# *RENEWAL OF THE ENVIRONMENTAL IMPACT ASSESSMENT TO UNDERTAKE EXPLORATION AND SMALL-SCALE TEST MINING ACTIVITIES FOR PRECIOUS STONES, PRECIOUS METALS AND BASE AND RARE METALS ON EXCLUSIVE PROSPECTING LICENSE (EPL) 6952, KATIMA MULILO, ZAMBEZI REGION*

***September 2023***

***App - 230925002142***

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| **Project Name:** | ***RENEWAL OF THE ENVIRONMENTAL IMPACT ASSESSMENT TO UNDERTAKE EXPLORATION AND SMALL-SCALE TEST MINING ACTIVITIES FOR PRECIOUS STONES, PRECIOUS METALS AND BASE AND RARE METALS ON EXCLUSIVE PROSPECTING LICENSE (EPL) 6952, KATIMA MULILO, ZAMBEZI REGION*** |
| **Proponent:** | Clarina Zita Dias<br>P O Box 2356<br>Ngwezi<br>Katima Mulilo<br>Zambezi Region |
| **Prepared by:** | Green Earth<br>ENVIRONMENTAL CONSULTANTS<br>1st floor Bridgeview Offices & Apartments, No. 4 Dr Kwame Nkrumah Avenue, Klein Windhoek, Namibia<br>PO Box 6871, Ausspannplatz, Windhoek |
| **Release Date:** | September 2023 |
| **Consultant:** | C. Du Toit<br>C. Van Der Walt<br>Cell: 081 127 3145<br>Email: charlie@greenearthnamibia.com |

# EXECUTIVE SUMMARY

*Green Earth Environmental Consultants* were appointed by the proponent, Clarina Zita Dias, to apply **for the renewal of the Environmental Clearance Certificate** to undertake exploration and small-scale test mining activities for precious stones, precious metals and base and rare metals on EPL 6952 located in the Zambezi Region ±100km south of the town of Katima Mulilo.

**An Environmental Impact Assessment was conducted, and an Environmental Clearance Certificate was obtained 25 August 2020. This ECC expired on 25 August 2023 and must be renewed to continue with the exploration and small-scale test mining activities.**

During the effective validity period of the clearance certificate, the following were undertaken:

(1) Hiring of LDA Geolocal Company, to undertake High Resolution Ground Magnetic Surveying Acquisition (the report is included in this EIA).

(2) Identification of 13 potential targets for RC (Reverse Circulation) sampling drilling. **The renewal is required to accompany the RC bulk sampling tasks at the 13 identified targets as per the geophysist report recommendations.**

In accordance with the Environmental Impact Assessment Regulations (GN 30 in GG 4878 of 6 February 2012) of the Environmental Management Act (No. 7 of 2007), the activities listed below, which forms part of the proposed operations, may not be undertaken without an Environmental Clearance Renewal:

> ***MINING AND QUARRYING ACTIVITIES***
> *3.1 The construction of facilities for any process or activities which requires a license, right or other form of authorisation, and the renewal of a license, right or other form of authorisation, in terms of the Minerals (Prospecting and Mining Act), 1992.*
> *3.2 Other forms of mining or extraction of any natural resources whether regulated by law or not.*
> *3.3 Resource extraction, manipulation, conservation and related activities.*

The environmental impacts during the operational phase of the proposed project:

| IMPACTS DURING OPERATIONAL PHASE | | | |
|---|---|---|---|
| **Aspect** | **Impact Type** | **Significance of impacts Unmitigated** | **Significance of impacts Mitigated** |
| Ecology Impacts | - | M | L |
| Dust and Air Quality | - | M | L |
| Groundwater Contamination | - | M | L |
| Waste Generation | - | M | L |

| | | | |
|---|---|---|---|
| Failure of Reticulation Pipeline | - | M | L |
| Fires and Explosions | - | M | L |
| Safety and Security | - | M | L |

| **IMPACT EVALUATION CRITERION (*DEAT 2006*):** | | |
|---|---|---|
| **Criteria** | **Rating (Severity)** | |
| **Impact Type** | + | Positive |
| | O | No Impact |
| | - | Negative |
| **Significance of impacts** | L | Low (Little or no impact) |
| | M | Medium (Manageable impacts) |
| | H | High (Adverse impact) |

Positive impacts derived from the proposed exploration and test mining operations are that additional employment, although limited, will be created during the exploration and test mining activity, unused natural resources may be found which can be mined, processed and exported and the positive spinoffs which will come if the exploration shows results which will lead to the eventual establishment of a full commercial mining operation.

Negative impacts derived from the project are mainly associated with the exploration drilling and test mining activity for instance damage to vegetation, roads, farming, water and electrical installations, dust and noise and the risk of soil, surface and groundwater pollution. None of the potential impacts identified are regarded as having a significant impact to the extent that the proposed project should not be allowed. However, the exploration and test-mining activities need to be controlled and monitored by the assigned contractors and the proponent.

The Environmental Impact Assessment Renewal which follows upon this paragraph was conducted in accordance with the guidelines and stipulations of the Environmental Management Act (No 7 of 2007) meaning that all possible impacts have been considered and the details are presented in the report.

Based upon the conclusions and recommendations of the renewed Environmental Impact Assessment Report and Environmental Management Plan, the Environmental Commissioner of the Ministry of Environment, Forestry and Tourism is herewith requested to:

1. Accept and approve the renewed Environmental Impact Assessment.
2. Accept and approve the renewed Environmental Management Plan.
3. Issue a renewed Environmental Clearance to undertake exploration and small-scale test mining activities for precious stones, precious metals and base and rare metals on EPL 6952 located in the Zambezi Region ±100km south of the town of Katima Mulilo and for the following listed activities:

***MINING AND QUARRYING ACTIVITIES***

*3.1 The construction of facilities for any process or activities which requires a license, right or other form of authorisation, and the renewal of a license, right or other form of authorisation, in terms of the Minerals (Prospecting and Mining Act), 1992.*

*3.2 Other forms of mining or extraction of any natural resources whether regulated by law or not.*

*3.3 Resource extraction, manipulation, conservation and related activities.*

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| | |
|---|---|
| EC | Environmental Clearance |
| ECO | Environment Control Officer |
| EIA | Environmental Impact Assessment |
| EMP | Environmental Management Plan |
| I&APs | Interested and Affected Parties |
| MAWLR | Ministry of Agriculture, Water and Land Reform |
| MEFT | Ministry of Environment, Forestry and Tourism |

# 1. INTRODUCTION

*Green Earth Environmental Consultants* were appointed by the proponent, Clarina Zita Dias, to apply for the renewal of the Environmental Clearance Certificate to undertake exploration and small-scale test mining activities for precious stones, precious metals and base and rare metals on EPL 6952 located in the Zambezi Region ±100km south of the town of Katima Mulilo.

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> *3.2 Other forms of mining or extraction of any natural resources whether regulated by law or not.*
> *3.3 Resource extraction, manipulation, conservation and related activities.*

The following Environmental Impact Assessment Renewal contains information on the project and the surrounding areas and activities.

# 2. TERMS OF REFERENCE

To be able to implement the project, an Environmental Impact Assessment Renewal and Environmental Clearance Renewal is required. For this environmental impact exercise, *Green Earth Environmental Consultants* followed the terms of reference as stipulated under the Environmental Management Act.

The aim of the environmental impact assessment is:

- To comply with Namibia's Environmental Management Act (2007) and its regulations (2012).
- To ascertain existing environmental conditions on the site to determine its environmental sensitivity.
- To inform I&APs and relevant authorities of the details of the proposed activities and to provide them with an opportunity to raise issues and concerns.
- To assess the significance of issues and concerns raised.
- To compile a report detailing all identified issues and possible impacts, stipulating the way forward and identify specialist investigations required.
- To adhere to the National Solid Waste Management Strategy of the Ministry of Environment, Forestry and Tourism.
- To outline management guidelines in an Environmental Management Plan (EMP) to minimize and/or mitigate potentially negative impacts.

The tasks that will be undertaken for the Environmental Impact Assessment Renewal include the evaluation of the following: climate, water (hydrology), vegetation, geology, soils, social, cultural heritage, groundwater, sedimentation, erosion, biodiversity, sense of place, socio-economic environment, health, safety and traffic.

The renewed EIA and EMP from the assessment will be submitted to the Environmental Commissioner for consideration. A renewed Environmental Clearance will only be obtained (from the DEA) once the renewed EIA and EMP has been examined and approved for the listed activities.

The public consultation process as per the guidelines of the Act has been followed. The methods that were used to assess the environmental issues and alternatives included the collection of data on the project site and area from the proponent and identified stakeholders. All other permits, licenses or certificates that are further on required for the operation of the proposed project still needs to be applied for by the proponent.

## 3. NEED AND DESIRABILITY

Limited geological information on this part of the Zambezi Region, including the EPL 6952 area, has been generated, especially about the possible occurrence of base metals and precious stones. The area is underexplored with respect to diamonds and other mineral commodities. From the study completed by the Geologist (Josia Shilunga - see copy attached), it has been established that the EPL 6952 is prospective in diamonds and copper. The magnetic anomalies in the southern part of the EPL 6952 area are potential sites of the kimberlites and they are worth a detailed geophysical survey to delineate the single magnetic bodies in a high-resolution geophysical data.

There was a need to do a more detailed survey of the area through exploration and test mining. Apart from investigating the geology for traces of these and determining whether it is commercially minable, all the geological information will be made available to the Ministry of Mines and Energy which will make the information available to the Geological Survey of Namibia.

The Zambezi Region is well known for its lush vegetation, high concentration of free ranging wild life and natural ambiance. It is not known for any mining activities. In general, the public is sceptic to the mining potential of the Zambezi Region as well as the desirability of allowing such activity into the region. However if there is potential for mining it should be investigated and if feasible, the area should be mined subject to strict environmental management practices to minimize the impact on the environment. If mining opportunities are identified, employment will be created, a natural resource will be utilized, and value will be added to the area in general.

# 4. PROJECT DESCRIPTION/SITE INFORMATION

## 4.1. LOCALITY OF PROJECT SITE

EPL 6952 is located in the Zambezi Region ±100km south of the town of Katima Mulilo. The EPL area can be accessed from various existing roads which crosses the Zambezi Region. EPL 6952 is ±98 380 hectares in size and is located on state land. The EPL area falls outside any of the protected wildlife areas/national parks proclaimed in the Zambezi Region. See locality map below:

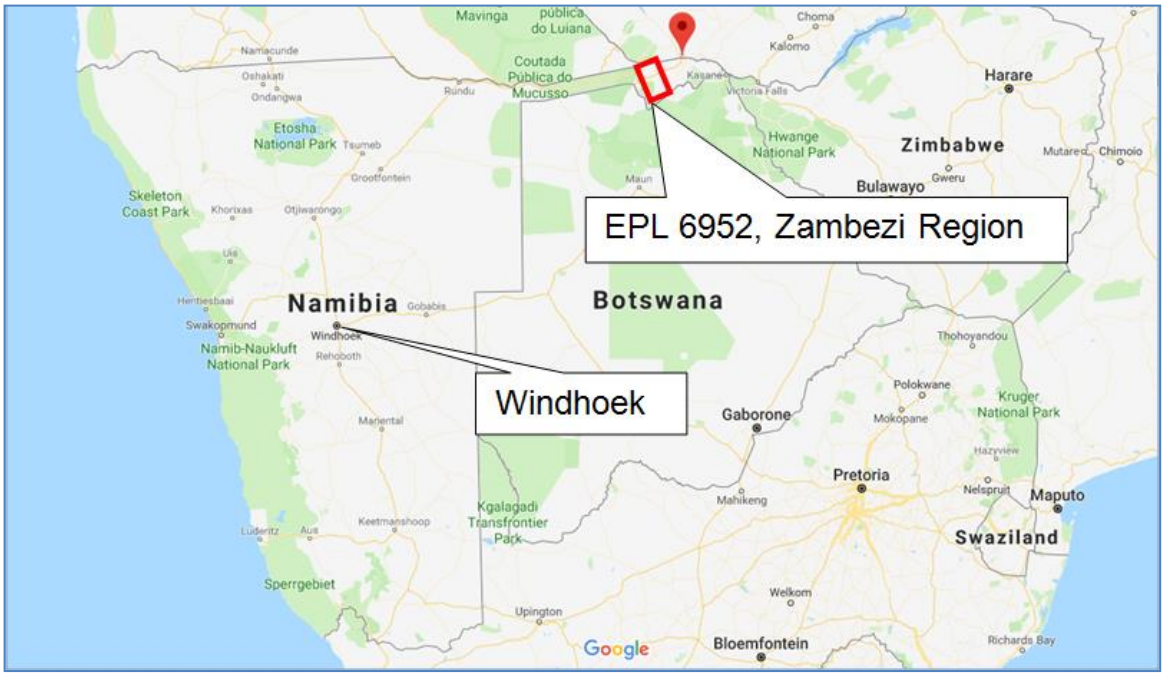


*Figure 1: Project Site location*

The EPL area lies east of the Mudumo National Park and northeast of the Nkasa Rupara National Park. The Parks are not enclosed by fences which mean that wildlife is roaming free between the protected areas and the EPL area. The EPL area is not home to any environmentally sensitive areas although there are some known animal migration roads going through the area. These migration roads have been identified and mapped and the possible impacts of the proposed exploration activities will be minimal. The natural environment shows signs of human and animal intervention as it is used for livestock

(cattle and goats) farming, the cultivation of crops (maize, peanuts, millets vegetables and sorghums), wood and timber harvesting, hunting and tourism concessions and for residential purposes where build up areas are found which includes houses, schools, clinics and shops. The concession area is accessible from various roads which cross the area (both tar and gravel). In some areas it is serviced with a water supply network from NamWater and electricity from Nored. See map below:

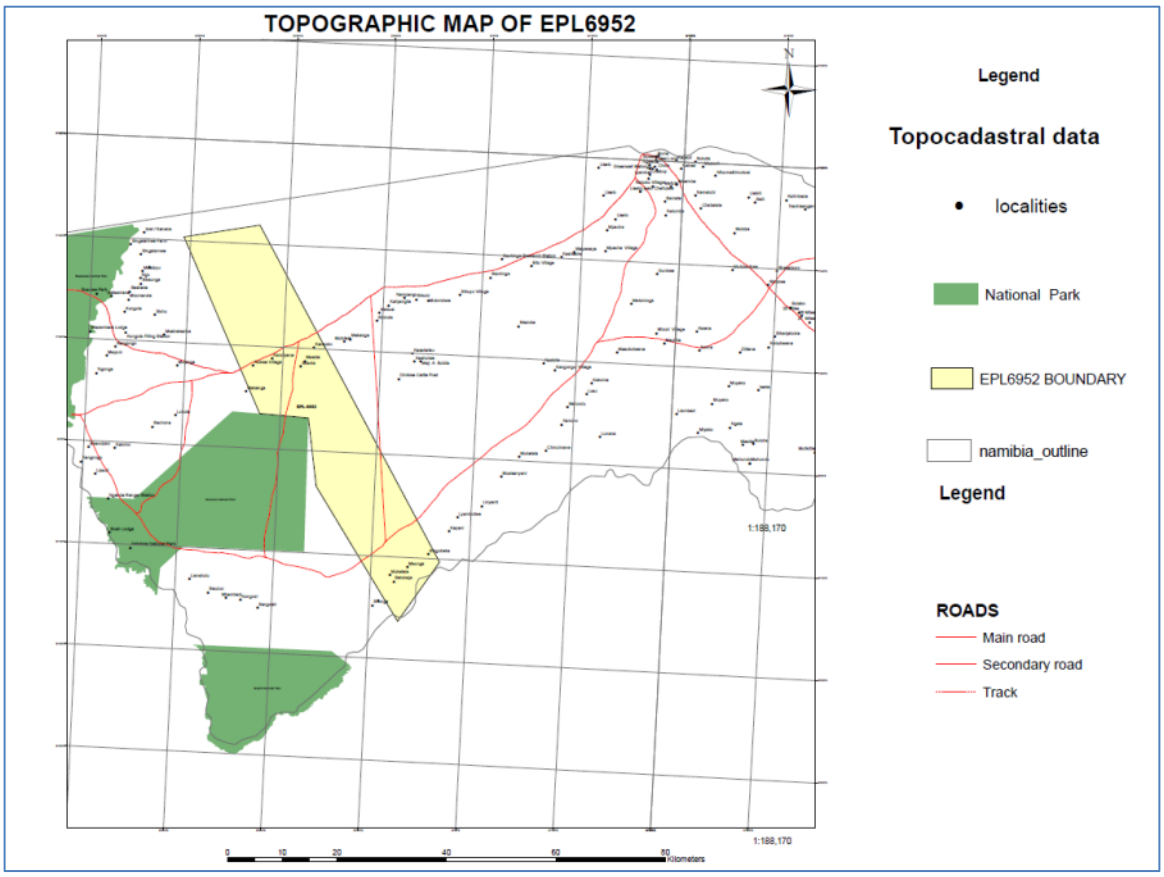


*Figure 2: Locality Plan of EPL 6952, Zambezi Region*

The protection of the natural environment is thus a key focus area in the Environmental Management Plan for the proposed activity.

The northern section of EPL 6952 includes the following villages/settlements:

- Nukwa Village
- Kandiyana
- Sitanta
- Masida
- Kansoko

The southern section of EPL 6952 includes the following villages/settlements:

- Mbilajwe
- Shikhakhu

- Batubaja
- Muketela
- Maunga
- Singobeka

The locality of the villages/settlements is shown on the map below:

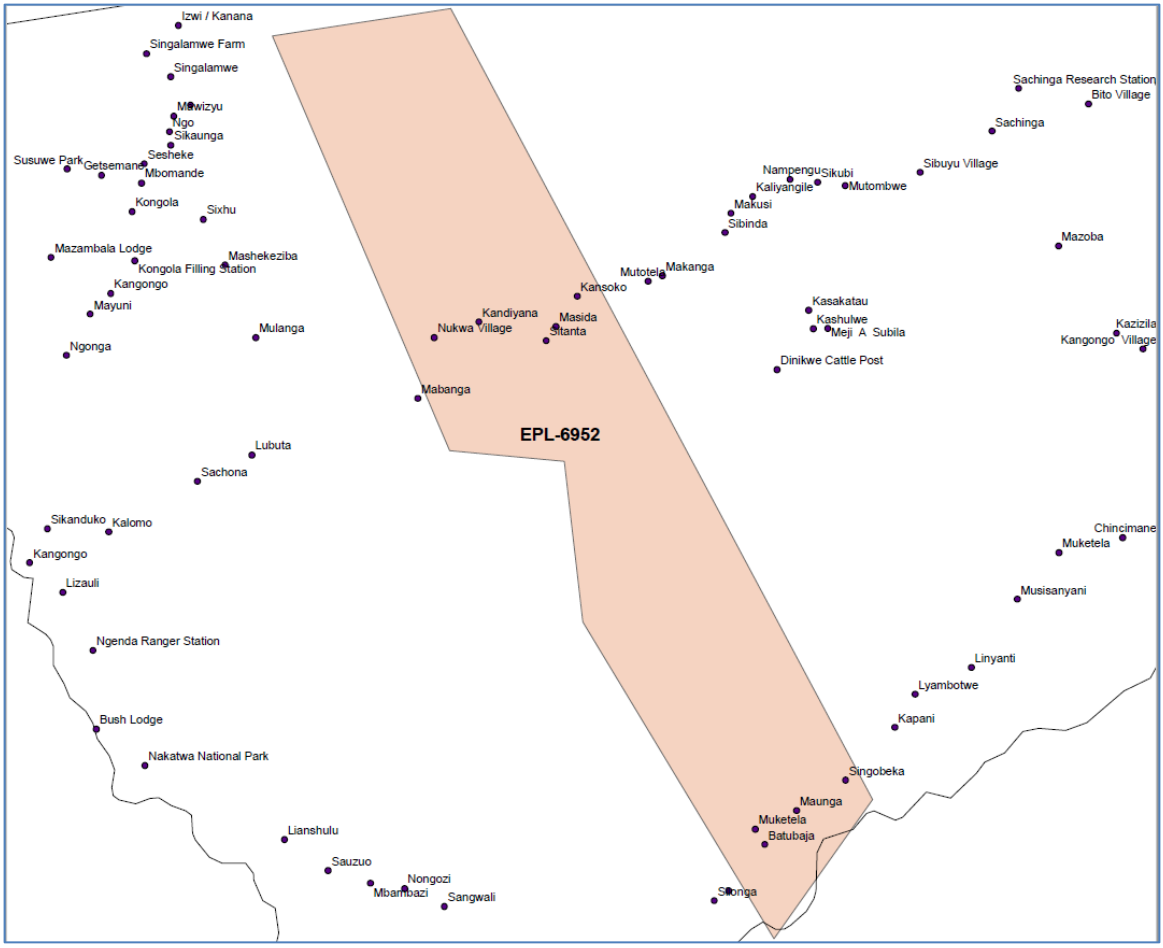


*Figure 3: Map showing the villages/settlements located in EPL 6952*

The EPL is located on State Land which falls under the control of the Mafwe Royal Establishment and the Mayeyi Traditional Authority. Both the Mafwe Royal Establishment and the Mayeyi Traditional Authority have been informed that the Proponent has been granted EPL 6952 and of the proposed exploration and test mining activities. Both these authorities issued the Proponent with a 'permission letter' for the proposed mining and exploration activities. *See copies of letters below:*

# MAFWE ROYAL ESTABLISHMENT

Office of the Ngambela. Linyanti Khuta
P. O. Box 7004 – Chinhimani,Katima Mulilo – Republic of Namibia

July 19, 2018

**TO WHOM IT MAY CONERN**

Dear Sir/ Madam

**Permission letter of Mining Exploration**

The Mafwe Traditional Authority hereby testify that Mrs.**Clarina Zita Dias** Identity Number. **640509 00092** the holder of **EPL** Number: 6952 have been authorized to do Mining Exploration to the land/areas which have been approved by the Ministry of Mines and Energy.

