



**mineral resources**

Department:  
Mineral Resources  
**REPUBLIC OF SOUTH AFRICA**

**DRAFT BASIC ASSESSMENT REPORT**  
**And**  
**ENVIRONMENTAL MANAGEMENT PROGRAMME REPORT**

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

**NAME OF APPLICANT:** THAYA TRADING ENTERPRISE

**TEL NO:** 071 959 9207

**FAX NO:**

**POSTAL ADDRESS:** 9705 EERSTE LAAN, ROOISAND KATHU, 8446

**PHYSICAL ADDRESS:** 9705 EERSTE LAAN, ROOISAND KATHU, 8446

**FILE REFERENCE NUMBER SAMRAD:** NC 30/5/1/3/2/10774 MP

**Author** : **Zandile Dwane (M. Sc in Geology)**

**FILE REFERENCE NUMBER SAMRAD:** NC 30/5/1/3/2/10774 MP



## 1. IMPORTANT NOTICE

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

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

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

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

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

## 2. Objective of the basic assessment process

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

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

## PART A

### SCOPE OF ASSESSMENT AND BASIC ASSESSMENT REPORT

#### 3. Contact Person and correspondence address

##### a) Details of

##### i) Details of the EAP

Name of The Practitioner: Zandile Dwane

Tel No.: 063 859 6616

Fax No. :

e-mail address: kamvisto@gmail.com

##### ii) Expertise of the EAP.

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

(with evidence).

M. Sc in Geology

South African Council for Natural Scientific Professionals

American Association of Petroleum Geologists

Attach evidence as ANNEXURE 1

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

(In carrying out the Environmental Impact Assessment Procedure)

Relevant past experiences include, but not limited, to the following: Environmental Impact Assessments, Environmental Management Plans and / or Reports, Rehabilitation progress assessments, Environmental compliance monitoring, Scoping Reports, etc.

See CV herewith attached

Attach evidence as Appendix 1

##### b) Location of the overall Activity.

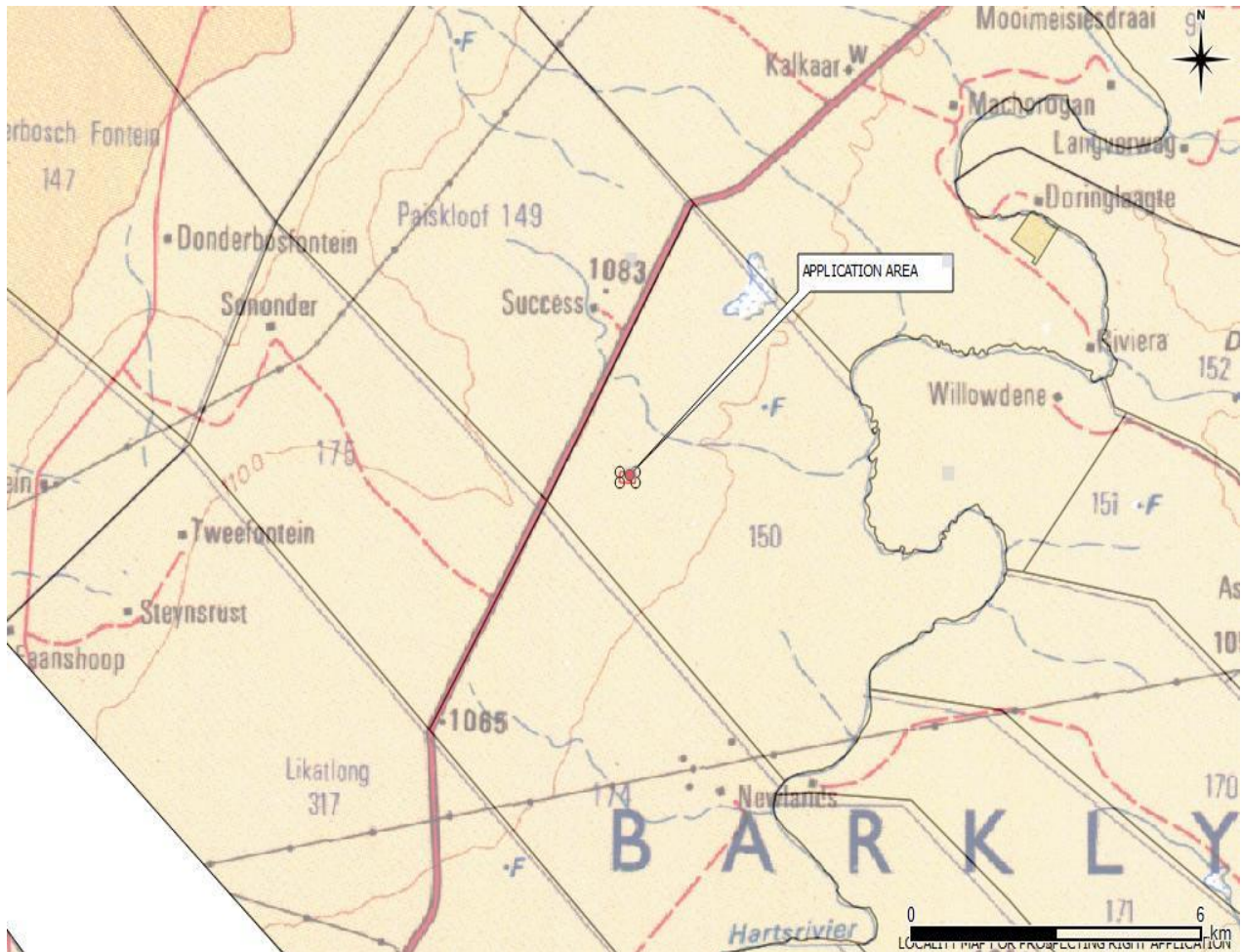
Table 1: Description of property

<b>Farm Name:</b>	A certain piece of land of Farm 150.
<b>Application area (Ha)</b>	Approximately 5 Ha
<b>Magisterial district:</b>	Diklatong Local Municipality, Frances Baard District Municipality
<b>Distance and direction from nearest town</b>	The application area is situated on the small piece of ground in Farm 150, approximately 45 Km out of

	Barkley West town
21 digit Surveyor General Code for each farm portion	0000C007000000001500000000

**c) Locality map**

(show nearest town, scale not smaller than 1:250000)

