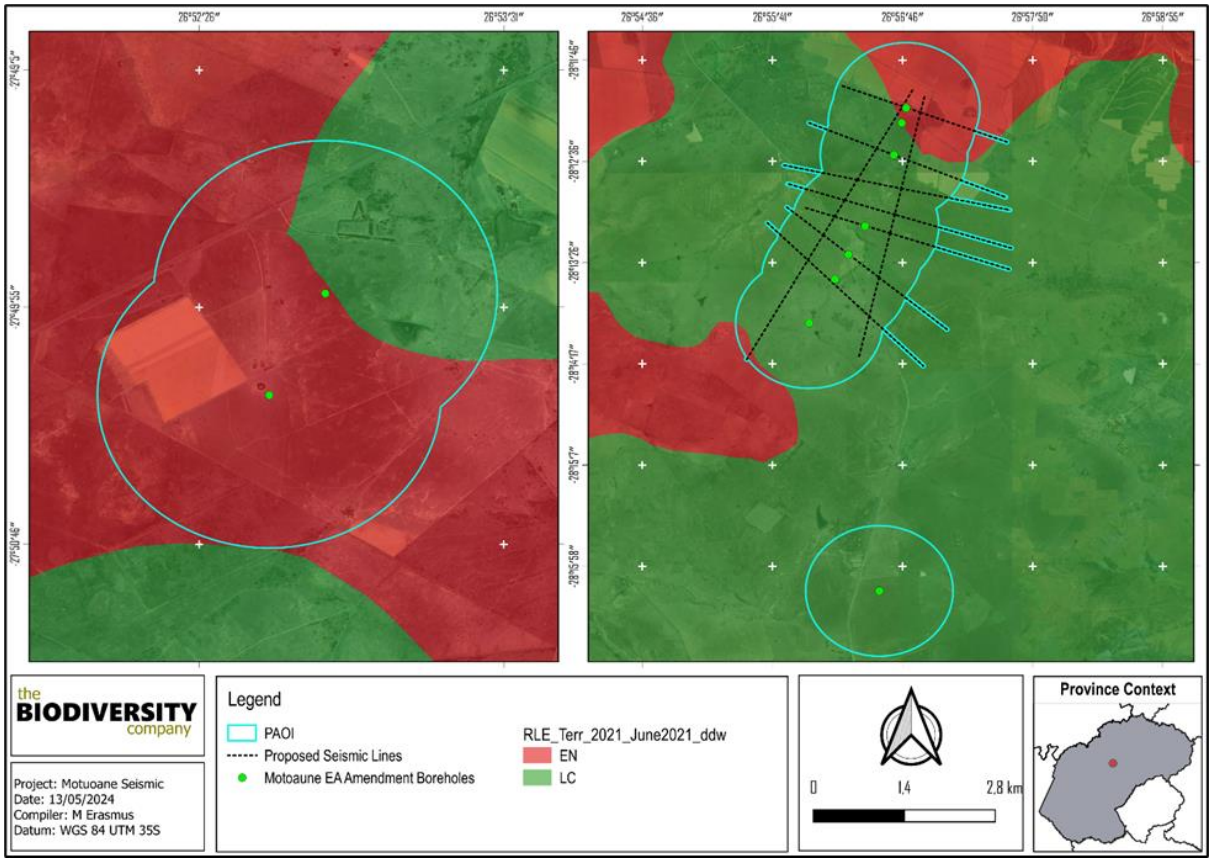



Figure 15: Site Ecological Threat Status Map (The Biodiversity Company, 2024).

#### 4.5.3.2 ECOSYSTEM PROTECTION LEVEL

Ecosystem protection level tells us whether ecosystems are adequately protected or under-protected. Ecosystem types are categorised as not protected (NP), poorly protected (PP), moderately protected (MP) or well protected (WP), based on the proportion of each ecosystem type that occurs within a protected area recognised in the Protected Areas Act. The project area was superimposed on the ecosystem protection level map to assess the protection status of terrestrial ecosystem associated with the development (**Figure 16**). The proposed development area is situated within a 'Poorly Protected' ecosystem.

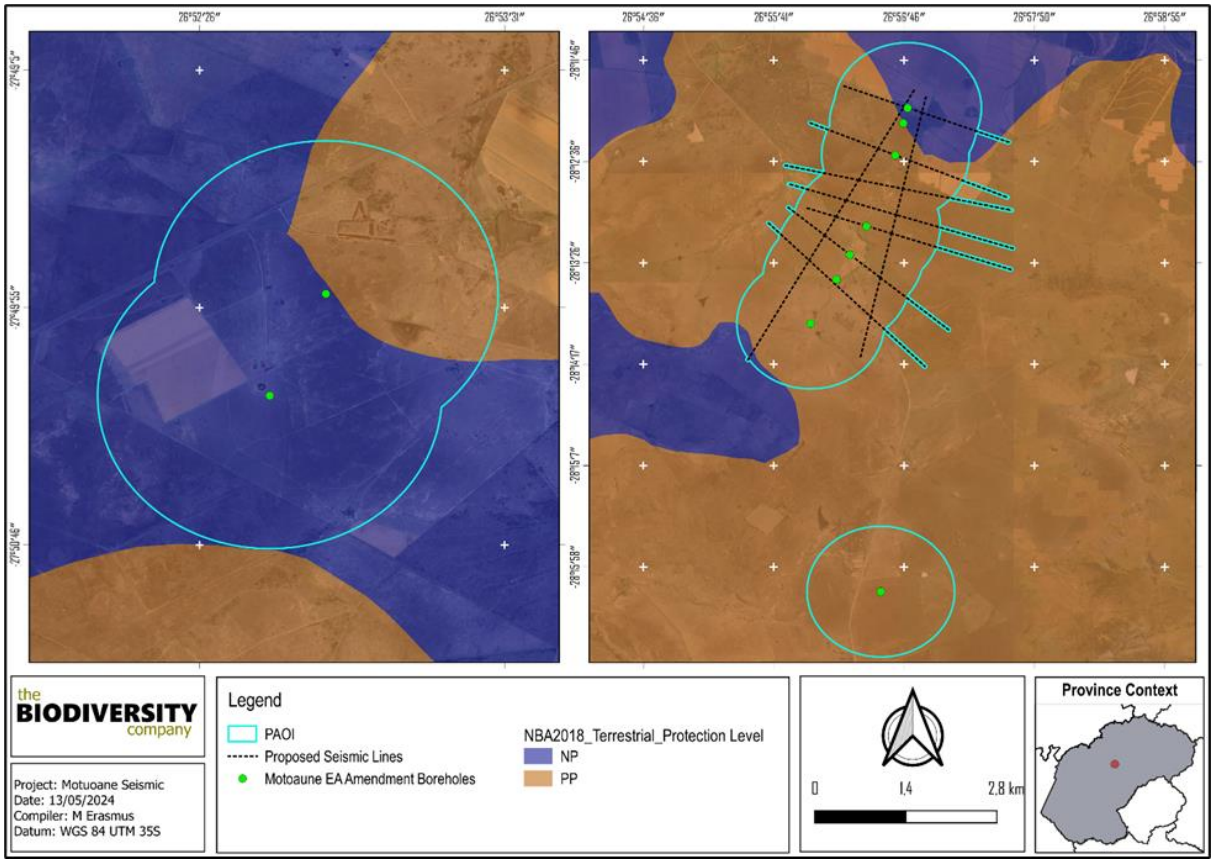



Figure 16: Site Ecosystem Protection Level Map (The Biodiversity Company, 2024).

#### 4.5.3.3 FLORAL SPECIES

The project area is situated within the Grassland biome. In South Africa, the Grassland Biome occurs mainly on the high central plateau (Highveld), the inland areas of the eastern seaboard, the mountainous areas of KwaZulu-Natal (KZN) and the central parts of the Eastern Cape (Mucina & Rutherford, 2006). However, grasslands can also be found below the Drakensberg, both in KZN and the Eastern Cape, with floristic links to the high-altitude Drakensberg grassland (Mucina & Rutherford, 2006). The topography is mainly flat to rolling, but also includes mountainous regions and the Escarpment (Mucina & Rutherford, 2006). Altitude is mostly from about 300 to 400 m.a.s.l, but reaches up to 3 482 m on Thabana Ntlenyana, the highest mountain in southern Africa (Mucina & Rutherford, 2006).

In terms of vegetation structural composition, grasslands are characteristically dominated by grasses of the Poaceae Family (Mucina & Rutherford, 2006). On the Lesotho Plateau and highest peaks of the Drakensberg, grassland plants xeromorphic characteristics due to the severity of the climate in these places (Mucina & Rutherford, 2006). On a fine-scale vegetation type, the project area overlaps with the Central Free State Grassland, Highveld Alluvial Vegetation and Vaal-Vet Sandy Grassland (**Figure 17**).

(i) Central Free State Grassland

Is undulating plains supporting short grassland, in natural condition dominated by *Themeda triandra* while *Eragrostis curvula* and *E. chloromelas* become dominant in degraded habitats. The national conservation target is 24%. Only small portions enjoy statutory conservation (Willem Pretorius, Rustfontein and Koppies Dam Nature Reserves) as well as some protection in private nature reserves. The conservation status of this vegetation community was listed by Mucina and Rutherford (2006) as Vulnerable.

(ii) Highveld Alluvial Vegetation

The highveld alluvial vegetation type is characterised by flat topography supporting riparian thickets dominated by *Vachellia karroo.* This vegetation type can be found in the Free State, North West, Mpumalanga and Gauteng

Province. It is embedded in the Grassland and Savanna biomes. According to Mucina & Rutherford (2006), this vegetation type is classified as Least Threatened (LT). The national target for conservation protection for both these vegetation types is 31%, with nearly 10% statutorily conserved in the Barberspan (a Ramsar site), Bloemhof Dam, Christiana, Faan Meintjes, Sandveld, Schoonspruit, Soetdoring and Wolwespruit Nature Reserves.

(iii) Vaal-Vet Sandy Grassland

The Vaal-Vet Sandy Grassland occurs on a plains-dominated landscape with some scattered, slightly irregular undulating plains and hills (Mucina & Rutherford, 2006). In terms of plant types, it consists mainly of low-tussock grasslands with an abundant karroid element (Mucina & Rutherford, 2006). It occurs in the North-West and Free State Provinces at altitudes of 1 260 to 1 360 m (Mucina & Rutherford, 2006). This vegetation is classified as Endangered (EN), with a conservation target of 24% (Mucina & Rutherford, 2006).

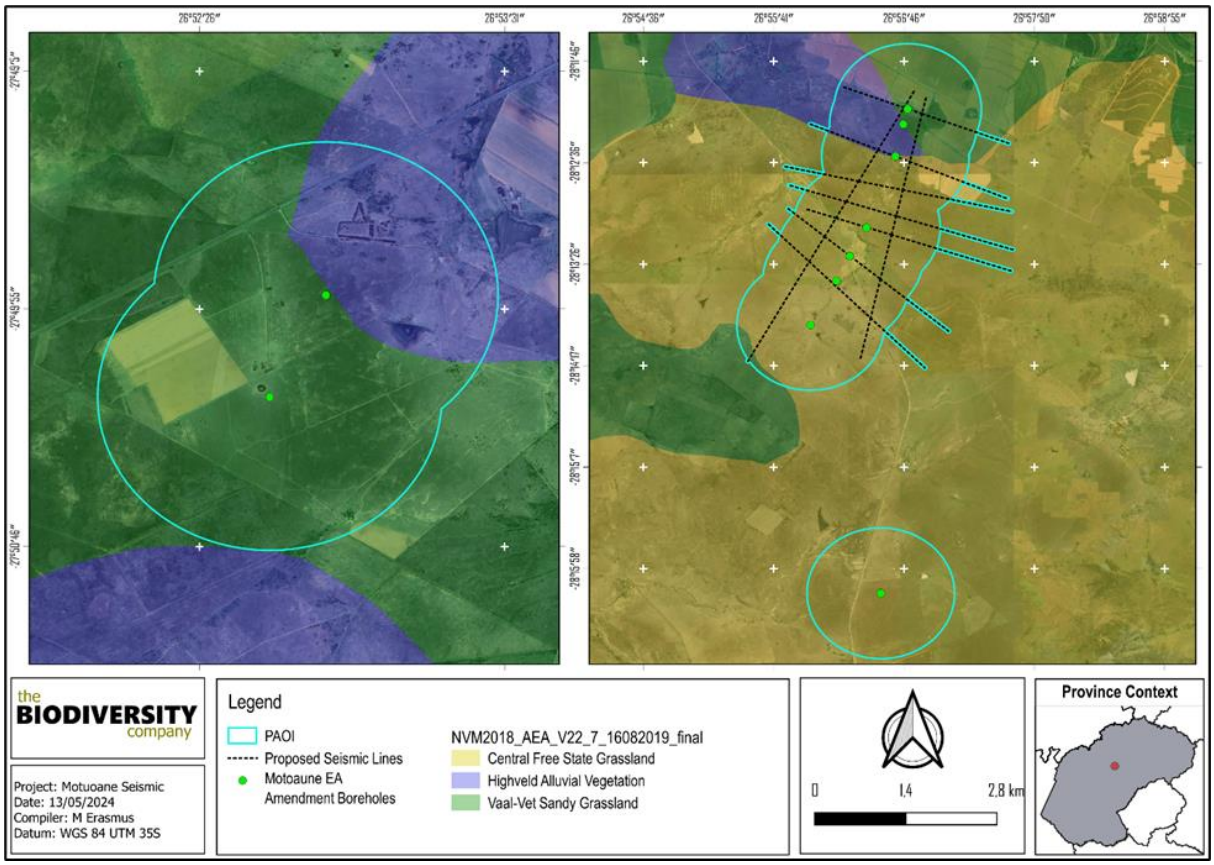



Figure 17: Site Vegetation Map (The Biodiversity Company, 2024).

In addition to the modified habitat, four (4) primary terrestrial habitat types were delineated within the project area namely, rocky grassland habitat, water resource habitat, disturbed Grassland habitat, and degraded grassland habitat as indicated in **Figure 14** and discussed in **Table 13** (The Biodiversity Company, 2024).


Figure 18: Site Terrestrial Habitats. (A) Rocky grassland habitat, (B) Water resource habitat, (C) Disturbed Grassland habitat, and (D) Degraded grassland habitat (The Biodiversity Company, 2024).

Table 13: Summary of habitat types delineated within field assessment area of project area (The Biodiversity Company, 2024).

| Item | Description and condition | Ecosystem Processes and Services |
|---|---|---|
| Rocky Grassland | This habitat includes areas that are stony and rocky ridges/hills with varying slopes and bedrock protruding from the soil layer. The current ecological condition of this habitat regarding the main driving forces, are intact, only being slightly disturbed by edge effect and infringement. The intact state is evident in the amount and importance of the species recorded in the faunal assessment; and the high species diversity and number of plant species recorded. Current human infringement occurs, especially in areas close to roads, however it is limited. | The rocky grassland habitat is used by faunal species as fine-scale habitats and is important for several life stages. These habitats can be considered as ecological hotspots being an important habitat for fauna and flora, especially plants as well as reptiles. This habitat forms part of a unique landscape within the region and provides refugia, food and a more natural environment. The unit also serves as a movement corridor for fauna within a landscape fragmented. Contributes as viable CBA |
| Water Resources | Impacted permanently to seasonally wet portions of land as delineated by the wetland specialist. Even though somewhat disturbed, the ecological integrity, importance and functioning of these areas play a crucial role as a water resource system locally and regionally and an important habitat for various fauna and flora. | Provides surface water resources within the landscape. Aids in trapping sediment and nutrients carried by surface runoff. Corridor for fauna dispersion within the landscape and important foraging and nesting habitat. |
| Disturbed Grassland | The habitat isn't entirely modified but in a constant disturbed state and can't recover to a more natural state due to historic and ongoing disturbances and impacts received from grazing, edge effects from land use and mismanagement. | Provides limited grazing and foraging resources for indigenous fauna and livestock. Aids in the filtration of water permeating through the soil into the drainage areas. Important corridor for fauna dispersion within the landscape. The areas may be used as a movement corridor and in many cases form a barrier between the more degraded and the modified areas. |
| Degraded Grassland | Degraded Grassland habitat type is regarded as semi-natural, but disturbed due to fragmentation, grazing by livestock and human infringement in areas close to roads. The condition difference within this habitat depends on the extent of the disturbance in some areas being more severe, usually related to one being more overgrazed than the other. Variable in the presence or absence of Woody species and shrub density. Semi-natural, but slightly disturbed due to the grazing by livestock and also human infringement. including woody plant species in form of trees and shrubs. | The current ecological condition of this habitat, regarding the driving forces, are inconsistent due to the different land uses Provides grazing and foraging resources for indigenous fauna and livestock. Aids in the filtration of water permeating through the soil into the drainage areas. Important corridor for fauna dispersion within the landscape. Supports SCCs. |
| Modified | The transformed areas have little to no remaining natural vegetation due to land transformation by historic and current agriculture, roads and mismanagement. These habitats exist in a constant disturbed state as it cannot recover to a more natural state due to ongoing disturbances and impacts it receives. | The ecological services provided by this habitat are limited due to the extensive cover of impermeable surfaces and the large amount of bare land. Locally common bird species will forage and nest in the larger trees, and parts of the area may be considered a movement corridor. |

According to the Biodiversity Company (2024), the Plants of Southern Africa (POSA) database indicates that 463 species of indigenous plants are expected to occur within the project area. Appendix A of the Terrestrial Biodiversity Impact Assessment Report (**Appendix C1**: Approved Public Participation Plan

Appendix C2: Pre-Application Correspondence

Appendix C3: Initial Notification and Proof

Appendix C4: Site Notices

Appendix C5: Newspaper Adverts

Appendix C6: Report Availability Notification and Proof

Appendix C7: Public Meeting Document

Appendix C8: Interested and Affected Parties Database

Appendix C9: Table of Correspondence

Appendix C10: Correspondence Proof

Appendix D) provides the list of species and their respective conservation status and endemism. Of these 463 plant species, no species are listed as being Species of Conservation Concern (SCC). No sensitive species were highlighted by the assessment.

#### 4.5.3.4 FAUNAL SPECIES

Three (3) herpetofauna species were recorded during the survey period *Pseudaspis cana* (Mole Snake), *Lygodactylus capensis* (Common Dwarf Gecko) and *Hemachatus haemachatus* (Rinkhals). However, there is the possibility of more species being present, due to the seasonality of the survey and the fact that certain reptile species are secretive and require long-term surveys to ensure capture. *Sensitive species 15* was recorded and is threatened. Nineteen (19) mammal species were recorded during this survey of the project area based on either direct observation, the presence of visual tracks and signs as well as personal communication with farm owners/managers (**Figure 19**). Ten (10) of the mammals are listed provincially (refer to the specialist report for the detailed list). The larger mammal species, such as Blue Wildebeest, were kept as game on one of the properties (Wildskamp 5), which include SSCs.


Figure 19: Photograph illustrating some of the mammal species recorded in the project area. A) *Raphicerus campestris* (Steenbok), B) *Hystrix africaeaustralis* (Cape Porcupine), C) *Antidorcas marsupialis* (Springbok), D) *Phacochoerus africanus* (Common Warthog), E) *Suricata suricatta* (Suricate) (The Biodiversity Company, 2024).

#### 4.5.3.5 AVIFAUNA

Forty-two (42) avifauna species were recorded in the project area during the survey based on either direct observation, vocalisations, or the presence of visual tracks & signs (**Figure 20**). Two (2) species, *Eupodotis caerulescens* (Korhaan, Blue) and *Sagittarius serpentarius* (Secretary bird) are rated as SCC, whereas 30 are listed provincially (refer to the specialist report for the detailed list).


Figure 20: Some of the avifaunal species recorded; A) *Plectropterus gambensis* (Goose, Spur-winged) , B) *Afrotis afraoides* (Korhaan, Northern Black) and C) *Sagittarius serpentarius* (Secretarybird) (EN), D) *Elanus caeruleus* (Kite, Black-shouldered) (The Biodiversity Company, 2024).

## 4.6. WETLANDS AND AQUATICS

This section provides an overview of the regional hydrological (surface water) environment across the extent of the project area. Information in this section has been sourced from the 2017 EIA Geohydrology Report by Exigo Sustainability (Pty) Ltd and the current Aquatic Biodiversity and Wetland Baseline Risk Assessment by the Biodiversity Company (Appendix D2).

Five rivers run through the Matjhabeng local municipality, including the Koolspruit, Sand, Sandspruit and Vet. Wetlands cover 5.5% of this municipality. There is only one water management area in this municipality, namely the Middle Vaal. The Vaal River borders Moqhaka local municipality to the west. The Vals and Renoster Rivers drain through the area towards the Vaal River. These rivers play a significant role in providing the raw water supply to Kroonstad, Steynsrus and Viljoenskroon respectively. The western areas, in the vicinity of Viljoenskroon, are known for various shallow and non-perennial pans.

The Sand and the Vet Rivers are the two main drainage systems within the exploration right footprint, but a number of smaller streams drain into these two systems, including the Erasmusspruit, Schoemansspruit, Middelspruit, Klipspruit, Leeuspruit, Blomspruit, Enslinspruit, and the Doringrivier. The low hills consist mostly of undulating areas with hills at Koppieskraal north-east of Ventersburg and steeper river valleys in the region south-west of Ventersburg. The site varies in elevation from approximately 1330 to 1495m above sea level with the highest point being on the central western boundary and the lowest point on the north-eastern boundary.

The entire site is made up fully or partially of 13 quaternary catchments located in the Middle Vaal Water Management Area (WMA). No major surface water features are located within the exploration area right area. The Allemanskraal dam is located 21km south of Ventersburg, however, it is outside the exploration area. The area surrounding the Allemanskraal Dam is also the only protected area in the vicinity, according to the Department of Water and Sanitation GIS data.