Our permission for granting this permission is without apprehension of any nature, because the areas are under our jurisdiction.

Thanking you in anticipation

Mr. M.D.Lusepani
Hon. Ngambela

Mr. P.M. Kawana
Hon. Natamoyo

Ms. A.M.Matali
Secretary

MAFWE ROYAL ESTABLISHMENT
Office of The Ngambela
Linyanti Khuta
2018 -07- 19
P. O. Box 7004
Chinchimani
REPUBLIC OF NAMIBIA

*Figure 4: Permission letter from the Mafwe Royal Establishment*

# MAYEYI TRADITIONAL AUTHORITY

Enquiries:
Cell: 0813630908

Private Bag 1537
Ngweze, Katima Mulilo
Zambezi Region
Republic of Namibia

12th December 2018

TO WHOM IT MAY CONCERN

**RE: Permission letter of mining & exploration**

Dear Sir/Madam

The Mayeyi Traditional Authority hereby authorise Mrs Dias Clarina Zita of I.D. No. 64050900092, the holder of EPL 6952 which was given to her by the Ministry of Mines and Energy to do Exploration and Mining activities in our land/areas.

Our authority for granting this permission is without apprehension of any nature, because the areas/land is under our jurisdiction.

Thank you for your anticipation.

Yours Faithfully

Mr Josias Mufalali Falali
Hon. Ngambela
.....

Mr Jeke Sifu Crispin
Hon. Natamoyo
.....

Ms/Mr Albert Zibiso
Secretary
.....

MAYEYI TRADITIONAL AUTHORITY
PO Box 1537
Ngweze
2018 -12- 12
BATSARA BATSAPI
REPUBLIC OF NAMIBIA

*Figure 5: Permission letter from the Mayeti Traditional Authority*

## 4.2. PROSPECTIVE MINERALS TO BE FOUND

This part of the Zambezi Region including the EPL 6952 area is underexplored with respect to diamonds and thus other mineral commodities. A Geological Scoping Report has been prepared on EPL 6952 by a Geological Consultant (Mr Josia Shilunga) in August 2018. This is a desktop study which has been undertaken to ascertain the prospectively of the EPL 6952. The following commodities were covered in this license area:

1. Precious Stones;
2. Precious Metals;
3. Base and Rare Metals;

From the study completed by the Geologist, it has been established that the EPL 6952 is prospective in diamonds and copper. The magnetic anomalies in the southern part of the EPL 6952 area are potential sites of the kimberlites and it is worth a detailed geophysical survey to delineate the single magnetic bodies in a high resolution geophysical data.

Based on the presented magnetic data, the EPL 6952 area comprises structural lineaments (Karoo dykes) with a similar orientation as that of Sikereti in Namibia and Okavango Zone in western Botswana. Other metals sought for would require a detailed field campaign to establish whether they can be present in sufficient quantities.

## 4.3. THE EXPLORATION PROCESS

The identified area of exploration is largely an unknown geological area. Very little or any mapping thereof had been conducted in the past. The objective of the planned exploration is consequently to generate geological data and to identify any base metal deposits therein, copper in particular and/or precious stones (diamonds), which are viable for commercial mining. Such exploration is to be conducted in two phases.

**First Phase:** Non-invasive exploration was conducted through airborne geophysical surveying and data analysis. The most important parameters measured are conductivity, magnetic susceptibility, rock density, radioactive element concentration, and reflectance spectra. The photo below shows a typical aircraft conducting geophysical survey with related equipment. Once the information gathered through these processes have been evaluated and confirmed, target areas will be identified which may be drilled or undergo test-mining (as part of invasive exploration).

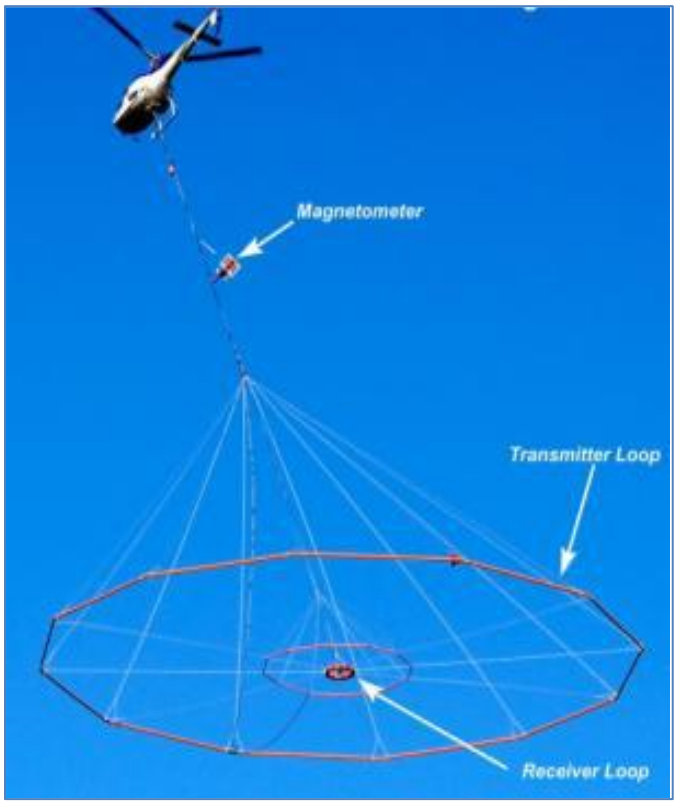


*Figure 6: Aircraft conducting airborne geophysical surveys (Ministry of Mines and Energy, 2006)*

**Second Phase:** This phase, which entails invasive exploration, is fundamentally dependent on the first non-invasive exploration phase. The phase provides information on the broader geological structure of the area and is indicative of possible ore bodies which may be explored through drilling and resource evaluation (which forms part of invasive exploration). It may also involve small scale test mining where a specific area is mined on a very small scale. Exploration drilling is used to probe the contents of known ore deposits and potential sites. By withdrawing a small diameter core (150 – 200mm in diameter) of rock from the orebody, geologists can analyze the core by chemical assay and conduct petrologic, structural and mineralogical studies of the rock. Normally two types of drilling are used for exploration drilling:

Air Drilling

There are two main types of air drilling used to drill deeper holes, namely open hole percussion and reverse circulation (RC). These drilling techniques are very similar in equipment to water bore drilling. Air drilling uses compressed air to drive a slowly rotating percussion drill bit, which operates in a similar manner to a jack hammer. The drill bit is typically fitted with numerous hardened protrusions that crush the rock at the bottom of the hole. It produces rock chips that are lifted to the surface by compressed air. This drilling method is relatively fast, can penetrate hard rock and is capable of drilling holes up to 300 meters deep. These methods do not usually require significant site preparation. Truck-mounted rigs with one or two support vehicles, to carry drill rods and an air compressor, are typically required. Most drill holes can be completed in a single day. The rock chips

brought to the surface are logged by a geologist and samples are sent for laboratory analysis.

Diamond Drilling

Diamond drilling uses a truck-mounted rig with support vehicles to extract a continuous cylinder of rock. This method uses a rapidly rotating drill bit that uses water and drilling fluids, contained in either an in-ground sump or above ground tanks, to cool and lubricate the drill bit. As the drill rods advance, the cylinder of remaining rock gradually becomes enveloped by the drill rods. The core of rock is logged by a geologist and samples are sent for laboratory analysis. Ground up rock material is transported to the surface by the returning drilling fluids and is separated from the fluids, typically in drill sumps or small ponds. Above ground sumps may be used in sensitive environments. Diamond drilling is the costliest form of drilling and is capable of drilling holes many kilometers in depth. Each drill hole can take several days to complete, and some programs drill over 24 hours a day if practical.

Depending on the duration of the drilling program, additional equipment such as portable shelters, storage containers and portable lighting plants may be required. This method requires significant site preparation and rehabilitation. Most advanced exploration for minerals uses a combination of diamond and reverse circulation drilling.

## 4.4. EXPLORATION ACTIVITIES AND REQUIREMENTS

The activities associated with exploration phases as well as related labour and equipment requirements are summarized in the table below:

*Table 1: Equipment Requirements*

| | Non-invasive exploration | Invasive exploration |
|---|---|---|
| Description of Exploration Activities | Historical data collation<br> File sampling<br> Geological field mapping, including soil sampling or ground geophysical surveys (such as line cutting)<br> Fixed and rotary wing aerial geophysical surveys | Field sampling<br> Reverse Circulation (RC) and/or Diamond Drilling |
| Equipment Requirements | Airborne survey aircraft (fixed or rotary wing)<br> Geophysical survey vehicle(s) (4x4 vehicles) and equipment | 4x4 vehicle(s)<br> Drilling support truck(s)<br> Reverse Circulation & Diamond drill rig(s)<br> Compressor and generator(s)<br> Fuel to power the drill rigs (transported in drums or in a small fuel truck) |
| Approximate In-house Labour Requirements | Geologist(s) (two),<br> Field assistant(s), (two) | Geologist(s) (up to two)<br> Field assistant(s) up to four |

| | | |
|---|---|---|
| | □ Health and Safety Officer<br>□ Logistics Officer<br>□ Aircraft and geo-mapping operator (aerial surveyor & Pilot) | □ Health and Safety Officer<br>□ Logistics Officer<br>□ Drilling Crew (up to 10) |
| Site Access | Via existing track | Via existing track<br>□ Development of new tracks will be kept to a minimum if required |
| Storage Requirements | Bag samples<br>□ Geo-mapping equipment<br>□ Aircraft | Lay down area to accommodate:<br>□ Hydrocarbon and fuel (storage in bonded area)<br>□ Core sample storage<br>□ Drill rig equipment |
| Accommodation Requirements | Hired accommodation to accommodate all staff | Exploration Project Camp to accommodate:<br>□ 10 Crew and professional staff<br>□ In designated pre-determined, area |

The activities and resulting actions are covered during the impact assessment and any negative impacts are covered in the environmental management plan for mitigation.

## 4.5. SCHEDULING OF EXPLORATION ACTIVITIES

The Proponent appointed an operator to do the exploration work. It was agreed at the public meetings that, should the EC be granted, the Proponent and the appointed exploration operator will initiate communication with regards to non-invasive exploration through established community communication channels. Thereafter such activities will be conducted. Due to the nature of exploration, the long-term duration thereof will be determined by its findings. Experience has shown that this phase may take a couple of months. Once the results of its findings have been verified and proven feasible for continued exploration, a drilling program will be drawn up and the invasive explorations conducted accordingly. Once the drilling sites have been identified and the program has been finalised the Proponent and exploration operator will inform the affected communities through the established community communication channels. This process is also result-driven and may last for a couple of months to many years.

## 4.6. REHABILITATION OF EXPLORATION DRILLING

Rehabilitation is a condition of every exploration license and must be undertaken as soon as practical following disturbance of the surface. Planning for rehabilitation is undertaken before surface disturbance and in consultation with the landholder.

Rehabilitation of drill holes includes casing, sealing and capping the hole. Usually the hole is given a temporary cap prior to the results of the laboratory analyses. The hole is then plugged below ground with a concrete and metal plug, so it can be found with a metal

detector. The surface is backfilled and left slightly mounded, to allow for subsidence then reseeded and fertilized as appropriate for the surrounding area.

## 4.7. ALTERNATIVES TO BE CONSIDERED

Various alternatives have been identified in terms of the exploration and its supporting activities. The most significant of these are technology, timing and sanitation. Technology alternatives refer to the various drilling techniques and equipment available. These will largely be determined by the geology and results on the non-invasive exploration activities. Timing and location of any exploration activities are further highlighted in terms of sensitive receptors which are to be considered in this tourism sensitive environment.

The Proponent and exploration operator are advised not to subtract water directly from any rivers in the area unless as a last resort and not without required permits and additional community communication. Water must be obtained from existing sources for domestic and operational use. All attainment of water will be discussed and negotiated with the holder of the water rights, for each particular source from which it may be required. All alternatives are listed below in a comparison table which indicates the preferred alternative.

*Table 2: Activity Summary Table*

| ALTERNATIVE OPTIONS | ADVANTAGE | DISADVANTAGE | PREFERRED OPTION |
|---|---|---|---|
| Supply of Energy: Cooking | | | |
| Purchased Wood for Cooking | Financial benefit to the local economy<br><br>Natural source | Limited registered vendors available which have harvesting permits | During the non-invasive phase there will be limited cooking as staff will reside in hired accommodation and related meal provision. If and when cooking is to be conducted, it will be done as per electricity or gas.<br><br>During the invasive phase energy requirements are proposed to be met using gas and purchased wood (from registered permit holding vendors). |
| Gas for cooking | Portable and removable source<br><br>Renewable and not obtained from the receiving environment | Explosive properties in terms of health and safety requirements.<br><br>Transportation and storage of hazardous material<br><br>Require training in use | |
| Electricity for cooking | Inexpensive<br><br>Readily usable and consumer friendly | Infrastructure to connect to no everywhere available | |

| | | | |
|---|---|---|---|
| Supply of Energy: Operations | | | |
| Fuel | Readily available<br><br>Cost effective | Required safety and emergency procedures – storage and transportation training<br><br>Waste by-product (gas emissions)<br><br>Safe and secured Storage area required | The only option during the non-invasive phase.<br><br>During the invasive phase, it is proposed that fuel be used as the conventional energy provide.<br><br>The amount thereof is proposed to be decreased by the employment solar technologies where available and feasible such as for lighting. |
| Solar | It is a Renewable resource<br><br>Easily transportable to required application area<br><br>Limited storage area | Dependent on sunny days radiation<br><br>Expensive capital expenditure<br><br>Specialist installation and repair requirements costly and time consuming | |
| Provision of Sanitation | | | |
| Trench Latrine | No artificial chemicals<br><br>Very cost effective<br><br>Limited vegetation disturbance | Limited capacity<br><br>Only for short term use<br><br>Fixed location | Ablution facilities for the non-invasive phase will be those as per the hired accommodation.<br><br>It is proposed that the invasive phase consider a combination of the VIP system and portable camp toilet.<br><br>Depending on the drilling program, a VIP system may be established at the |
| VIP System | No artificial chemicals<br><br>Extensive capacity | Soil and vegetation disturbance<br><br>Fixed locality | |
| | Easily transportable | | |

| | | | |
|---|---|---|---|
| Portable chemical toilet | No direct impact on the environment and ecology (if disposed legitimately) | System involves chemicals<br><br>Transportation of hazardous material<br><br>Disposal required at existing facility | contactors camp while portable camp toilets should be taken and removed daily to drill sites. |

## 4.8. CURRENT PROGRESS ON THE PROJECT

The following information was obtained from Gideon Haingura (Geotrend & Research Data Solutions) on *The Drilling Programme for Diamondiferous Kimberlite Target for EPL 6952* (2023):

## 1. Background

Exploration Prospecting Licenses (EPL) 6952 is fully owned by Zita Dias Diamond Resources (Pty) Ltd. Zita Dias Diamond Resources (Pty) Ltd is a Namibian company whose interest to develop EPL6952 into a formable resource mining project. EPL6952 was granted to Zita Dias Diamond Resources Pty Ltd by the Ministry of Mines and Energy. Following the official granting of the license, GG4 (SL) Ltd and the Geophysics LDA were tasked to carry out the remote sensing interpretation and geophysics studies on the property. The survey confined 13 targets of diamond-kimberlites within the property which are meant to be tested with a drilling and confined the depth and extend of mineralisation.

At this stage of exploration, 13 targets were identified, and the Reverse Circulation (RC) type was recommended. These 13 targets are defined as, ZM001 to ZM013 (see Figure 3). RC drilling was chosen as a reasonable at this early stage of exploration which is mainly preliminary before embarking on with diamond drilling. The company planned to embark on 2 600 m of RC programme on their Diamondiferous project in the Zambezi region. The protocol below outlines drilling programme stages to be implemented from administration, costing, logging to sampling techniques to be employed at Zambezi project to ensure NI 43-101 compliance throughout the drilling programme. Gideon Haingura is qualified personnel and has been contracted by Zita Dias Diamond Resources Pty Ltd to manage and oversee the drill programme. The project has already been issued with Environmental Clearance Certificate from the Ministry of Environment and Tourism.

The Drilling will be carried out by the drilling contractor (to be named prior to the commencement of the project) using RC. It is proposed that one RC drilling rig will be conducted over two 12-hour shifts per day for 6 days per week. The drilling process is anticipated to last for two months with a total budget of more than 5 million Namibian dollars. Most of the holes are planned on north or northeast azimuths at 90°. RC holes are expected to be drilled to a nominal 150 m to 200 m drill depth but, depending on results obtained during drilling, these borehole depths can be changed at the discretion of the responsible geologist on the site.

## 2. Locality

EPL6952 is located in the North-eastern region called Zambezi, formerly known as Caprivi, an area belonging to the communal land covered and bordered by Angola and Botswana. The area is surrounded by villages such as Chegere, Singalamwe, Kongolo, Dipito, Yaka and Lyinyati, just to

mention a few (Figure 1). Geological, the area is mostly compromises of a recent material to Kalahari sediments with no physical geology outcrops present. The area is accessed by B and C road, mainly with 4X4 transport.

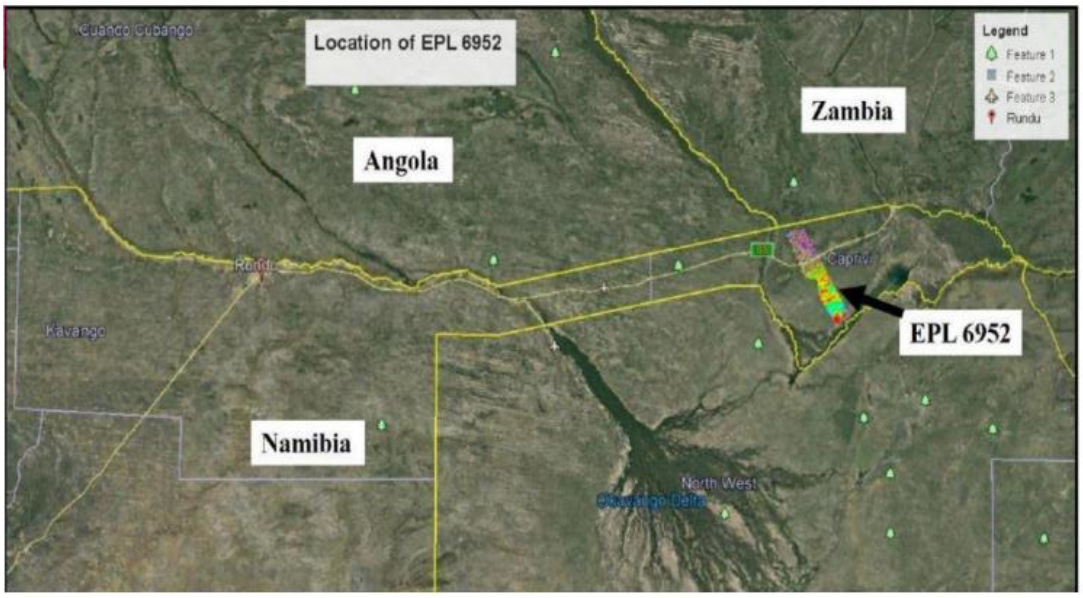


*Figure 1: location of the EPL6952 with surrounding villages.*

## 3. Permits and Access

For any drilling to proceed, it is reasonable to acquire access and get permission from the relevant authority on the property. The area is located in the Communal area; thus, permission should be sought from the Traditional leaders. The area is accessed by B and C-road (Figure 2). The copies of EPL ownership should be given to all parties of the exploration project, project geologists and drillers on site to avoid surprises from local authorities over the mineral rights. Prior to commencement, an environmental consultant should be present to take note of the physical landscape before and after drilling by taking photographs.