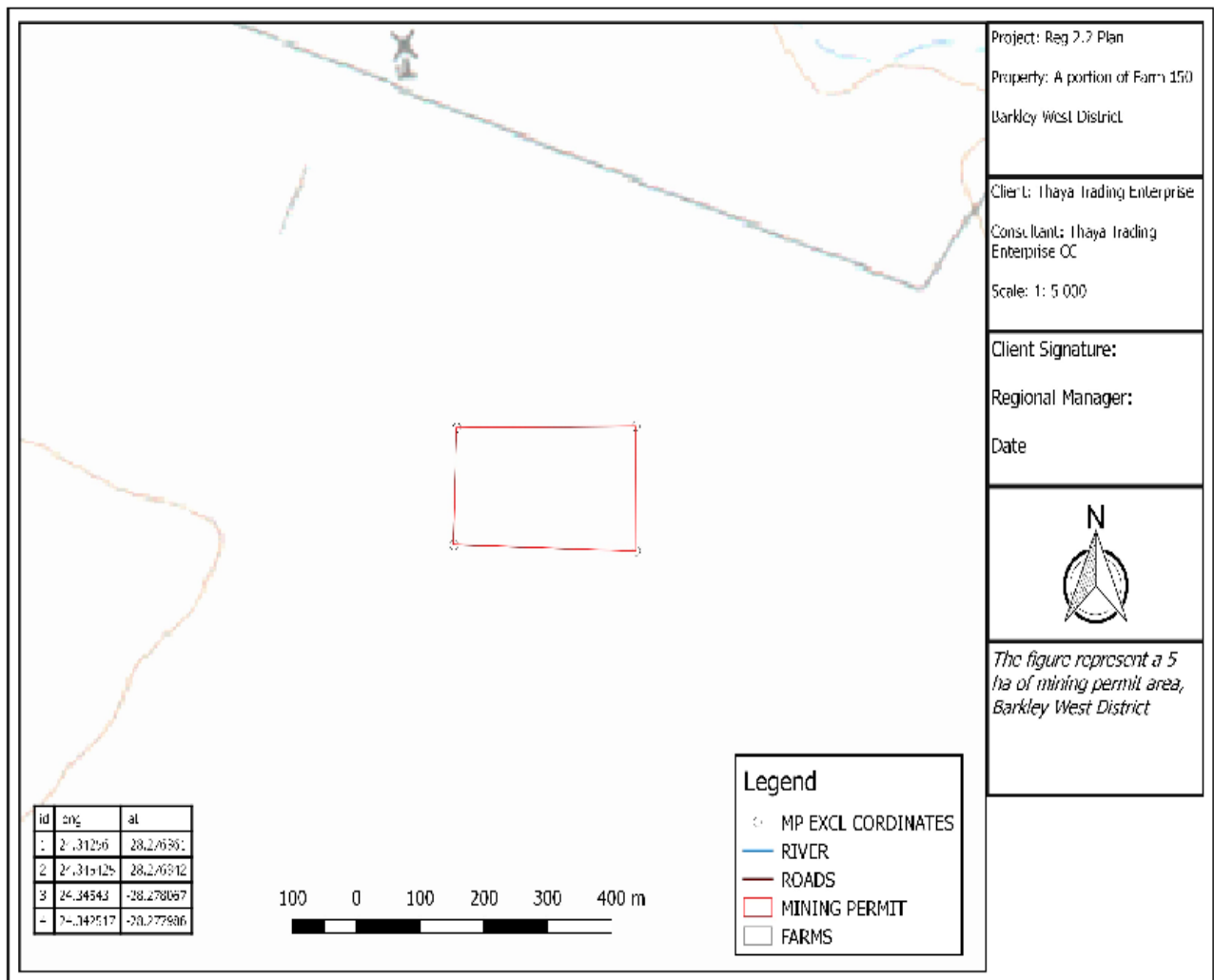


**Figure 1: Locality Map Dikgatlong Municipality**

**d) Description of the scope of the proposed overall activity.**

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

Thaya Trading Enterprise proposes to develop a small-scale diamond mine on a small piece (5 Ha) of Farm 150. The environmental authorisation for the planned development is expected to be granted for a period of 5 years. In executing the planned development, an environmental authorisation application has been applied for and lodged with the competent authority. Accordingly, a Basic Assessment Report is being drafted and will be submitted to the competent authority in compliance with NEMA and associated EIA Regulations. The planned operations will include the excavation of pits using excavator or Truck Load Backhoe and subsequently process material thereof. The excavated material will be transported using Articulated Dump Truck (ADT) that is going to be loaded using Truck Load Backhoe (TLB) or Front End Loader. The material is doing to be processed using 16 Foot Rotary Pan max.



**Figure 2a: Map shows the location, and area (hectares) of all the aforesaid main and listed activities**



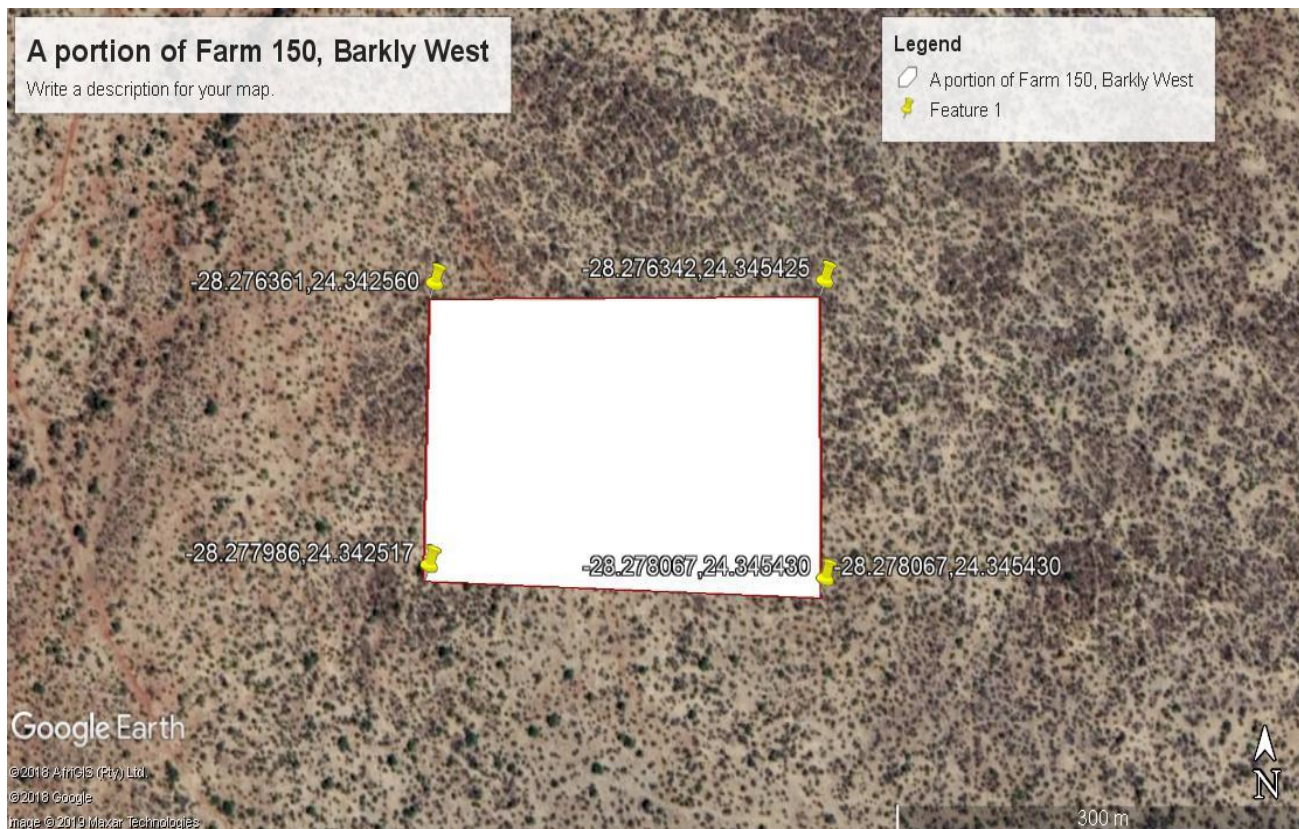


Figure 2b: Map shows the location and infrastructure

(i) Listed and specified activities

Table 2

NAME OF ACTIVITY  (E.g. For prospecting – drill site, site camp, ablution facility, accommodation, equipment storage, sample storage, site office, access route etc...etc...etc  E.g. for mining.- excavations, blasting, stockpiles, discard dumps or dams, Loading, hauling and transport, Water supply dams and boreholes, accommodation, offices, ablution, stores, workshops, processing plant, storm water control, berms, roads, pipelines, power lines, conveyors, etc...etc...etc.)	Aerial extent of the Activity Ha or m <sup>2</sup>	LISTED ACTIVITY Mark with an X where applicable or affected.	APPLICABLE LISTING NOTICE (GNR 544, GNR 545 or GNR 546)
All activities, including the operation of a particular activity associated with primary processing of a mineral resource such as extraction, classifying, reduction, concentrating, winning, crushing, screening and washing but excluding the smelting, beneficiation, refining, calcining or gasification of the mineral resource in which case Activity 6 of this Notice applies. Activity 21 of Listing Notice 2	5 Ha	X	GNR 325 Listing Activity 21
Temporary structures	0.095 ha	X	Not listed



Temporary Dump Site	0.04 ha	X	GNR 325, Listed 1, Activity 21
Stock Pile	0.04	X	GNR 325, Listed 1, Activity 21
Oil storage facility	50 m <sup>2</sup>	X	Not listed
Water pipeline of undetermined length but less than 10 Km	3 Km	X	Not listed
Roads to trenches and processing plant	<2 Km	X	GNR 325, Listed 1, Activity 21
Excavations	3 Ha	X	GNR 325, Listed 1, Activity 21
Diesel Storage	0.0008 ha	X	GNR 325, Listed 1, Activity 21
Domestic Waste Facility	0.0008 ha	X	GNR 325, Listed 1, Activity 21
Chemical Storage	0.0025 ha	X	GNR 325, Listed 1, Activity 21
Vehicle Storage	0.0025 ha	X	GNR 325, Listed 1, Activity 21

## (ii) Description of the activities to be undertaken

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

Thaya Trading Enterprise plans to develop an open pit mining operation for diamonds within a 5 Ha area that is located on a piece of Farm 150, Dikgatlong Municipality. Noteworthy, this section on description of the activities to be undertaken may still have to be worked on. The applicant is yet to confirm some information pertaining the machinery utilised and process to be followed.