The South African Inventory of Inland Aquatic Ecosystems spatial dataset is part of the South African Inventory of Inland Aquatic Ecosystems (SAIIAE) which was released as part of the National Biodiversity Assessment (NBA 2018). National Wetland Map 5 includes inland wetlands and estuaries, associated with river line data and many other data sets within the South African Inventory of Inland Aquatic Ecosystems (SAIIAE, 2018). Two depression wetlands are located in both the northern and southern clusters, towards the northern side of the project areas. Both these wetlands are far away from the proposed development and will most like not be influenced by the proposed development (see **Appendix C1**: Approved Public Participation Plan

Appendix C2: Pre-Application Correspondence

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Appendix D).

The National Freshwater Ecosystem Priority Areas (NFEPA) database forms part of a comprehensive approach for the sustainable and equitable development of South Africa's scarce water resources. This database provides

guidance on how many rivers, wetlands and estuaries, and which ones, should remain in a natural or near-natural condition to support the water resource protection goals of the NWA. This directly applies to the NWA, which feeds into Catchment Management Strategies, water resource classification, reserve determination, and the setting and monitoring of resource quality objectives (Nel et al., 2011). The NFEPAs are intended to be conservation support tools and envisioned to guide the effective implementation of measures to achieve the National Environment Management Biodiversity Act's biodiversity goals (Act No.10 of 2004) (NEM:BA), informing both the listing of threatened freshwater ecosystems and the process of bioregional planning provided for by this Act (Nel et al., 2011). According to Nel et al. (2011), multiple seep wetlands are located within the project area, as well as a near threatened river (Merriespruit), located in the western part of the project area (see **Figure 21**).

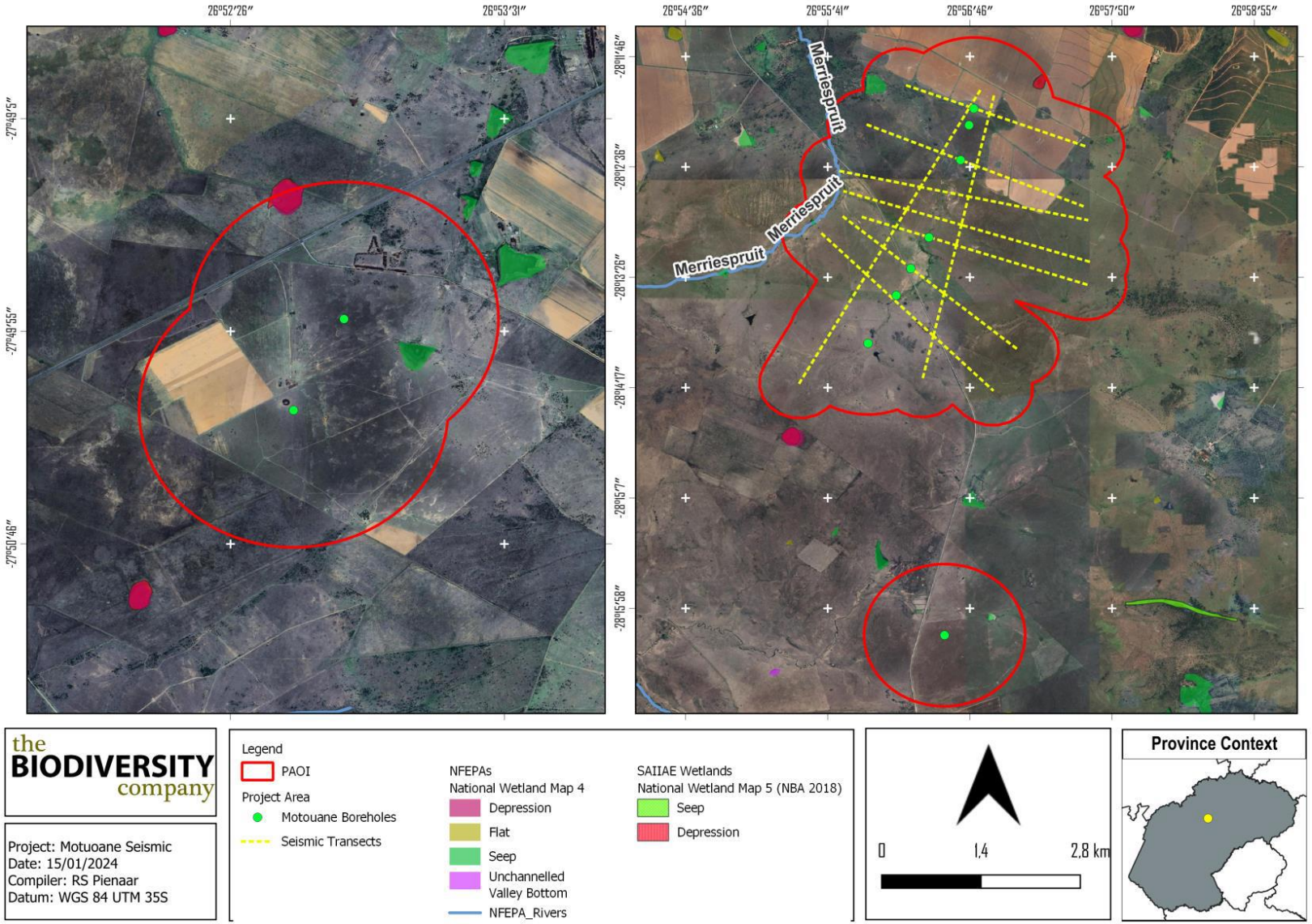


Figure 21: Site Hydrological Conditions (The Biodiversity Company, 2024).

According to the Wetland and Baseline Risk Assessment Report by the Biodiversity Company (2024), seven Hydrogeomorphic (HGM) units were identified within the project area of influence (PAOI) that relate to the proposed project (**Appendix C1**: Approved Public Participation Plan

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Appendix D **& Figure 22**). The wetland types were classified as a channelled valley bottom (HGM 1), multiple depressions (HGM 2 and HGM 6), a floodplain (HGM 3) and multiple unchannelled valley bottom wetlands (HGM 4, 5 and 7). Along with the natural wetlands multiple artificial wetlands (off channel dams) and multiple big drainage features were identified within the PAOI. These features are referred to as 'A' Section channels that convey surface runoff immediately after a storm event and are not associated with a baseflow (DWAF, 2005). These systems were not characterised as wetlands due to the lack of wetland vegetation and soils present inside the systems. It is evident while looking at the location of the wetlands as well as the impacts of the proposed development that only HGM 1, 2 and 3 will be impacted on by the proposed development.

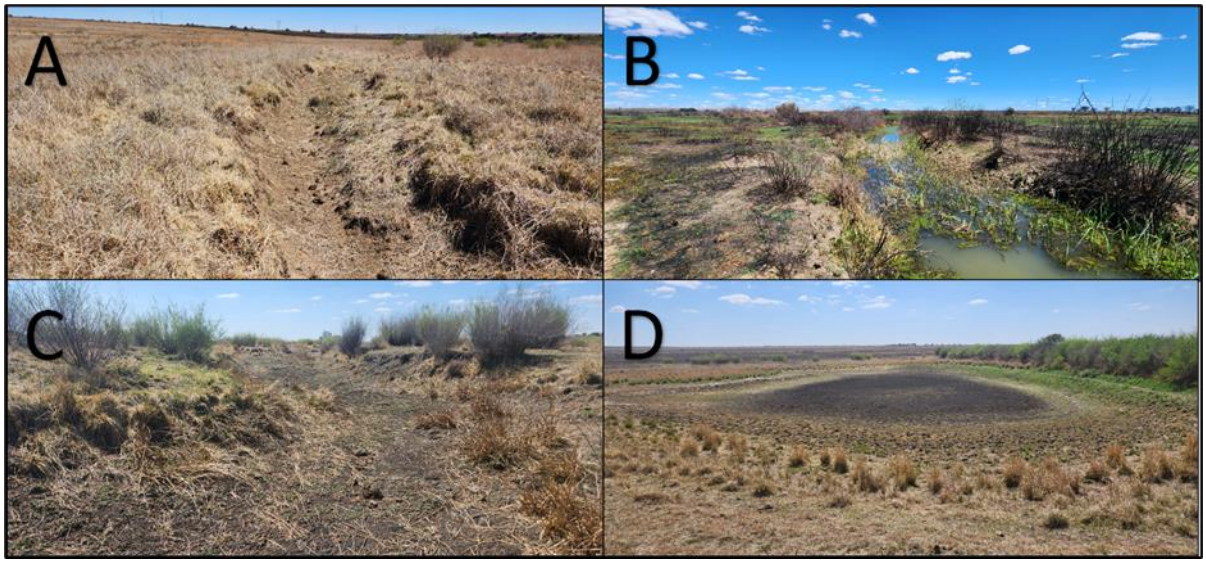


Figure 22: Photographical evidence of the different HGM units found within the PAOI. A) Drainage features., B) Floodplain wetland., C) Channelled valley bottom., D) Dams located within the channelled valley bottom (The Biodiversity Company, 2024).

### 4.6.1. PRESENT ECOLOGICAL STATUS

Three modules, namely hydrology, geomorphology and vegetation, were assessed as a single unit for the HGM Units and subsequently an area weighted score was obtained for the HGM Units by the specialist. The potential

impacts of activities such as agriculture, drought, prospecting, mining, altered hydrological functions and clearing of natural vegetation within the greater catchment were taken into consideration during the assessment. The Present Ecological Status (PES) for the assessed HGM units is presented in **Figure 23**. The ecological state of the wetlands located within the project area of influence were rated as ranging between "D"- Largely Modified to "E"- Seriously Modified. These scores are due to the magnitude of anthropogenic impacts such as agricultural activities as well as the construction of roads inside the wetlands and wetland catchments.

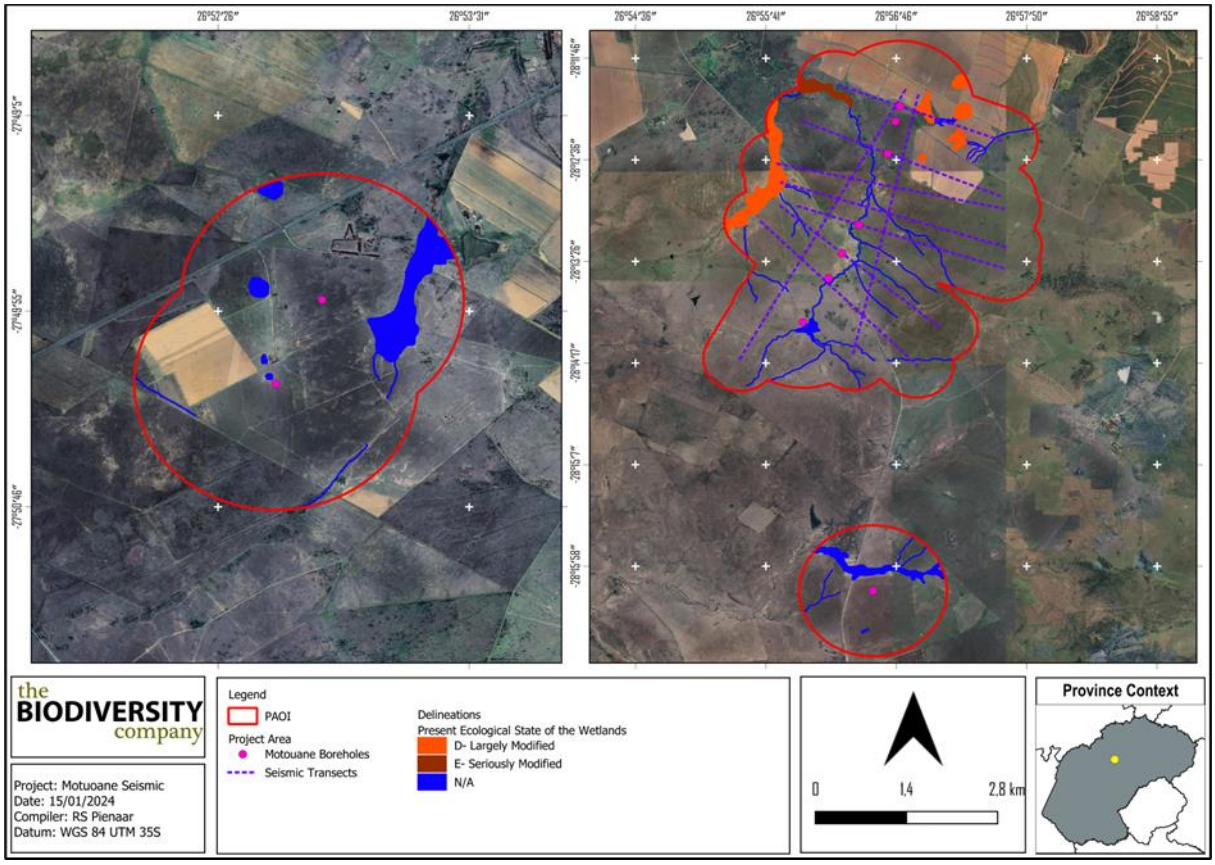


Figure 23: Overall present ecological state of delineated wetlands (The Biodiversity Company, 2024).

## 4.6.2. SITE ECOLOGICAL IMPORTANCE

Site Ecological Importance (SEI) is a function of the Biodiversity Importance (BI) of the receptor (e.g., SCC, the vegetation/fauna community or habitat type present on the site) and Receptor Resilience (RR) (its resilience to impacts). The SEI assessment was applied to all wetland features within the study area in order to ascertain the levels of sensitivity and ecological importance of the features, as well as to assist in informing a suitable Recommended Management Objective (RMO) for each. The importance and sensitivity of water resources is determined in order establish resources that provide higher than average ecosystem services, biodiversity support functions or are particularly sensitive to impacts. The mean of the determinants is used to assign the Importance and Sensitivity (IS) category. The results of these assessments from the aquatic specialist are summarised in **Table 14** below.

Table 14: The SEI results for the delineated HGM types (The Biodiversity Company, 2024).

| HGM Type | NFEPA Wet Veg | | | NBA Wetlands | | | SWSA (Y/N) | Calculated IS |
|---|---|---|---|---|---|---|---|---|
| | Type | Ecosystem Threat Status | Ecosystem Protection Level | Wetland Condition | Ecosystem Threat Status 2018 | Ecosystem Protection Level | | |

| | | | | | | | | |
|---|---|---|---|---|---|---|---|---|
| Channelled Valley Bottom | Dry Highveld Grassland Group 3 | Least Threatened | Not Protected | D/E/F Largely Modified | Critically | Not Protected | N | Moderate |
| Depression | Dry Highveld Grassland Group 3 | Least Threatened | Not Protected | A/B Largely Natural | Least Concerned | Not Protected | N | Moderate |
| Floodplain | Dry Highveld Grassland Group 3 | Critically Threatened | Not Protected | D/E/F Largely Modified | Critically | Not Protected | N | High |
| Unchannelled Valley Bottom | Dry Highveld Grassland Group 3 | Least Threatened | Not Protected | D/E/F Largely Modified | Critically | Not Protected | N | Moderate |

### 4.6.3. BUFFER REQUIREMENTS

It is worth noting that the scientific buffer calculation (Macfarlane et al., 2014) was used to determine the size of the buffer zones relevant to the proposed project. **A pre-mitigation buffer of 32 m and a post-mitigation wetland and watercourse buffer of 15 m is recommended for the delineated systems**. This is attributed to pre-existing modifications of the catchments around the wetlands and the nature of the project, which has the potential of minimally impacting on the wetland systems. Refer to for the buffer requirements.

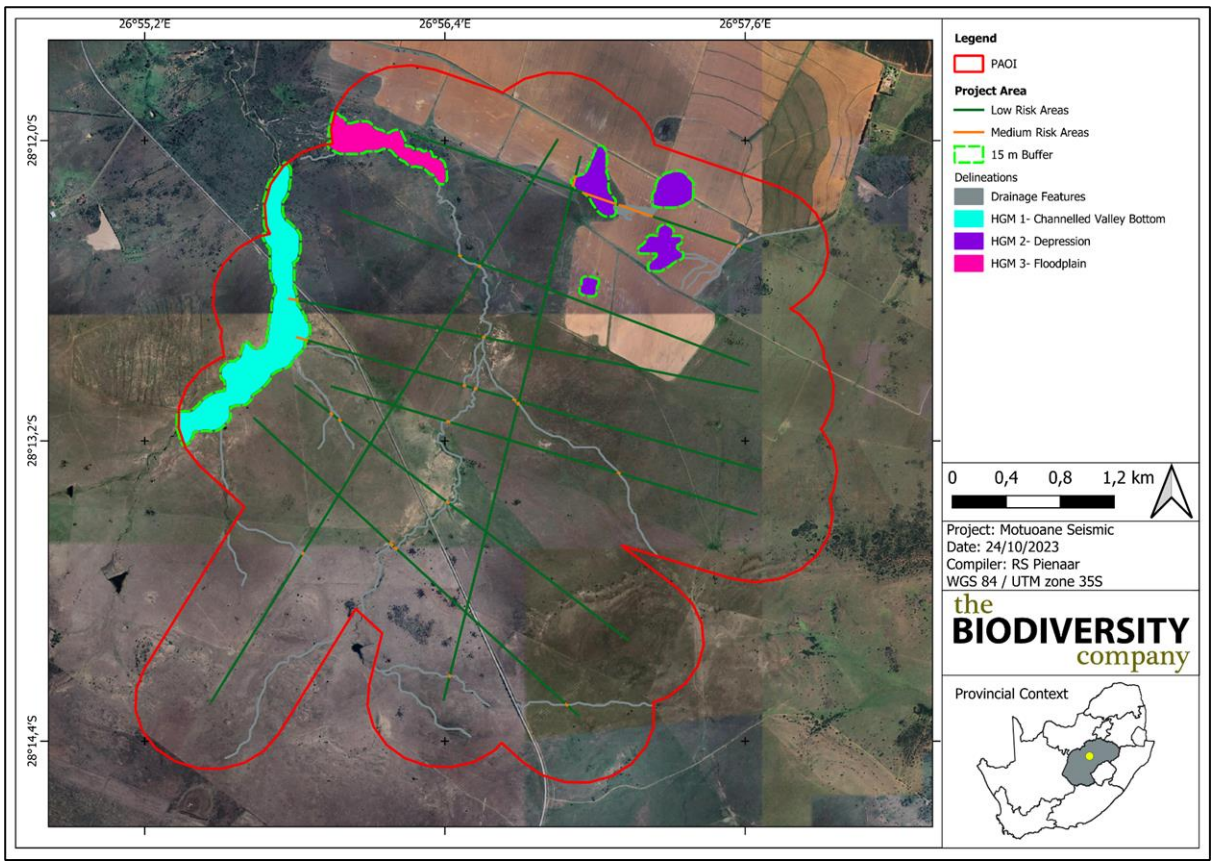


Figure 24: The identified risk areas within the project area (The Biodiversity Company, 2024).

The suggested buffer in this report does not qualify as a relaxation to any other legislated buffers managed by the respective authorities (e.g., DFFE and DWS). Therefore, the relevant authorisations relevant authorisations

where applicable (i.e. Water Use Authorisation due to activities within legislated regulatory zones for Water Use License Application in terms of the National Water Act) are still required prior to project commencement.

## 4.7. SOCIO-ECONOMIC ENVIRONMENT

The following section provides a summary of the social and economic environment that may be influenced by the proposed project. Information in this section was obtained from the Integrated Development Plans (IDPs) for the Matjhabeng-, Masilonyana-, and Moqhaka Local Municipalities as well as from the Stats SA website. The information provided in the IDPs are based on a 2011 National census.

According to the National Environmental Management Act (NEMA, 1998) environment refers to the surroundings in which humans exist. When viewing the environment from a socio-economic perspective the question can be asked what exactly the social environment is. Different definitions for social environment exist, but a clear and comprehensive definition that is widely accepted remains elusive. Pathak & Casper (2001) offers the following definition of human social environment:

"Human social environments encompass the immediate physical surroundings, social relationships, and cultural milieus within which defined groups of people function and interact. Components of the social environment include built infrastructure; industrial and occupational structure; labour markets; social and economic processes; wealth; social, human, and health services; power relations; government; race relations; social inequality; cultural practices; the arts; religious institutions and practices; and beliefs about place and community. The social environment subsumes many aspects of the physical environment, given that contemporary landscapes, water resources, and other natural resources have been at least partially configured by human social processes. Embedded within contemporary social environments are historical social and power relations that have become institutionalized over time. Social environments can be experienced at multiple scales, often simultaneously, including households, kin networks, neighbourhoods, towns and cities, and regions. Social environments are dynamic and change over time as the result of both internal and external forces. There are relationships of dependency among the social environments of different local areas, because these areas are connected through larger regional, national, and international social and economic processes and power relations."