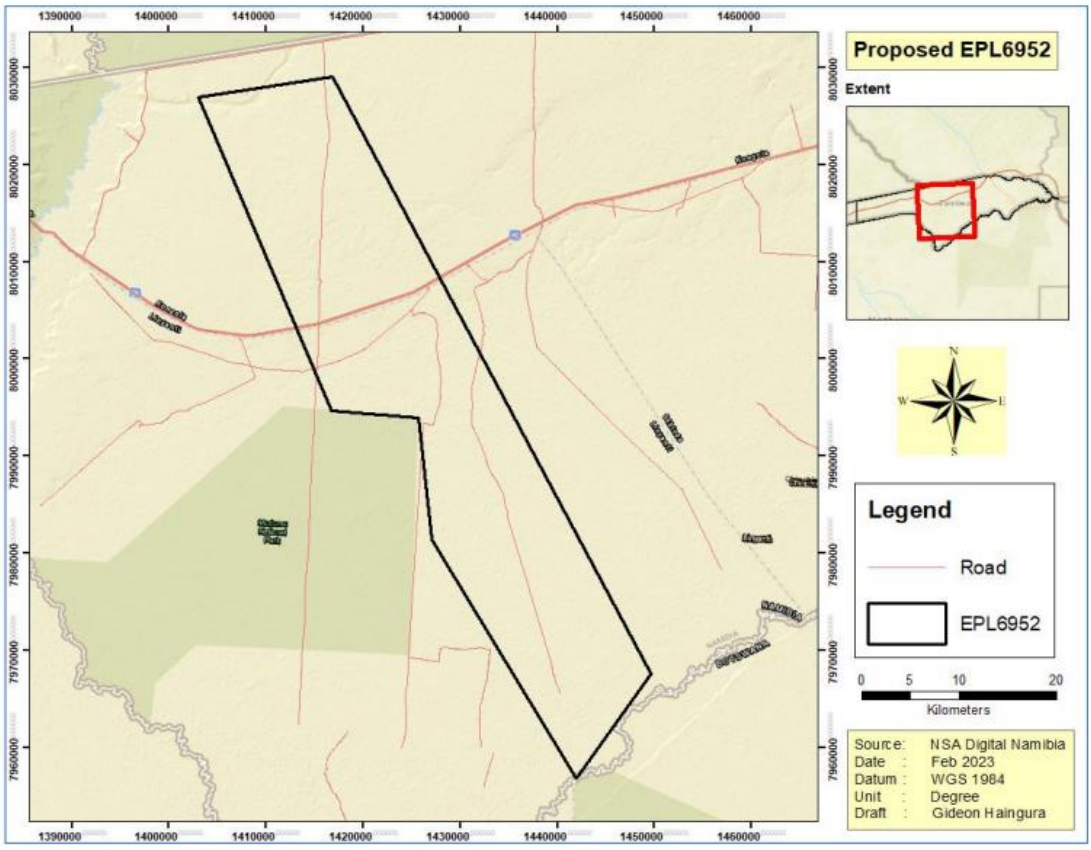


*Figure 2: Proposed drill area with access roads.*

## 4. Reconnaissance and pegging

To confirm all 13 targets for drilling, the geologist will be sent to the field to do pegging and ground truthing to all 13 holes. This is to make sure that targets are accessible and seen as intended. Notes will be taken for each respective hole and this process is likely to take place within a week. RC Drilling holes be sited using a handheld GPS unit set on WGS84, UTM Zone 33S. Based on the ground truthing, the drilling targets will be valued and rated on their respective presence geology and accessibility.

## 5. Planning and logistics

Drilling is an expensive exercise and needs extensive planning. The whole drilling process from administration to drilling is anticipated to take two months. The drilling programme will flow chart as

shown in Figure 3. Usually, each entity on chart flow(Figure 3) should run their own administration and logistics as independent to avoid bureaucracy in planning. It should be noted both drillers and exploration will have separate campsites. These campsites should be enacted before undertaking the drilling process. The campsites should be constructed in line with environmental compliance and traditional authorities or other necessary authorities. Water and power are essential in the task, it is likely that Namwater will supply drilling water or water will be drawn from underground or Zambezi River. Thus, is crucial, the inspection team should take note the source of water and power prior to constructing campsites and drilling. It is believed that both drillers and exploration teams will utilize it is own power either using petrol or diesel fuel.

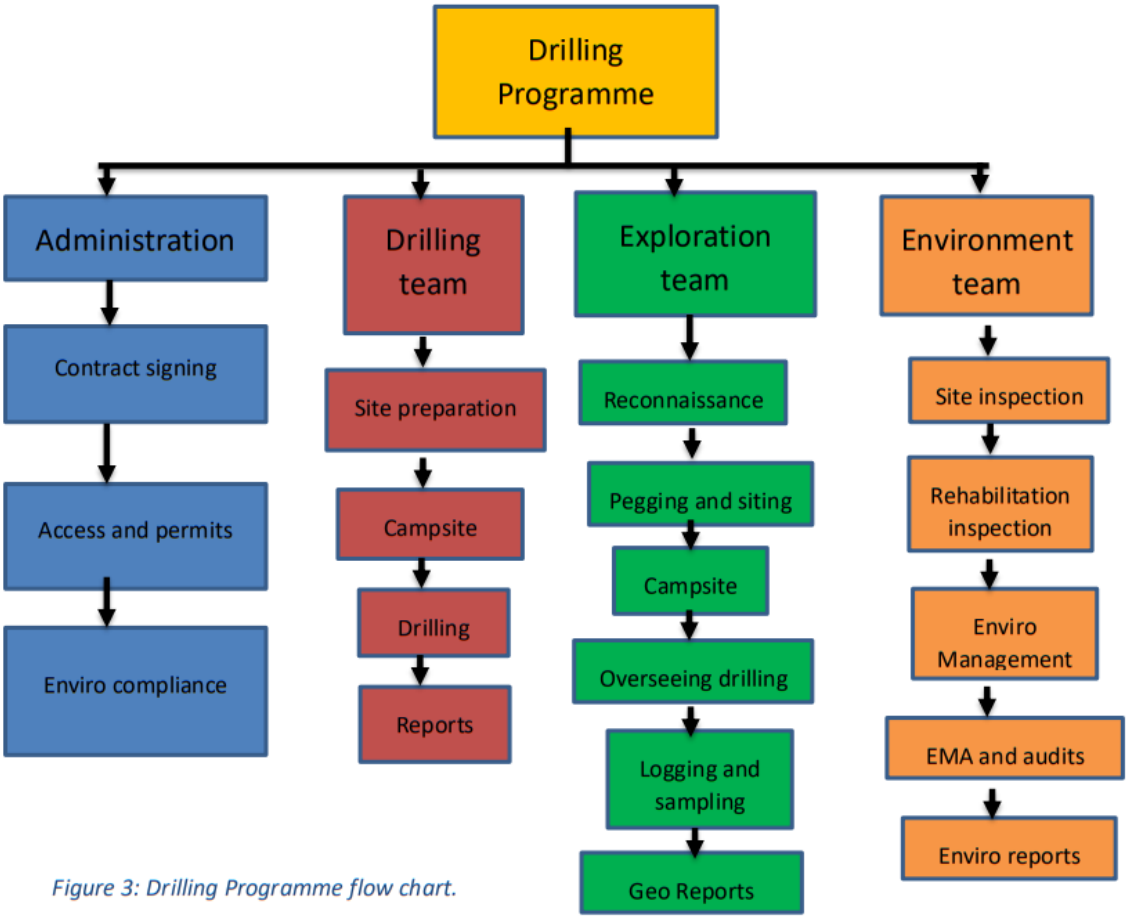


*Figure 3: Drilling Programme flow chart.*

## 6. Drilling targets

Once the drilling sites have been cleared and given the green light for drilling to take place, it should be taken into consideration that both drillers, geologists, as well as environment consultant, should

visit the sites/pegs to familiarize themselves. This task is planned for two to three days of the visit. After verifying these targets, then it will be known to exploration team on how many holes will be drilled or accessible to drill with no sort of restrictions. At current, before ground truthing, the drill targets are set as seen in Table 1 and Figure 3.

*Table 1: Target description with coordinate locations, anticipated end of the hole and drill direction (azimuth)*

| Hole ID | Coordinates | | End of Hole (EOH) | Azimuth | Description |
|---|---|---|---|---|---|
| | Easting | Northing | | | |
| ZM001 | 773168 | 8044809 | 200 | 90 | Moderate potential, centre of caldera, low magnetic anomaly |
| ZM002 | 773735 | 8044895 | 200 | 90 | Moderate potential, centre of caldera, low magnetic anomaly |
| ZM003 | 774802 | 8044934 | 200 | 90 | Moderate potential, centre of caldera, low magnetic anomaly |
| ZM004 | 773466 | 8044271 | 200 | 90 | Moderate potential, centre of caldera, low magnetic anomaly |
| ZM005 | 774110 | 8044367 | 200 | 90 | Moderate potential, centre of caldera, low magnetic anomaly |
| ZM006 | 774628 | 8044357 | 200 | 90 | Moderate potential, centre of caldera, low magnetic anomaly |
| ZM007 | 772130 | 8043377 | 200 | 90 | Centre of caldera, low magnetic anomaly |
| ZM008 | 771945 | 8043906 | 200 | 90 | Centre of caldera, low magnetic anomaly |
| ZM009 | 776724 | 8043781 | 200 | 90 | High potential, very low magnetic anomaly, within weak crustal zone |
| ZM010 | 777080 | 8043809 | 200 | 90 | High potential, very low magnetic anomaly, within weak crustal zone |
| ZM011 | 777801 | 8043886 | 200 | 90 | High potential, very low magnetic anomaly, within weak crustal zone |
| ZM012 | 778118 | 8044040 | 200 | 90 | High potential, very low magnetic anomaly, within weak crustal zone |
| ZM013 | 778579 | 8044090 | 200 | 90 | High potential, very low magnetic anomaly, within weak crustal zone |

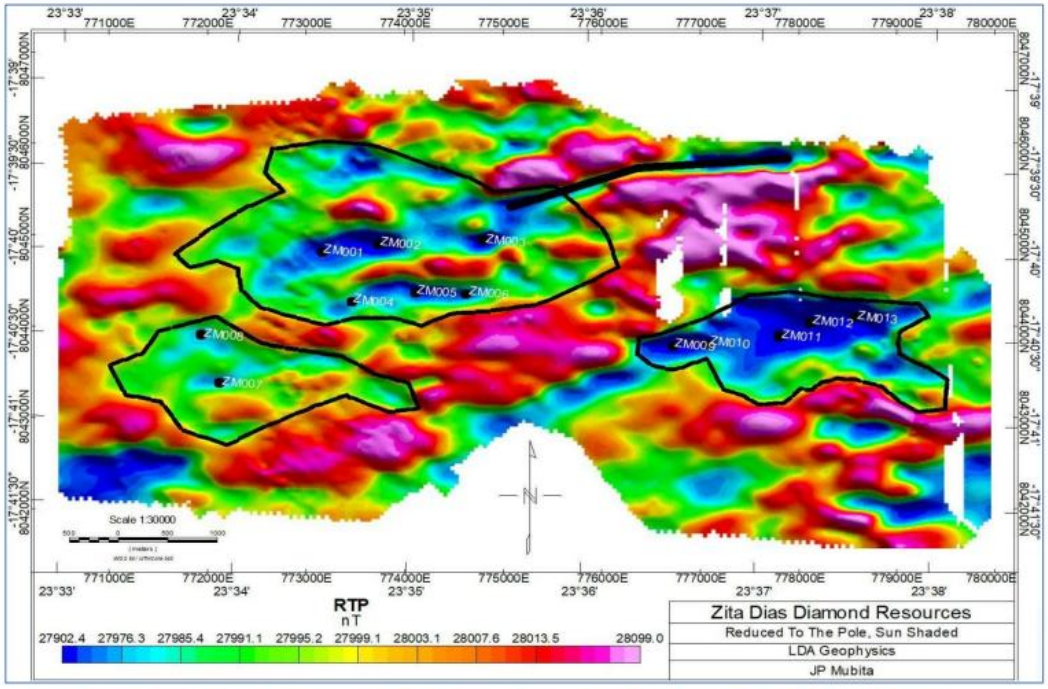


*Figure 4: The Total Magnetic Intensity (TMI RTP) with planned drill hole sites from ZM001 to ZM013.*

The site photography should be undertaken for environmental monitoring purposes. This should be done prior to the establishment of the drill pad from a pre-determined marked vantage point. Further photographs must be taken from this vantage point at similar times of the day during drilling and

following rehabilitation of the drill site. The planned drill sites with borehole collar locality pegs are to be placed at all sites by the responsible geologist. It is important to clearly mark the collar position of the hole along the desired azimuth either using a compass or GPS waypoints.

It is anticipated that all holes will be angled at 90 degrees. Here azimuth relative to True North must be checked by the responsible geologist using a compass which is to consider the local magnetic declination. A compass reading for the bearing should be taken from outside the influence sphere of the metal minerals or rig to accurately determine the azimuth of the hole. Local declination for Katima Mulilo is **Magnetic Declination: -6° 87'** west of True North. It is the responsibility of the geologist in charge to make sure that a rig is set up correctly.

## 7. Logging and sampling

RC Drilling deals with chips, to gain whose chips should be sufficient and effective to recover and provide enough split samples. Prior to the RC drilling, the standards, codes, and colours should provide to exploration manager/project manager and drillers to avoid sample mix up. The indicated mineral of kimberlite, lithology and alteration should be made known to the drillers and responsible geologists on the site. The physical property of geology mineralisation will help the sampler or logger to determine when to end the drilling known, refer here as EOH, End of the Hole.

## 8. Expenditure and costs

For two months, the total cost for this operation is estimated at more than 5 million Namibian dollars (for details costing see Appendix A). Over 30 personnel are expected to undertake this project including admin, drillers, geologists, labourers, drivers and cooks. Drilling is expected to have more personnel than other teams of the exploration. We anticipated of using one rig to cut costs and avoid challenges in handling more than two rigs for such low drilling meters.

## 9. Environmental compliance

The exploration and drilling team under operation ensures that environmental compliance is followed strictly. Each team will have a Safety, Health, and Environment officer to ensure that all environmental concerns are addressed as per Environmental Management Act No 7 of 2007, hereafter as EMA. In any drilling activities within Namibia, the EMA allows both the drilling team and environment consultant to work concurrently, hand in hand. After completion of drilling, all tracks and disturbed land are rehabilitee and left in the condition it should recover. All the drill holes should be sealed and marked accordingly as well as trenches are covered completely. Environmental compliance is an ongoing

process, however, after the drilling operation ceased it is recommended that environmental management are taken into consideration as part of Environmental Clearance Certificate requirement (Appendix B).

## 10. Reporting and database management

All the reporting should be in line with NI43-101 compliance. All the data should be stored in databases and backup systems. The project expects to implement a daily, weekly and monthly reporting system.

The following information was obtained from JP Mubita Mubita (Geophysics LDA) on *High-Resolution Ground Magnetic Survey Interpretation for Diamondiferous Kimberlite targets for EPL 6852 (Ground Magnetic Survey for Diamondiferous Kimberlite Exploration targets covering part of Exclusive Prospecting License are EPL 6952* (2023):

The aim of the high-resolution ground magnetic survey was to map areas of low magnetic anomalies that may be related to zones of crustal weakness or kimberlite/calderas hosting diamondiferous mineralisation. Figure 1 shows EPL 6952 locality in white polygon, north eastern part of Namibia.

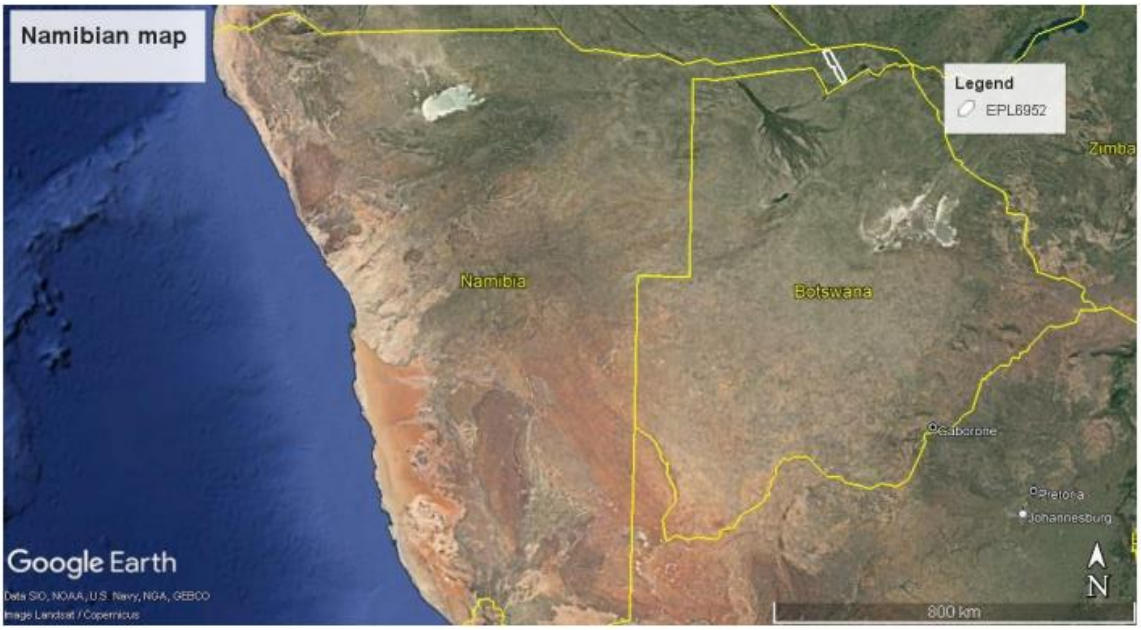


*Figure 1. EPL6952 locality in white polygon, north eastern part of Namibia.*

Figure 2 shows ground magnetic survey in red polygon north of EPL6952. The survey area may be accessed through farm roads from the Kongola-Kamenga road. The EPL lies about 70 km west of Katima Mulilo.