### 1) Description of Planned Non-Invasive Activities

(These activities do not disturb the land where mining will take place e.g. aerial photography, desktop studies, aeromagnetic surveys, etc.)

#### *Phase 1*

#### **Imagery Analysis and Geological Mapping**

High resolution satellite images will be studied and used to geologically map the application area. Contacts between various lithologies will be mapped and specific attention will be given to delineate and define areas underlain by alluvial gravels or Kimberlites. Rock stockpile will be properly examined for the best method to employ in handling the material.

A site investigation of the target areas will be undertaken to identify infrastructure and determine any potential problems that may need to be addressed.

## **2) Description of Planned Invasive Activities**

(These activities result in land disturbances e.g. drilling, mining, etc.)

### **Phase 2**

#### **Trenches Sampling**

Discussed herein after, Section 3.

## **3) Description of Pre-feasibility Studies**

(Activities in this section include, but are not limited to, the following: initial, geological modelling, resource determination, possible future funding models, etc.)

Phase 3

#### **Analytical Desktop Study**

The project Geologist monitors the programme, consolidates and processes the data and amends the programme depending on the results. This is a continuous process throughout the programme and continues even when no mining is done on the ground.

Each physical phase of mining shall be completed taking into consideration the activity, quantity, resources, expenditure and duration.

## **4) Description of Sampling Activities**

### **Volumes of the mineral to be tested**

About 5 Trenches will be excavated with the following dimensions that prove to contain dolerite, alluvial gravels and kimberlite. It is estimated that an average 3m of overburden (calcrete and soil) will be removed before accessing the gravel layer (average width 2 – 4m) which is host to the diamonds. However, this is going to be confirmed during operations The trenches will be 50m x 30m x 0.5 – 50 m deep. We calculated the volume of gravel on 2m and if all 5 trenches are going to be excavated an average of 9 375 m<sup>3</sup> will be tested.

### **Why will they be tested?**

The gravel kimberlitic material will be tested to determine a grade (carats per hundred tonne) and value (US\$ per carat). The closest alluvial operation is next to this farm on all sides of the river which necessitates this project. Additionally, there are old diggings that took place along the Harts River on the side of the proposed project.

The crushed doleritete will be sold to local markets.

## **Where will they be tested?**

The operation is to be conducted using conventional open pit mining equipment:

Earthmoving and ancillary equipment

1 – 3 x Dump Trucks

1 – 3 x Excavator

1 – 3 x Front-end Loader and / or TLB

1 – 3 x Water Truck

1 x 16ft-Rotary Pan (max.) and / or DMS plant

1 x Crusher

Screen

Utility vehicles and small tools

Diamond recovery unit with Flow sort Machines, Plant, and recovery, crushing and screening equipment

Dolerite will be processed separately from diamond-bearing material. Gravels and Kimberlite are loaded onto a vibrating grizzly and the +85mm oversize material is discarded back into the open pit (about 25% reduction). The remaining -85mm fraction is loaded into a 16-foot rotary pan with a treatment capacity of 50 – 80 tph. A magnetic separator is used to extract some of the heavy banded iron stones. Tracer tests are done regularly to ensure that the pans are operating at the correct density. Approximately 2.5 tonne of concentrate is tapped from the pan every hour and transported in locked containers to the final recovery unit. The final recovery unit consists of a holding bin, sizing screen, sizing bins and one state of the art Flowsort X-ray recovery unit which recover diamonds from the +2mm to -32mm size fraction. Final sorting of the X-ray concentrate will be done manually. Rehabilitation will take place continuously and at any stage only one trench will be open.

The crushing of rock will be conducted as described above.

## **To whom they will be disposed of:**

At an expected grade of 1.5 carats per hundred tonnes, 8 800 carats could be recovered from the gravels. However, this will be confirmed during operations. Diamonds will be sold at a reputable diamond tender house in Kimberley to determine an average US\$ carat value for the diamonds. Alternatively, the stones will be sold to international markets that affiliate to the Kimberley process.



## **7) Decommissioning Phase**

Mobile equipment is going to be used in these operations. When mobile infrastructure is used, the decommissioning phase is going to be straight forward as the infrastructure would be transported away from site. It is worth mentioning that the schedule of rehabilitation is going to be phased to run in parallel with the mining and crushing activities to ensure 'pain-free' rehabilitation ultimately. Meaning, simultaneous backfilling is going to be employed during actual operations as soon as material has been exhausted from the pit. The pollution control measures and associated infrastructure will be removed at closure, then, the polymeric material will be sent away for recycling if possible. The disturbed areas are going to be rehabilitated in such a manner that the environmental condition is of reasonable standard.

a. **Policy and Legislative Context**

**Table 4: Policy and Legislative Context**

<p><b>APPLICABLE LEGISLATION AND GUIDELINES USED TO COMPILE THE REPORT</b>                      (a description of the policy and legislative context within which the development is proposed including an identification of all legislation, policies, plans, guidelines, spatial tools, municipal development planning frameworks and instruments that are applicable to this activity and are to be considered in the assessment process)</p>	<p><b>REFERENCE WHERE APPLIED</b></p>	<p><b>HOW DOES THIS DEVELOPMENT COMPLY WITH AND RESPOND TO THE LEGISLATION AND POLICY CONTEXT.</b>                       (E.g. In terms of the National Water Act a Water Use License has/ has not been applied for)</p>
<p>Minerals and Petroleum Resources Development Act, 2002 (Act 28 of 2002)</p>	<p>Mining Permit application process</p>	<p>Mining Permit has been applied for and to the Department of Mineral Resources.</p>
<p>Minerals and Petroleum Resources Development Act, 2002 (Act 28 of 2002)</p>	<p>Mining Permit and Environmental Authorisation processes</p>	<p>In progress</p>
<p>National Environmental Management Act, 1998 (Act 107 of 1998)</p>	<p>Section 28 of the National Environmental Management Act, Act 107 of 1998 stipulates an obligation of consideration of care where reasonable measures are taken to prevent pollution or degradation from occurring, continuing or recurring, or, where this is not possible, to minimise and rectify pollution or degradation of the environment. Section 29 provides for the protection of workers who refuse to undertake work that poses a hazard to the environment. Section 30 emphasises on procedures to be followed in the event of an emergency, especially an incident which may impact negatively on the environment. Section 31 covers the aspect of access to environmental information and protection of whistle</p>	<p>In progress</p>



	blowers.	
National Environmental Management Act, 1998 (Act 107 of 1998) Environmental Impact Assessment Regulations, 2017 (G 40772)	GNR 325: 2017 Regulations promulgated in terms of NEMA, Act 107 of 1998: GNR 324, 325, 326 and 327 Government Gazette No. 40772, Pretoria, in terms of Chapter 5 of the National Environmental Management Act, Act 107 of 1998 (as amended), contain the EIA Regulations, as well as a schedule of activities that may have substantially negative effects on the environment, therefore, require authorisation from the competent environmental authority..	In progress
National Environmental Management Act: Biodiversity Act, 2004 (Act 10 of 2004)	The National Environmental Management: Biodiversity Act, Act 10 of 2004 provides for the MEC/ Minister to list ecosystems that are threatened and in need of protection (Section 52) and to identify any process or activity in such a listed ecosystem as a threatening process (Section 53). A list of threatened and protected species has been published in terms of Section 56(1) GG 29657 GNR 151 and GNR 152, Threatened or Protected Species Regulations. The Act also deals with restricted activities involving alien species; restricted activities involving certain alien species totally prohibited; and duty care to be taken pertaining to listed invasive species.	
National Environmental Management Act: Waste Act, 2008 (Act 59 of 2008)	Regulates waste management in order to protect health and the environment by stipulating reasonable measures to be taken to ensure prevention of pollution and ecological degradation, and for securing ecologically-sustainable-development.	
National Water Act, 1998 (Act 36 of 1998)	In terms of the definitions contained in Section 1 of the National Water Act, Act 36 of 1998, a “water resource” includes a watercourse, surface water, estuary, or aquifer. “Aquifer” means a geological formation which has structures or textures that hold water or permit appreciable water movement through them. “Watercourse” means a river or spring; a natural channel in which water flows regularly or intermittently; a wetland, lake or dam	In progress