Environment-behaviour relationships are interrelationships (Bell, Fisher, Baum & Greene, 1996). The environment influences and constrains behaviour, but behaviour also leads to changes in the environment. The impacts of a project on people can only be truly understood if their environmental context is understood. The baseline description of the social environment will include a description of the area within a provincial, district and local context that will focus on the identity and history of the area as well as a description of the population of the area based on a number of demographic, social and economic variables. **Table 15**, presents a summary of the socio-economic aspects that may be influenced by the proposed project

Table 15: Summary of the socio-economic aspects of the proposed project (IDPs for the Matjhabeng, Masilonyana, and Moqhaka Local Municipalities & Stats SA)

| Aspect | Matjhabeng Local Municipality | Masilonyana Local Municipality | Moqhaka Local Municipality |
|---|---|---|---|
| **District Municipality** | Lejweleputswa | Lejweleputswa | Fezile Dabi |
| **Province** | Free State | Free State | Free State |
| **Municipal Area Size** | 5155.46 km$^2$ | 6796.08 km$^2$ | 7925 km$^2$ |
| **Number of Wards** | 36 wards | 10 wards | 25 wards |
| **Social** | | | |
| **Population Size** | 406 461 individuals | 63 334individuals | 160 532 individuals |
| **Number of households** | 123 195 | 17 575 | 45 661 |
| **Estimated growth/change in population size from 2001** | 2.4% increase | Decline of 0.17% | Decline of 0.45% |
| **Population composition** | 89.48% individuals of the population are Black African, followed by 8.75% White, 1.42% Coloured, and 0.35% Indian or Asian. | 91.6% individuals of the population are Black African, followed by 6.66% White, 1.5% Coloured, 0.33% Indian or Asian, and 0.27% classified as Other. | 87.4% individuals of the population are Black African, followed by 9.4% White, 2.9% Coloured, and 0.3% Indian or Asian. |
| **Languages** | Sesotho – 64.0%.<br>IsiXhosa – 12.3%.<br>Afrikaans – 12.3%.<br>English – 3.6%.<br>Other – 7.8%. | Sesotho – 66.9%.<br>IsiXhosa – 10.8%.<br>Afrikaans – 9.6%.<br>Setswana – 6.9%.<br>Other – 5.8%. | Sesotho – 74.6%.<br>Afrikaans – 13.6%<br>IsiXhosa – 3.9%.<br>English – 2.5%<br>Other – 5.4% |
| **Gender** | They are slightly more females than males as 50.42% of the population are females, and the remaining 49.58% are males. | There are slightly more males (50.46%) than females (49.54%). | The sex ratio in the Census 2001 results was 99.2, and as of the Census 2011 the ratio is 98.1. In general, there are slightly more females than males especially for age groups above 40 years old. |
| **Land use** | The following land uses occur currently in this municipality:<br>Business, cemetery, education, government, industrial, parks and residential. | The region accommodates predominantly agricultural related activities, land use in the area comprises of commercial agriculture (59%), Residential (10%), Unspecified (38%) and Conservation area (3%). A significant portion of the area is under dry land cultivation. The following irrigation schemes do however exist that enables intensive farming: | |

| Aspect | Matjhabeng Local Municipality | Masilonyana Local Municipality | Moqhaka Local Municipality |
|---|---|---|---|
| | | • The sand-vet scheme below the Erfenis and Allemanskraal Dams; ad<br>• Irrigation along the Modder River. | |
| **Housing** | Formal dwellings numbers were 56.8% in Census 2001, and the number increased to 78.5% in Census 2011.<br><br>Housing owned/paying off was 51.4% in Census 2001and this has increased to 58.5% in Census 2011. | Although the Municipality has continued to provide housing opportunities to the people, it must be mentioned that the number of people who qualify for housing subsidy, is growing on daily basis, especially because the masses of the people continue to migrate to the area in search of employment opportunities.<br><br>In the spirit of intergovernmental relations and line with Intergovernmental Relations Act, the Municipality is working closely with the Department of Human Settlements as well as the Department of Agriculture and Rural Department; to solicit land for housing development.<br><br>Middle income housing is one area that has been neglected for so long. The Municipality will continue to play an enabling environment with aim of addressing the middle income housing backlog. | Formal dwellings numbers have increased from 82.5% in Census 2001 to 88.7% in Census 2011.<br><br>Housing owned/paying off – Census 2001 indicated 61.4% and this has decreased to 56.1% according to the Census 2011 results. |
| **Access to water** | Water infrastructure consists mostly of reservoirs (18) and 99 Km of bulk pipelines of Sedibeng Water, 29 pump stations, 1 water treatment plant and 12 waste water treatment plant. Sedibeng Water is the water service provider in terms of Water Service Act, and supply mainly the Goldfields region and the mines with water from the Vaal River, Bulkfontein near Bothaville and to a lesser extent from the Sand River.<br><br>Main reservoirs are east of Allanridge, in Welkom, north and south of Virginia. Pump stations are east of Allanridge and at Virginia where purification plant exist. Other water infrastructure resources were constructed by the DWS including dams in Allemanskraal and canals serving the Sand – Vet irrigation scheme. | Census 2011 results show a significant decline of piped water to dwelling as compared to 78.7 % in Census 2001. | There are 45 661 households in the municipality, with an average household size of 3.2 persons per household.<br><br>57.7% of households have access to piped water either in their dwelling or in the yard. Only 1% of households do not have access to piped water.<br><br>Access to piped water inside dwelling was 28.4% in Census 2001 results, and 57.7% in Census 2011. |
| **Sanitation facilities** | The second generation of democratic local government was mandated to among others to improve levels of sanitation and eradicate bucket | The Census results also indicate an increase of access to sanitation by 70.5% as compared to 23.4% in Census 2001. | Flush toilet connected to sewerage – was 65.6% in Census 2001, and 85.6% in Census 2011. |

| Aspect | Matjhabeng Local Municipality | Masilonyana Local Municipality | Moqhaka Local Municipality |
|---|---|---|---|
| | system as form of sanitation. In this regard this mandates were fulfilled. However, challenges were identified, among others were poor project planning, execution and reporting. This has led to a particular number of households still not able to use proper sanitation thus reverting back to old system.<br><br>The other challenge that came with expansion of service has been the capacity of waste water treatment plants and pump stations. As indicated above there are 12 treatment plants and all of them require major upgrade and refurbishment. | | |
| **Energy** | The bulk electrical network is well established around the Matjhabeng area. Eskom serves all mines and all townships in the municipal area and thus there is sufficient bulk infrastructure available to serve the whole area. Main challenge however remains an aging electrical infrastructure in particular in towns where the municipality is provider.<br><br>A change in cost recovery and their subsidisation policy has made it very expensive to electrify the rural areas, and these include farms and farming communities who need such basic power support.<br><br>The municipality is overly dependent on electricity as a source of energy for lighting, cooking and heating. In fact, the statistics reflect an increase of electricity as energy source in that the use electricity for lighting has increased from 84.98 to 8702; for cooking from 60% to 80%; and heating from 54% to 57%. | According to Census 2011, electricity provision has increased significantly by 93.2% compared to Census 2001 figures. | Electricity for lighting – was 83.8% in Census 2001 and has increased to 93.3% in Census 2011. |
| **Economic** | | | |
| **Percentage unemployment** | The number of unemployed residents in Matjhabeng has marginally decreased since 2001.<br><br>However, Matjhabeng still has the worst unemployment rate within the District at 42.0%, which is also above the provincial rate. | General and youth unemployment trends in the municipality show a 3.3 % decline of overall unemployment rate between Census 2001 and 2011 respectively. Similarly, results show a minimal decline of 4.6 % of youth unemployment during the same period. However, unemployment remains a serious challenge in the municipality. | Overall unemployment rate is 35.2%; and youth the unemployment rate is 47.2%.<br><br>Employment opportunities mainly created in Kroonstad as a continuous growth point, whilst |

| Aspect | Matjhabeng Local Municipality | Masilonyana Local Municipality | Moqhaka Local Municipality |
|---|---|---|---|
| | | | opportunities in the other smaller towns, remain limited and agricultural orientated. |
| **Largest Employing sector** | The district of Mangaung is the biggest employer in the province, employing 30% of the people employed in the province; this is in line with its 31% contribution to provincial GDP. The biggest regional economy is within the Fezile Dabi District, with a GDP share of around 35%, only employs 19% of the employed in the province, although its share has increased from only 15% in 2002. As is the case with the ranking in terms of GDP, Lejweleputswa (24%), and Thabo Mofutsanyane (22%) hold the third and fourth positions respectively in terms of employment share. | | |
| **Largest economic contribution** | The current statistics shows that the economies of Welkom 53%, Odendaalsrus 38%, and Virginia 78% are dominated by mining, whilst Hennenman is dominated by manufacturing 41%, agriculture 17%, trade 10%, and finance 10%.<br><br>The total area percentages show a combined figure of 58% dominance by the mining sector.<br><br>The biggest sectors in the district in 2012 were:<br>• Mining (42.9%);<br>• Community services (20.4%); and<br>• Trade (11.7%).<br><br>Matjhabeng has a relatively large economy with a production value of almost R27 billion (current prices 2011). The mining sector is by far the largest sectoral contributor. | The agricultural sector of certain areas in the district is extremely prominent and contributes largely to the GDP of the Lejweleputswa District, which emphasize the agricultural significance of this district. The latter results to industrial development that is agricultural orientated. The Municipal area has a significant weekend related tourism potential that could, in future, contribute to the GDP of the district and should be further exploited. Brick Making projects in Masilo, Tshepong (Verkeerdevlei) and resuscitating the same project in Makeleketla (Winburg). Transportation modes the residents use mostly consist of private vehicles buses, minibuses/ taxis, bicycles, motorcycles and non-motorized transport; walking is also common. | The Greater Kroonstad is the centre of a large agriculture community that plays an important role in the economy of the district. Industrial activities subsequently contribute significantly to the district's economy. |
| **Tourist attractions/ heritage resources** | There is one formal land-based protected area in the municipality, being the Willem Pretorius Nature Reserve. | Brandfort is also known for its rich political history, which includes the National Military Museum on a farm that used to be a concentration camp during the Anglo-Boer War and the Winnie Mandela House, where Mandela was sentenced to House Arrest during the State of Emergency in the 1980s.<br><br>Winburg prides itself with the Voortrekker Monument as its Heritage Site, and Masilonyana boasts several game reserves across all its towns (e.g. Erfenis Dam Nature Reserve and Soetdoring Nature Reserve). | Kroonstad has of late become a distinguished holiday destination due to the ultra-modern and popular holiday resort of Kroonpark, adjacent to the Vals River.<br><br>The hunting and guesthouse industries displayed an exceedingly rapid growth the past few years. |

## 4.8. ARCHAEOLOGICAL AND CULTURAL HERITAGE

The objective of the National Heritage Resources Act, 1999 (Act No. 25 of 1999) is to introduce an integrated system for the management of national heritage resources. The Act defines a 'heritage resource' as any place or object of cultural significance (aesthetic, architectural, historical, scientific, social, spiritual, linguistic, or technological value or significance). The identification, evaluation and assessment of any cultural heritage site, artefact or find in South Africa is required by this Act. This section of the report presents the heritage status of the proposed Motuoane Exploration area project. According to the Heritage Impact Assessment (PGS Heritage, 2024), a total of eleven heritage features and resources were identified (**Figure 25 to Figure 27**). These consist of five burial grounds (MH001, MH003, MH007, MH010 and MH011), three foundation remains (MH002, MH006 and MH009) of stone-built structures or homestead, one midden (MH004), one kraal (MH008) and one grinding stone (MH005). The detailed site descriptions as contained in the Heritage Impact Assessment Report (**Appendix C1**: Approved Public Participation Plan

Appendix C2: Pre-Application Correspondence

Appendix C3: Initial Notification and Proof

Appendix C4: Site Notices

Appendix C5: Newspaper Adverts

Appendix C6: Report Availability Notification and Proof

Appendix C7: Public Meeting Document

Appendix C8: Interested and Affected Parties Database

Appendix C9: Table of Correspondence

Appendix C10: Correspondence Proof

Appendix D).

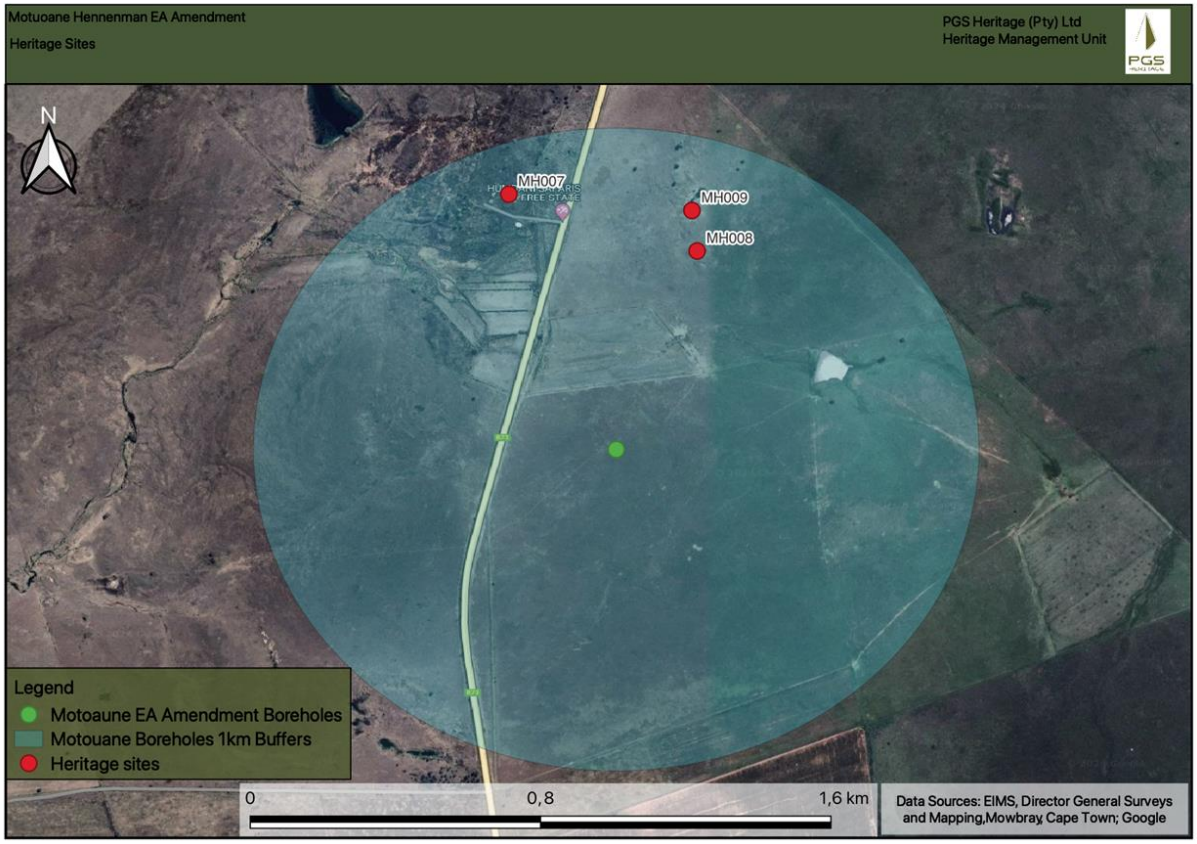


Figure 25: Identified heritage resources within the far section (PGS Heritage, 2024).

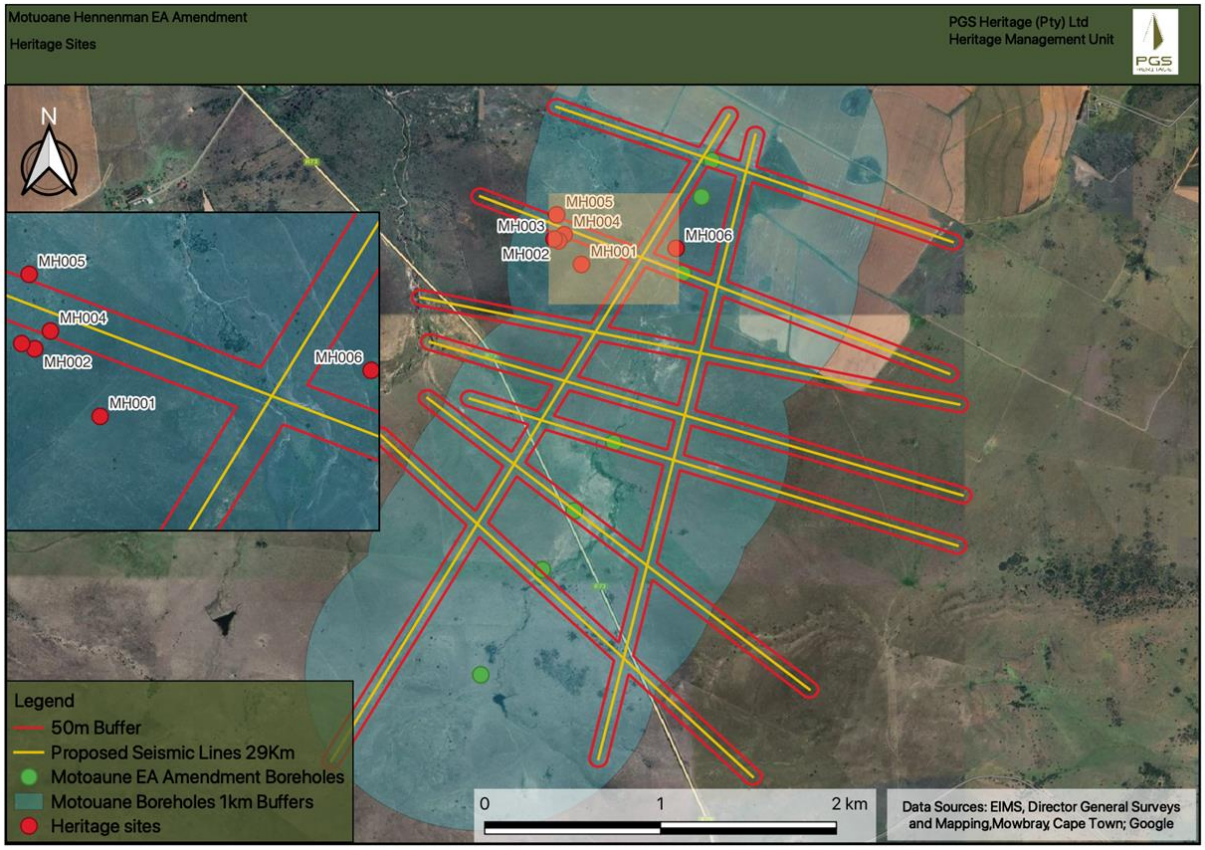

Figure 26: Identified heritage resources within the south-central section (PGS Heritage, 2024).


Figure 27: Identified heritage resources within the far north section (PGS Heritage, 2024).

The stone-built remains of structure MH002 and MH006 is possibly related to the depicted structures on the 1945 maps and most likely older than 60 years. The structure remains themselves are not conservation worthy. However, it is associated with an earlier 20th century farm worker settlement and the possibility of stillborn burials around the structures must be considered. As per African custom stillborn children are buried against the outside wall/foundation or inside the house. The structures (MH002, MH006 and MH009) must then provisionally grade as Grade IIIA. The kraal at MH008 in not depicted on the first edition maps and is not considered conservation worthy. The historical midden and griding stone. Middens could contain still born burials and therefore provisionally graded as Grade IIIA. The grinding stone is not conservation-worthy.

Five burial grounds were located. MH001 (approximately 15-18 graves), MH003 (approximately 2 graves), MH007 (approximately 4 graves), MH010 (approximately 1 grave, possibly more), and MH011 (approximately 1 grave, possibly more). **All burial grounds and graves should be retained and avoided with a buffer zone of 30m as per SAHRA guidelines. If this is not possible, the graves could be relocated after completion of a detailed grave relocation process, that includes a thorough stakeholder engagement component, adhering to the requirements of s36 of the NHRA and its regulations as well as the National Health Act and its regulations**. Due to the cultural and religious significance of burial grounds, the sites have a high heritage significance and graded as Grade IIIA. Some of the identified heritage features are presented in **Figure 28 to Figure 31**.

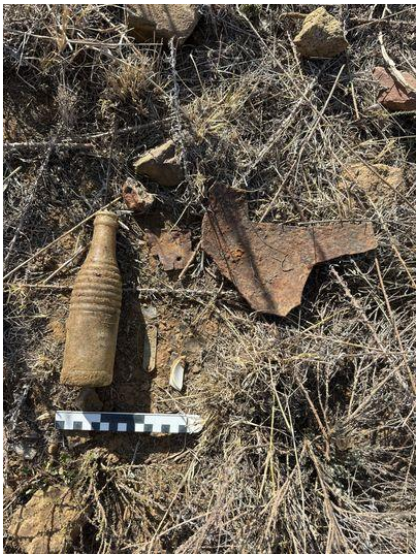

Figure 28: Midden at MH004 (PGS Heritage, 2024).

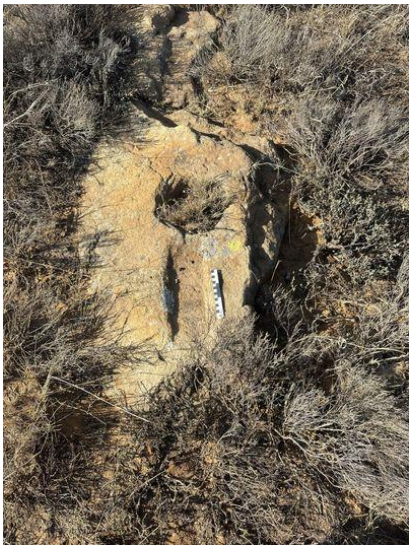

Figure 29: Grinding stone at MH005 (PGS Heritage, 2024).

Figure 30: Burial ground at MH010 (PGS Heritage, 2024)

Figure 31: Burial ground at MH007 (PGS Heritage, 2024)

## 4.9. PALAEONTOLOGY

Cultural Heritage in South Africa, including all heritage resources, is protected by the National Heritage Resources Act (Act 25 of 1999) (NHRA). Heritage resources as defined in Section 3 of the Act include "all objects recovered from the soil or waters of South Africa, including archaeological and **palaeontological objects** and material, meteorites and rare geological specimens". Palaeontological heritage is exceptional and non-renewable and is protected by the NHRA. Palaeontological resources and may not be unearthed, broken moved, or destroyed by any development without prior assessment and without a permit from the relevant heritage resources authority as per section 35 of the NHRA.

A Palaeontological Impact Assessment was undertaken Banzai Environmental in September 2023 (**Appendix C1**: Approved Public Participation Plan

Appendix C2: Pre-Application Correspondence

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Appendix D). According to the study, the study area is underlain by Quaternary deposits, while the largest portion of the development is underlain by the Adelaide Subgroup (Beaufort Group, Karoo Supergroup). Jurassic dolerite is present in the southern portion of the development. The PalaeoMap of the South African Heritage Resources Information System (SAHRIS) as indicated in **Figure 32** depicts that the Palaeontological Sensitivity of Quaternary sediments is Moderate, that of the Adelaide Subgroup is Very High while the Palaeontological Sensitivity of Jurassic dolerite is Zero as it is igneous in origin and thus unfossiliferous. The Palaeontological Sensitivity generated by the DFFE Screening Tool indicates that the Sensitivity of the proposed development is Very High. Updated Geology (Council of Geosciences) indicates that the proposed development is underlain by alluvium, colluvium, eluvium and gravel as well as the Balfour Formation (Groenewald et al., 2014).