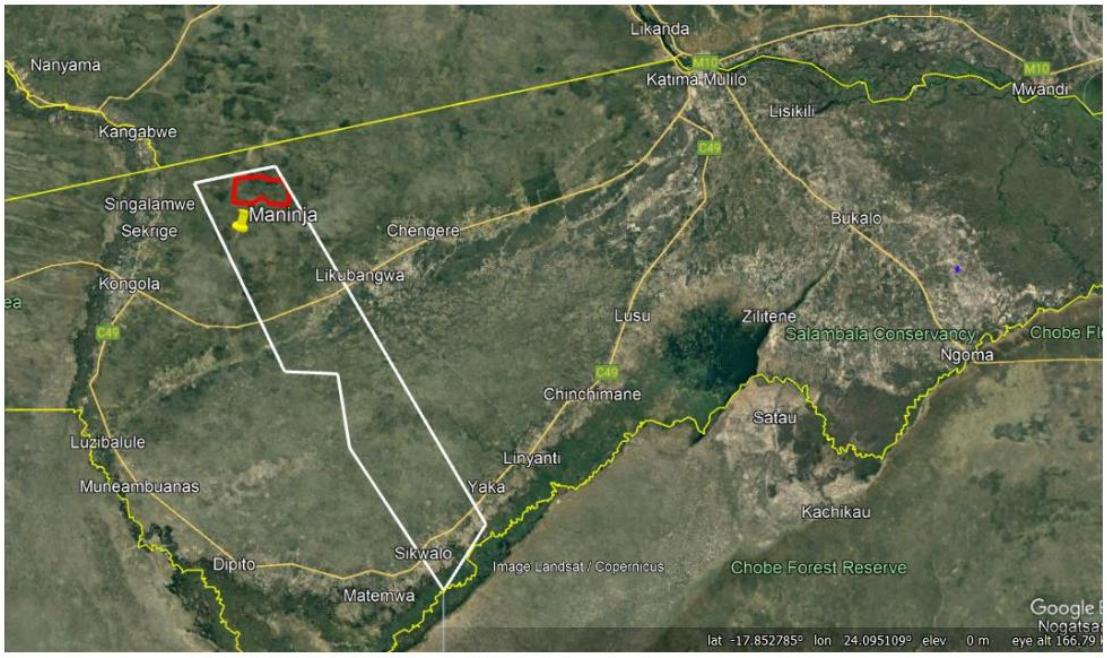


*Figure 2. Ground magnetic survey in red colour north of EPL6952 in white, also indicated is Maninja borehole locality some 5 km south of the survey are, where sandstone rock types were observed..*

## 2. Local Geology

EPL6952 is located in the Zambezi Region, an area covered by mostly Kalahari sediments with no outcrop geology observed. Minor outcrop geology is observed along river banks and is described as that of basaltic characteristics and volcanic (Miller, 2008). Samples observed from a nearby private water borehole some 5km south of the survey area (see Figure 2, Maninja location) indicates the presence of sandstone and calcrete ithology (Maninja borehole, Unpublished). Other borehole drilled within the region have also shown presence of calcareous and silicified sandstone, see Table 1 (WAPCOS, 1995).

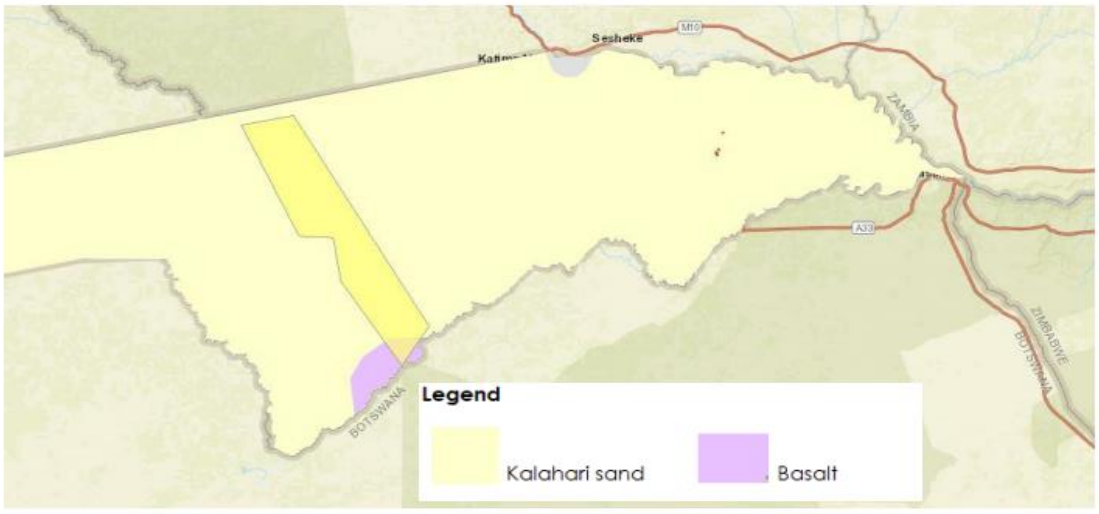


*Figure 3: Geology map of EPL6952 in yellow courtesy of Geological Survey of Namibia*

Table 1: Lithology Description

| Rock Unit | Lithology | Thickness |
|---|---|---|
| Upper Aquifer | very fine to coarse grained, partly calcareous sandstone with intercalations of silicified sandstone * | 102 – 115 m* |
| Aquitard | bluish-green clay, fine to medium grained sandstone | 14 – 26 m |
| Lower Aquifer | fine to coarse grained, partly calcareous sandstone with layers of bluish-green clay | 56 – >125 m |
| Karoo Basalt | dark green weathered basalt, with abundant calcite coating on fracture planes | ? – not penetrated |
| Karoo Sandstone | | ? – not reached |

* DWA-BGR boreholes; ** all boreholes in E-Caprivi

## 3. Mineralisation

The area is prospective for alluvial/kimberlite hosted diamond mineralisation as well as precious stones, precious metals and base & rare metals. The inferred zone of crustal weakness prospective for diamond runs from known diamond mines in Angola and through the EPL all the way to Orapa mine in Botswana.

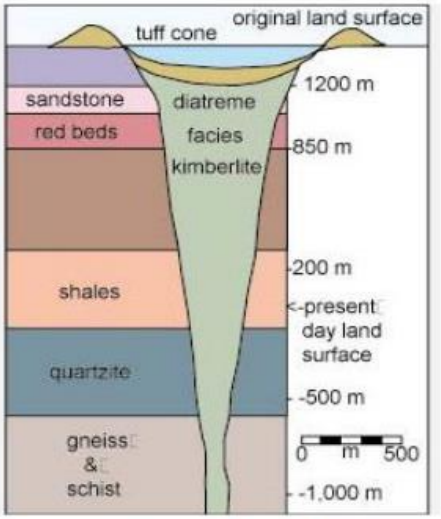


*Figure 4: Kimberlite geology example, note sandstone lithology in the first 1200m depth.*

## 4. Ground Magnetic Survey

The high-resolution ground magnetic survey was acquired from 20th November 2022 to 19th December 2022. The survey was acquired using the GSM-W19 magnetometer from GEM systems Inc. Figure 5 shows a Rover magnetometer in action during the survey. See instrument specifications in Table 2 below.

Table: 2 Instrument Specifications

| GSM-W19 | |
|---|---|
| Sensitivity | 0.022 nT |
| Accuracy | +/- 0.1 nT |
| Operating Range | 20 000nT to 120 000nT |

The line direction of 090° azimuth was implemented with line spacing of 80m. A base station was implemented for diurnal corrections using GSM-19W in figure 5.


*Figure 5: GSM-19 Magnetometer equipment used*

## 5. Data Processing

For GSM-19W, diurnal correction is performed in GEMLink 5.4 and all the zero dropouts & outliers were removed in excel. The data was then saved as text files for data enhancement in Geosoft.

The data is then grided using a grid cell size of 20 which is ¼ of 80 m line spacing. A directional cosine filter of 90° and an upward continuation of 10 meters was

applied in order to smoothen the data from ground noise and direction noise. A convolution filter was also applied to effectively remove cultural noise in the data.

Various data enhancement products were then produced for better data interpretation and visualisation from the raw total magnetic intensity (tmi) these include:

- reduced to pole (rtp): this filter centres anomalies above their causative bodies, and largely removes the dipolar effect.
- First vertical derivative (1vd): resolves anomalies much better and suppresses deeper (longer wavelength) anomalies.
- Analytic Signal (AS): resolves anomalies much better and it is very useful for contact mapping.
- Tilt Derivative (TDR): best for anomaly resolution and strike continuity i.e. good for fabric mapping
- Total Horizontal Derivative : maps anomaly inflection points which lie close to the contacts, thus good for contact mapping.

## 6. Targets

Table 3: Target description with coordinate locations, anticipated end of hole as well as drill direction (azimuth).

| Hole ID | Coordinates | | End of Hole (EOH) | Azimuth | Description |
|---|---|---|---|---|---|
| | Easting | Northing | | | |
| ZM001 | 773168 | 8044809 | 200 | 90 | Moderate potential, centre of caldera, low magnetic anomaly |
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| ZM003 | 774802 | 8044934 | 200 | 90 | Moderate potential, centre of caldera, low magnetic anomaly |
| ZM004 | 773466 | 8044271 | 200 | 90 | Moderate potential, centre of caldera, low magnetic anomaly |
| ZM005 | 774110 | 8044367 | 200 | 90 | Moderate potential, centre of caldera, low magnetic anomaly |
| ZM006 | 774628 | 8044357 | 200 | 90 | Moderate potential, centre of caldera, low magnetic anomaly |
| ZM007 | 772130 | 8043377 | 200 | 90 | Centre of caldera, low magnetic anomaly |
| ZM008 | 771945 | 8043906 | 200 | 90 | Centre of caldera, low magnetic anomaly |
| ZM009 | 776724 | 8043781 | 200 | 90 | High potential, very low magnetic anomaly, within weak crustal zone |
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| ZM012 | 778118 | 8044040 | 200 | 90 | High potential, very low magnetic anomaly, within weak crustal zone |
| ZM013 | 778579 | 8044090 | 200 | 90 | High potential, very low magnetic anomaly, within weak crustal zone |

## 7. Results Discussion

The acquired high resolution total magnetic intensity field is displayed on Figure 6 and shows acquired data with gaps indicating inaccessible areas due to thick vegetation. High anomalies are indicated in red/pink colour with low anomalies in blue/green. Mapped potential kimberlite targets are areas of low magnetic anomalies i.e. blue colours outlined as black dotted polygons on Figures 7 to 12 as well as linear structural features observed in the north-eastern part of the area. Dotted points within low anomalous polygon are deduced from Table 3. Low anomalies are deemed potential kimberlite targets as kimberlite rock types have no/low magnetic characteristics.

The reduced to the pole magnetic map in Figure 7 and 8 outlines low anomalous areas. The observed anomalies are also evident in the first vertical derivative (Figure 9) and analytic signal (Figure 10) indicating that, the mapped anomalies are of shallow behaviour and hence not produced by regional influence. The tilt derivative in Figure 11 confirms continuity in the anomalous areas. Total horizontal derivative in Figure 12 shows observed inflection points on the linear structure. Observed low magnetic anomalies have sources ranging from 100 m to 125 m deep throughout the area.

From Table 6, targets ZM009 to ZM013 are deemed to be of high potential as they are within weak crustal zones which may imply kimberlite presence. ZM001 to ZM006 are of moderate potential, they appear to be centred at potential anomalous calderas/kimberlites see Figures 7 to 9.

Figures 8 and 9 may be within collapsed calderas and are off interest in exploring potential mineralisation.

## 8. Recommendations

Drilling is highly recommended as a way of following up on the potentially delineated targets by drilling at suggested borehole sites. All drill holes are to be drilled using Reverse Circulation (RC) drilling at 090 degrees azimuth. Samples are to be transported to any local geochemical analysis laboratories as to ascertain kimberlite presence and potential diamondiferous mineralisation.

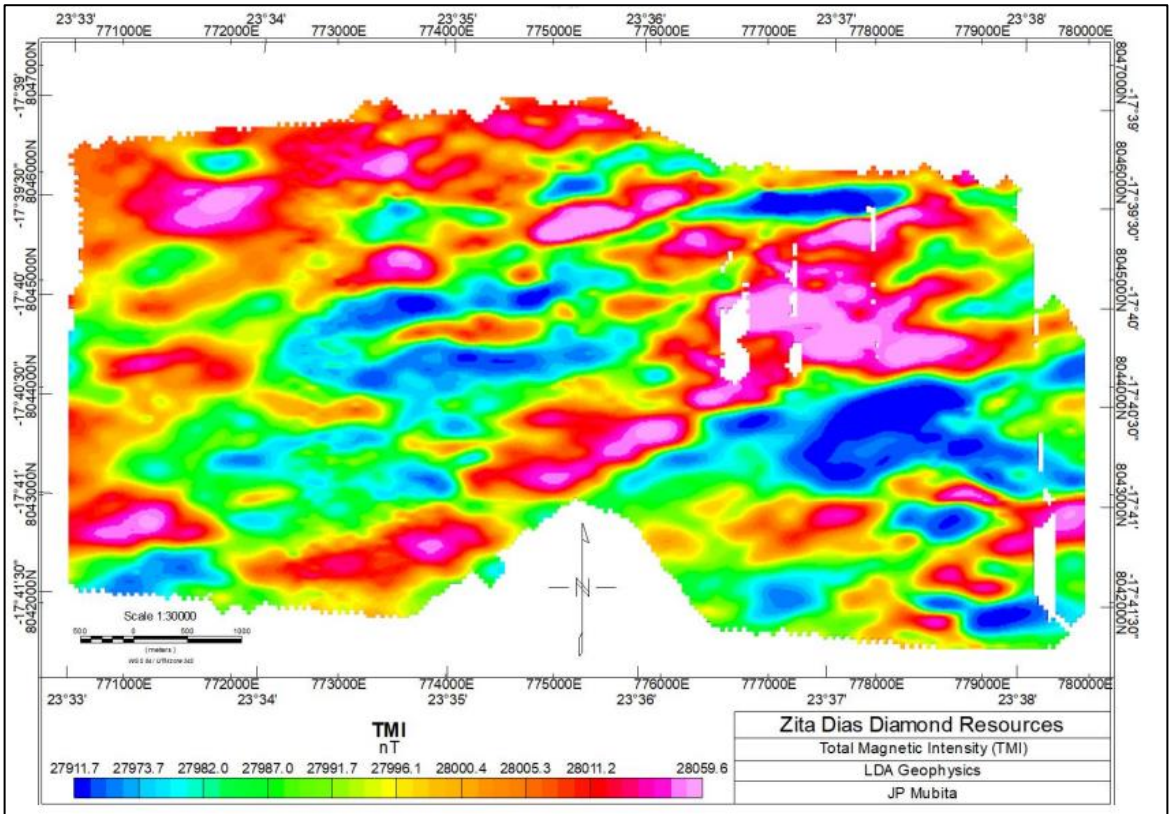



*Figure 6: High Resolution Total Magnetic Intensity (TMI ).*

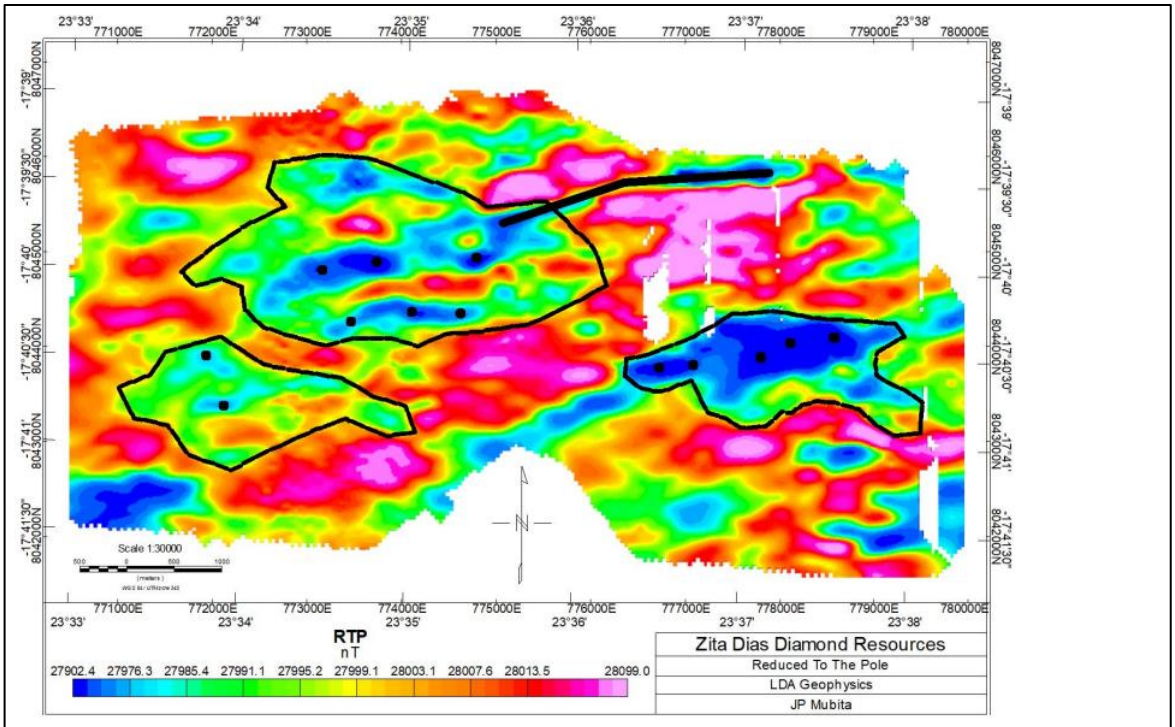



*Figure 7: Reduced to the pole of the, Total Magnetic Intensity (TMI RTP). Outlined black polygons portrays areas of low m agnetic intensity, while linear features showing possible fault structures. Black dots shows planned drillholes.*

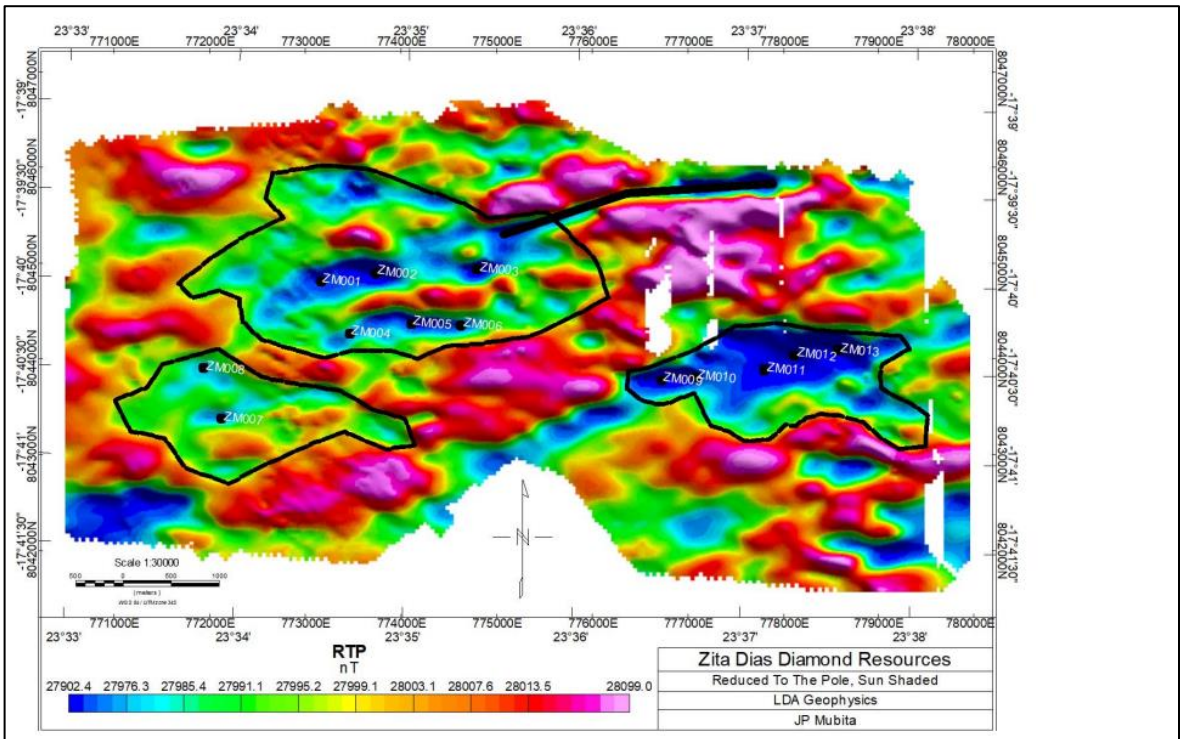



*Figure 8: Reduced to the pole of the Total Magnetic Intensity (TMI RTP), sunshaded at 45 degrees. Outlined black polygons portrays areas of low magnetic intensity, while linear features showing possible fault structures. Black dots shows planned drillholes.*