	<p>into which, or from which, water flows; and any collection of water which the Minister may, by notice in the Gazette declare to be a watercourse, and a reference to a watercourse includes, where relevant, its bed and banks.</p> <p>In addition, in terms of the definitions contained in Section 1 of the National Water Act, waste “includes any solid material or material that is suspended, dissolved or transported in water (including sediment) and which is spilled or deposited on land or into a water course in such volume, composition or manner as to cause, or to be reasonably likely to cause, the water resource to be polluted”. The Minister of Water and Environmental Affairs is allowed to regulate activities which have a detrimental impact on water resources by declaring them to be controlled activities. No person may undertake a controlled activity unless such person is authorised to do so by or under the Act. Duty of Care to prevent and remedy the effects of pollution to water resources is addressed in Section 19. Section 20 addresses the procedures to be followed, as well as control of emergency incidents which may impact on a water resource.</p> <p>Recognised water uses are addressed in terms of Section 21 and the requirements for registration of water uses are stipulated in Section 26 and Section 34.</p>	
World Heritages Convention Act, 1999 (Act 49 of 1999)		
Environmental Conservation Act, 1989 (Act 73 of 1989)	Section 25 of the Environment Conservation Act, Act No. 73 of 1989, as well as the National Noise Control Regulations GNR 154 dated 10 January 1992, regarding noise, vibration and shock, is applicable.	
Environmental Conservation Amendment Act, 2003 (Act 50 of 2003) G26023		
National Environmental		

<p>Management Act: Protected Areas Act, 2003 (Act 57 of 2003)</p>		
<p>In terms of the National Heritage Resources Act, 1999 (Act No. 25 of 1999)</p>	<p>In terms of the National Heritage Resources Act, Act No. 25 of 1999, any person who intends to undertake “any development or other activity which change the character of a site – exceeding 5 000m<sup>2</sup> in extent” and “the construction of a .... Linear development or barrier exceeding 300m in length” must at the very earliest stages of initiating the development notify the responsible heritage resources authority, viz. the Northern Cape Provincial Heritage Resources Agency (NCPHRA) and/or the South African Heritage Resources Agency (SAHRA), as well as the Northern Cape Department of Sports, Arts and Culture.</p>	
<p>Conservation of Agricultural Resources Act, Act No 43 of 1983</p>	<p>Section 5 of the Conservation of Agricultural Resources Act, Act No. 43 of 1983, prohibits the spreading of weeds and Section 6 and Regulation 15 and 15E of GNR 1048 address the implementation of control measures for alien and invasive plant species. This aspect has been addressed in the Environmental Management Programme. This Act also make provision for the conservation of agricultural land.</p>	
<p>National Forests Act, 1998 (Act No. 84 of 1998)</p>	<p>National Forests Act, Act No. 84 of 1998 and Regulations, Section 7: No person may cut, disturb, damage or destroy any indigenous, living tree in a natural forest, except in terms of a licence issued under Section 7(4) or Section 23; or an exemption from the provisions of this subsection published by the Minister in the Gazette. Sections 12 – 16 deal with protected trees, with the Minister having the power to declare a particular tree, a group of trees, a particular woodland, or trees belonging to a certain species, to be a protected tree, group of trees, woodland or species. In terms of Section 15, no person may cut, disturb, damage, destroy or remove any protected tree; or collect, remove, transport, export, purchase, sell, donate</p>	

	or in any other manner acquire or dispose of any protected tree, except under a licence granted by the Minister.	
Subdivision of Agricultural Land Act, Act 70 of 1970	Control the subdivision, and in connection therewith, the use of agricultural land. It also controls long terms leases over portions of agricultural land. The applicant needs to apply for consent from Department of Agriculture for these leases.	
Section 17 of the Fencing Act, Act No 31 of 1963	States that any person erecting a boundary fence may clean any bush along the line of the fence up to 1.5m on each side therefore and remove any tree standing in the immediate line of the fence. However, this provision must be read in conjunction with the environmental legal provisions relevant to protection of flora.	
Section 8 of the Atmospheric Pollution Prevention Act, Act No. 45 of 1965	Section 8 of the atmospheric Pollution Prevention Act, Act No. 45 of 1965, regulating controlled areas, as well as Section 27, with regard to dust control, is still applicable.	
The Occupational Health and Safety Act, Act No. 85 of 1993 GN R 2281 of 1987 – 10-16.	Environmental Regulations for Workplaces are applicable.	
The Northern Cape Nature Conservation Act, Act No. 9 of 2009 addresses protected species in the Northern Cape and the permit application processes related thereto.	Addresses protected species in the Northern Cape and the permit application processes related thereto.	
The South African Civil Aviation Regulation Act, Act 13 of 2009.	Controls markings of structures that may influence aviation through the Civil Aviation Technical Standard, SA-CATSAH 139.01.33 Obstacle Limitations and Markings outside Aerodrome or Heliports. It states that any structure exceeding 45m above ground level, or structures where the top of the structure exceeds 150m above the MEAN ground level, like on top of a hill, the mean ground level considered to be the lowest point in a 3km radius around	

	<p>such structure.</p> <p>Structures lower than 45m, which are considered as a danger or a potential danger to aviation, shall be marked as such when specified. Overhead wires, cables, etc., crossing a river, valley or major roads shall be marked and in addition, their supporting towers marked and lighted if an aeronautical study indicates that it could constitute a hazard to aircraft.</p> <p>The highest structures that would be constructed at the proposed development would be the lighting conductors, which would have a height of 25m.</p>	
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**b. Need and desirability of the proposed activities.**

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

For years, mining has been the driving force behind South Africa's economy and continues to make a valuable contribution to the country's GDP. The economy of South Africa is built mostly on gold and diamond-mining, with gold-mining contributing over a third of the country's exports. Whereas, South African diamond-mining industry was listed as one of the largest mining countries in the world in the year 2009. It is predicted that mining will still play an important role to the economy, most notably through foreign exchange earnings and employment provision. It is also one of the primary sectors that provide employment opportunities for unskilled and semi-skilled people. The South African mining industry has its origin in small-scale to medium-scale mining activities, with these operations offering much needed employment opportunities and entrepreneurship, as well as contributing to the mineral sector and local economy. Small-scale mining and medium-scale mining's impact on employment is especially observed in the rural areas and province such as the Northern Cape where there are limited opportunities; providing significant livelihood for rural communities and a means of alleviating poverty.

The proposed development of the Mine is aimed at supporting the economy of South Africa by producing a commodity that has a potential to leverage the economy of the country. The primary beneficiaries of this project include, among others, the employees, members of surrounding communities and the country. Secondary beneficiaries include the suppliers of goods and services, and the local businesses through the buying power of employees. This is in line with the National Development Plan (NDP). The Social Labour Plan of the Proposed development is aimed at ensuring local economic development through implementation of the various projects.

The applicant estimates that these small pieces of land could, if mining permit is granted, prove to be bearing commodities of high economic value. Only a small piece of the farm 150 that is targeted will be temporarily disturbed. The remainder of the farm portions will proceed as normal according to this particular application.