Figure 32: Extract of the SAHRIS PalaeoMap map (Banzai Environmental, 2023).

A site-specific field survey of the development footprint was conducted in September 2023. No fossiliferous outcrop was detected in the proposed development. This could be attributed to the lack of outcrops as well as the lush grassy vegetation in the area. Based on the site investigation as well as desktop research it is concluded that fossil heritage of scientific and conservational interest in the development footprint is rare. This is in contrast with the High Sensitivity allocated to the development area by the SAHRIS Palaeosensitivity Map and DFFE Screening Tool. A medium Palaeontological Significance has been allocated for the construction, operational and decommissioning phases of the development.

# 5. IMPACT ASSESSMENT

This section identifies, describes, and assesses the primary impacts associated with the proposed amendment.

## 5.1. IDENTIFICATION OF IMPACTS

Potential environmental impacts associated with the proposed amendments were identified. These impacts were identified by the EAP through literature reviews of the project description, existing EIR (EIMS, 2017), specialist studies and site visit by the EAP conducted in April 2024. The impacts were identified and assessed with specific focus on the planned amendments and with due consideration of the fact that the amendments are effectively extensions to activities previously assessed and approved as part of the current environmental authorisation.

**It must be noted that the EIA Report (EIMS, 2017), identified and assessed comprehensive impacts across the approved broader exploration right footprint. The potential main impacts associated with the proposed amendment activities are not necessarily new, they were identified and assessed in the EIR Report, but the following identified impacts are a site-specific incorporation for the proposed 10 drilling sites and 9 seismic transects areas and form part of the all-inclusive identified impacts for the exploration right**:

- Impacts related to nuisance on sense of place;
- Impacts on existing services and infrastructure;
- Impacts on air quality / greenhouse gas emissions
- Impacts on interference with existing land uses
- Impacts on landownership and displacement of landowners and livestock;
- Impacts on soils potential and agricultural activities;
- Impacts on soil erosion and sedimentation;
- Impacts on indigenous vegetation;
- Impacts on natural habitat;
- Impacts on micro-organisms;
- Impacts on faunal species;
- Impacts on floral species;
- Impacts on cultural heritage features;
- Impacts on palaeontological heritage features;
- Impacts on surface water;
- Impacts on groundwater;
- Impacts on noise impacts;
- Impacts on traffic and damage to road infrastructure;
- Impacts on health and safety of the community; and
- Impacts on socio-economic dynamics.

Without proper mitigation measures and continual environmental management, most of the identified impacts may potentially become cumulative, affecting areas outside of their originally identified zone of impact. The

potential cumulative impacts have been identified, evaluated, and mitigation measures suggested. When considering cumulative impacts, it is vitally important to bear in mind the scale at which different impacts occur. Groundwater acts as a vector for distribution of impacts such as contamination across a much wider area than the localised extent of the impact source. At a finer scale, there are also impacts that have the potential to result in a cumulative effect, although due to the smaller scale at which these operate, the significance of the cumulative impact is lower in the broader context.

## 5.2. IMPACT ASSESSMENT METHODOLOGY

The impact significance rating methodology, as provided by EIMS, is guided by the requirements of the NEMA EIA Regulations 2014 (as amended). The broad approach to the significance rating methodology is to determine the environmental risk (ER) by considering the consequence (C) of each impact (comprising Nature, Extent, Duration, Magnitude, and Reversibility) and relate this to the probability/ likelihood (P) of the impact occurring. This determines the environmental risk. In addition, other factors, including cumulative impacts and potential for irreplaceable loss of resources, are used to determine a prioritisation factor (PF) which is applied to the ER to determine the overall significance (S). The impact assessment is applied to all identified alternatives (where possible). Where possible, mitigation measures will be recommended for impacts identified.

### 5.2.1. DETERMINATION OF ENVIRONMENTAL RISK

The significance (S) of an impact is determined by applying a prioritisation factor (PF) to the environmental risk (ER). The environmental risk is dependent on the consequence (C) of the particular impact and the probability (P) of the impact occurring. Consequence is determined through the consideration of the Nature (N), Extent (E), Duration (D), Magnitude (M), and reversibility (R) applicable to the specific impact.

For the purpose of this methodology the consequence of the impact is represented by:

$$\boldsymbol{C = \frac{(E + D + M + R) * N}{4}}$$

Determination of Environmental Risk

Each individual aspect in the determination of the consequence is represented by a rating scale as defined in **Table 16** below.

Table 16: Criteria for Determining Impact Consequence.

| Aspect | Score | Definition |
|---|---|---|
| **Nature** | - 1 | Likely to result in a negative/ detrimental impact |
| | +1 | Likely to result in a positive/ beneficial impact |
| **Extent** | 1 | Activity (i.e. limited to the area applicable to the specific activity) |
| | 2 | Site (i.e. within the development property boundary), |
| | 3 | Local (i.e. the area within 5 km of the site), |
| | 4 | Regional (i.e. extends between 5 and 50 km from the site |
| | 5 | Provincial / National (i.e. extends beyond 50 km from the site) |
| **Duration** | 1 | Immediate (<1 year) |
| | 2 | Short term (1-5 years), |
| | 3 | Medium term (6-15 years), |
| | 4 | Long term (the impact will cease after the operational life span of the project), |

| Aspect | Score | Definition |
|---|---|---|
| | 5 | Permanent (no mitigation measure of natural process will reduce the impact after construction). |
| **Magnitude/ Intensity** | 1 | Minor (where the impact affects the environment in such a way that natural, cultural and social functions and processes are not affected), |
| | 2 | Low (where the impact affects the environment in such a way that natural, cultural and social functions and processes are slightly affected), |
| | 3 | Moderate (where the affected environment is altered but natural, cultural and social functions and processes continue albeit in a modified way), |
| | 4 | High (where natural, cultural or social functions or processes are altered to the extent that it will temporarily cease), or |
| | 5 | Very high / don't know (where natural, cultural or social functions or processes are altered to the extent that it will permanently cease). |
| **Reversibility** | 1 | Impact is reversible without any time and cost. |
| | 2 | Impact is reversible without incurring significant time and cost. |
| | 3 | Impact is reversible only by incurring significant time and cost. |
| | 4 | Impact is reversible only by incurring prohibitively high time and cost. |
| | 5 | Irreversible Impact |

Once the C has been determined the ER is determined in accordance with the standard risk assessment relationship by multiplying the C and the P. Probability is rated/ scored as per **Table 17**.

Table 17: Probability Scoring.

| | | |
|---|---|---|
| **Probability** | 1 | Improbable (the possibility of the impact materialising is very low as a result of design, historic experience, or implementation of adequate corrective actions; <25%), |
| | 2 | Low probability (there is a possibility that the impact will occur; >25% and <50%), |
| | 3 | Medium probability (the impact may occur; >50% and <75%), |
| | 4 | High probability (it is most likely that the impact will occur- > 75% probability), or |
| | 5 | Definite (the impact will occur), |

The result is a qualitative representation of relative ER associated with the impact. ER is therefore calculated as follows:

**ER= C x P**

Table 18: Determination of Environmental Risk.

| | | | | | | |
|---|---|---|---|---|---|---|
| **Consequence** | 5 | 5 | 10 | 15 | 20 | 25 |
| | 4 | 4 | 8 | 12 | 16 | 20 |
| | 3 | 3 | 6 | 9 | 12 | 15 |
| | 2 | 2 | 4 | 6 | 8 | 10 |
| | 1 | 1 | 2 | 3 | 4 | 5 |

| | | 1 | 2 | 3 | 4 | 5 |
|---|---|---|---|---|---|---|
| | **Probability** | | | | | |

The outcome of the environmental risk assessment will result in a range of scores, ranging from 1 through to 25. These ER scores are then grouped into respective classes as described in **Table 19**.

Table 19: Significance Classes.

| **Environmental Risk Score** | |
|---|---|
| **Value** | Description |
| **< 9** | Low (i.e. where this impact is unlikely to be a significant environmental risk). |
| **≥9 - <17** | Medium (i.e. where the impact could have a significant environmental risk), |
| **≥17** | High (i.e. where the impact will have a significant environmental risk). |

The impact ER will be determined for each impact without relevant management and mitigation measures (pre-mitigation), as well as post implementation of relevant management and mitigation measures (post-mitigation). This allows for a prediction in the degree to which the impact can be managed/mitigated.

### 5.2.2. IMPACT PRIORITISATION

Further to the assessment criteria presented in the section above, it is necessary to assess each potentially significant impact in terms of:

1. Cumulative impacts; and
2. The degree to which the impact may cause irreplaceable loss of resources.

To ensure that these factors are considered, an impact prioritisation factor (PF) will be applied to each impact ER (post-mitigation). This prioritisation factor does not aim to detract from the risk ratings but rather to focus the attention of the decision-making authority on the higher priority/significance issues and impacts. The PF will be applied to the ER score based on the assumption that relevant suggested management/mitigation impacts are implemented.

Table 20: Criteria for Determining Prioritisation.

| | | |
|---|---|---|
| **Cumulative Impact (CI)** | Low (1) | Considering the potential incremental, interactive, sequential, and synergistic cumulative impacts, it is unlikely that the impact will result in spatial and temporal cumulative change. |
| | Medium (2) | Considering the potential incremental, interactive, sequential, and synergistic cumulative impacts, it is probable that the impact will result in spatial and temporal cumulative change. |
| | High (3) | Considering the potential incremental, interactive, sequential, and synergistic cumulative impacts, it is highly probable/ definite that the impact will result in spatial and temporal cumulative change. |
| **Irreplaceable Loss of Resources (LR)** | Low (1) | Where the impact is unlikely to result in irreplaceable loss of resources. |
| | Medium (2) | Where the impact may result in the irreplaceable loss (cannot be replaced or substituted) of resources but the value (services and/or functions) of these resources is limited. |
| | High (3) | Where the impact may result in the irreplaceable loss of resources of high value (services and/or functions). |

The value for the final impact priority is represented as a single consolidated priority, determined as the sum of each individual criteria represented in **Table 20**. The impact priority is therefore determined as follows:

**Priority = CI + LR**

The result is a priority score which ranges from 3 to 9 and a consequent PF ranging from 1 to 1.5 (Refer to **Table 21**).

Table 21: Determination of Prioritisation Factor.

| Priority | Ranking | Prioritisation Factor |
|---|---|---|
| **2** | Low | **1** |
| **3** | Medium | **1.125** |
| **4** | Medium | **1.25** |
| **5** | Medium | **1.375** |
| **6** | High | **1.5** |

In order to determine the final impact significance, the PF is multiplied by the ER of the post mitigation scoring. The ultimate aim of the PF is an attempt to increase the post mitigation environmental risk rating by a full ranking class, if all the priority attributes are high (i.e. if an impact comes out with a medium environmental risk after the conventional impact rating, but there is significant cumulative impact potential and significant potential for irreplaceable loss of resources, then the net result would be to upscale the impact to a high significance).

Table 22: Final Environmental Significance Rating.

| Significance Rating | Description |
|---|---|
| <-17 | High negative (i.e. where the impact must have an influence on the decision process to develop in the area). |
| ≥-17, ≤-9 | Medium negative (i.e. where the impact could influence the decision to develop in the area). |
| >-9, < 0 | Low negative (i.e. where this impact would not have a direct influence on the decision to develop in the area). |
| 0 | No impact |
| >0, <9 | Low positive (i.e. where this impact would not have a direct influence on the decision to develop in the area). |
| ≥9, ≤17 | Medium positive (i.e. where the impact could influence the decision to develop in the area). |
| >17 | High positive (i.e. where the impact must have an influence on the decision process to develop in the area). |

The significance ratings and additional considerations applied to each impact will be used to provide a quantitative comparative assessment of the alternatives being considered. In addition, professional expertise and opinion of the specialists and the environmental consultants will be applied to provide a qualitative comparison of the alternatives under consideration. This process will identify the best alternative for the proposed project. **The EIA impact assessment matrix (including pre- and post-mitigation assessment) is included in Appendix F.**

## 5.3. ASSESSMENT AND EVALUATION OF POTENTIAL PROJECT IMPACTS

This section presents the potential impacts that have been identified during the course of this EIA in 2017 through input from the public, the initial specialist assessments as well as current environmental status quo, proposed amendment activities and specialist studies. The potential impacts relating to the construction and exploration phase, the closure and decommissioning phase as well as the rehabilitation phase, have been separated for ease of reference. Refer to **Appendix F** for a detailed full scoring for each of the assessed impacts, as discussed in this Section. It must be noted that the EIA Report (EIMS, 2027), identified and assessed comprehensive impacts across the approved broader exploration right footprint. The potential main impacts associated with the proposed amendment activities (seismic surveys and additional 10 wells) are not necessarily new, they were identified and assessed in the EIR Report, but these identified impacts are a site-specific incorporation to the all-inclusive identified impacts.

### 5.3.1. INTERFERENCE WITH EXISTING LAND USES / ACTIVITIES

#### A. DESCRIPTION OF IMPACT

The proposed site for the exploration comprises large areas of cultivation and historical mining activities. The dominant farming activities are livestock and mixed farming. Livestock farming dominates agricultural activity with sheep and cattle being the main livestock bred. Existing land uses may be affected by the proposed drilling and seismic activities.

i. Impact from Drilling Activities

The drill rig and supporting machinery may require new access roads and the establishment of drilling pads within largely farming areas which may cause an interference with the existing land uses. In addition, although exploration drilling plays a crucial role in the mining industry as it helps identify and assess potential mineral deposits. However, it can also come with its own set of challenges on existing mining operations. The drilling activity can penetrate a mine shaft destabilizing the shaft and/or affect mining operations. The impact ratings associated with the proposed drilling activities related to interference with existing land uses are indicated in **Table 23**.

ii. Impact from Seismic Activities

The Vibroseis truck may need access across boundary fences used for grazing or game which may be affected if access gates are left open. The seismic transects may also overlap with farming grounds which may result in temporary loss and/impact on agricultural fields and production. The impact ratings associated with the proposed seismic activities related to interference with existing land uses are indicated in **Table 23.**

#### B. IMPACT RATING

Table 23: Summary of impacts related to interference with existing land uses.

| Project Phase | Nature of Impact | Significance Without Mitigation | Significance With Mitigation | Final Significance Score |
|---|---|---|---|---|
| Construction / Exploration | Negative | Low Negative | Low Negative | Low Negative |
| Decommissioning | Negative | Low Negative | Low Negative | Low Negative |
| Cumulative | Negative | Low Negative | Low Negative | Low Negative |

#### C. CUMULATIVE IMPACT

The proposed activities are not intensive in nature and do not require a large footprint and are of short duration. The seismic surveys are expected to last for a couple of weeks and the drilling activities to be completed within months, therefore the period of activities is also reduced. It must also be noted that in the event that a Vibroseis truck is used, it will be equipped with very wide, low-pressure tires and will not leave ruts. There is also a chance of using an alternative method of a portable weight drop method, which is much smaller than the Vibroseis truck

and has lesser impacts. In addition, the activities are largely located on low-laying grassland. Although there were no identified surface mining activities or evidence of underground mining in the study area, it does not indicate the lack of active unground mining. However, it is unlikely that the drilling activities will intercept a mine shaft and therefore pose low risks to mining activities. Therefore, the cumulative impact of proposed activities on existing land uses is low.

**D. PROPOSED MITIGATIONS**

The proposed mitigation measures to avoid adverse impacts on existing land uses due to proposed activities are provided below.

i. Existing approved relevant management and mitigation measures (**Appendix E** Table 6 Item 6.2):

- Prior to accessing any portion of land, the Applicant must enter into formal written agreements with the affected landowner. This formal agreement should additionally stipulate landowners special conditions which would form a legally binding agreement;
- Landowners must be notified beforehand of the activities to be undertaken in their properties and requested to indicate the type and location of services within their properties;
- There must be a formal procedure in place on how to report incidents to ensure records of all grievances are kept, and responses are given within a certain time; and

ii. New relevant management and mitigation measure (**Appendix E** Table 6 Item 6.2):

- Before the project commences, an asset and services baseline of services that may be affected within 50 m of the exploration area must be compiled. A copy of the baseline records should be given to each landowner/ service provider, and a master document kept by the applicant;
- Underground mining companies (if any) within the identified drilling locations must be engaged during the planning phase to ensure the drilling activities do not interfere with underground mining activities.

## 5.3.2. IMPACT ON EXISTING SERVICES / INFRASTRUCTURE

**A. DESCRIPTION OF IMPACT**

i. Impact from Drilling Activities

Drilling operations have the potential to disrupt or damage services such as water supply or sewage collection pipes if not situated correctly within the study area. Activities associated with drilling may also impact on existing infrastructure such as increased traffic on the adjacent road network, damage to fences and other local infrastructure from the drilling machinery and movement from one drill site to the other. The impact ratings associated with the proposed drilling activities related to existing services and/or infrastructure are indicated in **Table 24**.

ii. Impact from Seismic Activities

Activities associated with seismic survey may also impact on existing infrastructure such as increased traffic on the adjacent road network, damage to fences and other local infrastructure from the surveying machinery and movement from one transect site to the other. The impact ratings associated with the proposed seismic survey activities related to existing services and/or infrastructure are indicated in **Table 24**.

**B. IMPACT RATING**

Table 24: Summary of impacts related to existing services and/or infrastructure.

| Project Phase | Nature of Impact | Significance Without Mitigation | Significance With Mitigation | Final Significance Score |
|---|---|---|---|---|
| Construction / Exploration | Negative | Low Negative | Low Negative | Low Negative |

| | | | | |
|---|---|---|---|---|
| Decommissioning | Negative | Low Negative | Low Negative | Low Negative |
| Cumulative | Negative | Low Negative | Low Negative | Low Negative |

**C. CUMULATIVE IMPACT**

The study area is generally a rural area in nature with minimal existing services and infrastructure noted during the site visit. The properties are fenced using galvanized wire with a few farmhouses forming part of the buildings in the area. Boreholes were noted to be the main potable water source while there were noticeable high voltage and low voltage Eskom powerlines proving electricity as some of the observed services and infrastructure. There is overall low presence of infrastructure and services in the area and the proposed activities are less likely to impact on the services and infrastructure provided mitigation measures are implemented.

**D. PROPOSED MITIGATIONS**

The proposed mitigation measures to avoid adverse impacts on existing services / infrastructure due to proposed activities are provided below.

i. Existing approved relevant management and mitigation measure (**Appendix E** Table 6 Item 6.2):

- If any damage occurs to services / infrastructure, the applicant will be liable to fix it to its original state.

ii. New relevant management and mitigation measure (**Appendix E** Table 6 Item 6.2):

- The Developer shall inform all landowners of the commencement of construction activities at least 30 days before commencement. Landowners must be requested to indicate the type and location of services within their properties;
- Before the project commences, an asset and services baseline of services that may be affected within 10m of the centreline of the seismic transect and 10m from the edge of drilling point must be compiled. A copy of the baseline records should be given to each landowner/ service provider, and a master document kept by the applicant; and
- A services impact and interruption plan must be developed for sites which intersect existing services in order to minimise and manage potential interruptions should they occur due to an incident. Notice of planned service interruptions (if any) must be given at least 2 days before the interruption takes place and must be as short as reasonably possible – an SMS or e-mail system can be used for this purpose.

## 5.3.3. IMPACTS ON TEMPORARY DISPLACEMENT OF LANDOWNERS AND LIVESTOCK

**A. DESCRIPTION OF IMPACTS**

i. Impact from Drilling Activities

The proposed activities are located across various farms owned by different landowners. There may be a need to temporary displace the current landowners and/or their livestock so that the proposed drilling activities may be undertaken. The impact ratings associated with the proposed drilling activities related to landownership and displacement of livestock are indicated in **Table 25**.

ii. Impact from Seismic Activities

The proposed activities are located across various farms owned by different landowners. There may be a need to temporary displace the current landowners and/or their livestock so that the proposed seismic activities may be undertaken. The impact ratings associated with the proposed seismic activities related to landownership and displacement of livestock are indicated in **Table 25**.

**B. IMPACT RATINGS**

Table 25: Summary of impacts related to landownership and displacement of livestock.

| Project Phase | Nature of Impact | Significance Without Mitigation | Significance With Mitigation | Final Significance Score |
|---|---|---|---|---|
| Construction / Exploration | Negative | Low Negative | Low Negative | Low Negative |
| Decommissioning | Negative | Low Negative | Low Negative | Low Negative |
| Cumulative | Negative | Low Negative | Low Negative | Low Negative |

**C. CUMULATIVE IMPACT**

The temporary displacement of the current landowners and/or their livestock so that the proposed exploration activities may be undertaken would result in more agricultural land lost and reduce the livestock and the farming community's enablement to sustain themselves. However, at present this impact is not anticipated and is considered improbable. Negotiations with affected landowners have previously been undertaken and are currently ongoing with the current authorised exploration activities and these will continue for the amendment activities. Therefore, this impact is considered low negative overall.

**D. PROPOSED MITIGATIONS**

The proposed mitigation measures to avoid adverse impacts on landownership and displacement of livestock due to the proposed activities are provided below.

i. Existing approved relevant management and mitigation measure (**Appendix E** Table 6 Item 6.2):

- Ensure that all affected landowners are identified, and relevant information is provided to the landowners during the application phase;
- Prior to accessing any portion of land, the Applicant must enter into formal written agreements with the affected landowner. This formal agreement should additionally stipulate landowner's special conditions which would form a legally binding agreement; and
- Negotiations with affected landowners must be undertaken and any loss of revenue caused by the exploration works must be reasonably compensated.

ii. New relevant management and mitigation measure:

- None.