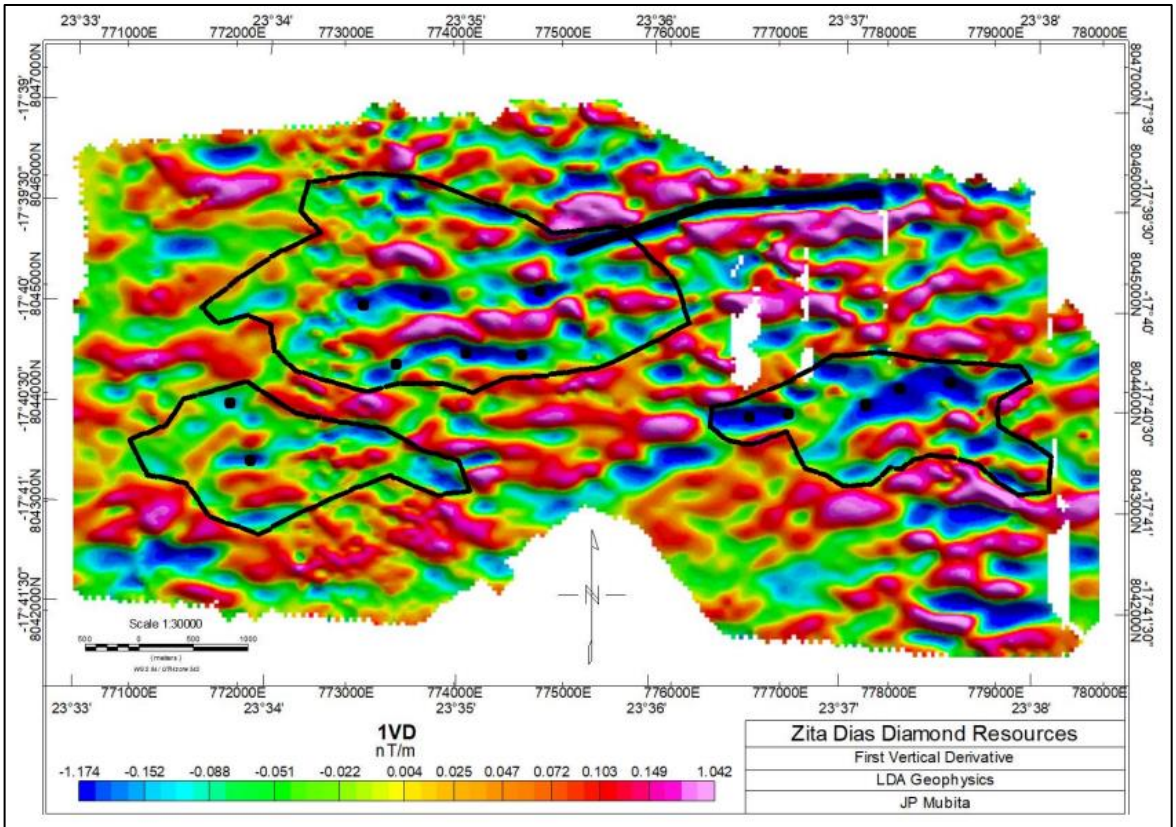



*Figure 9: First vertical derivative (1vd) of study area showing geophysical structures.*

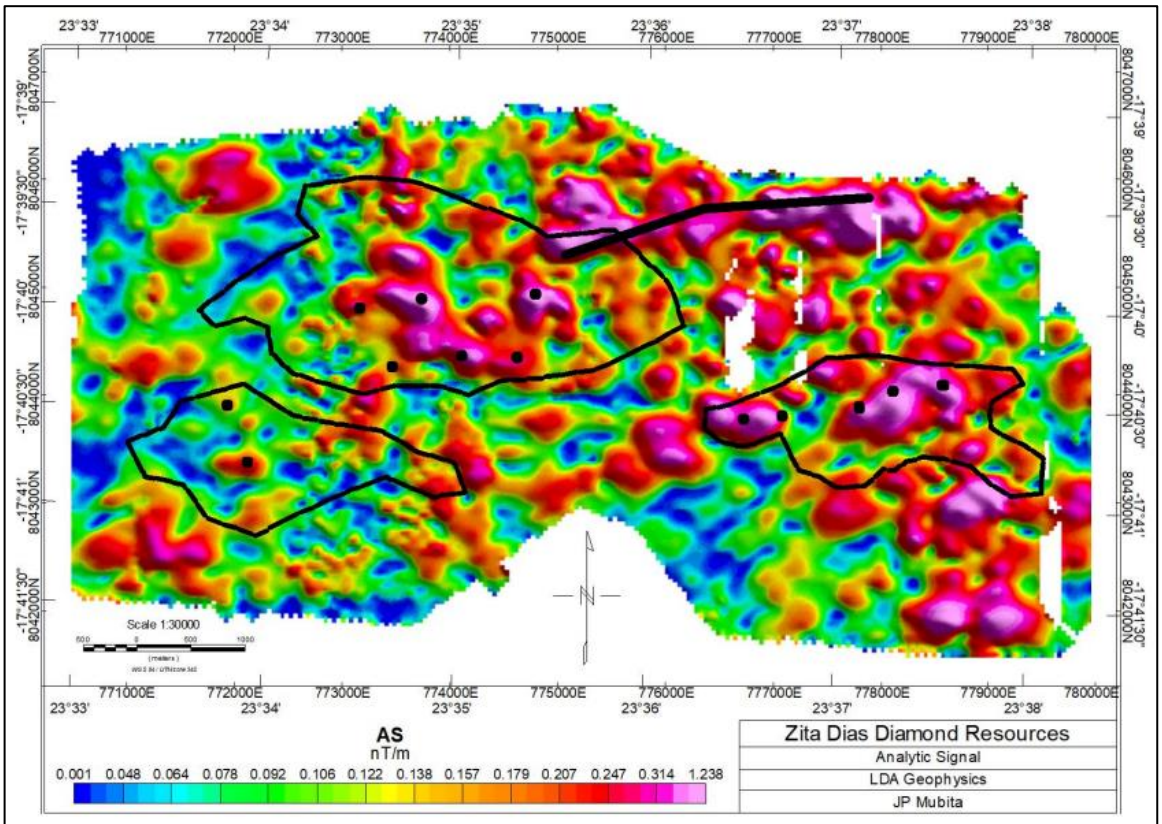



*Figure 10: Analytic Signal image portraying anomalous magnetic areas boundaries and linear fault structure.*

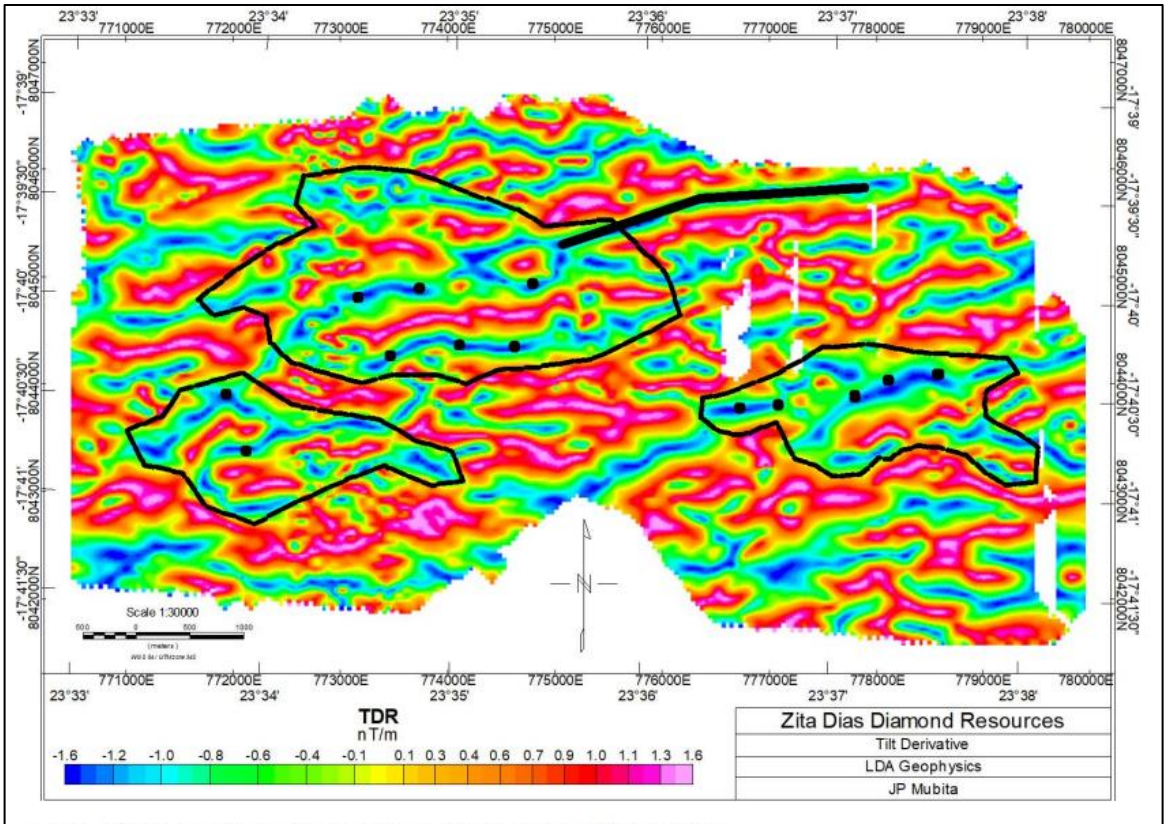



*Figure 11: Tilt Derivative image ideal for strike continuity and also fabric mapping.*

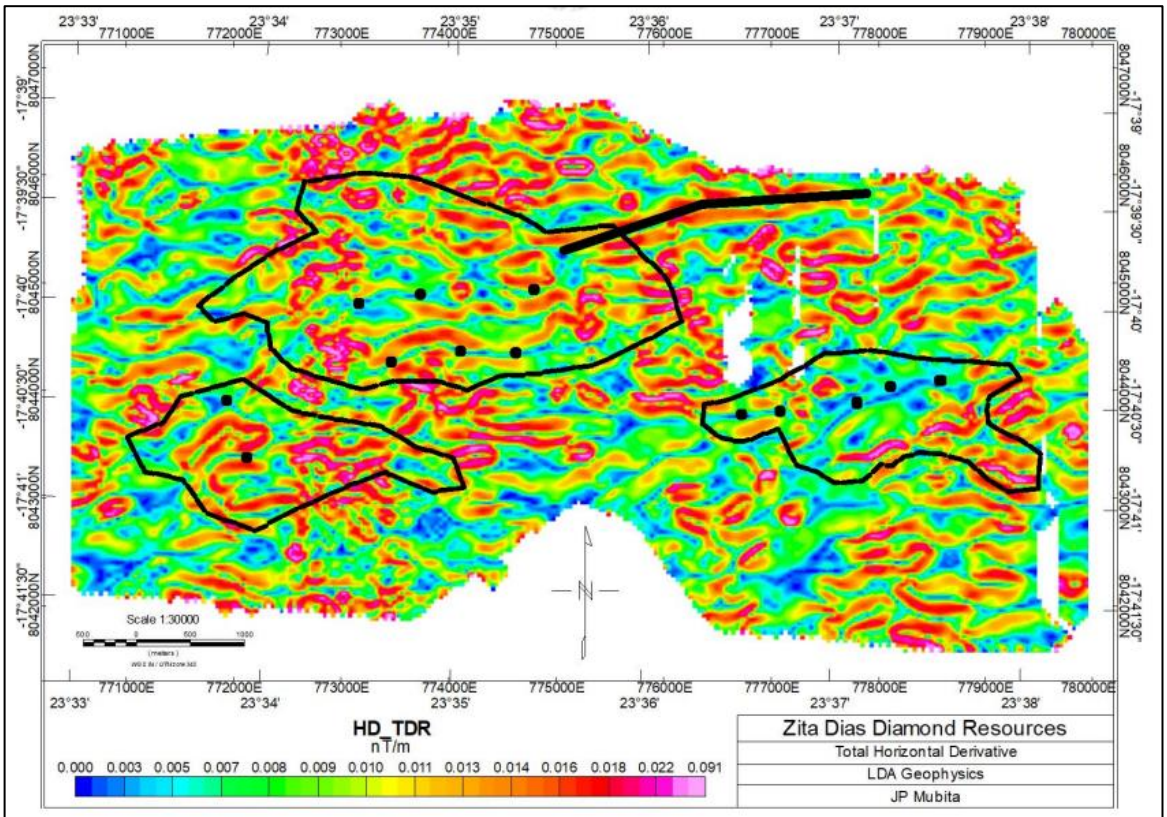



*Figure 12: The Total Horizontal Derivative image which is ideal for contact mapping as inflection points lie on contact geology .*

## 4.9. AVAILABILITY OF SUPPORTING SERVICES

The EPL Area is well serviced by infrastructure, such as telephone and cell phone coverage, petrol stations and electricity. Mpacha Airport is nearby. Water is available from the NamWater network from the Zambezi River water scheme. For the purposes of exploration and ore reserve estimation drilling, boreholes can be sunk to tap into the groundwater system in the area or from the tributaries of the main rivers with the necessary permits from the Ministry of Agriculture, Water and Forestry. There is sufficient manpower to work in the area as unskilled labour; whereas skilled labour can be obtained from Katima Mulilo or elsewhere in Namibia.

# 5. APPROVALS OBTAINED

The following approvals have been obtained:

## 5.1. ENVIRONMENTAL CLEARANCE CERTIFICATE

The Office of the Environmental Commissioner on 25 August 2020 issued an Environmental Clearance Certificate for EPL 6952. See below a copy of the ECC:

ECC – 00874 Serial: MaTNux874

REPUBLIC OF NAMIBIA

MINISTRY OF ENVIRONMENT, FORESTRY AND TOURISM

OFFICE OF THE ENVIRONMENTAL COMMISSIONER

ENVIRONMENTAL CLEARANCE CERTIFICATE

ISSUED

In accordance with Section 37(2) of the Environmental Management Act (Act No. 7 of 2007)

TO

Clarina Zita Dias
P O Box 2356, Ngweze, Katima Mulilo

TO UNDERTAKE THE FOLLOWING LISTED ACTIVITY

PROPOSED EXPLORATION AND SMALL-SCALE TEST MINING ACTIVITIES FOR SEMI-PRECIOUS STONES, PRECIOUS METALS AND BASE AND RARE METALS ON EXCLUSIVE PROSPECTING LICENSE (EPL) 6952, KATIMA MULILO, ZAMBEZI REGION

MINISTRY OF ENVIRONMENT, FORESTRY AND TOURISM Private Bag 13306 WINDHOEK, NAMIBIA 25 AUG 2020

ENVIRONMENTAL COMMISSIONER

ENVIRONMENTAL COMMISSIONER REPUBLIC OF NAMIBIA

Issued on the date: 2020-08-25

Expires on this date: 2023-08-25

(See conditions printed over leaf)

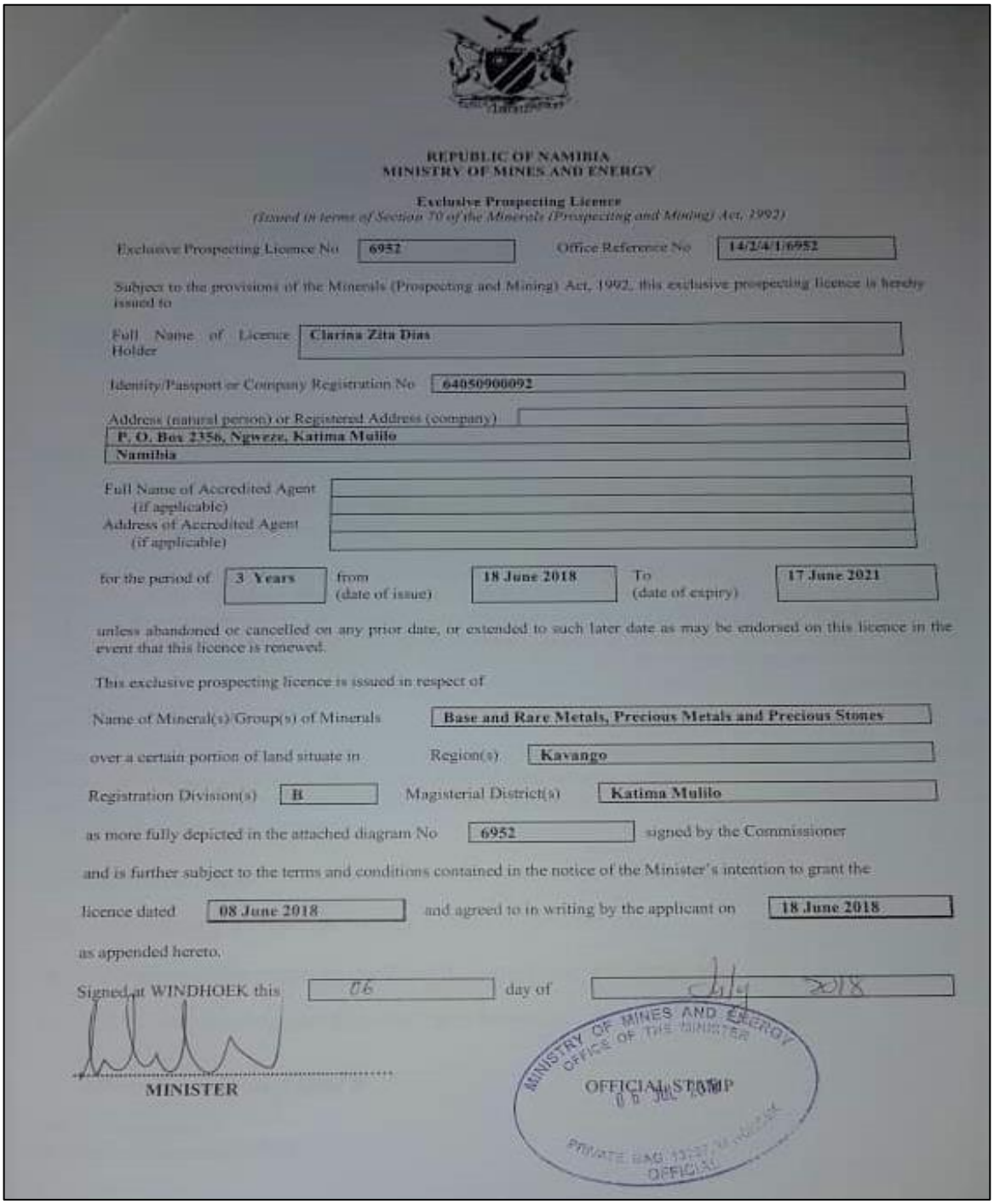
Reduce Reuse Recycle

NAMIBIA IS NOT A TRASH BIN

This certificate is printed without erasures or alterations

## 5.2. EPL 6952, ZAMBEZI REGION

Exclusive Prospecting License 6952 was issued to Mrs. Clarina Zita Dias (Proponent) as per the provisions of the Minerals (Prospecting and Mining) Act of 1992. The EPL was issued for 3 years from 18 June 2018 to 17 June 2021 and it may be cancelled and/or extended as per the stipulations of the Act. The EPL was issued in respect of Base and Rare Metals, Precious Metals and Precious Stones. See below a copy of the EPL:



REPUBLIC OF NAMIBIA
MINISTRY OF MINES AND ENERGY

**Exclusive Prospecting Licence**
*(Issued in terms of Section 70 of the Minerals (Prospecting and Mining) Act, 1992)*

Exclusive Prospecting Licence No: 6952 Office Reference No: 14/2/4/1/6952

Subject to the provisions of the Minerals (Prospecting and Mining) Act, 1992, this exclusive prospecting licence is hereby issued to

Full Name of Licence Holder: Clarina Zita Dias

Identity/Passport or Company Registration No: 64050900092

Address (natural person) or Registered Address (company): P. O. Box 2356, Ngweze, Katima Mulilo, Namibia

Full Name of Accredited Agent (if applicable):

Address of Accredited Agent (if applicable):

for the period of: 3 Years from (date of issue): 18 June 2018 To (date of expiry): 17 June 2021

unless abandoned or cancelled on any prior date, or extended to such later date as may be endorsed on this licence in the event that this licence is renewed.

This exclusive prospecting licence is issued in respect of

Name of Mineral(s)/Group(s) of Minerals: Base and Rare Metals, Precious Metals and Precious Stones

over a certain portion of land situate in Region(s): Kavango

Registration Division(s): B Magisterial District(s): Katima Mulilo

as more fully depicted in the attached diagram No: 6952 signed by the Commissioner

and is further subject to the terms and conditions contained in the notice of the Minister's intention to grant the licence dated: 08 June 2018 and agreed to in writing by the applicant on: 18 June 2018

as appended hereto.

Signed at WINDHOEK this: 06 day of: July 2018

MINISTER

MINISTRY OF MINES AND ENERGY OFFICE OF THE MINISTER
OFFICIAL STAMP
06 JUL 2018
PRIVATE BAG 13297 WINDHOEK

*Figure 7: EPL 6952*

# 6. BULK SERVICES AND INFRASTRUCTURE PROVISION

Bulk services like water supply, electricity, sewer, roads and solid waste management are available at some of the villages but the bulk of the EPL area has no services. This will not influence the non-invasive phase of exploration. The availability of bulk services will impact on the invasive phase especially with regard to the availability of access roads, water, sewer and handling and storage of solid waste.