### **c. Motivation for the overall preferred site, activities and technology alternative.**

Diamond mining activity dominated regions include the Northern Cape and North West in South Africa. These regions or provinces are known to bear alluvial diamond deposits. Farm 350 is known bear dolerite, alluvial diamond deposits and some kimberlite pipes. As a consequence, a number of individuals who reside in Longlands and Delportshoop have indicated that they intend to apply for prospecting rights and mining permits. However, affordability is the limiting factor.

As discussed in section (f), the proposed development of the Mine will get only a small piece of the property disturbed in relation to this particular application.

The mining activities will be conducted following dolerite, alluvial and target the kimberlite with anticipation that the identified area on the farm could be efficiently mined to produce commodity of high grade and quality of economic value.

#### **Mining Site Location**

A Mining Permit application was lodged with the Department of Mineral Resources.

#### **Water Usage**

In an event the mining activities go as planned, a rotary diamond plant which uses a 16 feet rotary pan will be used. On estimation, a 16 feet rotary pan may use 17 000 liters of water per hour. In an event operations run for 8 hours during daytime only, water usage is estimated at 720 000 liters per week. A 16 feet rotary pan can work of approximately 65 tons per hour which, in essence, constitutes approximately 17 000 liters per hour. However, the mining activities will be conducted over a period as stipulated in the mining permit that is in place which reduces water usage over the mining period. Mining activities have a potential to change the subsurface flow of surface water resources through the dewatering activities. However, in this case, loss of run-off contribution to the Harts River is not anticipated.

#### **Mine Residue Dam**

A slimes dam design will be established in order to maximise the capacity of the dam and to minimise the risks in terms of general safety and Department of Water and Sanitation regulations.

- The locality of the mine residue dam will be identified with the following factors in consideration:
- No structures, environmental threats can be identified downstream
- Accessibility and proximity to the road
- Enable easy rehabilitation during the closing down of the mine
- Absence of underlying ore body

#### **Fuel Storage**

Mobile fuel bousers will be utilised in order to cut cost and minimise carbon emissions. As time progresses and the profit margins increase, fuel tanks on a concrete bund wall may be installed. Accessibility, proximity and general safety are some of the factor that will be consider when selecting the location of fuel tanks.



#### **d. Full description of the process followed to reach the proposed preferred alternatives within the site.**

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

A Mining Permit application was lodged and accepted by the Department of Mineral Resources to be done whereby the grade and quality will be determined.

#### **Volumes of the mineral to be tested**

It is estimated that an average 3m of overburden (calcrete and soil) will be removed before accessing the gravel layer (average width 2 – 4m) which is host to the diamonds.

#### **Why will they be tested?**

The gravel will be tested to determine a grade (carats per hundred tonne) and value (US\$ per carat). The closest operations are within Barkly West and are on all sides of the river which necessitates this project. Dolerite will be processed separately from diamond-bearing material.

#### **How will they be tested?**

The operation is to be conducted using conventional open pit mining equipment:

Earthmoving and ancillary equipment

1 - 3 x Dump Trucks

1 - 3 x Excavator

1 - 3 x Front-end Loader

1 - 3 x Water Truck

1 x 16ft-Rotary Pan and / or DMS plant

1 x crusher

Screen

Utility vehicles and small tools Diamond recovery unit with Flowsort Machines, Plant, recovery, crushing and screening equipment gravels are loaded onto a vibrating grizzly and the +85mm oversize material is discarded back into the open pit (about 25% reduction). The remaining -85mm fraction is loaded into a 16-foot rotary pan with a treatment capacity of 50 – 80 tph. A magnetic separator is used to extract some of the heavy banded iron stones. Tracer tests are done regularly to ensure that the pans are operating at the correct density. Approximately 2.5 tonne of concentrate is tapped from the pan every hour and transported in locked containers to the final recovery unit.

The final recovery unit consists of a holding bin, sizing screen, sizing bins and one state of the art Flowsort X-ray recovery unit which recover diamonds from the +2mm to - 32mm size fraction. Final sorting of the X-ray concentrate will be done manually.

## **To whom they will be disposed of:**

At an expected grade of 1.5 carats per hundred tonnes, 8 800 carats could be recovered from the gravels. Diamonds will be sold at a reputable diamond tender house in Kimberley to determine an average US\$ carat value for the diamonds. The crushed rock will be sold to local markets and to international markets, if possible.

### **i) Details of the development footprint alternatives considered.**

With reference to the site plan provided as Appendix 4 and the location of the individual activities on site, provide details of the alternatives considered with respect to:

- (a) the property on which or location where it is proposed to undertake the activity;
- (b) the type of activity to be undertaken;
- (c) the design or layout of the activity;
- (d) the technology to be used in the activity;
- (e) the operational aspects of the activity; and
- (f) the option of not implementing the activity.

There are no alternative properties to be considered as the the application area was previously mined or disturbed and the local community of Dikgatlong is in such a need of a development of this proposed nature. The BAR process identifies, among others, critical components of alternatives to be considered whilst ensuring that the desired outcome pertaining the proposed project is realised. In the process of identifying and assessing the feasible options, factors such as the National Development Plan and sustainable development to mention just a few are considered. The assessment process may include the environmental friendliness, economic viability and reasonable practicability. As a consequence, alternatives for the locality of the mining activities are not discussed in this piece of work because the position and location of the mine are influenced to an unlimited extent by the availability of the commodity at a particular location.

## Land use

There is no specialist comparative study in place for the mining area. The reports are going to be sourced from the existing environmental reports pertaining to the application area as the area has been mined before. If such reports do not exist, then a specialist is going to be appointed to conduct the report as required. In this instance, it was deemed necessary to appoint a Palaeontologist together with an Archaeologist to conduct respective studies. The process that is going to be employed from beginning to end of mining activities is going to be step-wise; the initial step is going to be to establish whether or not there commodities of economic value that could be mined in the area of interest before any development can take place.

The rehabilitation process is going to be conducted in parallel with the operations and immediately after mine closure in order to ensure that the pits that get opened are backfilled. All the material taken out of the pits that does not bare the commodity of interest will be deposited back into the pits. The rehabilitation process will be performed with the aim to enable normal agricultural activities to be undertaken after the mining has been deemed economically not viable.

## Project Infrastructure

Considerations of alternatives in respect of infrastructure of this project were discussed in the previous section (h).

## Mining Method

To the best of our knowledge, the most economically viable method to be applied in open pit mining operations is 'backfilling'. The method of backfilling is going to be used in this proposed development as well.

Proceed without the Mine (no go)

#### Biodiversity

The proposed development is going to have a positive impact on biodiversity because some indigenous vegetation is going to grow back. Additionally, there is going to be some re-building of habitats. However, none of this re-building would have been possible if this proposed development was not going to go on.

#### Land Use

The pieces of land in the area of interest are partly used for mining and farming. However, some of the parts of this land were previously used for residential purposes. Both surface and ground water may be impacted negatively by the proposed operations, especially the Vaal River. However, necessary measures such as to build reservoir dams would be a good contingent option. Municipal water would be another good resource to utilise in order not to have to abstract any ground water.

#### Heritage and Cultural Resources

The existing heritage resources, if any, are going to be protected through demarcation of the NO-GO zone(s). All encountered graves, if any, are going to be preserved.

#### Socio-Economy

The proposed project will, if proven to be economically viable, definitely contribute to the economy of the local communities, and to that of the country at large. At inception of the proposed development alone, there are some people who are going to benefit as employees of the company.

Thaya Trading Enterprise is in a position to employ people from all walks of life, however, preference is going to be given to locals. Furthermore, Thaya Trading Enterprise is committed to Development and Sustainability of the Local Economy and Infrastructure Development.

## **ii) Details of the Public Participation Process Followed**

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

Letters will be sent out by registered mail to interested and affected parties (land owners, the CPA, neighbouring farmers, certain government departments and parastatals). A notice will be published on DFA newspaper in year 2019 for public viewing and comments.