## 5.3.4. NUISANCE AND IMPACT ON SENSE OF PLACE

**A. DESCRIPTION OF IMPACT**

i. Impact from Drilling Activities

The proposed drilling activities will impact on the established sense of place of a particular property. The character of the area would change due to the drilling activities being undertaken on that particular place. Additional vehicles, increased noise and dust, the removal of vegetation for drilling well site/s, and potential influx of workers will all contribute to the alteration of the sense of place. The impact ratings associated with the proposed drilling activities related to nuisance on sense of place are indicated in **Table 26**.

ii. Impact from Seismic Activities

The proposed seismic activities will impact on the established sense of place of a particular property. The character of the area would change due to the seismic activities being undertaken on that particular place. Additional vehicles including Vibroseis truck, increased noise and dust, the potential removal of vegetation along the seismic transect, and potential influx of workers will all contribute to the alteration of the sense of place.

The impact ratings associated with the proposed seismic survey activities related to nuisance on sense of place are indicated in **Table 26**.

**B. IMPACT RATING**

Table 26: Summary of impacts related to nuisance on sense of place.

| Project Phase | Nature of Impact | Significance Without Mitigation | Significance With Mitigation | Final Significance Score |
|---|---|---|---|---|
| Construction / Exploration | Negative | Low Negative | Low Negative | Low Negative |
| Decommissioning | Negative | Low Negative | Low Negative | Low Negative |
| Cumulative | Negative | Low Negative | Low Negative | Low Negative |

**C. CUMULATIVE IMPACT**

The study area is generally a rural area in nature. It can be described as an open swath of land that has few homes or other buildings, and not very many people with very low population density. The area consists of minimal activities that are nuisance and have an impact on sense place. With the proposed exploration activities, minimal changes to the current sense of place is anticipated and low cumulative impact is expected.

**D. PROPOSED MITIGATIONS**

The proposed mitigation measures to avoid adverse impacts on sense of place due to proposed activities are provided below.

i. Existing approved relevant management and mitigation measure (**Appendix E** Table 6):

- Rehabilitation of the disturbed areas must be made a priority. Any disturbed area must be re-habilitated to its pre-disturbed state. Any disturbed area must be re-habilitated to its pre-disturbed state as defined in the pre-drill survey. Disturbed areas must be rehabilitated to support its post-closure land use, and this must be undertaken within six (6) months post drilling activities;
- All construction/operational and access must make use of the existing roads;
- Noise producing activities should be limited to day-time after 07h00 and 17h00 on week days; and
- Adequate dust suppression measures should be utilized to minimize dust production.

ii. New relevant management and mitigation measure (**Appendix E** Table 6 Item 6.1):

- The duration of the construction should be minimized to as short term as possible, to reduce the period of disturbance on the area; and
- Areas outside the direct project footprint, should under no circumstances be disturbed.

## 5.3.5. IMPACTS ON AIR QUALITY / GREENHOUSE GAS EMISSIONS

**A. DESCRIPTION OF IMPACT**

During the original EA Application (EIMS, 2017), there were concerns raised by the public over the possibility of greenhouse gas releases during the exploratory drilling as well as during the decommissioning phase. The MPRDA regulations provide for stringent measures to be included during the drilling and decommissioning phases which measures have been stipulated in the EMPr.

i. Impact from Drilling Activities

Different types of gases can be encountered while drilling, depending on the type and depth of the well being drilled. Some common gases encountered during drilling operations include Hydrocarbons Gases, Oil and

condensate gases, Carbon dioxide ($CO_2$), Helium (He), etc. Although the oil and gas industry may release large amounts of methane, a potent greenhouse gas, either by accident or design. Equipment and operational techniques can be applied across production chains to significantly reduce these emissions, and because methane (natural gas) is a valuable commodity, this can often be done at no cost or even at a profit. In addition, the release of methane is mainly during the production phase, while the current project is only exploration. Therefore, the potential short-term releases of greenhouse gasses from drilling activities arising from the drill rig, support machinery and vehicles are not anticipated to significantly impact on the regional or global greenhouse gas emissions and as such this impact is rated to have a low negative significance with mitigation. The impact ratings associated with the proposed drilling activities related to air quality and greenhouse gas emissions are indicated in **Table 27.**

ii. Impact from Seismic Activities

Hydrocarbon exploration and production activities, including seismic operations, emit greenhouse gases. However, GHG emission from seismic surveys are mainly offshore seismics from the large vessel and supporting vessel operations over a period of several months. While onshore seismic surveys have a short duration (weeks) and GHG are limited to the operation of the Vibroseis truck. Therefore, the potential short-term releases of greenhouse gasses are not anticipated to significantly impact on the regional or global greenhouse gas emissions and as such this impact is rated to have a low negative significance with mitigation. The impact ratings associated with the proposed seismic activities related to air quality and greenhouse gas emissions are indicated in **Table 27.**

**B. IMPACT RATING**

Table 27: Summary of impacts related to air quality and greenhouse gas emissions.

| Project Phase | Nature of Impact | Significance Without Mitigation | Significance With Mitigation | Final Significance Score |
|---|---|---|---|---|
| Construction / Exploration | Negative | Medium Negative | Low Negative | Low Negative |
| Decommissioning | Negative | Low Negative | Low Negative | Low Negative |
| Cumulative | Negative | Low Negative | Low Negative | Low Negative |

**C. CUMULATIVE IMPACT**

The area is known to have good hydrocarbon reserves which the current project aims to identify and quantify. There are also several existing hydrocarbon stations in the area which the proposed activities increase the number substantially. Collectively, these stations would increase gas emissions if they were leaking, however they are sealed with concrete and have pressure readings to identify potential leaks. Therefore, the addition of the 10 drilling wells will have minimal cumulative impact on air quality and greenhouse gas emissions considered that the mitigation measures are implemented.

**D. PROPOSED MITIGATIONS**

The proposed mitigation measures to avoid adverse impacts on air quality / greenhouse gas due to the proposed activities are provided below.

i. Existing approved relevant management and mitigation measure (**Appendix E** Table 6 Item 6.1 and 6.9):

- Limit air emissions as far as practically possible;
- Reduce to nuisance factor of dust to neighbouring residents;
- All drilling sites must be properly sealed to trap all gases from escaping;

- Implement dust suppression measures in all areas that will be affected by construction activities and where dust will be generated. Dust suppression must also be undertaken during windy and dry weather conditions; and

ii. New relevant management and mitigation measure (**Appendix E** Table 6 Item 6.1):

- Speed restriction of no more than 20 km/h must be implemented for all construction vehicles within the construction site;

## 5.3.6. IMPACTS ON SOILS AND AGRICULTURAL ACTIVITIES

### A. DESCRIPTION OF IMPACT

According to the land type database (Land Type Survey Staff, 1972 - 2006), the site is characterised by three different landtypes, these are Bd 20, Dc 8 and Dc12 land types. The Bd landtype consists of plinthic catena. Upland duplex and margalitic soils are rare and eutrophic and/or mesotrophic red soils are not widespread. The Dc land types is characterised with duplex, transitional young alluvial soil deposits with occasional red soils, some saturated profiles, shallow soils, and intrusive hard rocks. The proposed site for drilling comprises large areas of cultivation and historical mining activities. The dominant farming activities are livestock and mixed farming. Livestock farming dominates agricultural activity with sheep and cattle being the main livestock bred.

#### i. Impact from Drilling Activities

Existing land uses may be affected by the proposed activities and in particular during the drilling of the wells. The drill rig and supporting machinery may require new access roads and the establishment of drilling pads within largely farming areas which may affect the soils and agricultural activities. The geochemical and soil sampling activities are anticipated to have a low impact on existing soils and agricultural activities. The impact ratings associated with the proposed drilling activities related to soil potential and agricultural activities are indicated in **Table 28**.

#### ii. Impact from Seismic Activities

Existing land uses may be affected by the proposed exploration activities and in particular during the seismic surveys. The seismic transects may overlap with farming grounds which may result in temporary loss and/impact on soils agricultural fields and production. The seismic activities will have a short duration, use existing gravel roads as far as possible and are therefore anticipated to have a low impact on existing soils and agricultural activities. The impact ratings associated with the proposed exploration activities related to soil potential and agricultural activities are indicated in **Table 28**.

### B. IMPACT RATING

Table 28: Summary of impacts related to soil potential and agricultural activities.

| Project Phase | Nature of Impact | Significance Without Mitigation | Significance With Mitigation | Final Significance Score |
|---|---|---|---|---|
| Construction / Exploration | Negative | Medium Negative | Low Negative | Low Negative |
| Decommissioning | Negative | Low Negative | Low Negative | Low Negative |
| Cumulative | Negative | Low Negative | Low Negative | Low Negative |

### C. CUMULATIVE IMPACT

Based on the National Web-Based Environmental Screening Tool Report also known as the DFFE Screening Tool Report (**Appendix B**), the proposed activities are located within areas of *Low to High* agricultural potential. However, it must be noted that the proposed new 10 exploration boreholes will approximately have a 50 x 50 m footprint each and the ~30 km of new seismic transects will have minimal impact on the soils and agriculture. It is anticipated that there will be minimal impact on soil and agricultural potential. Considering the small extent

of the proposed activities compared to the large extent the agricultural land, the proposed activities and associated infrastructure will not result in the segregation of any high production agricultural land. Therefore, the cumulative impact on soil and agricultural potential is low subject to adherence of the mitigation measures.

**D. PROPOSED MITIGATIONS**

The proposed mitigation measures to avoid adverse impacts on soils and agricultural activities due to the proposed activities are provided below.

i. Existing approved relevant management and mitigation measure (**Appendix E** Table 6 Item 6.1 and 6.9):

- As far as possible interference with existing land uses/livelihoods should be avoided. If any interference takes place, the landowner should be compensated for their losses;
- The duration of the construction should be minimized to as short term as possible, to reduce the period of disturbance on soils and agricultural activities;
- Rehabilitation of the disturbed areas must be made a priority. Any disturbed area must be re-habilitated to its pre-disturbed state. Any disturbed area must be re-habilitated to its pre-disturbed state as defined in the pre-drill survey. Disturbed areas must be rehabilitated to support its post-closure land use, and this must be undertaken within six (6) months post drilling activities; and
- All construction / exploration and access must make use of the existing roads to avoid unnecessary disturbance to soils and agricultural land.

ii. New relevant management and mitigation measure (**Appendix E** Table 6 Item 6.1):

- Soils and agricultural fields outside the direct project footprint, should under no circumstances be disturbed; and
- Landowner engagement must be undertaken during the project phases to investigate possible scenarios for appropriate compensation of landowners for loss / disturbance of high land capability and/or grazing areas where necessary.

## 5.3.7. IMPACTS ON SOILS EROSION AND SEDIMENTATION

**A. DESCRIPTION OF IMPACT**

i. Impact from Drilling Activities

Clearing of vegetation for the drilling activities such as vehicular movement of drill rig and supporting vehicles will result in compaction of soils which will impact the soils and increase the rate of erosion, especially on sloping terrain. The impact ratings associated with the proposed drilling activities related to soil erosion and sedimentation are indicated in **Table 29**.

ii. Impact from Seismic Activities

Clearing of vegetation for the seismic activities such as vehicular movement of Vibroseis truck and supporting vehicles will result in compaction of soils which will impact the soils and increase the rate of erosion, especially on sloping terrain. The impact ratings associated with the proposed seismic activities related to soil erosion and sedimentation are indicated in **Table 29**.

**B. IMPACT RATING**

Table 29: Summary of impacts related to soil erosion and sedimentation.

| Project Phase | Nature of Impact | Significance Without Mitigation | Significance With Mitigation | Final Significance Score |
|---|---|---|---|---|
| Construction / Exploration | Negative | Low Negative | Low Negative | Low Negative |

| | | | | |
|---|---|---|---|---|
| Decommissioning | Negative | Low Negative | Low Negative | Low Negative |
| Cumulative | Negative | Low Negative | Low Negative | Low Negative |

**C. CUMULATIVE IMPACT**

The proposed activities and associated infrastructure will result in compaction and increased soil erosion during the construction / exploration phase and accumulatively increase the erosion rate in the area through the removal of the vegetation soil disturbance from vehicular movement and drilling. However, considering that no seismic activities nor drilling activities are permitted on or near to watercourses, the risk of sedimentation of watercourses is considered very low. Through the implementation of the proposed mitigation measures, this impact is considered to have an overall low negative cumulative impact significance as the area has small soil erosion surfaces (i.e. drainage lines) and the activities will not be permitted on the erosion surfaces to further enlarge them.

**D. PROPOSED MITIGATIONS**

The proposed mitigation measures to avoid adverse impacts associated with soil erosion and sedimentation due to the proposed activities are provided below.

i. Existing approved relevant management and mitigation measure (**Appendix E** Table 6 Item 6.1, 6.3 and 6.16):

- The duration of the construction should be minimized to as short term as possible, to reduce the period of disturbance on soils;
- Best known techniques of soil erosion and management should be adopted for the project if necessary;
- Construction / exploration impacts associated with the proposed project must be contained within the footprint of the assessed areas;
- Rehabilitation of the disturbed areas must be made a priority. Any disturbed area must be re-habilitated to its pre-disturbed state as defined in the pre-drill survey. Disturbed areas must be rehabilitated to support its post-closure land use, and this must be undertaken within six (6) months post drilling activities;
- All construction / exploration and access must make use of the existing roads as far as possible; and

ii. New relevant management and mitigation measure (**Appendix E** Table 6 Item 6.1):

- No seismic activities nor drilling activities are to be permitted within on wetlands or watercourses (32m prelitigation and a 15m post-mitigation buffer).

## 5.3.8. IMPACTS ON INDIGENOUS VEGETATION

**A. DESCRIPTION OF IMPACT**

i. Impact from Drilling Activities

The clearance of vegetation is required in order to prepare the drill site and may be required for new access roads. An area of approximately 50 x 50 m will be impacted upon for the drilling site and potential new temporary access roads. No clearance of vegetation is required for the geochemical and soil sampling activity. The impact ratings associated with the proposed drilling activities related to indigenous vegetation are indicated in **Table 30**.

ii. Impact from Seismic Activities

The clearance of vegetation may be required for the seismic activities. Approximately 30 km of seismic transects will be undertaken along existing gravel and potential new temporary access roads which may require clearance

of vegetation. The impact ratings associated with the proposed seismic activities related to indigenous vegetation are indicated in **Table 30**.

**B. IMPACT RATING**

Table 30: Summary of impacts related to indigenous vegetation.

| Project Phase | Nature of Impact | Significance Without Mitigation | Significance With Mitigation | Final Significance Score |
|---|---|---|---|---|
| Construction / Exploration | Negative | Medium Negative | Low Negative | Low Negative |
| Decommissioning | Negative | Medium Negative | Low Negative | Low Negative |
| Cumulative | Negative | Medium Negative | Low Negative | Low Negative |

**C. CUMULATIVE IMPACT**

The proposed activities will result in a loss of vegetation supporting the floral and fauna. However, due to the small scale of clearing required for the proposed activities, the short duration thereof and the rehabilitation that will occur, this impact has a low negative significance. In addition, the impacts are mainly anticipated during the drilling phase and the vegetation cover is expected to recover during the closure and rehabilitation. The cumulative impact for impact on floral species is, therefore, expected to be low negative.

**D. PROPOSED MITIGATIONS**

The proposed mitigation measures to avoid adverse impacts on indigenous vegetation due to the proposed activities are provided below.

i. Existing approved relevant management and mitigation measure (**Appendix E** Table 6 Item 6.1 and 6.3):

- Minimise vegetation clearance. Existing gravel roads must be used as far as possible, and the closest disturbed areas must be considered for drill pads. Clearance of vegetation must be kept to the required footprint (i.e. 50 x 50 m drill pad). Areas of indigenous vegetation, even secondary communities outside of the direct project footprint, should under no circumstances be fragmented or disturbed. A vegetation clearance management plan should be compiled prior commencement of activities which at minimum should state how the minimisation with be managed based on the affected environmental aspect or phase of the exploration.

- Rehabilitation of the disturbed areas must be made a priority. Any disturbed area must be re-habilitated to its pre-disturbed state. Any disturbed area must be re-habilitated to its pre-disturbed state as defined in the pre-drill survey. Disturbed areas must be rehabilitated to support its post-closure land use, and this must be undertaken within six (6) months post drilling activities;

- All construction / exploration and access must make use of the existing roads as far as possible.

iii. New relevant management and mitigation measure (**Appendix E** Table 6 Item 6.1):

- A suitable qualified Environmental Officer (EO) or Environmental Compliance Officer (ECO) must be appointed prior to the construction / exploration phase. If the final seismic transect route and/or the drilling location changes from the currently proposed areas, but within the assessed footprint and is situated within the high sensitive area, the EO / ECO must undertake final walkdown along the specific final planned transect route/s and drilling location/s in order to ensure that no sensitive vegetation or floral SCC are to be impacted;

- Areas of indigenous vegetation, even secondary communities outside of the direct project footprint, should under no circumstances be fragmented or disturbed;

- Areas rated as High sensitivity outside of the direct construction / exploration areas should be declared as 'no-go' areas during the life of the project, and all efforts must be made to prevent impacts and access to these areas from construction workers and machinery; and
- All laydown, chemical toilets etc. should be restricted to low / medium sensitivity areas. Any materials may not be stored for extended periods of time and must be removed from the project area once the construction/exploration phase has been concluded.

## 5.3.9. IMPACTS ON NATURAL HABITAT

### A. DESCRIPTION OF IMPACT

#### i. Impact from Drilling Activities

As indicated in **Section 4.5.3** there are five (5) identified habitats in the area namely, the modified habitat, rocky grassland habitat, water resource habitat, disturbed Grassland habitat, and degraded grassland habitat. The proposed drilling activities on site will lead to localised disturbance to an area approximately 50 x 50 m per well with a total of 10 additional exploration wells across the entire study area. There will possibly also be damage to habitats associated with travelling from existing access routes to sites selected for wells. The activities will fragment these habitat units regarded as important, not only within the within the local landscape, but also regionally as they are used for habitat, foraging and movement corridors for fauna within a landscape fragmented by agriculture and mining to more natural areas where they may reproduce. The impact ratings associated with the proposed drilling activities related to natural habitat are indicated in **Table 31**.

#### ii. Impact from Seismic Activities

The proposed activities on site will lead to localised disturbance of approximately 30 km seismic transects across the entire study area. There will possibly also be damage to habitats associated with travelling from existing access routes to sites selected for seismic transects. The activities will fragment these habitat units regarded as important, not only within the within the local landscape, but also regionally as they are used for habitat, foraging and movement corridors for fauna within a landscape fragmented by agriculture and mining to more natural areas where they may reproduce. The impact ratings associated with the proposed seismic activities related to natural habitat are indicated in **Table 31**.

### B. IMPACT RATING

Table 31: Summary of impacts related to natural habitat.

| Project Phase | Nature of Impact | Significance Without Mitigation | Significance With Mitigation | Final Significance Score |
|---|---|---|---|---|
| Construction / Exploration | Negative | Medium Negative | Low Negative | Low Negative |
| Decommissioning | Negative | Low Negative | Low Negative | Low Negative |
| Cumulative | Negative | Medium Negative | Low Negative | Low Negative |

### C. CUMULATIVE IMPACT

The activities will result in a loss of natural habitat units regarded as important, not only within the within the local landscape, but also regionally as they are used for habitat, foraging and movement corridors for fauna within a landscape fragmented by agriculture and mining to more natural areas where they may reproduce. However, due to the small scale of clearing required for the proposed activities, the short duration thereof and the rehabilitation that will occur, this impact has a low negative significance upon implementation of the mitigation measures.

**D. PROPOSED MITIGATION**

The proposed mitigation measures to avoid adverse impacts on natural habitat due to the proposed activities are provided below.

i. Existing approved relevant management and mitigation measure (**Appendix E** Table 6 Item 6.1 and 6.3):

- Minimise vegetation clearance.
- Rehabilitation of the disturbed areas must be made a priority. Any disturbed area must be re-habilitated to its pre-disturbed state. Any disturbed area must be re-habilitated to its pre-disturbed state as defined in the pre-drill survey. Disturbed areas must be rehabilitated to support its post-closure land use, and this must be undertaken within six (6) months post drilling activities;
- An Invasive Species Management Plan must be compiled and implemented during the lifecycle of the project; and
- All construction/exploration and access must make use of the existing roads as far as possible.

ii. New relevant management and mitigation measure (**Appendix E** Table 6 Item 6.1 and 6.3):

- A suitable qualified Environmental Officer (EO) or Environmental Compliance Officer (ECO) must be appointed prior to the construction / exploration phase. If the final seismic transect route and/or the drilling location changes from the currently proposed areas, but within the assessed footprint and is situated within the high sensitive area, the EO / ECO must undertake final walkdown along the specific final planned transect route/s and drilling location/s in order to ensure that no sensitive vegetation or floral SCC are to be impacted;
- Areas of indigenous vegetation, even secondary communities outside of the direct project footprint, should under no circumstances be fragmented or disturbed further;
- Areas rated as High sensitivity outside of the direct development areas should be declared as 'no-go' areas during the life of the project, and all efforts must be made to prevent development access to these areas from construction workers and machinery; and
- All laydown, chemical toilets etc. should be restricted to low / medium sensitivity areas. Any materials may not be stored for extended periods of time and must be removed from the project area once the construction/exploration phase has been concluded.