## 6.1. ACCESS ROAD

The EPL area is well serviced with properly constructed gravel roads. See map showing the formal roads below:

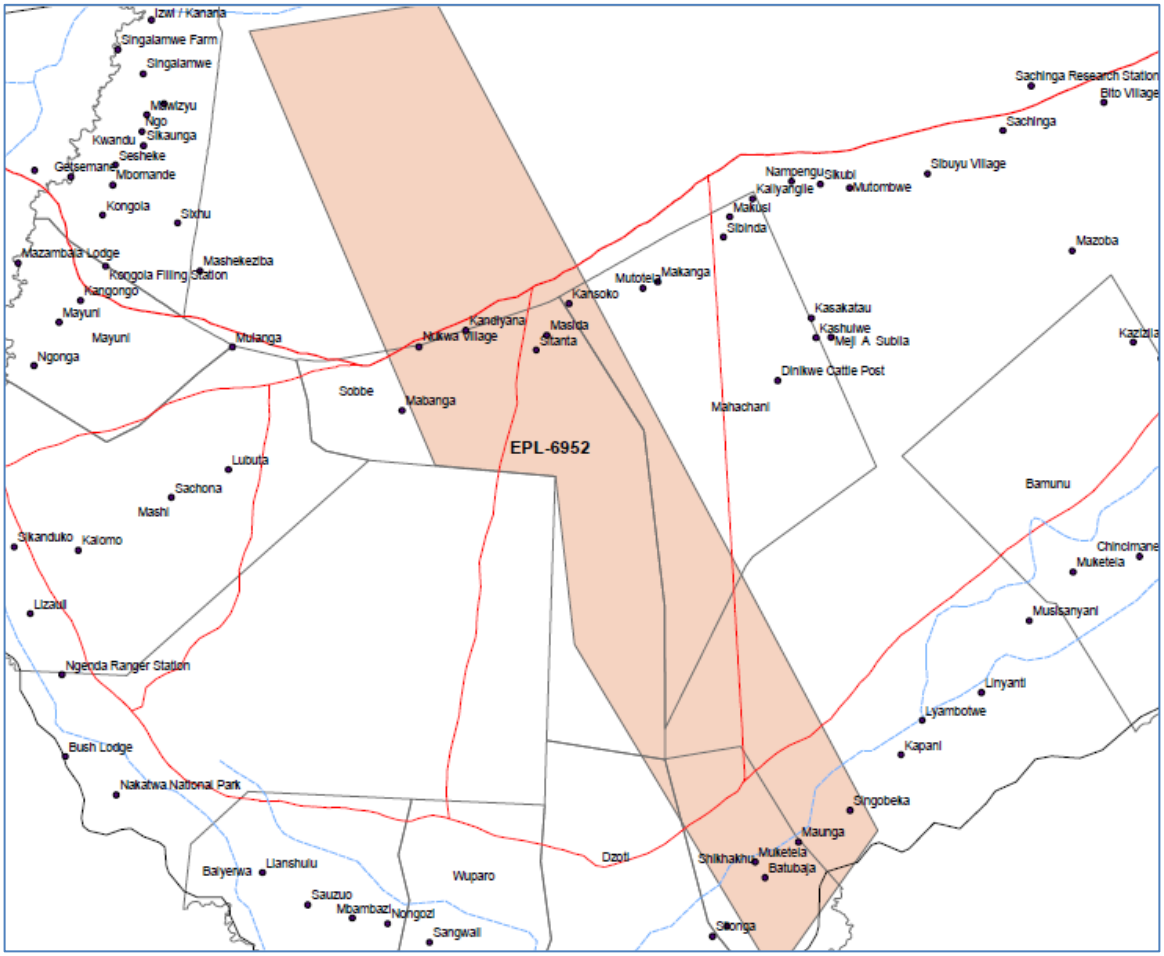



*Figure 8: Map with roads*

The EPL area is also covered by a well-established informal road system that link up the more remote areas with the existing formal road network. The exploration operator should as far as possible make use of this road network. The creation of new roads to access exploration sites should be avoided and limited.

## 6.2. WATER SUPPLY

Water is available from the NamWater network from the Zambezi River water scheme. For the purposes of exploration and ore reserve estimation drilling, boreholes can be sunk to tap into the groundwater system in the area or from the tributaries of the main rivers with the necessary permits from the Ministry of Agriculture, Water and Forestry.

## 6.3. ELECTRICITY RETICULATION

Some of the Villages located in the EPL area are linked to the NamPower grid. It is advised that the exploration operator link to this network where possible. For the rest of the area the exploration operator will have to rely on portable electrical sources.

## 6.4. SEWAGE DISPOSAL

The sewer generated during the exploration phase (depending on the system used) must be disposed of in the sewer systems located at some of the Villages once exploration is completed with the necessary permission from the local authority.

## 6.5. STORM WATER AND DRAINAGE

Seasonal flooding in the area has been observed in the past. The natural flow of storm water and drainage must be minimally disturbed, and the natural flow accommodated where possible. Provision must be made for the accommodation of surface water/stormwater management as it may endanger infrastructure.

## 6.6. SOLID WASTE

The solid waste will be collected and temporarily stored at dedicated points near the exploration sites from where it will be disposed of at the approved landfill sites.

## 6.7. FIRE PROTECTION

The Proponent will put in the necessary fire protection infrastructure / extinguishers as per requirements. It is advised that a specialist Fire Protection Specialist is contracted to introduce a proper fire protection plan with the required infrastructure and to oversee the annual auditing and maintenance of the infrastructure.

# 7. ASSUMPTIONS AND LIMITATIONS

It is assumed that the information provided by the Proponent (Clarina Zita Dias) is accurate. The assessment is based on the prevailing environmental conditions and not on future happenings on the site. However, it is assumed that there will be no significant changes to the proposed project, and the environment will not adversely be affected

between the compilation of the assessment and the implementation of the proposed construction activities.

# 8. ADMINISTRATIVE, LEGAL AND POLICY REQUIREMENTS

To protect the environment and achieve sustainable development, all projects, plans, programs and policies deemed to have adverse impacts on the environment require an EIA according to Namibian legislation. The administrative, legal and policy requirements to be considered during the Environmental Assessment for the proposed project are the following:

- The Namibian Constitution
- The Environmental Management Act (No. 7 of 2007)
- The Minerals (Prospecting and Mining) Act (No. 33 of 1992)
- Other Laws, Acts, Regulations and Policies

**THE NAMIBIAN CONSTITUTION**

Article 95 of Namibia's constitution provides that:

"The State shall actively promote and maintain the welfare of the people by adopting, inter alia, policies aimed at the following:

Management of ecosystems, essential ecological processes and biological diversity of Namibia and utilization of living natural resources on a sustainable basis for the benefit of all Namibians, both present and future; in particular, the Government shall provide measures against the dumping or recycling of foreign nuclear and toxic waste on Namibian territory." This article recommends that a relatively high level of environmental protection is called for in respect of pollution control and waste management.

Article 144 of the Namibian Constitution deals with environmental law and it states:

"Unless otherwise provided by this Constitution or Act of Parliament, the general rules of public international agreements binding upon Namibia under this Constitution shall form part of the law of Namibia". This article incorporates international law, if it conforms to the Constitution, automatically as "law of the land". These include international agreements, conventions, protocols, covenants, charters, statutes, acts, declarations, concords, exchanges of notes, agreed minutes, memoranda of understanding, and agreements (*Ruppel & Ruppel-Schlichting, 2013*).

**CONCLUSION AND IMPACT**

In considering the environmental rights, Clarina Zita Dias should consider the following in devising an action plan in response to the articles:

- Implement a "zero-harm" policy that would guide decisions.

- Ensure that no management practice or decision result in the degradation of future natural resources.
- Take a decision on how this part of the Constitution will be implemented as part of Clarina Zita Dias's Environmental Control System (ECS).

**ENVIRONMENTAL MANAGEMENT ACT (NO. 7 OF 2007)**

The Environmental Impact Assessment Regulations (GN 30 in GG 4878 of 6 February 2012) of the Environmental Management Act (No. 7 of 2007) that came into effect in 2012 requires/recommends that an Environmental Impact Assessment Renewal and an Environmental Management Plan Renewal be conducted for the following listed activities in order to obtain an Environmental Clearance Certificate:

> ***MINING AND QUARRYING ACTIVITIES***
> *3.1 The construction of facilities for any process or activities which requires a license, right or other form of authorisation, and the renewal of a license, right or other form of authorisation, in terms of the Minerals (Prospecting and Mining Act), 1992.*
> *3.2 Other forms of mining or extraction of any natural resources whether regulated by law or not.*
> *3.3 Resource extraction, manipulation, conservation and related activities.*

Cumulative impacts associated with the development must be included as well as public consultation. The Act further requires all major industries to prepare waste management plans and present these to the local authorities for approval.

The Act, Regulations, Procedures and Guidelines have integrated the following sustainability principles. They need to be given due consideration, particularly to achieve proper waste management and pollution control:

**Cradle to Grave Responsibility**

This principle provides that those who handle or manufacture potentially harmful products must be liable for their safe production, use and disposal and that those who initiate potentially polluting activities must be liable for their commissioning, operation and decommissioning.

**Precautionary Principle**

If there is any doubt about the effects of a potentially polluting activity, a cautious approach must be adopted.

**The Polluter Pays Principle**

A person who generates waste or causes pollution must, in theory, pay the full costs of its treatment or of the harm, which it causes to the environment.

**Public Participation and Access to Information**

Public notices, informing the general public of the proposed project and inviting Interested and Affected Parties to provide comments on the proposed development, appeared in the Namibian and New Era of 21 and 28 November 2018. Several people listed as Interested and Affected Parties based on the notices. The last date for comments and/or registration was 15 January 2019. A Background Information Document has been sent to Interested and Affected Parties (I&APs) and to relevant authorities. The closing date for comments or inputs on the Background Information Document was 13 December 2018.

Based on the public response from the newspaper notices, the I&AP's were informed and invited to attend public meetings to provide them with more information on the proposed project and to get more feedback from them. The sites for the public meetings were identified in consultation with the Traditional Leaders. Notices were displayed at various villages located in EPL 6952 and the meetings were also announced over the local radio. These announcements were made in the local language on 10 December 2018 and repeated on 11 and 13 December 2018. A Power Point presentation was presented to the Interested and Affected Members at the public meeting.

In the context of environmental management, citizens must have access to information and the right to participate in decisions making.

**CONCLUSION AND IMPACT**

The proposed project site has been assessed in terms of the Environmental Management Act (No. 7 of 2007) and the Regulations (2012). From the assessment, it can be concluded that the activities will have impacts on the prevailing environment but that the negative impacts can be sufficiently mitigated and managed by following the Environmental Management Plan which is part of this document.

**THE MINERALS (PROSPECTING AND MINING) ACT (No. 33 of 1992)**

The purpose of the Act is to provide for the reconnaissance, prospecting and mining for, and disposal of, and the exercise of control over, minerals in Namibia; and to provide for matters incidental thereto. The Act also prohibits carrying on certain operations without license, and transfer of certain licenses or grant, cession or assignment of interests in such licenses, and joiner of persons as joint holders of such licenses or interests.

Part X of the Minerals Act of 1992 covers the provisions relating to exclusive prospecting licenses which include the following under clause 67 – 76:

*67. Rights of holders of exclusive prospecting licenses*
*68. Applications for exclusive prospecting licenses*
*69. Exercise of powers by Minister to grant or refuse exclusive prospecting licenses*

*70. Issue of exclusive prospecting licenses*
*71. Duration of exclusive prospecting licenses*
*72. Applications for renewal of exclusive prospecting licenses*
*73. Applications for amendment of exclusive prospecting licenses*
*74. Obligations of holders of exclusive prospecting licenses*
*75. Work programs of prospecting operations*
*76. Records, maps, plans and financial statements to be kept, and information reports and returns to be submitted, by holders of exclusive prospecting licenses*

The Proponent applied for an exclusive prospecting license in the Zambezi Region upon which the MME granted EPL 6952. Exclusive Prospecting License 6952 was issued to the Proponent as per the provisions of the Minerals (Prospecting and Mining) Act of 1992. The EPL is valid for a period of 3 years (from 18 June 2018 to 17 June 2021) and it may be cancelled and/or extended as per the stipulations of the Act. The EPL was issued in respect of Base and Rare Metals, Precious Metals and Precious Stones. The stipulations of the Act as well as the conditions under which the EPL was granted had been studied by Green Earth Environmental Consultants and the conditions relevant to the exploration process have been included in the EMP. Exploration and test-mining in terms of the Minerals Act of 1992 may only proceed once an EC has been obtained.

*Table 3: Other laws, acts, regulations and policies*

| **Laws, Acts, Regulations & Policies consulted:** | | |
|---|---|---|
| **Electricity Act (No. 4 of 2007)** | In accordance with the Electricity Act (No. 4 of 2007) which provides for the establishment of the Electricity Control Board and provide for its powers and functions; to provide for the requirements and conditions for obtaining licenses for the provision of electricity; to provide for the powers and obligations of licenses; and to provide for incidental matters: the necessary permits and licenses will be obtained. | The Proponent must abide to the Electricity Act. |
| **Pollution Control and Waste Management Bill (guideline only)** | The **Pollution Control and Waste Management Bill** is currently in preparation and is therefore included as a guideline only. Of reference to the mining, Parts 2, 7 and 8 apply. Part 2 provides that no person shall discharge or cause to be discharged, any pollutant to the air from a process except under and in accordance with the provisions of an air pollution license issued under section 23. | The Proponent must adhere to the Pollution Control and Waste Management Bill. |

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| | Part 2 also further provides for procedures to be followed in license application, fees to be paid and required terms of conditions for air pollution licenses. Part 7 states that any person who sells, stores, transports or uses any hazardous substances or products containing hazardous substances shall notify the competent authority, in accordance with sub-section (2), of the presence and quantity of those substances. The competent authority for the purposes of section 74 shall maintain a register of substances notified in accordance with that section and the register shall be maintained in accordance with the provisions. Part 8 provides for emergency preparedness by the person handling hazardous substances, through emergency response plans. | |
| **Water Resources Management Act** | The **Water Resources Management Act (No. 11 of 2013)** stipulates conditions that ensure effluent that is produced to be of a certain standard. There should also be controls on the disposal of sewage, the purification of effluent, measures should be taken to ensure the prevention of surface and groundwater pollution and water resources should be used in a sustainable manner. | The Act must be consulted. Fresh water abstraction and waste-water discharge permits should be obtained when required. |
| **Solid and Hazardous Waste Management Regulations: Local Authorities 1992** | Provides for management and handling of industrial, business and domestic waste. | The Proponent must abide to the solid waste management provisions. |
| **Hazardous Substances Ordinance** | The **Ordinance** applies to the manufacture, sale, use, disposal and dumping of hazardous substances, as well as their import | The Proponent must abide to the Ordinance's provisions. |

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| **(No. 14 of 1974)** | and export and is administered by the Minister of Health and Social Welfare. Its primary purpose is to prevent hazardous substances from causing injury, ill-health or the death of human beings. | |
| **Atmospheric Pollution Prevention Ordinance of Namibia (No. 11 of 1976)** | Part 2 of the **Ordinance** governs the control of noxious or offensive gases. The Ordinance prohibits anyone from carrying on a scheduled process without a registration certificate in a controlled area. The registration certificate must be issued if it can be demonstrated that the best practical means are being adopted for preventing or reducing the escape into the atmosphere of noxious or offensive gases produced by the scheduled process. | The proponent should adhere to the stipulations of the Atmospheric Pollution Prevention Ordinance. |
| **Nature Conservation Ordinance** | The **Nature Conservation Ordinance (No. 4 of 1975)** covers game parks and nature reserves, the hunting and protection of wild animals, problem animals, fish and indigenous plant species. The Ministry of Environment, Forestry and Tourism (MEFT) administer it and provides for the establishment of the Nature Conservation Board. | The proposed project implementation is not located in a demarcated conservation area, national park or unique environments. |
| **Forestry Act** | The **Forestry Act (No. 12 of 2001)** specifies that there be a general protection of the receiving and surrounding environment. The protection of natural vegetation is of great importance, the Forestry Act especially stipulates that no living tree, bush, shrub or indigenous plants within 100m from any river, stream or watercourse, may be removed without the necessary license. | No removal of protected tree species or removal of mature trees should happen. The Ministry of Environment, Forestry and Tourism should be consulted when required. |
| **EU Timber Regulation: FSC (2013)** | Forest Stewardship Council (FSC) came into effect in March 2013, with the aim of preventing sales of illegal timber and timber products in the EU market. Now, any actor | The Proponent is advised to adhere to the regulation. |

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| | who places timber or timber products on the market for the first time must ensure that the timber used has been legally harvested and, where applicable, exported legally from the country of harvest. | |
| **Labour Act** | The **Labour Act (No. 11 of 2007)** contains regulations relating to the Health, Safety and Welfare of employees at work. These regulations are prescribed for among others safety relating to hazardous substances, exposure limits and physical hazards. Regulations relating to the Health and Safety of Employees at Work are promulgated in terms of the Labour Act 6 of 1992 (GN156, GG1617 of 1 August 1997). | The proponent and contractor should adhere to the Labour Act. |
| **Communal Land Rights** | Communal land is land that belongs to the State and is held in trust for the benefit of the traditional communities living in those areas. Communal land cannot be bought or sold, but one can be given a customary land right or right of leasehold to a part of communal land in accordance with the provisions of the **Communal Land Reform Act (No. 5 of 2002)** and **Communal Land Reform Amendment Act (No. 13 of 2013)**. The Communal Land Reform Act provide for the allocation of rights in respect of communal land to establish Communal Land Boards to provide for the powers of Chiefs and Traditional Authorities and boards in relation to communal land and to make provision for incidental matters. Consent and access to land for the proposed project should be requested from the relevant traditional authority through the Regional Council and Regional Communal Land Boards. | Consent should be obtained from Traditional Authorities, Communal Boards, Chiefs, Kings, Queens etc. if required. |

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| **Traditional Authorities Act (No. 17 of 1995)** | The **Traditional Authorities Act (No. 17 of 1995)** provide for the establishment of traditional authorities, the designation and recognition of traditional leaders; to define their functions, duties and powers; and to provide for matters incidental thereto. | Traditional Authorities should be consulted when required. |
| **Public and Environmental Health Act** | The Public and Environmental Health Act (No. 1 of 2015) provides with respect to matters of public health in Namibia. The objects of this Act are to: (a) promote public health and wellbeing; (b) prevent injuries, diseases and disabilities; (c) protect individuals and communities from public health risks; (d) encourage community participation in order to create a healthy environment; and (e) provide for early detection of diseases and public health risks. | The proponent and contractor should adhere to the Public and Environmental Health Act. |
| **Coronavirus (Covid-19) Pandemic** | The current global **Coronavirus (Covid-19)** pandemic and the associated State of Emergency and health restrictions globally may result in some delays and logistic disruptions. The pandemic might have an impact on obtaining equipment, specialist workforce mobilisation and implementation of the project. The health restrictions may have an impact on campsite set-up, traveling of personal/workers and building of the infrastructure. The proponent, contractor and subcontractors should adhere to all the international, regional and local Covid-19 health restrictions and protocols. | The proponent, contractor and workforce should adhere to the restrictions and regulations. |
| **National Heritage Act (No. 27 of 2004)** | All protected heritage resources discovered need to be reported immediately to the National Heritage Council (NHC) and require a permit from the NHC before it may be relocated. This should be applied from the NHC. | The National Heritage Council should be consulted when required. |

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| **National Monuments Act of Namibia (No. 28 of 1969) as amended until 1979** | No person shall destroy, damage, excavate, alter, remove from its original site or export from Namibia:<br>(a) any meteorite or fossil; or<br>(b) any drawing or painting on stone or a petroglyph known or commonly believed to have been executed by any people who inhabited or visited Namibia before the year 1900 AD; or<br>(c) any implement, ornament or structure known or commonly believed to have been used as a mace, used or erected by people referred to in paragraph; or<br>(d) the anthropological or archaeological contents of graves, caves, rock shelters, middens, shell mounds or other sites used by such people; or<br>(e) any other archaeological or palaeontological finds, material or object; except under the authority of and in accordance with a permit issued under this section. | The proposed site for development is not within any known monument site both movable or immovable as specified in the Act, however in such an instance that any material or sites or archeologic importance are identified, it will be the responsibility of the developer to take the required route and notify the relevant commission. |
| **Public Health Act (No. 36 of 1919)** | Under this act, in section 119: "No person shall cause a nuisance or shall suffer to exist on any land or premises owned or occupied by him or of which he is in charge any nuisance or other condition liable to be injurious or dangerous to health." | The proponent will ensure that all legal requirements of the project in relation to protection of the health of their employees and surrounding residents is protected and will be included in the EMP.<br>Relevant protective equipment shall be provided for employees in construction.<br>The development shall follow requirements and specifications in relation to water supply and sewerage handling and solid waste management so as not to threaten public health of future residents on this piece of land. |
| **Soil Conservation Act (No. 76 of 1969)** | The objectives of this Act are to:<br>Make provisions for the combating and prevention of soil erosion;<br>Promote the conservation, | Only the area required for the operations should be cleared from vegetation to ensure the minimum impact on the soil |

| | | |
|---|---|---|
| | protection and improvement of the soil, vegetation, sources and resources of the Republic; | through clearance for construction. |
| **Air Quality Act (N0. 39 of 2004)** | The **Air Quality Act (No. 39 of 2004)** intends to provide for national norms and standards regulating air quality monitoring, management and control by all spheres of government; for specific air quality measures; and for matters incidental thereto. | The proponent and contractor should adhere to the Air Quality Act. |
| **Vision 2030 and National Development Plans** | Namibia's overall development ambitions are articulated in the Nation's Vision 2030. At the operational level, five-yearly national development plans (NDP's) are prepared in extensive consultations led by the National Planning Commission in the Office of the President. Currently the Government has so far launched a 4th NDP which pursues three overarching goals for the Namibian nation: high and sustained economic growth; increased income equality; and employment creation. | The proposed project is an important element in employment creation. |

**CONCLUSION AND IMPACT**

It is believed the above administrative, legal and policy requirements which specifically guide and governs development will be followed and complied with in the planning, implementation and operations of the activity.