The process as described by NEMA for Environmental Authorisation will be followed. Letters were sent by registered mail to all Interested and Affected Parties in Table 5.

iii)

**Summary of issues raised by I&As**

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

Table 5: Summary of issues raised by I&As

Interested and Affected Parties		Date	Issues raised	EAPs	Section and
List the names of persons consulted in this column, and Mark with an X where those who must be consulted were in fact consulted.		Comments Received		response to issues as mandated by the applicant	paragraph reference in this report where the issues and or response were incorporated.
<b>AFFECTED PARTIES</b>					
Landowner/s	X				
Dikgatlong Municipality	Local X				
Lawful occupier/s of the land					
Landowners or lawful occupiers on adjacent properties					
Municipal councillor					
Municipality	X				
Dept. of Water Sanitation	X				
Communities					
Dept. Land Affairs	X				
Dept. of Agriculture	X				
Dept. Environmental Affairs	X				



diamondiferous and barren) intrusive event took place during the late Mesozoic. The Kalahari craton, which includes the Kaapvaal and Zimbabwe craton comprises of all the kimberlites that host economic deposits while those occurring in the surrounding Proterozoic basement are non-diamondiferous. The remnants of the kalahari sands which are known as Hutton Sands are found in many places along the Middle Orange. The Karoo Supergroup is covered by the early Quaternary sediments particularly the Dwyka Group and the Eccca Group. The Dwyka Group is situated on the glaciated Precambrian bedrock surfaces along the northern basin margin and is overlain by the Cape Supergroup in the south. This group consists of massive diamictite, stratified diamictite, massive carbonate-rich diamictite, mudrock with stones and mudrock facies. The bedrock of the Orange River valley is cut by faults and dolerite dykes, which are rarely exposed. The Eccca Group consists of up to 16 formations which mirrors the lateral facies changes that characterizes the Eccca Group Formation. These formations comprises of mainly: sandstone, siltstone, mudrock, limestone and coal seams depending on the geographical areas (Johnson et al., 2006).

### Land Use

The land use and land cover of the area can be classified into three classes. These are: grazing land, **forest** and **bushveld** land. Most of the area is bare land, with thin soil layer between fractures and also covered by thin vegetation which was used for grazing by the farmers. The grazing land is on the flat land, which covers the whole area of the project area. Only small area is covered by forest which is found on the far North-Eastern part of the study area.

### Soil Type

The Harts River in the area meanders through various geological structures which give rise to a variety of soil types and textures. Based on the soil textural classification method, the soil that is found in the study area is grouped into different soil classes. **Namely: sandy loam, clayey sand and sandy clay loam.** Loam is a soil composed of a relatively even a mixture of three mineral particle size groups: sand, silt and clay. Loams are plastic when moist, and retain water easily. The proportions of sand sized particles are also prominent in sandy clay loam and sandy loam soil types. Sand loam, clayey sand and sandy clay loam have 12.5%, 8.3%, 7.7% aerial coverage, respectively.

### Climate

The project site is approximately 45 km away from Barkly West. The Barkly west climate is predominantly semi-arid with low rainfall and high evaporation. Climate plays a vital role in determining the availability of water resources, the nature of the natural landscape and vegetation types. Temperatures are high during the summer and low during the winter. The coldest months are experienced from June to August while the hottest months range from September to March. The average daily temperatures range from 18.5°C in June, to 35°C in January. The mean maximum average temperature during the summer months range from 27 to 34°C, while during the winter months the mean average minimum temperature range from between 5.6 and 7.4°C. The average rainfall is 427 mm. The area also experiences extreme events on a regular basis, including frost, hail, drought, and high speed winds. Prevailing winds are north-westerly with an average speed of 15km/h, between the driest and wettest months, the difference in precipitation is 73 mm. During the year, the average temperatures vary by 15.3 °C.



### Topography

The area is characterised by a flat topography. The elevation is approximately 1113.65 m. The terrain morphological class of the area can be described as plains with high relief, either moderately or strongly undulating. The area lies at an altitude of 1145 meters above sea level, with the highest elevations occurring in the east. Harts river flows eastward between the Project

### Ecology

The information below was obtained from Mucina & Rutherford, 2006,

### Flora

The region is dominated by the Savanna Biome. This biome is species rich and contains many threatened flora and fauna. The project area is situated within the North Eastern shrubveld grass which is characterised by bushveld. The shrubveld grass also occurs approximately 800m to the south east of the study area. The regional vegetation of the area is, however, used for grazing, mainly by cattle. A major factor delimiting the biome is the lack of sufficient rainfall which prevents the upper layer from dominating, coupled with fires and grazing, which keep the grass layer dominant. This ensures a sustained supply of low quality water into the rivers. The area was used for cattle-farming, it can thus be considered as effectively preserved.

The most distinctive trees in the area are the Camel Thorn (*Acacia erioloba*) and the Camphor Bush (*Tarchonanthus camphorates*). Other prominent trees are the Portly Baobab (*Adansonia digitata*) and the Candelabra tree (*Euphorbia ingens*).

### Fauna

The wildlife on site and in the surrounding area is typical of disturbed Highveld region where all but the small animals such as hares, duikers, rodents, birds and insects have been eradicated. Rine Rabbit (*Bunolagus monticularis*) is found in limited habitats in the southern Karoo. It is regarded as one of the world's rarest mammals with an estimated adult population of less than 250. In August 2003, the Riverine Rabbit Program (EWT-RRP) was established to co-ordinate all conservation efforts of this species and its habitat. The Northern Cape, especially the Kalahari, is a primary bird habitat. Raptors that occur include Black Eagle (*Aquila verreauxii*), Tawny Eagle (*Aquila rapax*), Black-breasted Snake Eagle (*Circaetus pectoralis*), Jackal Buzzard (*Buteo rufofuscus*), Pale Chnating Goshawk (*Melierax canorus*), Rock Kestrel (*Falco tinnunculus*) and Pygmy Falcon (*Polihierax semitorquantus*), etc.

### Air Quality

The air quality of the pre-mining period is expected to have been of a better quality, however, the existing mines in the surrounding areas also contribute to the air quality degradation. The main concern in this regard would however be dust from the proposed diamond mining settling on surrounding areas. However, a dust control plan will be implemented for the proposed project in order to control any possible nuisance dust that might give rise from the surrounding.

### Heritage and Palaeontology

In terms of Section 38 of the National Heritage Resources Act (Act No. 25 of 1999), guidelines and conditions under which heritage impact assessments must be conducted are set out pertaining to a proposed development. Thaya Trading Enterprise is expected to provide for on-going heritage monitoring on the identified resources of significant importance in the Heritage Impact Assessment report. The environmental management plan presented herein provides guidance on steps to follow when any major heritage feature is encountered during and at any phase of development or actual mining and associated operations. In the event of finding any resources of

significant heritage importance, reporting by the developer to relevant heritage authority should be immediate.

Contact: SAHRA Ms N. Higgins 021-4624502 or NC Heritage, or Resources Authority Mr Andrew Timothy 053 831 2537/ 807 4700.

Additionally, officials from relevant heritage authorities (National and Provincial) are going to be permitted to inspect the operation at any time in relation to the heritage resources and the EMP presented in this piece of work.

In the event that fossil remains are discovered during any phase of construction, either on the surface or exposed by fresh excavations the **Chance Find Protocol** must be implemented by the ECO in charge of these developments. These discoveries ought to be secured (preferably *in situ*) and the ECO ought to alert SAHRA so that appropriate mitigation (e.g. documented and collection) can be undertaken by a professional palaeontologist.

The specialist would need a collection permit from SAHRA. Fossil material must be curated in an approved collection (museum or university) and all fieldwork and reports should meet the minimum standards for Palaeontological impact studies developed by SAHRA. All what is presented in this section will be followed provided it is consistent with the recommendation presented in the specialist reports to be conducted. If there are any inconsistencies, the recommendations of the applicable reports will be considered as recommended.

### Wetlands

A wetland as defined by the National Water Act refers to land which is transitional between terrestrial and aquatic systems where the water table is usually at or near the surface, or the land is periodically covered with shallow water, and which under normal circumstances supports or would support vegetation typically adapted to life in water saturated soil. However, there are no wetlands in the region surrounding the project area.

The proposed Project area is in a low rainfall area and Sandstone and conglomerate are a prominent feature of the geology and result in considerable linkage between surface and ground water systems.