## 5.3.10. IMPACTS ON MICROORGANISMS

**A. DESCRIPTION OF IMPACT**

i. Impact from Drilling Activities

A microorganism, or microbe, is an organism of microscopic size, which may exist in its single-celled form or as a colony of cells. The movement of drill rigs and supporting vehicles as well as the establishment of 50 x 50 m drill pads will directly impact on microorganisms within that particular site. The impact ratings associated with the proposed drilling activities related to microorganisms are indicated in **Table 32.**

ii. Impact from Seismic Activities

One of the main impacts of seismic surveys is impacts on microorganisms through the use of Vibroseis technology. As explained in detail in **Section 2.4.1**, seismic surveying along the transects is proposed to be undertaken through a Vibroseis technique by deploying an array of energy sources from a small-sized Seismic Vibrator and an array of sensors or receivers (geophones) on the identified area of interest. A single Seismic Vibrator consisting of a vibrating baseplate that is connected to the ground will be used. The vibrating plate will emit a low frequency signal (4-80 Hz) into the ground, called a sweep. The vibrator vehicle will move slowly along the pre-determined lines (transects) using GPS for navigation. It will stop, emit a signal 8-20 seconds long, moves approximately 10 meters ahead, stops, emits a signal and so on until all the transects have been traversed. In

addition to the vehicular movements, site establishments and vegetation clearance, in total, it is anticipated that there will be 2 500 sweeps which will impact on the microorganisms. The impact ratings associated with the proposed seismic activities related to microorganisms are indicated in **Table 32.**

**B. IMPACT RATING**

Table 32: Summary of impacts related to microorganisms.

| Project Phase | Nature of Impact | Significance Without Mitigation | Significance With Mitigation | Final Significance Score |
|---|---|---|---|---|
| Construction / Exploration | Negative | Medium Negative | Low Negative | Low Negative |
| Decommissioning | Negative | Medium Negative | Low Negative | Low Negative |
| Cumulative | Negative | Medium Negative | Low Negative | Low Negative |

**C. CUMULATIVE IMPACT**

Without mitigation, there will be substantially impacts on microorganisms from the proposed activities which will result in less presence of microbes in the area. However, with the implementation of the mitigation measures such as the uses of frequency signal (4-80 Hz), existing gravel roads and reducing the period of exploration, there will be acceptable impacts on the microorganisms. It must also be noted that in the event that a Vibroseis truck is used, it will be equipped with very wide, low-pressure tires and will not leave ruts. There is also a chance of using an alternative method of a portable weight drop method, which is much smaller than the Vibroseis truck and has lesser impacts. In addition, microorganisms are mobile and likely to temporary migrate nearby where they may not be directed impacted. Furthermore, the activities are limited to specific areas and over a short period of time. Therefore, the overall cumulative impacts on microorganisms is anticipated to be low negative with mitigations.

**D. PROPOSED MITIGATIONS**

The proposed mitigation measures to avoid adverse impacts on microorganisms due to the proposed activities are provided below.

i. Existing approved relevant management and mitigation measure (**Appendix E** Table 6 Item 6.1, 6.2 and 6.3):

- Minimise vegetation clearance.
- The duration of the exploration should be minimized to as short term as possible. This will reduce the period of disturbance on microorganisms;
- All construction/exploration activities and access must make use of the existing roads as far as possible; and
- Rehabilitation of the disturbed areas must be made a priority. Any disturbed area must be re-habilitated to its pre-disturbed state. Any disturbed area must be re-habilitated to its pre-disturbed state as defined in the pre-drill survey. Disturbed areas must be rehabilitated to support its post-closure land use, and this must be undertaken within six (6) months post drilling activities. This will allow for microorganism to reestablish / recover.

ii. New relevant management and mitigation measure (**Appendix E** Table 6):

- None.

## 5.3.11. IMPACTS ON FAUNAL SPECIES

### A. DESCRIPTION OF IMPACT

#### i. Impact from Drilling Activities

Localised loss of modified habitat may occur within the remaining areas providing shelter for faunal species due the clearance of vegetation for new temporary access roads, drilling pads, vehicular movement and drilling. The loss of habitat will directly result in the loss of fauna community (i.e. amphibians and birds). Disturbance and mortalities of fauna species such as amphibians, reptiles and birds are anticipated. Loss of habitat also means loss of food and nesting resources, cover and movement corridors, which could lead to the disappearance of the affected species from the area. The impact ratings associated with the proposed exploration activities related to fauna species are indicated in **Table 33**.

#### ii. Impact from Seismic Activities

Localised loss of modified habitat may occur within the remaining areas providing shelter for faunal species due the clearance of vegetation for new temporary access roads and site camp, vehicular movement and seismic transects. The loss of habitat will directly result in the loss of fauna community (i.e. amphibians and birds). Disturbance and mortalities of fauna species such as amphibians, reptiles and birds are anticipated. Loss of habitat also means loss of food and nesting resources, cover and movement corridors, which could lead to the disappearance of the affected species from the area. The impact ratings associated with the proposed seismic activities related to fauna species are indicated in **Table 33**.

### B. IMPACT RATING

Table 33: Summary of impacts related to fauna species.

| Project Phase | Nature of Impact | Significance Without Mitigation | Significance With Mitigation | Final Significance Score |
|---|---|---|---|---|
| Construction / Exploration | Negative | Medium Negative | Low Negative | Low Negative |
| Decommissioning | Negative | Low Negative | Low Negative | Low Negative |
| Cumulative | Negative | Medium Negative | Low Negative | Low Negative |

### C. CUMULATIVE IMPACT

Three (3) herpetofauna species, nineteen (19) mammal species and forty-two (42) avifauna species were recorded in the project area during the survey based on either direct observation, vocalisations, or the presence of visual tracks & signs. Ten (10) of the mammals are listed with the larger mammal species, such as Blue Wildebeest, were kept as game on one of the properties (Wildskamp 5), which include SSCs. Two (2) avifauna species, *Eupodotis caerulescens* (Korhaan, Blue and *Sagittarius serpentarius* (Secretary bird) are rated as SCC, whereas 30 are listed provincially. Although these species will be negatively impacted due to the construction / exploration, there is a high likelihood that they can easily relocate to the adjacent properties and may even resettle during the post exploration phase of the project. The cumulative impact for impact on fauna species is, therefore, expected to be low with mitigation.

### D. PROPOSED MITIGATIONS

The proposed mitigation measures to avoid adverse impacts on fauna species due to the proposed activities are provided below.

i. Existing approved relevant management and mitigation measure (**Appendix E** Table 6 Item 6.1, 6.2, 6.3 and 6.9):

- The duration of the construction / exploration should be minimized to as short term as possible, to reduce the period of disturbance on fauna;

- Noise must be kept to an absolute minimum during the evenings and at night to minimize all possible disturbances to amphibian species and nocturnal mammals;
- No trapping, killing, or poisoning of any wildlife is to be permitted on site;
- Outside lighting should be designed and limited to minimize impacts on fauna;
- Rehabilitation of the disturbed areas must be made a priority. Any disturbed area must be re-habilitated to its pre-disturbed state. Any disturbed area must be re-habilitated to its pre-disturbed state as defined in the pre-drill survey. Disturbed areas must be rehabilitated to support its post-closure land use, and this must be undertaken within six (6) months post drilling activities;
- All construction/operational and access must make use of the existing roads as far as possible;
- Construction impacts associated with the proposed project must be contained within the footprint of the demarcated areas as indicated on the final approved project layout plan; and
- A suitable qualified Environmental Officer must be appointed prior to the construction / exploration phase. The EO must undertake walkdowns / surveys along the final planned transect routes and drilling locations in order to ensure that no sensitive, protected or SCC fauna species are to be directly impacted;
- Identified protected or SCC fauna species that will be impacted upon must be relocated by a suitably qualified environmentalist / ecologist.

ii. New relevant management and mitigation measure (**Appendix E** Table 6 Item 6.2 and 6.3):

- Areas of indigenous vegetation, even secondary communities outside of the direct project footprint, should under no circumstances be fragmented or disturbed further;
- Areas rated as High sensitivity outside of the direct development areas should be declared as 'no-go' areas during the life of the project, and all efforts must be made to prevent impacts / access to these areas from construction workers and machinery; and
- The custodian for sensitive species 15 (Endangered Wildlife Trust (EWT)) must be informed of the presence of the species. A walkdown by a suitable specialist (EWT) should be done in the area surrounding the drilling two northern wells (Wildskamp 5 and Nooitgedacht M2) prior to any activities, mainly to confirm that SCCS are not present or will be harmed.

## 5.3.12. IMPACTS ON FLORAL SPECIES

### A. DESCRIPTION OF IMPACT

#### i. Impact from Drilling Activities

Localised loss of floral habitat and diversity may occur within areas of increased ecological sensitivity, such as the rocky grassland and water resource habitat. Due to the clearance of indigenous vegetation for new temporary access roads and drilling pads, drilling activities and vehicular movement, disturbance and mortalities of flora species is anticipated. Clearing of vegetation for construction purposes as well as compaction of soils due to vehicular movement will result in reduced floral habitat availability and re-establishment success post exploration phase. Disturbances to soil and vegetation on site will also favour alien plants in places. As indicated in **Section 3.10.2**, nine (9) IAP species were recorded within the project area. Three (3) species are NEMBA Category 1b IAP species that must be controlled by implementing an IAP Management Programme, in compliance of section 75 of the NEMBA. The impact ratings associated with the proposed drilling activities related to flora species are indicated in **Table 34**.

#### ii. Impact from Seismic Activities

Localised loss of floral habitat and diversity may occur within areas of increased ecological sensitivity, such as the rocky grassland and water resource habitat. Due to the clearance of indigenous vegetation for new temporary access roads, Vibroseis and vehicular movement and site establishment, disturbance and mortalities of flora species is anticipated. Clearing of vegetation for construction purposes as well as compaction of soils due to vehicular movement will result in reduced floral habitat availability and re-establishment success post exploration phase. Disturbances to soil and vegetation on site will also favour alien plants in places. As indicated in **Section 3.10.2**, nine (9) IAP species were recorded within the project area. Three (3) species are NEMBA Category 1b IAP species that must be controlled by implementing an IAP Management Programme, in compliance of section 75 of the NEMBA. The impact ratings associated with the proposed seismic activities related to flora species are indicated in **Table 34**.

**B. IMPACT RATING**

Table 34: Summary of impacts related to flora species.

| Project Phase | Nature of Impact | Significance Without Mitigation | Significance With Mitigation | Final Significance Score |
|---|---|---|---|---|
| Construction / Exploration | Negative | Medium Negative | Low Negative | Low Negative |
| Decommissioning | Negative | Medium Negative | Low Negative | Low Negative |
| Cumulative | Negative | Medium Negative | Low Negative | Low Negative |

**C. CUMULATIVE IMPACT**

According to the Biodiversity Company (2024), the Plants of Southern Africa (POSA) database indicates that 463 species of indigenous plants are expected to occur within the project area. Of these 463 plant species, no species are listed as being Species of Conservation Concern (SCC). No sensitive species were highlighted by the screening assessment. Although the activities will result in a loss of habitat supporting the floral species and results in less floral presence and diversity. However, the impacts will be short term and localized. The floral species will likely recover post exploration phase. In terms of AIP, an AIP Management Plan will be required for the project during construction / exploration. Therefore, the cumulative impact for impact on floral species is expected to be low negative with mitigation.

**D. PROPOSED MITIGATIONS**

The proposed mitigation measures to avoid adverse impacts on flora species due to the proposed activities are provided below.

i. Existing approved relevant management and mitigation measure (**Appendix E** Table 6 Item 6.1, 6.2, 6.3 and 7.9):

- An Alien Invasive Plant Management Plan must be compiled and implemented during the construction / exploration phase;
- Rehabilitation of the disturbed areas must be made a priority. Any disturbed area must be re-habilitated to its pre-disturbed state. Any disturbed area must be re-habilitated to its pre-disturbed state as defined in the pre-drill survey. Disturbed areas must be rehabilitated to support its post-closure land use, and this must be undertaken within six (6) months post drilling activities;
- All activities must be restricted too within the very low sensitivity areas as far as possible. No further loss of high sensitivity areas should be permitted;
- All construction/operational and access must make use of the existing roads as far as possible;
- Identified protected or SCC flora species that will be impacted upon must be relocated by a suitably qualified environmentalist / ecologist.

ii. New relevant management and mitigation measure (**Appendix E** Table 6 Item 6.2 and 6.3):

- Areas rated as High sensitivity outside of the direct development areas should be declared as 'no-go' areas during the life of the project, and all efforts must be made to prevent impact / access to these areas from construction workers and machinery;
- Areas of indigenous vegetation, even secondary communities outside of the direct project footprint, should under no circumstances be fragmented or disturbed further; and
- All laydown, chemical toilets etc. should be restricted to medium sensitivity areas. Any materials may not be stored for extended periods of time and must be removed from the project area once the construction phase has been concluded.

## 5.3.13. IMPACTS ON CULTURAL HERITAGE FEATURES

### A. DESCRIPTION OF IMPACT

As indicated in Section 4.8, a total of eleven heritage features and resources were identified. These consist of five burial grounds (MH001, MH003, MH007, MH010 and MH011), three foundation remains (MH002, MH006 and MH009) of a stone-built structures or homestead, one midden (MH004), one kraal (MH008) and one grinding stone (MH005).

#### i. Impact from Drilling Activities

Construction activities such as vegetation clearance, excavations, drilling and/or vehicular movement could expose or damage features of heritage and cultural value beneath the surface. The impact ratings associated with the proposed drilling activities related to cultural heritage are indicated in **Table 35**.

#### ii. Impact from Seismic Activities

Exploration activities related to seismic survey such as vegetation clearance, site establishment and/or vehicular movement could expose or damage features of heritage and cultural value beneath the surface. The impact ratings associated with the proposed seismic activities related to cultural heritage are indicated in **Table 35**.

### B. IMPACT RATING

Table 35: Summary of impacts related to cultural heritage.

| Project Phase | Nature of Impact | Significance Without Mitigation | Significance With Mitigation | Final Significance Score |
|---|---|---|---|---|
| Construction / Exploration | Negative | Medium Negative | Low Negative | Medium Negative |
| Decommissioning | Negative | Medium Negative | Low Negative | Medium Negative |
| Cumulative | Negative | Medium Negative | Low Negative | Medium Negative |

### C. CUMULATIVE IMPACT

The main impact on archaeological sites/ remains will be the physical disturbance of the material and its context. The clearing of vegetation for the proposed activities will expose, disturb and displace archaeological sites / material. However, from the specialist investigations, it appears that the cultural heritage features are easily identifiable and with the 30m recommended buffer, these will ideally be not impacted upon. However, there is always a risk of impacts on new discoveries during the construction / exploration phase which will impact on irreversible loss of cultural heritage features. Therefore, the cumulative impact on heritage resources is medium negative.

### D. PROPOSED MITIGATIONS

The proposed mitigation measures to avoid adverse impacts on cultural heritage features due to the proposed activities are provided below.

i. Existing approved relevant management and mitigation measure (**Appendix E** Table 6 Item 6.10):

- The planning of all additional exploration footprints must take cognizance of the heritage sensitivities depicted on the heritage sensitivity maps.

ii. New relevant management and mitigation measure (**Appendix E** Table 6 Item 6.10):

- An independent and suitably qualified ECO must be appointed and must train the Contractor to recognise potential heritage features;
- All burial grounds and graves should be retained and avoided with a buffer zone of 30m as per SAHRA guidelines. If this is not possible, the graves could be relocated after completion of a detailed grave relocation process, that includes a thorough stakeholder engagement component, adhering to the requirements of s36 of the NHRA and its regulations as well as the National Health Act and its regulations; and
- Should any heritage features be exposed during excavation, work on the area where the artefacts were discovered, shall cease immediately and the ECO shall be notified within 24hours, and a Chance Find Protocol must be implemented. The responsible heritage resources authority (FSPHRA), as well as the South African Police Service (SAPS) must be notified within 72hours.

## 5.3.14. IMPACTS ON PALAEONTOLOGICAL HERITAGE FEATURES

### A. DESCRIPTION OF IMPACT

No fossiliferous outcrop was detected in the proposed footprint by the specialist. This could be attributed to the lack of outcrops as well as the lush grassy vegetation in the area. Based on the site investigation as well as desktop research it is concluded that fossil heritage of scientific and conservational interest in the development footprint is rare. This is in contrast with the High Sensitivity allocated to the development area by the SAHRIS Palaeosensitivity Map and DFFE Screening Tool.

#### i. Impact from Drilling Activities

Threats to palaeontological resources are earth moving equipment/machinery (for example haul trucks, drilling rigs, front end loaders, excavators, graders, dozers) during drilling activities. The impact ratings associated with the proposed drilling activities related to palaeontological heritage are indicated in **Table 36**.

#### ii. Impact from Seismic Activities

Threats to palaeontological resources are earth moving equipment / machinery (for example Vibroseis truck, haul trucks, etc.) during seismic surveys. The impact ratings associated with the proposed seismic activities related to palaeontological heritage are indicated in **Table 36**.

### B. IMPACT RATING

Table 36: Summary of impacts related to palaeontological heritage.

| Project Phase | Nature of Impact | Significance Without Mitigation | Significance With Mitigation | Final Significance Score |
|---|---|---|---|---|
| Construction / Exploration | Negative | Medium Negative | Low Negative | Medium Negative |
| Decommissioning | Negative | Low Negative | Low Negative | Low Negative |
| Cumulative | Negative | Medium Negative | Low Negative | Low Negative |

### C. CUMULATIVE IMPACT

The main impact on palaeontology remains (if any) will be the physical disturbance of the material and its context. The clearing of vegetation, excavations and/or drilling may expose, disturb and displace archaeological sites/material. However, there are no known palaeontological features on site and an impact (if any) will be local and not result in extensive significant loss of palaeontological features in the regional scale as there will likely

be more similar features in the extended area. Therefore, the cumulative impact on palaeontological resources is low negative with mitigation.

**D. PROPOSED MITIGATIONS**

The proposed mitigation measures to avoid adverse impacts on palaeontological heritage features due to the proposed activities are provided below.

i. Existing approved relevant management and mitigation measure (**Appendix E** Table 6 Item 6.10):

- The planning of all additional exploration footprints must take cognizance of the heritage sensitivities depicted on the heritage sensitivity maps.
- Once the drilling sites are final, the applicant should invite a professional palaeontologist to monitor drilling samples for subsurface fossil remains that may be intersected by the drilling process; and
- The palaeontologist must apply for a valid permit from SAHRA for the collection / removal of fossils if necessary;

ii. New relevant management and mitigation measure (**Appendix E** Table 6 Item 6.10):

- All known heritage features should be retained and avoided with a buffer zone of 30m as per SAHRA guidelines. If this is not possible, the graves could be relocated after completion of a detailed grave relocation process, that includes a thorough stakeholder engagement component, adhering to the requirements of s36 of the NHRA and its regulations as well as the National Health Act and its regulations;
- An independent and suitably qualified ECO must be appointed and must train the Contractor to recognise potential palaeontological features; and
- Should any palaeontological features be exposed during excavation, work on the area where the artefacts were discovered, shall cease immediately and the ECO shall be notified within 24hours, and a Chance Find Protocol must be implemented. The responsible heritage resources authority (FSPHRA), as well as the South African Police Service (SAPS) must be notified within 72hours.

## 5.3.15. IMPACTS ON SURFACE WATER

**A. DESCRIPTION OF IMPACT**

When surface water becomes polluted by contaminants, it puts strains on local and regional drinking water supplies and aquatic ecosystems that rely on surface water environments. Because of their geographical location, surface waters easily become polluted, and some leading causes of water pollution come from contaminated rainwater runoff, from fertilizers and other harmful chemicals that are used on farms, in homes, industries, and on infrastructure such as roads. Surface water pollution can also come from sewage leaks and waste products that leach into the environment.

i. Impact from Drilling Activities

Surface water may be impacted through the clearing of vegetation close to the water resource habitat, introduction of pollutants onto the water resource (i.e. leak from chemical toilets) and/or hydrocarbon spills from drill rig or supporting plant. This disturbance may also result in the proliferation of alien and invasive species within the surrounding watercourses. The impact ratings associated with the proposed drilling activities related to surface water are indicated in **Table 37**.

ii. Impact from Seismic Activities

Surface water may be impacted through the clearing of vegetation close to the water resource habitat, introduction of pollutants onto the water resource (i.e. leak from chemical toilets) and/or hydrocarbon spills from Vibroseis truck and/or supporting plant. This disturbance may also result in the proliferation of alien and

invasive species within the surrounding watercourses. The impact ratings associated with the proposed seismic activities related to surface water are indicated in **Table 37**.

**B. IMPACT RATING**

Table 37: Summary of impacts related to surface water.

| Project Phase | Nature of Impact | Significance Without Mitigation | Significance With Mitigation | Final Significance Score |
|---|---|---|---|---|
| Construction / Exploration | Negative | Medium Negative | Low Negative | Low Negative |
| Decommissioning | Negative | Low Negative | Low Negative | Low Negative |
| Cumulative | Negative | Medium Negative | Low Negative | Low Negative |

**C. CUMULATIVE IMPACT**

Concerns were previously raised by the public during the original EA Application surrounding the potential for contamination of water resources (including surface water resources). In terms of the relevant legislation, no drilling may take place on or near to surface water features and furthermore, mitigation measures have been put forward to prevent pollution on or near to the drill sites which will prevent contaminated surface water runoff from entering water resources. The accumulative surface water impact associated with the proposed development is low and this impact has been rated with a low negative significance.

**D. PROPOSED MITIGATION**

The proposed mitigation measures to avoid adverse impacts on surface water due to the proposed activities are provided below.

i. Existing approved relevant management and mitigation measure (**Appendix E** Table 6 Item 6.9 and 6.11 – 6.13):

- Ensure that detailed baseline water quality and quantity samples are obtained and analysed for reference purposes;
- Construction/drilling should preferably not be conducted during rainy days. If drilling is to be undertaken during rainy days, additional precautionary measures in consultation with the ECO must be implemented to prevent contamination on surface water;
- Excavations should be open for as short period as practically possible and drilling circulation fluid sumps be cleaned out and rehabilitated;
- Construction vehicles and machines must be maintained properly to ensure that oil spillages are kept at a minimum;
- Spill trays must be provided if refuelling of drilling rig and vehicles are done on site;
- Chemical sanitary facilities should be provided for drilling crew. Construction workers should only be allowed to use temporary chemical toilets on the site. Chemical toilets shall not be within close proximity of the drainage system. Frequent maintenance should include the removal without spillages;
- Adequate fuel containment facilities to be used during exploration phase;
- The use of all materials, fuels and chemicals which could potentially leach into the environment must be controlled;
- All materials, fuels and chemicals must be stored in a specific and secured area to prevent pollution from spillages and leakages;
- No uncontrolled discharges from the drilling pad or site shall be permitted; and

- Any spills that occur during the exploration phase must immediately be cleaned up and the contaminated soils, etc. suitably disposed of at a registered waste disposal facility.

ii. New relevant management and mitigation measure (**Appendix E** Table 6 Item 6.1):

- No seismic activities nor drilling activities are to be permitted within on wetlands or watercourses (32m prelitigation and a 15m post-mitigation buffer).