A flowchart indicating the entire EIA process is shown in the *Figure* below:

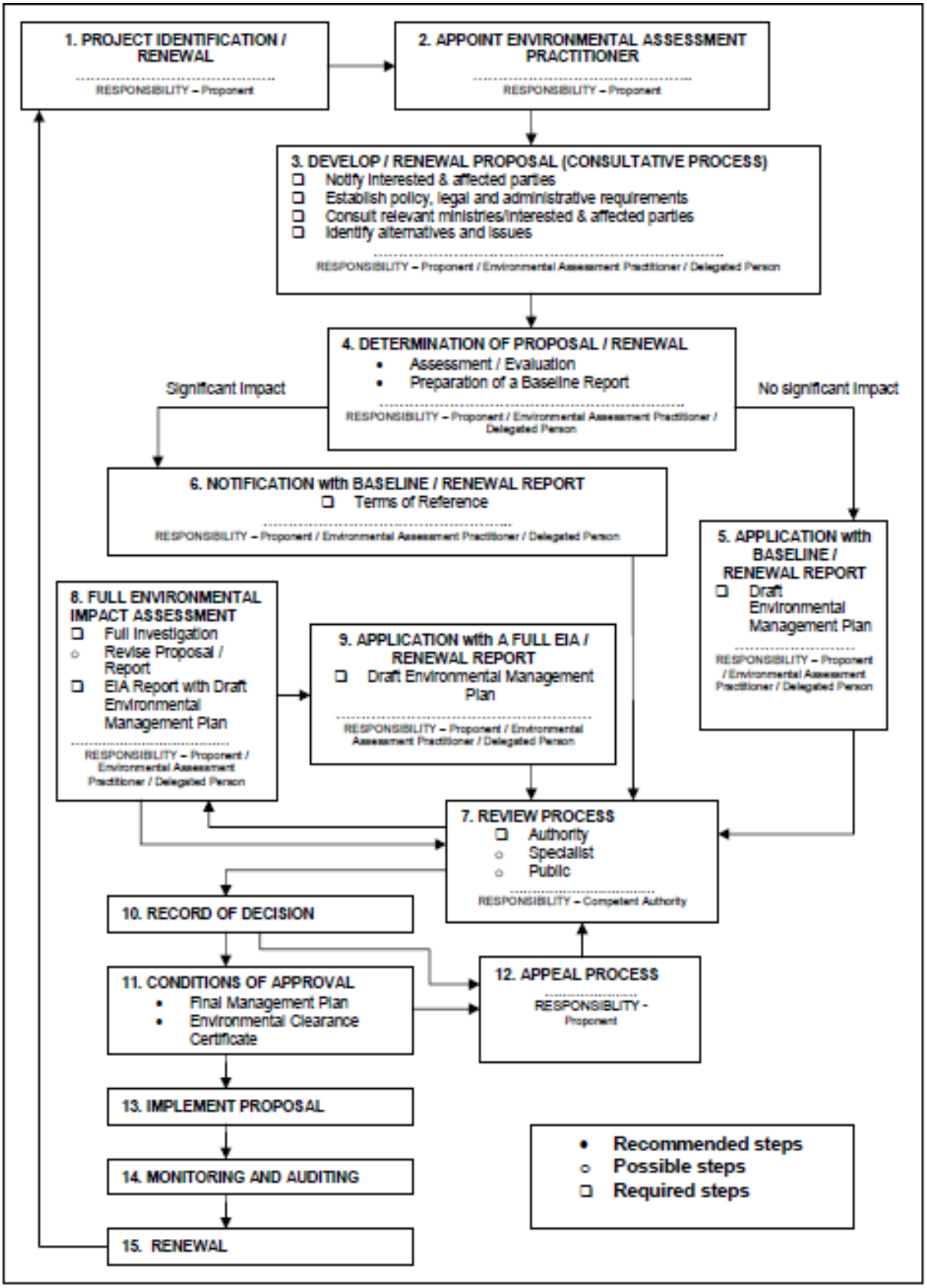


*Figure 9: Flowchart of the assessment Process*

## 8.1. LOCAL AND REGIONAL SPATIAL PLANNING

In addition to the above tabled legislation, various local and regional plans and processes have been considered. These, as obtained from the Integrated Regional Land Use Plan for the Zambezi Region (*SPC, 2014*) include the following:

The Zambezi Integrated Regional Land Use Plan (IRLUP) was commissioned by the Ministry of Lands and Resettlement (MLR) in March 2014 as part of its mandate to undertake land-use planning for the entire country. One of the main objectives of IRLUP, as set out by the MLR, is to correct previous deficiencies in land-use planning in Namibia and against this background, MLR (as custodian of land and land related issues) commissioned the Modelling Integrated Regional Land Use Planning Process. The Zambezi IRLUP is based on the new approach of bottom-up planning involving local stakeholders in the planning and creation of a Geographical Information System (GIS) database.

The Zambezi IRLUP consists of five components:

- Zambezi Integrated Regional Land Use Plan Baseline report (Volume 1)
- Zambezi Integrated Regional Land Use Plan report (Volume 2)
- Participatory Land Use Planning reports providing community inputs into the IRLUP
- Geographical Information System (GIS) database
- Strategic environmental assessment report on the Zambezi IRLUP

Based on the survey, information received from locals and specialists, the IRLUP made certain land-use proposals and recommendations for the Zambezi Region. From observations as well as the findings of the IRLUP, it is clear that dry-land cropping and livestock farming is currently the most important livelihood for communities in the region. However, there is a need for communities to start diversifying into other activities for a sustainable livelihood. Mining was considered as 'lower preference' in the IRLUP's Table of recommended land uses below:

*Table 4: Recommended land uses within the communal livestock support area*

| **Communal support livestock area** | **Higher preference** | **Lower preference** |
|---|---|---|
| | Livestock farming | Mining |
| | Crop cultivation | Private irrigation schemes |
| | Co-operative irrigation, intensive agriculture | No livestock farming to take place on areas zoned as wildlife exclusive areas/breeding areas by conservancy management plans |
| | Conservation farming | |
| | Conservancies | |

| | | |
|---|---|---|
| | Hunting (per agreed management plan) | |

The principles, considerations and recommendations of the IRLUP for the Zambezi Region should be followed during the exploration activities as well as during the future mining activities which will follow onto the exploration phase.

The provisions, recommendations and national legislation have been integrated into the EMP to ensure that the negative impacts associated with the exploration activities are mitigated.

# 9. AFFECTED NATURAL AND SOCIAL ENVIRONMENT

## 9.1. CLIMATE

The Zambezi Region belongs to the tropical climate zone and receives high rainfalls during the rainy season (December to March). High humidity is most often experienced in this region. The Caprivi is the wettest region in Namibia with its high annual rainfall of ±700 mm. Rainfall however can also be variable and drought years are common. The majority of rain appears in summer especially between January and February. The hottest months in Katima Mulilo are September, October and November with temperatures of generally above 30ºC. The prevailing wind in the area is southeast and eastern winds. The prevailing wind direction is expected to prevent the spread of any nuisance namely noise and smell.

Strong winds during certain times of the year may aggravate dust impacts during the construction phase. The wind direction of the study area is summarized in the images below:

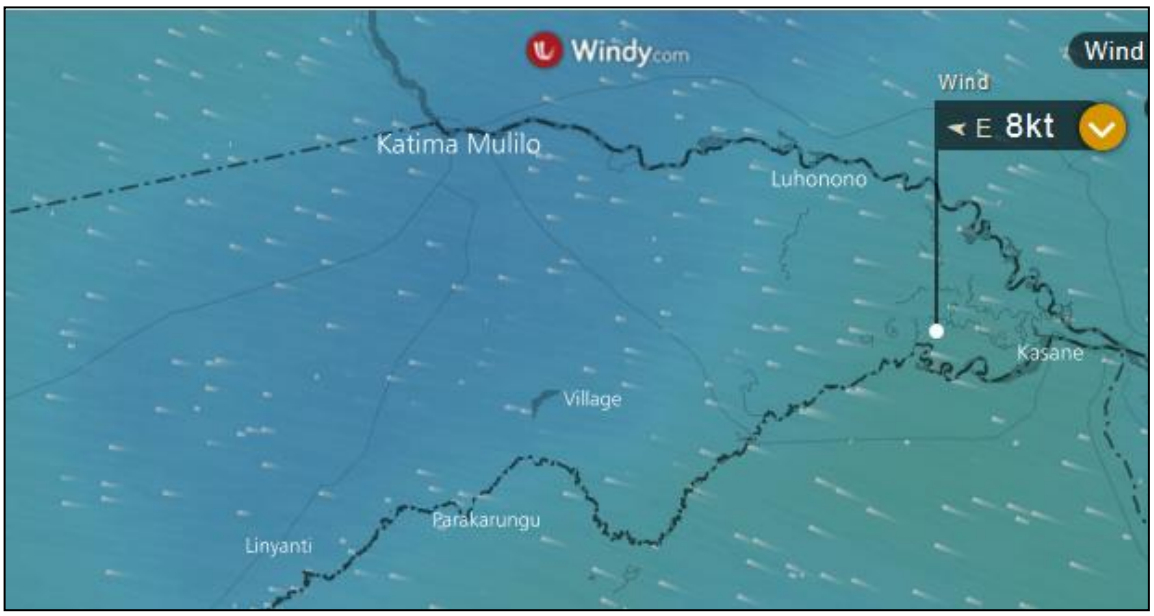


*Figure 10: Wind Direction (1) (Meteoblue)*

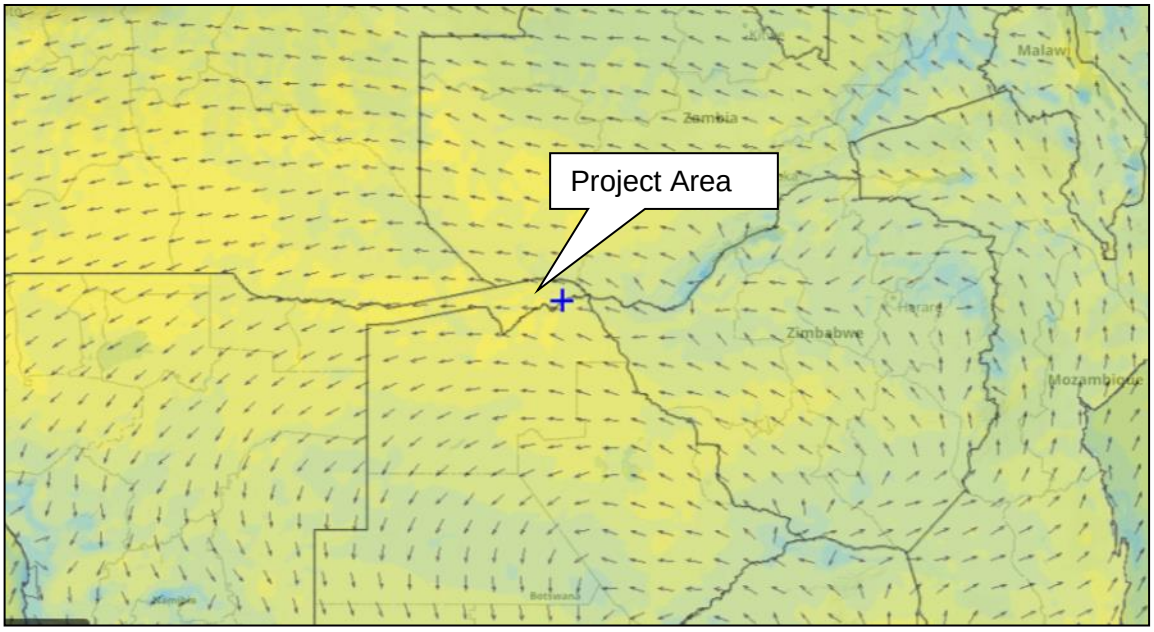


*Figure 11: Wind Direction (2) (Meteoblue)*

**CONCLUSION AND IMPACT**

The project will not have an impact on the climate.

## 9.2. GEOLOGY, SOILS AND GEOHYDROLOGY

The surface geology of the area consists of formations of the Kalahari Group which has a thickness of up to 30m in the study area. Within the Kalahari Group the following six lithological classifications are recognized: Duricrusts, Kalahari sand, Alluvium and lacustrine deposits, Sandstone, Marl, Basal conglomerate and gravel.

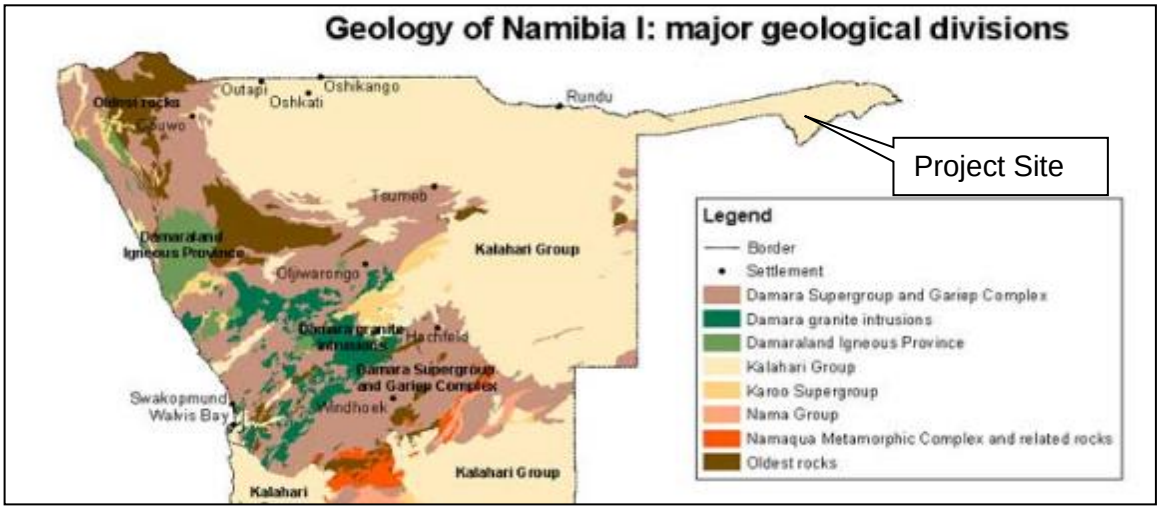


*Figure 12: Geology of Namibia (Atlas of Namibia Project, 2002)*

**CONCLUSION AND IMPACT**

The proposed exploration and test mining will not impact on the geology, soils and geohydrology of the area. The surface drainage canals will be kept open in order that water can flow through.

## 9.3. BIODIVERSITY AND VEGETATION

EPL 6952, Zambezi Region is located in the Tree and Scrub Savannah Biome which is characterized by woodland vegetation structure type with extremely high green vegetation biomass. However, the natural environment of the project site shows signs of human and animal intervention as it is used for livestock (cattle and goats) farming, the cultivation of crops (maize, peanuts, millets vegetables and sorghums), wood and timber harvesting, hunting and tourism concessions and for residential purposes where build up areas are found which includes houses, schools, clinics and shops.

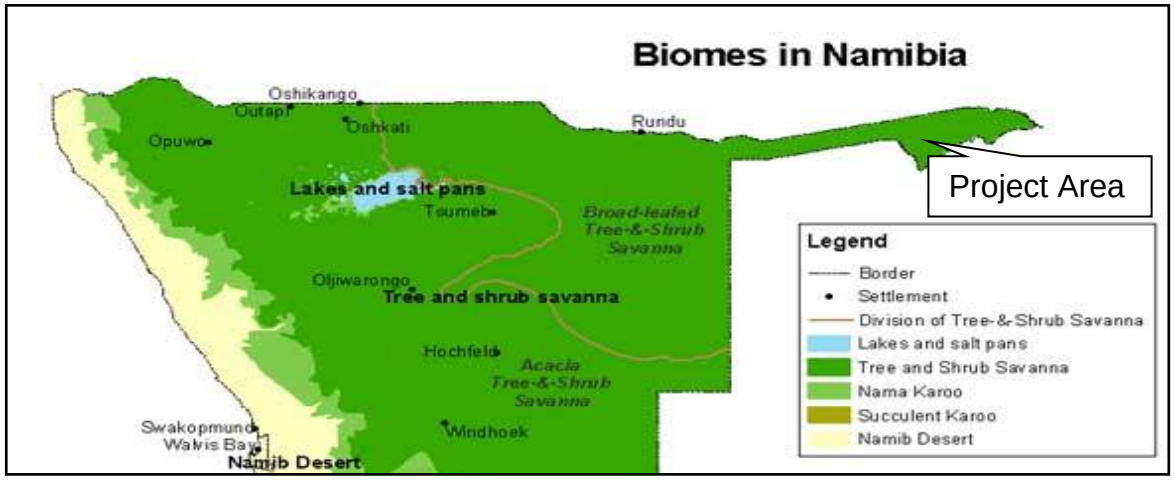


*Figure 13: Biomes in Namibia (Atlas of Namibia, 2002)*

The proposed exploration and test mining are expected to have a low impact on the natural environment. The following is an example of vegetation in EPL 6952 area:

*Figure 14: Vegetation in area*

**CONCLUSION AND IMPACT**

The proposed exploration and test mining will have an impact on the biodiversity and vegetation however the impacts will be mitigated.

## 9.4. WILDLIFE MIGRATION ROUTES/CORRIDORS

There is a wildlife corridor which crosses the EPL 6952 area. A wildlife corridor refers to areas of land linking various natural habitats. These corridors are mostly areas of nature through which wildlife has moved for centuries. The aim of formalising these corridors is to create awareness amongst communities of these areas, not only for their own safety, but also for the wildlife biodiversity. There are three types of corridors in the region:

- Identified elephant migratory routes;
- Identified wildlife corridors by the communities;
- Identified 'no-development' areas over major roads which were identified through the conservancy management plan.

These areas should be kept free of any service development so as to create open areas for wildlife. The corridors were identified through participatory planning workshops, GIS data from the conservancy management plans and GIS data from elephant tracking in the region. The greatest challenge is for communities to understand that wildlife will not move to 'manmade planned corridors', as wildlife simply will not know/understand such a concept. Therefore, maintaining existing migratory routes are a key component, rather than creating new ones and expecting wildlife to follow these. Even with following the existing corridors, there will be instances where wildlife will move into the region outside of these 'migratory routes'. It is therefore not a given that wildlife will always follow the same migratory routes, and there will still be instances of human wildlife conflict. However, by knowing where the main migratory corridors are, planners and communities can plan accordingly and minimize development within corridors, thereby minimizing human wildlife conflict.