### Hydrogeology

According to the Hydrogeological Map of the Republic of South Africa (Sheets 2722 – Kimberly 1:500 000) the main water bearing strata in the area is an intergranular and fractured aquifer made up of sandstone and conglomerate rocks.

According to the map, groundwater resources are generally limited, with sustainable borehole yields ranging from 0.6 – 1.7 l/s. The groundwater quality is thought to be good, with total dissolved solids (TDS) of less than 300mg/l. In intergranular and fractured aquifers, the water occurs in both the upper weathered rock zone and the fractured but fresh rock formation below. These zones are in hydraulic contact. The regional aquifer system is defined as a Minor Aquifer System (Parsons, 2005) with low to moderate vulnerability to contamination. Minor Aquifer Systems can be fractured or potentially fractured rocks, which do not have a high primary permeability, or other formations of variable permeability. The aquifer extent may be limited and water quality may be variable. Although these aquifers seldom produce large quantities of water, they are important both for local supplies and in supplying base flow to rivers.

Local Hydrogeology - Two types of aquifer systems have been recognized in the Project area, represented by:

- Weathered Aquifer - The Ecca sediments are weathered to depths between 5 – 15 metres below surface throughout the area. The upper aquifer, typically perched, is associated with this weathered zone and water is often found within a few metres of the surface (Hodgson, 2001). This aquifer is recharged by rainfall which infiltrates into the weathered rock and soon reaches

an impermeable layer of shale, underneath the weathered zone. The movement of groundwater on top of this layer is lateral and in the direction of the surface slope (Hodgson, 2001).

- Fractured Aquifer - The pores within the Ecca sediments are too well cemented to allow any significant permeation of water. All groundwater movement is therefore along secondary structures, such as fractures, cracks and joints. These structures are better developed in competent rocks such as sandstone, hence the better water-yielding properties of the latter rock type (Hodgson, 2001). It should, however, be emphasised that not all of the secondary structures are water-bearing. Many of these structures are closed due to compressional forces and the chances of intersecting a water-bearing fracture by drilling therefore decreases rapidly with depth. Water-bearing fractures with significant yields have been observed at depths of approximately 30m; these boreholes would, however, have insufficient yields for organised irrigation (Hodgson, 2001).

Groundwater Levels and Flow Direction – Groundwater depths range from 0 to 30 mbgl. In general, groundwater follows the topographical setting of the area.

The regional groundwater flow direction appears to be to the south-west towards the Vaal River. However, locally and on a small scale, flow directions can vary largely depending on topographic features.

- Groundwater Recharge - According to the Groundwater Resources of the Republic of South Africa Map aquifer recharge in the area is between 50 - 75mm/a.

### **(b) Description of the current land uses.**

The proposed area consists of non-perennial rivers, along the banks of Harts River, Slimes dam, Mine Shaft, Historic mining, furrow, farms, and communities. Where applicable a Water Use License Application will be launched for conducting mining operations.

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

Refer to the description above.

**(d) Environmental and current land use map.**  
(Show all environmental, and current land use features)

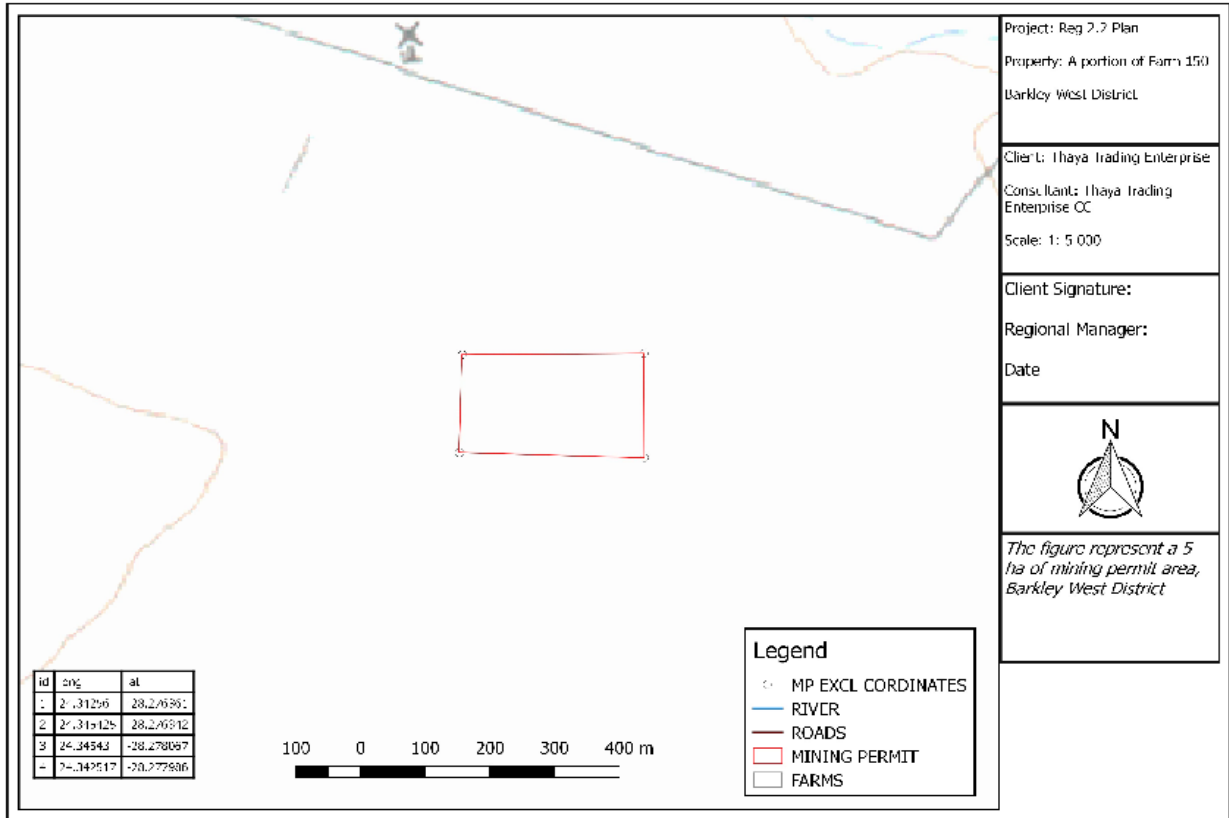


Figure 4: Current land use Map

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

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

Table 6: Potential impacts identified

Environmental Factor	Nature of impact	Significance	Probability	Duration	Consequence	Management
Geology and mineral resource	Sterilisation of mineral resources.	Very low	Highly unlikely	Decommissioning	Insignificant	Ensure that optimal use is made of the available mineral resource.
Topography	Changes to surface topography due to topsoil removal, excavations and placement of infrastructure and development of mine residue deposits.	Low to medium	Certain	Post-closure	Moderate	Backfill all excavations continuously and employ effective rehabilitation strategies to restore surface topography of excavations and plant site, and to stabilise the mine residue deposit.

Soils	Soil erosion by water and wind on disturbed and exposed soils; potential for dust production and soil microbial degradation; potential contamination of soils due to spillages.	Medium	Possible	Life of operation	Minimal	Employ appropriate management strategies to preserve soil resources.
Land capability	Loss of land capability through topsoil removal, disturbances and loss of soil fertility.	Very low	Possible	Short term	Minimal	Employ appropriate rehabilitation strategies to restore land capability.
Land use	Loss of land use due to poor placement of surface infrastructure and ineffective rehabilitation	Very low	Possible	Short term	Minimal	Carefully plan the placement of infrastructure and employ rehabilitation strategies to restore land capability.
Ground water	Pollution of underground water sources.	Medium	Possible	Decommissioning	Minimal	Construction of measures to prevent seepage into the groundwater by biological and engineering means. Implementation of the necessary management programs to ensure the integrity of ground water resources.
Surface water	Deterioration in water quality through spillages	Low	Certain	Decommissioning	Critical	Frequent monitoring of surface water resources (Standing water). Prevention of overspill of mine associated activities into the surrounding drainage channels streams. Implementation of the necessary management programs to ensure the integrity of surface water (Standing water) resources.