## 5.3.16. IMPACTS ON GROUNDWATER

### A. DESCRIPTION OF IMPACT

Another major concern previously raised by the public during the original EA Application is the potential for the exploratory drilling to have an adverse impact on groundwater quality and quantities. Stressors that affect ground water condition include application of pesticides and fertilizers to the land, waste from livestock and other animals, landfills, mining operations, and unintentional releases such as chemical spills or leaks from hydrocarbon tanks. There is always a risk of spills occurring during the construction / exploration. The spill can then infiltrate into the groundwater and contaminate the water resource.

#### i. Impact from Drilling Activities

Exploration drilling activities require water which will be sourced from existing license holders. The utilisation of groundwater for drilling and other associated activities may result in the alteration/ reduction of groundwater levels on site thereby affecting local users. The impact ratings associated with the proposed drilling activities related to groundwater are indicated in **Table 38**.

#### ii. Impact from Seismic Activities

The potential risk to groundwater from the seismic activities is in relation to the potential of spills from leaking Vibroseis truck, supporting plant or from the site camp facilities (i.e. chemical toilets) occurring during the seismic survey. The spill can then infiltrate into the groundwater and contaminate the water resource. The impact ratings associated with the proposed seismic activities related to groundwater are indicated in **Table 38**.

### B. IMPACT RATING

Table 38: Summary of impacts related to groundwater.

| Project Phase | Nature of Impact | Significance Without Mitigation | Significance With Mitigation | Final Significance Score |
|---|---|---|---|---|
| Construction / Exploration | Negative | Medium Negative | Low Negative | Low Negative |
| Decommissioning | Negative | Low Negative | Low Negative | Low Negative |
| Cumulative | Negative | Medium Negative | Low Negative | Low Negative |

### C. CUMULATIVE IMPACT

Although during the exploration activities, there is potential for alteration of the hydraulic regimes (head). However, the small scale of the impacts that would be perceived would not significantly alter the drainage patters over a large area and if perceived would be of short duration. This will likely be limited to the site and surrounding areas. Considering that the requirement of the MPRDA regulations for the insertion of casing in the underground aquifer zones (as presented in the EMPr) is anticipated to prevent any adverse impacts on groundwater quantity and quality for surrounding groundwater users. Furthermore, a monitoring programme is proposed in the EMPr for the continued monitoring of surface and groundwater quantity and quality. As such, this impact is anticipated to have a low negative cumulative significance through the implementation of these mitigation measures.

**D. PROPOSED MITIGATIONS**

The proposed mitigation measures to avoid adverse impacts on groundwater due to the proposed activities are provided below.

i. Existing approved relevant management and mitigation measure (**Appendix E** Table 6 Item 6.9 and 6.11 – 6.13):

- Ensure that detailed baseline water quality and quantity samples are obtained and analysed for reference purposes;
- Ensure that all mitigation measures as stipulated in the EMPr relating to the drilling (specifically technical specifications) as well as the MPRDA regulations are adhered to;
- The best drilling fluid option should be selected during construction towards minimising the potential for groundwater contamination and the exploration wells should be constructed such no gas or oil leakage occurs during the operational phase;
- The correct type of fluids should be used during the construction phase and the boreholes should be correctly constructed so that no gas leakage occurs during the construction or operational phases. Biodegradable drilling fluids should be used wherever possible;
- Excavations should be open for as short period as practically possible and drilling circulation fluid sumps be cleaned out and rehabilitated;
- Construction vehicles and machines must be maintained properly to ensure that oil spillages are kept at a minimum;
- Spill trays must be provided if refuelling of drilling rig and vehicles are done on site;
- Chemical sanitary facilities should be provided for drilling crew. Construction workers should only be allowed to use temporary chemical toilets on the site. Chemical toilets shall not be within close proximity of the drainage system. Frequent maintenance should include the removal without spillages;
- Adequate fuel containment facilities to be used during exploration phase;
- The use of all materials, fuels and chemicals which could potentially leach into the environment must be controlled;
- All materials, fuels and chemicals must be stored in a specific and secured area to prevent pollution from spillages and leakages;
- No uncontrolled discharges from the drilling pad or site shall be permitted; and
- Any spills that occur during the exploration phase must immediately be cleaned up and the contaminated soils, etc. suitably disposed of at a registered waste disposal facility; and
- Sound groundwater management measures need to be developed based on the results of the impact assessment

ii. New relevant management and mitigation measure (**Appendix E** Table 6):

- None.

## 5.3.17. NOISE IMPACTS

**A. DESCRIPTION OF IMPACT**

Construction sites are synonymous with noise impacts. High noise levels such as blasting, drilling and excavating can have an adverse impact on the farming community, adjacent landowners and fauna.

i. Impact from Drilling Activities

Construction activities and traffic during the drilling phase are anticipated to produce minimal noise. The onsite drilling activities will pose the potential for noisy conditions due to machinery and vehicles. The impact ratings associated with the proposed drilling activities related to noise are indicated in **Table 39**.

ii. Impact from Seismic Activities

Construction activities and traffic during the seismic survey phase are anticipated to produce minimal noise. The onsite seismic activities will pose the potential for noisy conditions due to Vibroseis truck, machinery and supporting vehicles. The impact ratings associated with the proposed seismic activities related to noise are indicated in **Table 39**.

**B. IMPACT RATING**

Table 39: Summary of impacts related to noise.

| Project Phase | Nature of Impact | Significance Without Mitigation | Significance With Mitigation | Final Significance Score |
|---|---|---|---|---|
| Construction / Exploration | Negative | Low Negative | Low Negative | Low Negative |
| Decommissioning | Negative | Low Negative | Low Negative | Low Negative |
| Cumulative | Negative | Low Negative | Low Negative | Low Negative |

**C. CUMULATIVE IMPACT**

The noise associated with the proposed activities are not expected to be excessive in nature relative to the surrounding agricultural / rural area extent. The location of the activities is relatively far away from residential and businesses which are high noise pollution receptors. The small number of vehicles and temporary exploration works are anticipated to general minimal noise. Excessive noise impacts (if any) will be limited to the site and the area, generally has low noise generators such as industries. Therefore, the cumulative impact on noise pollution due to the proposed activity is low.

**D. PROPOSED MITIGATIONS**

The proposed mitigation measures to avoid adverse noise impacts due to the proposed activities are provided below.

i. Existing approved relevant management and mitigation measure (**Appendix E** Table 6 Item 6.1 and 6.3):

- The working hours stipulated in the Construction permit, where applicable, must be adhered to. Where this is not applicable, the following working hours must be adhered to: Monday to Friday from sunrise to sunset and where applicable on a Saturday which must be agreed upon between the affected parties and the Contractor;
- The contractor must attempt to restrict noisy activities as far as possible to times and locations whereby the potential for noise nuisance is reduced.

iii. New relevant management and mitigation measure (**Appendix E** Table 7.3):

- All construction plant and other equipment must be in a good working order to reduce possible noise pollution.

## 5.3.18. IMPACTS ON TRAFFIC AND DAMAGE TO ROAD INFRASTRUCTURE

**A. DESCRIPTION OF IMPACT**

The movement of construction vehicles during the construction of the proposed roads can result in an increase in traffic congestion on local roads. Activities during the construction / exploration phase of the project for both the drilling and seismic survey such as the movement of abnormal loads of infrastructure in and out of the development area can impact on the overall traffic and subsequently damage to the road infrastructure. The

impact ratings associated with the proposed exploration activities related to traffic and damage to road infrastructure are indicated in **Table 40**.

**B. IMPACT RATING**

Table 40: Summary of impacts related to traffic and damage to road infrastructure.

| Project Phase | Nature of Impact | Significance Without Mitigation | Significance With Mitigation | Final Significance Score |
|---|---|---|---|---|
| Construction / Exploration | Negative | Low Negative | Low Negative | Low Negative |
| Decommissioning | Negative | Low Negative | Low Negative | Low Negative |
| Cumulative | Negative | Low Negative | Low Negative | Low Negative |

**C. CUMULATIVE IMPACT**

It was noted during the site inspection that the road leading to the southern sections (R73) was in poor conditions and movement of heavy vehicles associated with the exploration activities may cause further degradation. However, during visits to the study area, it was also noted that there is very little to no traffic in the area as it is located on the outskirts. The short duration of increased traffic as a result of the exploration works as well as few vehicle trips (especially heavy vehicles) are not anticipated to have a significant impact on the existing road networks and subsequent damage to road infrastructure. Therefore, it is anticipated that there will be low negative cumulative impact on traffic and damage to road infrastructure. However, the applicant must monitor the condition of roads to ensure that any damage caused by the exploration works is adequately rectified.

**D. PROPOSED MITIGATIONS**

The proposed mitigation measures to avoid adverse impacts on traffic and damage to road infrastructure due to the proposed activities are provided below.

i. Existing approved relevant management and mitigation measure (**Appendix E** Table 6 Item 6.1, 6.3 and 6.5):

- All construction and vehicles using public roads must be in a roadworthy condition and their loads secured. They must adhere to the speed limits and all local, provincial and national regulations with regards to road safety and transport;
- Damage caused to public roads as a result of the construction activities must be repaired in consultation with the relevant municipal authorities; and
- The working hours stipulated in the Construction permit, where applicable, must be adhered to. Where this is not applicable, the following working hours must be adhered to.

ii. New relevant management and mitigation measure (**Appendix E** Table 7.1):

- Construction vehicles must not exceed speed limits of 20 km/h within the construction site.

## 5.3.19. IMPACTS ON HEALTH AND SAFETY OF THE COMMUNITY

**A. DESCRIPTION OF IMPACT**

The exploration activities (drilling and seismic) may have health and safety implications for the personnel that will be working on the project. Required access to the property for exploration activities may result in a risk to the safety and security of landowners, lawful occupiers, and community members due to the increase in number of unfamiliar people in the area. Property gates may also be left open resulting in the robbery, loss or theft of livestock. The drilling activities may also expose gases which may ignite during the project causing fire that may result in loss of fauna and flora, livestock and/or human life. The impact ratings associated with the proposed exploration activities related to health and safety of the community are indicated in **Table 41**.

**B. IMPACT RATING**

Table 41: Summary of impacts related to health and safety of the community.

| Project Phase | Nature of Impact | Significance Without Mitigation | Significance With Mitigation | Final Significance Score |
|---|---|---|---|---|
| Construction / Exploration | Negative | Low Negative | Low Negative | Low Negative |
| Decommissioning | Negative | Low Negative | Low Negative | Low Negative |
| Cumulative | Negative | Low Negative | Low Negative | Low Negative |

**C. CUMULATIVE IMPACT**

Based on information obtained from the herders during the site inspection, there will relatively low crime in the area and the last unnatural fire event was several years ago. Therefore, with the proposed mitigations, it is anticipated there will low negative cumulative impacts as there will be an implementation of security as well as fire control.

**D. PROPOSED MITIGATIONS**

The proposed mitigation measures to avoid adverse impacts on health and safety of the community due to the proposed activities are provided below.

i. Existing approved relevant management and mitigation measure (**Appendix E** Table 6 Item 6.1, 6.3 and 6.5):

- All farm gates must be closed immediately upon entry/exit;
- Fencing of all drill sites with security access control and warning signs; and
- All drilling sites must be properly sealed to trap gases from escaping. Wells should be plugged to prevent crossflow of gas into aquifers and isolate all potential hydrocarbon / water bearing formations by utilizing placed cement plugs extending at least 30m above and below the reservoir.

ii. New relevant management and mitigation measure (**Appendix E** Table 6.1):

- There must be access control to the entry / exit points of the exploration sites; and
- Vehicles should be clearly marked as construction vehicles.

## 5.3.20. IMPACTS ON SOCIO-ECONOMIC DYNAMICS

**A. DESCRIPTION OF IMPACTS**

The proposed activities will have a small short-term positive impact in the area as suppliers of construction / exploration materials will experience economic growth during the drilling and/or seismic survey phase. During the exploration phase, the creation of skilled and semiskilled jobs will be created. The use of local labour, as far as possible, is recommended as this would have a positive impact on the local economy and would prevent the influx of job seekers from outside the area. The impact ratings associated with the proposed exploration activities related to health and safety of the community are indicated in **Table 42**.

**B. IMPACT RATING**

Table 42: Summary of impacts related to socio-economic dynamics.

| Project Phase | Nature of Impact | Significance Without Mitigation | Significance With Mitigation | Final Significance Score |
|---|---|---|---|---|
| Construction / Exploration | Positive | Low Positive | Low Positive | Low Positive |

| Project Phase | Nature of Impact | Significance Without Mitigation | Significance With Mitigation | Final Significance Score |
|---|---|---|---|---|
| Decommissioning | Positive | Low Positive | Low Positive | Low Positive |
| Cumulative | Positive | Low Positive | Low Positive | Low Positive |

**C. CUMULATIVE IMPACT**

Employment opportunities for some unskilled, skilled labour as well as providing services during construction (e.g. accommodation, transportation, etc.) may arise from this project. It is important to note that employment opportunities for local will be minimal as the project entails aspects which require qualified and skilled personnel (i.e. Vibroseis techniques and drilling). The proposed activities also cover a small footprint and a short period of survey. Therefore, there will be minimal opportunities for locals for tasks largely related to unskilled labour, resulting in low positive cumulative impact on socio-economics.

**D. PROPOSED MITIGATIONS**

The proposed mitigation measures to avoid adverse impacts on health and safety of the community due to the proposed activities are provided below.

i. Existing approved relevant management and mitigation measure (**Appendix E** Table 6 Item 6.1):

- Developer must allow for a transparent employment opportunity for locals; and
- Local suppliers and workers must be prioritised as far as possible for economic and professional growth.

# 6. ADVANTAGES AND DISADVANTAGES OF THE PROPOSED AMENDMENT

This section describes the advantages and disadvantages of the proposed amendment application.

## 6.1. ADVANTAGES

The main advantage associated with the approval of the proposed amendment is that the applicant will be able to improve the accuracy of their exploration for an economically viable resource (natural gas including Helium) available in the area. It is important to note that the exploration right will not provide the required authorisation for production activities to be undertaken. As such, any future intention to undertake production of hydrocarbons within the exploration right area would require a further application, investigation and public consultation process.

Exploration for additional domestic hydrocarbon reserves is considered important and any discoveries would be well received by the local market. The Department of Energy's Integrated Resource Plan (2010-2030) supports this view, stating that regional and domestic gas options should be pursued. The government's official position is that exploration and development of oil and gas fields should be encouraged. The identification of potential geological structures or "prospects" within the proposed exploration licence area for future exploration and possible well-drilling provides an opportunity to develop a South African oil and gas industry resulting in long-term benefits consisting of access to new energy sources, improved security of supply, major in-country investments in a development project and reduced dependence on the importation of hydrocarbons. There is also potential in the long-term for local economic stimulation through direct employment, future business opportunities, royalties and tax revenues.

## 6.2. DISADVANTAGES

The disadvantages associated with the proposed amendments are related to soils and agricultural activities, biodiversity, cultural heritage and water resource impacts. With respect to soils and agricultural impacts, it is anticipated that there will be minimal impact on soil and agricultural potential. Considering the small extent of the proposed activities compared to the large extent the agricultural land, the proposed activities and associated infrastructure will not result in the segregation of any high production agricultural land.

The proposed activities will result in some direct / indirect loss of habitats, direct / indirect mortalities, and displacement of fauna including SCC and Protected species. If these mitigation measures are implemented the terrestrial biodiversity impacts are expected to be reduced from a high to a moderate significance. In addition, the custodian of Sensitive Species 15 identified on site, the Endangered Wildlife Trust must be informed of the presence of the species. A walkdown by a suitable specialist (EWT) should be done in the area surrounding the drilling two northern wells (Wildskamp 5 and Nooitgedacht M2) prior to any activities, mainly to confirm that SCCS are not present or will be harmed and to ensure exploration complies with relevant EWT requirements / mitigation measures.

Concerns were previously raised by the public during the original EA Application surrounding the potential for contamination of water resources (including surface water resources). In terms of the relevant legislation, no drilling may take place on or near to surface water features and furthermore, mitigation measures have been put forward to prevent pollution on or near to the drill sites which will prevent contaminated surface water runoff from entering water resources.

The clearing of vegetation for the proposed activities will expose, disturb and displace archaeological sites / material. However, from the specialist investigations, it appears that the cultural heritage features are easily identifiable and with the 30m recommended buffer, these will ideally be not impacted upon. All known heritage features should be retained and avoided with a buffer zone of 30m as per SAHRA guidelines. A Chance Finds Protocol Must be implemented for archaeological and palaeontological heritage features.

# 7. STAKEHOLDER ENGAGEMENT

The Public Participation Process (PPP) is a requirement of several pieces of South African legislation and aims to ensure that all relevant Interested and Affected Parties (I&APs) are consulted, involved and their opinions are considered, and a record included in the reports submitted to relevant authorities. The process aims to ensure that all stakeholders are provided an opportunity as part of a transparent process which allows for a robust and comprehensive environmental study. The PPP for the proposed project needs to be managed sensitively and according to best practises to ensure and promote:

- Compliance with international best practise options;
- Compliance with national legislation;
- Establish and manage relationships with key stakeholder groups; and
- Encourage involvement and participation in the environmental study and authorisation / approval process.

As such, the purpose of the PPP and stakeholder engagement process is to:

- Provide an opportunity for I&APs to obtain clear, accurate and comprehensible information about the proposed activity, its alternatives or the decision and the environmental impacts thereof;
- Provide I&APs with an opportunity to indicate their viewpoints, issues and concerns regarding the activity, alternatives and / or the decision;
- Provide I&APs with the opportunity to suggest ways of avoiding, reducing, or mitigating negative impacts of an activity and enhancing positive impacts;
- Enable the applicant to incorporate the needs, preferences, and values of I&APs into the activity;
- Provide opportunities to avoid and resolve disputes and reconcile conflicting interests;
- Enhance transparency and accountability in decision-making;
- Identify all significant issues for the project; and
- Identify possible mitigation measures or environmental management plans to minimise and / or prevent environmental impacts associated with the project.

The PPP for this project was undertaken in accordance with the requirements of the MPRDA and NEMA, as well as in line with the principles of Integrated Environmental Management (IEM). IEM implies an open and transparent participatory process, whereby stakeholders and other I&APs are afforded an opportunity to comment on the project.

## 7.1. LEGAL COMPLIANCE

The PPP must comply with several important sets of legislation that require public participation as part of an application for authorisation or approval, namely:

- The Mineral and Petroleum Resources Development Act (Act No. 28 of 2002 – MPRDA); and
- The National Environmental Management Act (Act No. 107 of 1998 – NEMA).

Adherence to the requirements of the above-mentioned Acts will allow for an Integrated PPP to be conducted, and in so doing, satisfy the requirement for public participation referenced in the Acts. The details of the Integrated PPP followed are provided below.

## 7.2. PRE-APPLICATION CONSULTATION WITH AUTHORITIES

A pre-application meeting with the Petroleum Agency of South Africa (PASA) was held on the 17th of October 2023. The objective of the meeting was to present the project, identify listed activities and the applicable application process to be followed. The pre-application consultation process eventually involved engagements

with both PASA and DFFE to ensure that the correct process to be followed for the application is an Amendment Process and not a new EA Application. The process was completed in April 2024 prior to the compilation of this report.

## 7.3. GENERAL APPROACH TO PUBLIC PARTICIPATION

The PPP for the proposed amendment was undertaken in accordance with the requirements of NEMA as well as in line with the principles of Integrated Environmental Management (IEM). IEM implies an open and transparent participatory process, whereby stakeholders and other I&APs are afforded an opportunity to comment on the project. The PPP was undertaken in accordance with Chapter 6 of the NEMA EIA Regulations (2014, as amended).

## 7.4. IDENTIFICATION OF INTERESTED AND AFFECTED PARTIES

At the start of the application process, an initial I&AP database was compiled based on known key I&AP's (affected landowners, Organs of State, etc.) from the previous database for the original EA Application, Windeed searches for those landowners directly affected by the proposed new drill sites and seismic transects, and other stakeholder databases. The I&AP database includes amongst others, landowners, communities, regulatory authorities and other special interest groups. Additional I&APs were identified during the initial notification & call to register period and during public review and comment period of the Draft Amendment Report. The I&APs database was updated throughout the duration of the amendment process. A full list of I&APs is attached in **Appendix C**.

## 7.5. PUBLIC PARTICIPATION PLAN

According to Section (32)(a)(iv) of NEMA EIA Regulations, 2014 as amended, the applicant must within 90 days of receipt by the competent authority of the application made in terms of Regulation 31, submit to the competent authority a report which has been subjected to a public participation process, which had been agreed to by the competent authority, and which was appropriate to bring the proposed change to the attention of potential and registered interested and affected parties, including organs of state, which have jurisdiction in respect of any aspect of the relevant activity, and the competent authority, and which reflects the incorporation of comments received, including any comments of the competent authority. A Public Participation Plan (PP Plan), providing the competent authority with direction on the public participation processes to be implemented for the project was submitted to PASA on the 27th of March 2024 and approved on the 15th of April 2024. Refer to **Appendix C** for the PP Plan and approval.