By keeping these corridors open and free of development, this will also ensure that wildlife can move between key habitats and link key habitats with each other, thereby preventing the fragmentation of these habitats. The identified wildlife corridors are indicated on the MAP below:

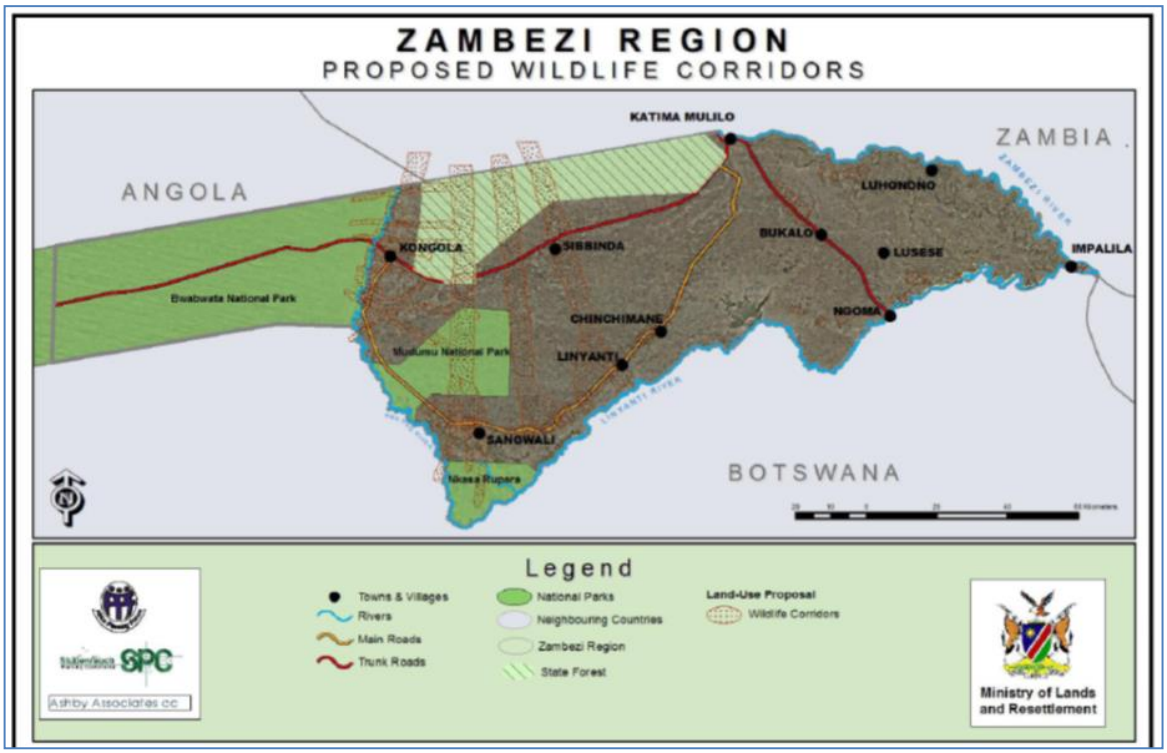


*Figure 15: Wildlife Corridors (Ministry of Lands and Resettlement)*

**CONCLUSION AND IMPACT**

The proposed exploration and test mining will have a low impact on the wildlife migration routes / corridors.

## 9.5. SURFACE WATER

EPL 6952, Zambezi Region is drained by a surface drainage system. Surface water flow in a catchment is largely determined by rainfall (quantity and intensity), potential evapotranspiration and catchment relief. A drainage system comprises all the elements of the landscape through which or over which water travels within that drainage basin. These elements include the soil, vegetation growing on it, geological materials underlying the soil, stream channels carrying surface water and the zones where water is held in the soil and moves below the surface. It also includes constructed elements such as pipes and culverts, cleared and compacted land surfaces, and pavement and other impervious surfaces unable to absorb water. The hydrology of a region is thus characterized by the collection, movement and storage of water through a drainage basin.

Alteration of a natural surface drainage in the exploration and test mining phase should be avoided or be done with the involvement of a professional engineer as well as the technicians of the Local Authority to ensure to avoid dramatic changes in the movement and storage of surface water. These changes can have negative impacts on other parties that use water for industrial, domestic and livestock watering purposes in the immediate vicinity or downstream.

**CONCLUSION AND IMPACT**

The proposed exploration and test mining will have a low impact on surface water.

## 9.6. SOCIAL-ECONOMIC COMPONENT

The bulk of the EPL 6952 area is scarcely populated. There is a concentration of people in the northern and southern regions of the EPL area, but the rest of the area is scarcely populated. The main concentration of people and activities are around the following villages/settlements located in the northern area:

- Nukwa Village
- Kandiyana
- Sitanta
- Masida
- Kansoko

and around the following villages/settlements located in the southern area:

- Mbilajwe
- Shikhakhu
- Batubaja
- Muketela
- Maunga
- Singobeka

The EPL area is used for livestock (cattle and goats) farming, the cultivation of crops (maize, peanuts, millets vegetables and sorghums), wood and timber harvesting, hunting and tourism concessions and for residential purposes where build up areas are found which includes houses, schools, clinics and shops. The economies of the villages/settlements are further supported by passing tourists, business people and government officials. The socio-economic characteristics of the area are continuously changing as more economic activities are established within the area.

From the site visit and interaction with I&AP's, it was observed that there is a lack of recreational and educational facilities and career opportunities in the EPL area. The exploration and mining project, especially once it proceeds to a full mining activity, would give the youth job opportunities, thus ultimately also gives them a sense of duty and purpose. Other advantages of living in a mining community are the following:

- Career Opportunities: The benefit of having a mine in a local area is the creation of job opportunities for the local people. Because of this factor, it leads to a number of benefits:

  i) Increase in standards of living since there is a source of income
  ii) Better housing facilities

- Facilities: Because of mining activities in a place, facilities such as hospitals, shops, sporting grounds etc. are usually build in order to provide different kinds of services to the people that live in that area.

- Support to the local: Schooling and communities are often better supported by mining companies in regional towns than in larger cities.

The EPL area will benefit from more employment opportunities, skills and technology transfer during exploration, the construction of the mining sites and supporting infrastructure as well as from the mining operations once started.

**CONCLUSION AND IMPACT**

The activities will have a positive impact on the community since employment will be created.

## 9.7. CULTURAL HERITAGE

The proposed project area is home to various cultural and historical importance or significance. Heritage sites and National Monuments are present. Various graves and graveyards were observed during the area/site visit. It is proposed that the proponent and manager of the exploration and mining activities provide access to the graves, monuments, cultural and historical sites and protect the sites. No disturbance to the sites is allowed.


*Figure 16: Hero's Acre and a grave stone*

**CONCLUSION AND IMPACT**

No heritage resources or graveyards were observed on the site and in the area.

## 9.8. SENSE OF PLACE

The proposed exploration activities will not have a negative impact on the sense of place in the area. An untidy or badly managed site can detract from the ecological well-being and individuality of the area. Unnecessary disturbance to the surroundings could be caused by poorly planned or poorly managed exploration activities. The exploration sites should be kept neat and clean where possible. Vegetation should not be removed or harmed if not necessary since it covers topsoil which prevents erosion. Noise and dust should be limited in the exploration phase not to unnecessary disturb neighbouring activities.

**CONCLUSION AND IMPACT**

The impact on the sense of place will be low.

## 9.9. HEALTH

The safety, security and health of the labour force, employees and neighbours are of great importance, workers should be orientated with the maintenance of safety and health procedures and they should be provided with PPE (Personal Protective Equipment). A health and safety officer should be employed to manage, coordinate and monitor risk and hazard and report all health and safety related issues in the work place. The introduction of external workers into the area is sometimes accompanied with criminal activities posing security risks for neighbours. However, the proponent will take certain measures to prevent any activity of this sort. The welfare and quality of life of the neighbours and workforce needs to be considered for the project to be a success. Conversely, the process should not affect the overall health of persons related to the project including the neighbours.

**CONCLUSION AND IMPACT**

The activity will have a low impact on the health of the affected community.

# 10. IMPACT ASSESSMENT AND EVALUATION

The Environmental Impact Assessment Renewal sets out potential positive and negative environmental impacts associated with the project site. The following assessment methodology will be used to examine each impact identified, see *Table* below:

*Table 5: Impact Evaluation Criterion (DEAT 2006)*

| Criteria | Rating (Severity) | |
|---|---|---|
| Impact Type | + | Positive |
| | O | No Impact |
| | - | Negative |
| Significance of impact being either | L | Low (Little or no impact) |
| | M | Medium (Manageable impacts) |
| | H | High (Adverse impact) |

| Probability: | Duration: |
|---|---|
| 5 – Definite/don't know | 5 - Permanent |
| 4 – Highly probable | 4 – Long-term (impact ceases) |
| 3 – Medium probability | 3 – Medium term (5 – 15 years) |
| 2 – Low probability | 2 – Short-term (0 – 5 years) |
| 1 – Improbable | 1 - Immediate |
| 0 - None | |
| **Scale:** | **Magnitude:** |
| 5 – International | 10 – Very high/don't know |
| 4 – National | 8 - High |
| 3 – Regional | 6 - Moderate |
| 2 – Local | 4 - Low |
| 1 – Site only | 2 - Minor |
| | 0 - None |

The impacts on the receiving environment are discussed in the paragraphs below:

## 10.1. IMPACTS DURING THE OPERATIONAL PHASE

### 10.1.1. ECOLOGICAL IMPACTS

Staff and visitors should only make use of walkways and existing roads to minimise the impact on vegetation. Minimise the area of disturbance by restricting movement to the designated working areas during maintenance and drives.

Impact Evaluation

| Aspect | Impact Type | Scale | Duration | Magnitude | Probability | Significance | |
|---|---|---|---|---|---|---|---|
| | | | | | | Unmitigated | Mitigated |
| Ecology Impacts | - | 1 | 2 | 4 | 2 | M | L |

### 10.1.2. DUST POLLUTION AND AIR QUALITY

Vehicles transporting goods and staff will contribute to the release of hydrocarbon vapours, carbon monoxide and sulphur oxides into the air. Possible release of sewer odour, due to sewer system failure of maintenance might also occur. All maintenance of bulk services and infrastructure at the project site has to be designed to enable environmental protection.

Impact Evaluation

| Aspect | Impact Type | Scale | Duration | Magnitude | Probability | Significance | |
|---|---|---|---|---|---|---|---|
| | | | | | | Unmitigated | Mitigated |
| Dust & Air Quality | - | 2 | 2 | 4 | 4 | M | L |

### 10.1.3. CONTAMINATION OF GROUNDWATER

Spillages might also occur during maintenance of the sewer system. This could have impacts on groundwater especially in cases of large sewer spills. Proper containment should be used in cases of sewerage system maintenance to avoid any possible leakages. Oil and chemical spillages may have a heath impact on groundwater users. Potential impact on the natural environment from possible polluted groundwater also exits.

Impact Evaluation

| Aspect | Impact Type | Scale | Duration | Magnitude | Probability | Significance | |
|---|---|---|---|---|---|---|---|
| | | | | | | Unmitigated | Mitigated |
| Groundwater contamination | - | 2 | 2 | 4 | 2 | M | L |

## 10.1.4. GENERATION OF WASTE

Household waste from the activities at the site and from the staff working at the site will be generated. This waste will be collected, sorted to be recycled and stored in on site for transportation and disposal at an approved landfill site.

Impact Evaluation

| Aspect | Impact Type | Scale | Duration | Magnitude | Probability | Significance | |
|---|---|---|---|---|---|---|---|
| | | | | | | Unmitigated | Mitigated |
| Waste Generation | - | 1 | 2 | 2 | 2 | M | L |

## 10.1.5. FAILURE IN RETICULATION PIPELINES

There may be a potential release of sewage, stormwater or water into the environment due to pipeline/system failure. As a result, the spillage could be released into the environment and could potentially be health hazard to surface and groundwater. Proper reticulation pipelines and drainage systems should be installed. Regular bulk services infrastructure and system inspection should be conducted.

Impact Evaluation

| Aspect | Impact Type | Scale | Duration | Magnitude | Probability | Significance | |
|---|---|---|---|---|---|---|---|
| | | | | | | Unmitigated | Mitigated |
| Failure of Reticulation Pipeline | - | 1 | 1 | 4 | 2 | M | L |

## 10.1.6. FIRES AND EXPLOSIONS

There should be sufficient water available for firefighting purposes. Ensure that all fire-fighting devices are in good working order and are serviced. All personnel have to be trained about responsible fire protection measures and good housekeeping such as the removal of flammable materials on site. Regular inspections should be carried out to inspect and test firefighting equipment by the contractor.

Impact Evaluation

| Aspect | Impact Type | Scale | Duration | Magnitude | Probability | Significance | |
|---|---|---|---|---|---|---|---|
| | | | | | | Unmitigated | Mitigated |
| Fires and Explosions | - | 2 | 1 | 4 | 2 | M | L |

## 10.1.7. HEALTH, SAFETY AND SECURITY

The safety, security and health of the labour force, employees and neighbours are of great importance, workers should be orientated with the maintenance of safety and health procedures and they should be provided with PPE (Personal Protective Equipment). Workers should be warned not to approach or chase any wild animals occurring on the site. No open flames, smoking or any potential sources of ignition should be allowed at the project location. Signs such as 'NO SMOKING' must be prominently displayed in parts where inflammable materials are stored on the premises.

Impact Evaluation

| Aspect | Impact Type | Scale | Duration | Magnitude | Probability | Significance | |
|---|---|---|---|---|---|---|---|
| | | | | | | Unmitigated | Mitigated |
| Safety & Security | - | 1 | 2 | 4 | 2 | M | L |

## 10.2.CUMULATIVE IMPACTS

These are impacts on the environment, which results from the incremental impacts of the construction and operation when added to other past, present, and reasonably foreseeable future actions regardless of which person undertakes such other actions. Cumulative impacts can result from individually minor but collectively significant actions taking place over a period of time. In relation to an activity, it means the impact of an activity that in it may not become significant when added to the existing and potential impacts resulting from similar or diverse activities or undertakings in the area.

Possible cumulative impacts associated with the proposed construction include: sewer damages/maintenance, uncontrolled traffic and destruction of the vegetation or the environment. These impacts could become significant especially if it is not properly supervised and controlled. This could collectively impact on the environmental conditions in the area. Cumulative impacts could occur in both the operational and the construction phase.

Impact Evaluation

| Aspect | Impact Type | Scale | Duration | Magnitude | Probability | Significance | |
|---|---|---|---|---|---|---|---|
| | | | | | | Unmitigated | Mitigated |
| Cumulative Impacts | - | 2 | 3 | 4 | 2 | M | L |

# 11. CONCLUSION

In line with the Environmental Management Act (No 7 of 2007), *Green Earth Environmental Consultants* have been appointed to conduct an Environmental Impact Assessment Renewal for the exploration and small-scale test mining activities for precious stones, precious metals and base and rare metals on EPL 6952 located in the Zambezi Region ±100km south of the town of Katima Mulilo.

Negative impacts that can be associated with the exploration and small-scale test mining activities are most likely to include: production of solid waste, dust emissions, atmospheric emissions, noise pollution, movement of soils, increased wastewater generation, the disruption of groundwater from the foundation or other structures, can result in an increase in traffic on the nearby roads and there can be an impact on the occupational health and safety of workers. However, this project is believed to be an asset to this area. Employment will be made available for which there is a need.

After assessing all information available on this project, *Green Earth Environmental Consultants* believe that the exploration and small-scale test mining activities is required.

# 12. RECOMMENDATION

It is therefore recommended that the Ministry of Environment, Forestry and Tourism through the Environmental Commissioner support and approve the Environmental Clearance Renewal to undertake exploration and small-scale test mining activities for precious stones, precious metals and base and rare metals on EPL 6952 located in the Zambezi Region ±100km south of the town of Katima Mulilo and for the following listed activities:

***MINING AND QUARRYING ACTIVITIES***

*3.1 The construction of facilities for any process or activities which requires a license, right or other form of authorisation, and the renewal of a license, right or other form of authorisation, in terms of the Minerals (Prospecting and Mining Act), 1992.*

*3.2 Other forms of mining or extraction of any natural resources whether regulated by law or not.*

*3.3 Resource extraction, manipulation, conservation and related activities.*

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## APPENDIX A: CURRICULUM VITAE OF CHARLIE DU TOIT

| | | |
|---|---|---|
| **1.** | **Position:** | Environmental Practitioner |
| **2.** | **Name/Surname:** | Charl du Toit |
| **3.** | **Date of Birth:** | 29 October 1960 |
| **4.** | **Nationality:** | Namibian |

| | | | |
|---|---|---|---|
| **5.** | **Education:** | Name of Institution | University of Stellenbosch, South Africa |
| | | Degree/Qualification | Hons B (B + A) in Business Administration and Management |
| | | Date Obtained | 1985-1987 |
| | | Name of Institution | University of Stellenbosch, South Africa |
| | | Degree/Qualification | BSc Agric Hons (Chemistry, Agronomy and Soil Science) |
| | | Date Obtained | 1979-1982 |
| | | Name of Institution | Boland Agricultural High School, Paarl, South Africa |
| | | Degree/Qualification | Grade 12 |
| | | Date Obtained | 1974-1978 |

| | | |
|---|---|---|
| **6.** | **Membership of Professional Association:** | EAPAN Member (Membership Number: 112) |

| | | | | |
|---|---|---|---|---|
| **7.** | **Languages:** | | Speaking | Reading | Writing |
| | | English | Good | Good | Good |
| | | Afrikaans | Good | Good | Good |

| | | | | | |
|---|---|---|---|---|---|
| **8.** | **Employment Record:** | From | To | Employer | Position(s) held |
| | | 2009 | Present | Green Earth Environmental Consultants | Environmental Practitioner |
| | | 2005 | 2008 | Elmarie Du Toit Town Planning Consultants | Manager |
| | | 2003 | 2005 | Pupkewitz Megabuild | General Manager |
| | | 1995 | 2003 | Agra Cooperative Limited | Manager Trade |
| | | 1989 | 1995 | | Chief Agricultural Consultant |

| | | | |
|---|---|---|---|
| 1985 | 1988 | Namibia Development Corporation<br>Ministry of Agriculture | Agricultural Researcher |

**Certification:**

I, the undersigned, certify that to the best of my knowledge and belief, this CV correctly describes myself, my qualifications, and my experience. I understand that any wilful misstatement described herein may lead to my disqualification or dismissal, if engaged.

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**Charl du Toit**

## APPENDIX B: CURRICULUM VITAE OF CARIEN VAN DER WALT

1. **Position:** Environmental Consultant

2. **Name/Surname:** Carien van der Walt

3. **Date of Birth:** 6 August 1990

4. **Nationality:** Namibian

5. **Education:**

| Institution | Degree/Diploma | Years |
|---|---|---|
| University of Stellenbosch | B.A. (Degree) Environment and Development | 2009 to 2011 |
| University of South Africa | B.A. (Honours) Environmental Management | 2012 to 2013 |

6. **Membership of Professional Associations:**

EAPAN Member (Membership Number: 113)

7. **Languages:**

| Language | Speaking | Reading | Writing |
|---|---|---|---|
| English | Good | Good | Good |
| Afrikaans | Good | Good | Good |

8. **Employment Record:**

| From | To | Employer | Positions Held |
|---|---|---|---|
| 07/2013 | Present | Green Earth Environmental Consultants | Environmental Consultant |
| 06/2012 | 03/2013 | Enviro Management Consultants Namibia | Environmental Consultant |
| 12/2011 | 05/2012 | Green Earth Environmental Consultants | Environmental Consultant |

9. **Detailed Tasks Assigned:**

Conducting the Environmental Impact Assessment, Environmental Management Plan, Public Participation, Environmental Compliance and Environmental Control Officer

**Certification:**

I, the undersigned, certify that to the best of my knowledge and belief, this CV correctly describes myself, my qualifications, and my experience. I understand that any wilful misstatement described herein may lead to my disqualification or dismissal, if engage.

_____

Carien van der Walt

## APPENDIX C: ENVIRONMENTAL MANAGEMENT PLAN