## 7.6. LIST OF PRE-IDENTIFIED ORGANS OF STATE/ KEY STAKEHOLDERS IDENTIFIED AND NOTIFIED

National, Provincial and Local Government Authorities as well as State Owned Entities (SOE's) were notified of the proposed project and include:

- Catchment Management Agency;
- Department of Forestry, Fisheries and the Environment (DFFE);
- Department of Water and Sanitation (DWS);
- Fezile Dabi District Municipality;
- Free State Department of Agriculture and Rural Development;
- Free State Department of Cooperative Governance and Traditional Affairs;
- African Conservation Trust;
- Agricultural Union Virginia;
- Agricultural Unions Theunissen;
- Agricultural Unions Welkom;
- Birdlife South Africa;
- Conservation South Africa;
- Endangered Wildlife Trust;
- Eskom Holding (SOC) Limited;

- Free State Department of Economic, Small Business Development and Tourism;
- Free State Department of Labour;
- Free State Department of Mineral Resources;
- Free State Department of Police, Roads and Transport;
- Free State Department of Public Works and Infrastructure;
- Free State Department of Social Development;
- Free State Department of Water and Sanitation;
- Lejweleputswa District Municipality;
- Masilonyana Local Municipality;
- Matjhabeng Municipality;
- Moqhaka Local Municipality;
- National Commission on Restitution on Land Rights;
- National Department of Agriculture, Forestry and Fisheries;
- National Department of Mineral Resources;
- National Department of Rural Development;
- National Development Agency;
- National Energy Regulator of South Africa (NERSA);
- Federation for a Sustainable Development; Treasure Karoo Action Group;
- Frack Free SA;
- Grain South Africa;
- Ground Work, Friends of the Earth South Africa;
- Project Africa;
- South African Civil Aviation Authority;
- South African Heritage Resource Agency.
- South African National Road Agency Limited;
- Sustainable Energy & Climate Change Project of Earthlife Africa;
- The Council for Scientific and Industrial Research;
- Transnet;
- Treasure Karoo Action Group;
- Urban Eco Life E-magazine;
- Wildlife & Environmental Society of South Africa; and
- Petroleum Agency South Africa (PASA).

## 7.7. PROJECT NOTIFICATION AND REQUEST FOR INITIAL COMMENTS

The PPP commenced on the 8th of May 2024 with a project notification (call to register) and request for initial comments on the project. The notification and request for comments was undertaken in accordance with the Chapter 6 of the NEMA EIA Regulations and was given in the following manner:

### 7.7.1. REGISTERED LETTERS, FAXES AND EMAILS

Notification letters, faxes, and emails were distributed to all pre-identified I&APs including government organisations, NGOs, relevant municipalities, ward councillors, landowners and other organisations that might be interested or affected. The notification letters included the following information to I&APs:

- The purpose of the proposed project;
- High level list of anticipated activities to be authorised;
- Scale and extent of activities to be authorised;
- Information on the intended production operation to enable I&APs to assess/surmise what impact the activities will have on them or on the use of their land;

- Details of the affected properties (including details of where a locality map and other information could be obtained including a Notification Letter);
- Summary of the relevant legislation pertaining to the application process;
- Initial registration period timeframes; and
- Contact details of the EAP.

### 7.7.2. NEWSPAPER ADVERTISEMENTS / GOVERNMENT GAZETTE

Advertisements describing the proposed project and registration and/or comment process was published in the Vista Newspaper with circulation in the vicinity of the study area. The advertisement was placed in the Newspaper in Sesotho, English, and Afrikaans on the 9th of May 2024. The newspaper advert included the following information:

- Project name;
- Applicant name;
- Project location;
- Nature of the activity and application;
- Date, venue and time of Public Meeting;
- Where additional information could be obtained; and
- Relevant EIMS contact person and contact details for the project.

### 7.7.3. SITE NOTICE PLACEMENT

A1 Correx board site notices in Sesotho, English, and Afrikaans were placed at various locations within and around the application area on the 9th of May 2024. The on-site notices included the following information:

- Project name;
- Applicant name;
- Project location and alternatives;
- Map of proposed project area;
- Project description;
- Legislative requirements;
- Date, venue and time of Public Meeting; and
- Relevant EIMS contact person and contact details for the project.

### 7.7.4. POSTER PLACEMENT

A3 posters in Sesotho, English, and Afrikaans were placed at a local public place in the area including Virginia and Welkom Public Libraries on the 9th of May 2024. The notices and posters afforded I&APs who may be interested in the project with the opportunity to register for the project as well as to submit any issues/queries/concerns and indicate the contact details of any other potential I&APs that should be contacted. The date, venue and time of Public Meeting was also included on the posters. The contact person at EIMS and contact details were stated on the posters. Comments/concerns and queries were encouraged to be submitted in either of the following manners:

- Electronically (fax, email);
- Telephonically; and/or

- Written letters (postal).

## 7.8. PUBLIC MEETING / OPEN DAY

Although the proposed project is an amended of the existing and approved authorisation whereby the extensive public participation including public meetings and focus group meetings were undertaken for the original EA. A public meeting was undertaken for the project. The meeting was held on the 15th of May 2024 at Harmonie Primary School in Virginia. I&APs were notified about the meeting in advance through telephone, emails, facsimiles, and/or registered letters. The notification will include the following information:

- Project background;
- Purpose / agenda; and
- Date, time and location of the meeting.

The meeting was recorded, and minutes compiled, the minutes are attached in **Appendix C**.

## 7.9. AVAILABILITY OF AMENDMENT REPORT

Notification regarding the availability of the Draft Amendment Report for public review was given in the following manner to all registered I&APs:

- Registered letters with details on where Amendment Report can be obtained and/or reviewed, public meeting date and time, EIMS contact details as well as the public review comment period;
- Facsimile notifications with information similar to that in the registered letter described above; and/or
- Email notifications with a letter attachment containing the information described above.

Hard copies of this Amendment Report and the Updated EMPr were made available for public review at the Virginia and Welkom and Phomolong Public Libraries. The report was also made available for download on the EIMS website (https://www.eims.co.za/public-participation/). The report and updated EMPr were initially available for public review from 15 May 2024 to 21 June 2024 for a period of at least 30 days. However, additional time was provided to PASA and EWT as requested to provide their comments on the report. The comments from PASA and EWT were received on the 1st and 9th of July 2024 respectively. During this additional review and comment period, comments were also received from DWS on the 24th of June. All comments have been captured, adequately responded to and added to the PPR (**Appendix C**). In addition, the comments have been considered and informed the **immaterial changes** to this Final Report.

## 7.10. COMMENTS AND RESPONSES REPORT

Issues raised have been addressed in a transparent manner and the full details (such as the comment received, the name of the I&AP who commented, the issue raised and the main aspect of the raised issue, as well as the response provided to the I&AP) included in the Public Participation Report **Appendix C**. The Public Participation Report and the comments and responses has continuously been updated throughout the public participation phase as and when new comments were received. A summary of comments received is as follows:

- Requests for a copy of the EA and ER;
- Requests clarification on the project location and consultation process;
- Requests for relevant documentation pertaining to this project (i.e. reports, specialist studies, etc.)
- Inquiries on how the community can benefit from the project;
- Acknowledgements of receipt of the initial notification from the Department of Water and Sanitation (DWS) and the Provincial Head of the DWS: Free State.

- Acknowledgement of receipt of the initial notification from the Department of Land Reform and Rural Development (DALRRD).
- I&APs wishing to de-register from the I&AP database.
- Notification from the South African Heritage Resources Agency (SAHRA) to create a SAHRIS application. If necessary, a SAHRIS application will be made, and the relevant case officer will be contacted.
- Confirmation from Transnet Pipelines that they are not affected by the proposed project.
- Comments from the Hennenman Farmers Union: Expressed the significance of sustainable development and responsible environmental stewardship, and the importance that the Hennenman Farmers Union engaging in the process to seek clarity to ensure the interests of the community are safeguarded where matters concerning land use and resource exploitation arise.
- The Hennenman Farmers Union requests more information regarding the project and procedural aspects of the amendment process as they had been approached by several farmers raising questions and apprehension regarding the project.
- Specific requests / comments included:
    - Details regarding the scope and objectives of the project in their district.
    - Clarification on the EIA procedures being undertaken, including potential risks or concerns identified, and the proposed mitigation measures.
    - Details regarding the timeline and stages of the Part II amendment process, along with opportunities for public consultation and participation.
    - Expressed that as stakeholders directly affected by the project, it is crucial that the Hennenman Farmers Union be adequately informed and involved in the process.
    - Explained that their aim is to engage constructively with all relevant stakeholders, including EIMS, to ensure that the interests of the farming community and the environment are considered appropriately and protected.

## 7.11. REVIEW OF REPORTS BY COMPETENT AUTHORITIES

It must be noted that PASA is the assessor of the applicant but is not the decision maker. The Competent Authority for making the final decision is the Department of Mineral Resources and Energy (DMRE). Both PASA as the assessor and DMRE as the Competent Authority have been provided with the Draft Amendment Report and Updated EMPr for review and comment as well as the application form. Comments received from PASA and DMRE will be captured and responded to on the comments and responses report.

According to Section (32)(a)(iv) of NEMA, the applicant must within 90 days of receipt by the competent authority of the application made in terms of regulation 31, submit to the competent authority a report which has been subjected to a public participation process, which had been agreed to by the competent authority, and which was appropriate to bring the proposed change to the attention of potential and registered interested and affected parties, including organs of state, which have jurisdiction in respect of any aspect of the relevant activity, and the competent authority, and which reflects the incorporation of comments received, including any comments of the competent authority. Therefore, the final Amendment Report and Updated EMPr will be submitted to both parties within 90 days of lodging the application. The competent authority must within 107 days of receipt of the report contemplated in regulation 32, in writing, decide the application.

## 7.12. NOTIFICATION OF DECISION TO I&APS AND APPEAL PERIOD

After a decision has been reached by DMRE, Chapter 2 of the National Appeal Regulations 2014 makes provision for any affected person to appeal against the decision also. Within 20 days of being notified of the decision by

the competent authority, the appellant must submit the appeal to the appeal administrator. An appeal panel may be appointed at the discretion of the delegated or organ of state to handle the case and it would then submit its recommendations to that organ of state for a final decision on the appeal to be reached. EIMS will communicate the decision of the Provincial Authority and the way appeals should be submitted to the Minister and to all I&APs as soon as reasonably possible after the final decision has been received.

# 8. CONCLUSION AND RECOMMENDATIONS

## 8.1. IMPACT STATEMENT

The aim of this report was to provide a concise analysis of the potential environmental impacts of the changes to the proposed exploration activities, including comments and issues raised by Interested and Affected Parties (I&APs). The Draft Report was made available to all I&APs to review and provide comment, for a period of 30 days as indicated in **Section 7**. The report assessed the project details, the environmental conditions, legislative requirements, specialist assessments, potential impacts and mitigations relating to the proposed amendments to the EA, namely:

- Amending the existing EA Conditions (number of authorised drilling wells) and EMPr;
- Add an addition of ten (10) new exploration boreholes (13 drilling wells in total including the initial 3 which were approved); and
- Undertake approximately 30 km of new seismic transects.

The EAP is of the opinion that the information contained in this amendment report, and the documentation attached in the appendixes, present a suitable independent evaluation of the proposed amendment and is sufficient in providing registered and potential I&APs with a transparent and objective assessment report. Based on the Low to and Very High relative environmental sensitivities identified by the DFFE Screening Tool Report, known sensitivities from previous studies and various reasons outlined in **Section 3.16**, the following specialist studies were conducted:

- Terrestrial Biodiversity Study;
- Wetland Baseline and Impact Assessment;
- Heritage Impact Assessment; and
- Palaeontology Impact Assessment.

The outcome of the specialist studies is provided in various sections in the report from **Section 3** to **Section 5** and the reports are attached in **Appendix C1**: Approved Public Participation Plan

Appendix C2: Pre-Application Correspondence

Appendix C3: Initial Notification and Proof

Appendix C4: Site Notices

Appendix C5: Newspaper Adverts

Appendix C6: Report Availability Notification and Proof

Appendix C7: Public Meeting Document

Appendix C8: Interested and Affected Parties Database

Appendix C9: Table of Correspondence

Appendix C10: Correspondence Proof

Appendix D. The Terrestrial Biodiversity Impact Assessment found that the main expected impacts of the proposed infrastructure will include the Habitat loss and fragmentation; Degradation of surrounding habitat; Disturbance and displacement caused during the construction and maintenance phases; and Direct fauna mortality during the construction phase. There are areas within the study area that possess a 'High' Site Ecological Importance. This denotes that avoidance mitigation wherever possible must be implemented. This

includes changes to project infrastructure design and activity to limit the amount of habitat impacted. The maintenance of basal vegetation cover is important for the project, so complete clearance of roads for activities is not recommended. Project planning according to mitigation may provide favourable avoidance mitigation. Considering the mentioned information, no fatal flaws are evident for the proposed project. It is the opinion of the specialist that the proposed project, may be favourably considered on condition that all prescribed mitigation measures and supporting recommendations are implemented. The seismic project is expected to have an overall low residual impact. If mitigation measures as described in the report are implemented, it will reduce the significance of the risk to an acceptable level.

The Wetland Baseline Risk Assessment found seven hydrogeomorphic (HGM) units within the study area. These comprise of a channelled valley bottom (HGM 1), multiple depression wetlands (HGM 2 and 6), a floodplain wetland (HGM 3) as well as multiple unchannelled valley bottoms (HGM 4, 5 and 7). Due to the location of the wetlands, it was deemed that only HGM 1, 2 and 3 were at risk by the proposed activities and was thus the focus of the study. These systems scored an overall PES scores ranging between D- "Largely Modified" and E – "Seriously Modified", due to the modifications arising from anthropogenic influences and surrounding agricultural activities. The Importance and Sensitivity (IS) category for both the valley bottom and depression wetlands were calculated to be "Moderate", which combines the low protection status of the wet veg and the and the high threat status of the wetlands themselves. The floodplain wetland scored "High" sensitivities due to the High threat status of the wet veg and the High threat status of the wetlands themselves. The average ecosystem service score was determined to range between "Intermediate" and "Moderately High". It is evident that the proposed activities will encroach into the delineated wetland areas but will not have a large impact on the systems. Considering the mentioned information, it is important that the mitigations measures outlined in the report are adhered to when conducting the seismic prospecting. No significant wetland loss is foreseen. It is the opinion of the specialist that the project may be favourably considered, on condition all prescribed mitigation measures and supporting recommendations are implemented.

Five heritage features and resources were identified within the site. These consist of two burial grounds, one foundation remains of a stone-built structure, one midden and one grinding stone. The stone-built remains of a structure is possibly related to the depicted structures on the 1945 maps and most likely older than 60 years. The structure remains itself are not conservation worthy. The midden and griding stone. Middens could contain still born burials. The grinding stone is not conservation-worthy. The heritage features are located within the extended 1 km assessment buffers, but further away from the proposed seismic transects and drilling locations. It is the opinion of the heritage specialist that the proposed project will not have a direct impact on the identified heritage resources as they are easily identifiable and distal from proposed sites, rated as being of low to high heritage significance. All burial grounds and graves will be avoided and retained with a buffer zone of 30m as per SAHRA guidelines. If this is not possible, the graves will be relocated after completion of a detailed grave relocation process, that includes a thorough stakeholder engagement component, adhering to the requirements of s36 of the NHRA and its regulations as well as the National Health Act and its regulations.

The Palaeontological Impact Assessment found that the area is underlain by Quaternary deposits, while the largest portion of the development is underlain by the Adelaide Subgroup (Beaufort Group, Karoo Supergroup). Jurassic dolerite is present in the southern portion of the development. The PalaeoMap of the South African Heritage Resources Information System (SAHRIS) depicts that the Palaeontological Sensitivity of Quaternary sediments is Moderate, that of the Adelaide Subgroup is Very High while the Palaeontological Sensitivity of Jurassic dolerite is Zero as it is igneous in origin and thus unfossiliferous. No fossiliferous outcrop was detected in the proposed development. This could be attributed to the lack of outcrops as well as the lush grassy vegetation in the area. Based on the site investigation as well as desktop research it is concluded that fossil heritage of scientific and conservational interest in the development footprint is rare. This is in contrast with the High Sensitivity allocated to the development area by the SAHRIS Palaeosensitivity Map and DFFE Screening Tool. A medium Palaeontological Significance has been allocated for the construction, operational and decommissioning phases of the development. A Chance Finds Protocol must be implemented for the project.

## 8.2. EAPS OPINION

It is concluded that the proposed amendments will not result in significant changes to the assessed impacts within the 2017 EIA / EMPr. Mitigation measures described in the original EMPr and the additional mitigation measures recommended in this report are adequate to manage the identified potential impacts. The EMPr has been updated to include all additional mitigation measures identified in this Amendment Report associated with the amendment activities. Although no fatal flawed issues were identified on the basis of the assessments done, consideration and best environmental practices should be given to the scale or extent of the activities in relation to the surrounding environmental sensitivities. Based on an assessment of information gathered from desktop studies, site environmental screening and a subsequent review of specialist's studies, it was determined that the site falls within a 'Low to Medium' relative environmental sensitivity with mitigations. It is the EAP's opinion that the proposed amendment activities should be authorised provided the mitigation measures and recommendations highlighted in this report (**Section 5.3 and 8.3**) and the updated EMPr (**Appendix E**) are adhered to.

## 8.3. EAPS RECOMMENDATIONS

It is the EAP's opinion that the proposed amendment activities should be authorised subject to adherence to the previously approved mitigation measures highlighted in the EMPr (**Appendix E**) as well as the following additional measures / recommendations based on the updated EAPs assessment and the specialist:

- The additional exploration activities (9 seismic transects and 10 drilling wells) may only be undertaken within the assessed corridors i.e. 50 m corridors for seismic transects and 1 km buffers for drilling wells;
- The Developer shall inform all landowners of the commencement of construction activities at least 30 days before commencement. Landowners must be requested to indicate the type and location of services within their properties;
- Before the project commences, an asset and services baseline of services that may be affected within 10 m of the centreline of the seismic transect and 10m from the edge of drilling point must be compiled. A copy of the baseline records should be given to each landowner/ service provider, and a master document kept by the applicant;
- Underground mining companies (if any) within the identified drilling locations must be engaged during the planning phase to ensure the drilling activities do not interfere with underground mining activities;
- A suitable qualified Environmental Officer (EO) or Environmental Compliance Officer (ECO) must be appointed prior to the construction / exploration phase. If the final seismic transect route and/or the drilling location changes from the currently proposed areas, but within the assessed footprint and is situated within the high sensitive area, the EO / ECO must undertake final walkdown along the final planned transect route/s and drilling locations in order to ensure that no sensitive vegetation or floral SCC are to be impacted;
- The suitably qualified Environmental Officer appointed must train the Contractor to identify possible archaeological, cultural, historic and palaeontological features during the construction / exploration phase;
- No seismic activities nor drilling activities are to be permitted within on wetlands or watercourses (32 m prelitigation and a 15 m post-mitigation buffer);
- Existing gravel roads must be used as far as possible, and the closest disturbed areas must be considered for drill pads. Clearance of vegetation must be kept to the required footprint (i.e. 50 x 50 m drill pad).
- Areas of indigenous vegetation, even secondary communities outside of the direct project footprint, should under no circumstances be fragmented or disturbed further. A vegetation clearance management plan should be compiled prior commencement of activities which at minimum should

state how the minimisation with be managed based on the affected environmental aspect or phase of the exploration;

- Areas rated as High sensitivity (i.e. Rocky Grassland habitat, heritage features and watercourses) outside of the direct exploration areas should be declared as 'no-go' areas during the life of the project, and all efforts must be made to prevent development access to these areas from construction workers and machinery;
- Rehabilitation of the disturbed areas must be made a priority. Any disturbed area must be re-habilitated to its pre-disturbed state. Any disturbed area must be re-habilitated to its pre-disturbed state as defined in the pre-drill survey. Disturbed areas must be rehabilitated to support its post-closure land use, and this must be undertaken within six (6) months post drilling activities;
- All laydown, chemical toilets etc. should be restricted to low / medium sensitivity areas. Any materials may not be stored for extended periods of time and must be removed from the project area once the construction/exploration phase has been concluded;
- No trapping, killing, or poisoning of any wildlife is to be permitted on site;
- The custodian for sensitive species 15 (Endangered Wildlife Trust (EWT)) must be informed of the presence of the species. A walkdown by a suitable specialist (EWT) should be done in the area surrounding the drilling two northern wells (Wildskamp 5 and Nooitgedacht M2) prior to any activities, mainly to confirm that SCCs are not present or will be harmed. The custodian must provide mitigation measure strictly to be followed; and
- Identified protected or SCC flora and/or fauna species according to the list of protected species under Schedule, if any individuals of these plant species are to be disturbed, permits must be obtained from the Free State Department of Economic, Small Business Development, Tourism and Environmental Affairs (FSDESTEA) and must be relocated by a suitably qualified environmentalist / ecologist;
- All burial grounds and graves should be retained and avoided with a buffer zone of 30 m as per SAHRA guidelines. If this is not possible, the graves could be relocated after completion of a detailed grave relocation process, that includes a thorough stakeholder engagement component, adhering to the requirements of s36 of the NHRA and its regulations as well as the National Health Act and its regulations;
- A Chance Finds Protocol must be implemented. When heritage features are discovered / uncovered, the area must be demarcated with a 30-meter no-go-buffer-zone and the archaeologist / palaeontologist must be called in to assess immediately. The EO must immediately notify the ECO of such findings, the ECO will advise the necessary actions to be taken;
- Should any heritage features be exposed during excavation, work on the area where the artefacts were discovered, shall cease immediately and the Environmental Control Officer shall be notified within 24hours, and a Chance Find Protocol must be implemented. The responsible heritage resources authority (FSPHRA), as well as the South African Police Service (SAPS) must be notified within 72 hours; and
- The applicant must adhere to the Approved PASA Basis of Design Report which specifies the engineering design principles and methodology which are applicable to this project.

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