Indigenous flora	The clearance of vegetation; potential loss of floral species with conservation value; potential loss of ecosystem function.	Low	Certain	Life of operation	Major	Prevention of overspill of mine associated activities onto the surrounding ecological environment. Employ proper protection and rehabilitation strategies.
Alien invasive plants	Proliferation of alien invasive plants species.	Low to medium	Certain	Decommissioning	High	Eradicate, and control the spread, of alien invasive species.
Fauna	Displacement of fauna	Low	Possible	Life of operation	Minimal	Prevention of overspill of mine associated activities onto the surrounding ecological environment. Employ proper protection strategies.
Habitat	The loss, damage and fragmentation of floral and faunal habitats; potential loss of ecosystem function.	Low to Medium	Certain	Residual	Critical	Prevention of overspill of mine associated activities onto the surrounding ecological environment. Employ proper protection and rehabilitation strategies.
Air quality	Sources of atmospheric emission associated with the prospecting operation are likely to include fugitive dust from materials handling operations, wind erosion of stockpiles, and vehicle entrainment of road dust.	Low	Certain	Decommissioning	Minimal	Effective soil management; identification of the required control efficiencies in order to maintain dust generation within acceptable levels.
Noise and vibration	Increase in continuous noise levels; the disruption of current ambient noise levels; and the disruption of sensitive receptors by means of increased noise and vibration.	Low to medium	Certain	Decommissioning	Minimal	Minimise the generation of excessive noise and vibration; Ensure all vehicles and equipment is in a good working order; proper communication.
Visual impacts	Visual impact of the mine infrastructure	Low	Possible	Decommissioning	Minimal	Effective planning of the location of

	, excavations, mine residue deposits, and waste rock stockpile; visibility of dust.					infrastructure and operations to minimise visual impact.
Traffic	Potential negative impacts on traffic safety and deterioration of the existing road networks	Low	Low	Decommissioning	Minimal	Utilise existing access roads, where applicable; implement measures that ensure adherence to traffic rules.
Heritage resources	The deterioration of sites of cultural and heritage importance.	High, subject to confirmation by specialists	Certain	Residual	Major	Preservation and protection of heritage and cultural resources identified within a no go zone; further resources uncovered during prospecting activities need to be reported to a suitably qualified archaeologist and palaeontologist.
Socio-economic	Negative: Loss of agricultural potential; influx of workers to the area increases health risks and loitering (resulting in lack of security and safety); negative impact of employment loss during mine closure.	Low to medium	Certain	Short-term and Closure	High and Major	Application of commitments made in the Social and Labour Plan; implementation of community development programmes
Interested and affected parties		Low to medium	Possible	Decommissioning	High	Ensure continuous and transparent communication with IAP's.

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

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

The criteria used to assess the significance of the impacts are discussed below. The criteria used to assess the significance of the impacts are shown in the table below. The limits were defined in relation to mining characteristics. Those for probability, intensity/severity and significance are subjective, based on rule-of-thumb and experience. Natural and existing mitigation measures were considered.

These natural mitigation measures were defined as natural conditions, conditions inherent in the project design and existing management measures, which alleviate impacts. The significance of the impacts was calculated by using the following formula:

$$(\text{Severity} + \text{Spatial Scope} + \text{Duration}) \times \text{Probability weighting}$$

For the impact assessment, the different project activities and associated infrastructure were identified and considered in order to identify and analyse the various possible impacts. These include roads and hauling, excavations, temporary waste dumping, topsoil storage, mine residue deposit dam, plant and processing area, temporary office, workshops and ablution facilities, water tanks, diesel tanks, pipeline, other temporary buildings, etc.

Significance of impacts is defined as follows:

**No Impact** – There will be no impact on the system or any of its parts.

**Very Low** – Impact would be negligible. Almost no mitigation and/or remedial activity would be needed, and any minor steps which might be needed would be easy, cheap and simple.

**Low** – Impact would have little real effect. Mitigation and/or remedial activity would be either easily achieved or little would be required or both.

**Medium** – Impact would be real but not substantial within the bounds of those which could occur. Mitigation and/or remedial activity would be both feasible and fairly easily possible.

**High** – Impacts of substantial order. Mitigation and/or remedial activity would be feasible but difficult, expensive, time consuming or some combination of these.

**Very High** – Of the highest order possible within the bounds of impacts which could occur. There would be no possible mitigation and/or remedial activity to offset the impact at the spatial or time scale for which was predicted.

**Table 7:**

Weight	Severity	Spatial Scope	Duration
1	Insignificant/non-harmful	Activity specific/No effect/Controlled	Immediate (0 – 6 months)
2	Minimal / potentially harmful	Slight permanent deviation / on-site	Short term / construction (6 months- 1 yr)
3	Medium / slightly harmful	Immediate surroundings / local / outside mine area	Life of operation
4	High / Critical / Serious	Regional effect	Decommissioning
5	Catastrophic / major	National/ Severe environmental damage	Residual
6	Disastrous	Trans boundary effects	Residual



Table 8:

Weight Number		1	2	3	4	5
Frequency						
Probability	Frequency of Impact	Highly unlikely	Rare	Low likelihood	Probable/possible	Certain
		Practically impossible	Conceivable but very unlikely	Only remotely possible	Unusual but possible	Definite
	Frequency of Activity	Annually or less	6 monthly/temporarily	Infrequent	Life of operation	Life of operation

Table 9:

CONSEQUENCE (Severity + Spatial Scope + Duration)															
PROBABILITY (Frequency of activity + frequency of impact)	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15
	2	4	6	8	10	12	14	16	18	20	22	24	26	28	30
	3	6	9	12	15	18	21	24	27	30	33	36	39	42	45
	4	8	12	16	20	24	28	32	36	40	44	48	52	56	60
	5	10	15	20	25	30	35	40	45	50	55	60	65	70	75
	6	12	18	24	30	36	42	48	54	60	66	72	78	84	90
	7	14	21	28	35	42	49	56	63	70	77	84	91	98	105
	8	16	24	32	40	48	56	64	72	80	88	96	104	112	120
	9	18	27	36	45	54	63	72	81	90	99	108	117	126	135
	10	20	30	40	50	60	70	80	90	100	110	120	130	140	150

Table 10

Colour Code	Significance Rating	Value	Negative Impact Management Strategy	Positive Impact Management Strategy
	VERY HIGH	126 – 150	Improve current management	Maintain current management
	HIGH	101 – 125	Improve current management	Maintain current management
	MEDIUM – HIGH	76 – 100	Improve current management	Maintain current management
	LOW – MEDIUM	51 – 75	Improve current management	Maintain current management
	VERY LOW	26 – 50	Improve current management	Maintain current management
		1 - 25	Improve current management	Maintain current management

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

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

During construction and operation of the mining operation, there is a possibility of sterilisation of the mineral reserves and resources due to improper placement of infrastructure. The infrastructure and slimes dam will alter the topography by adding features to the landscape. Topsoil removal and excavations will unearth the natural topography. The construction of infrastructure and various facilities in the mining area can also result in loss of soil due to erosion. That is if mobile infrastructure is not going to be used during operations. Vegetation will be stripped in preparation for placement of infrastructure and excavations, and therefore the areas will be bare and susceptible to erosion.

Protected trees should be avoided as far as possible during invasive mining activities. Placement of small access roads and or any other associated infrastructure such as office area and storage areas should avoid slow-growing protected trees as far as possible. Areas with high density protected trees should be regarded as “sensitive” it should be mapped and avoided as far as possible. If protected trees cannot be avoided, a licence must be applied for and obtained prior to disturbance of such species.

A search and rescue of plants of special concern (i.e. endemic species; provincially protected or specially protected species; CITES listed species and TOPS listed species) prior to disturbance of natural vegetation will be done. Succulents such as Aloe species should be rescued and transplanted after obtaining the necessary Flora Permit from the Provincial Department of Environment and Nature Conservation (DENC).

The developer may also need a Flora Permit from the DENC for destruction of natural indigenous, protected or specially protected plant species, if encountered, under the Northern Cape Nature Conservation Act, Act 9 of 2009 (NCNCA). The same applies to TOPS or CITES listed plant species under the NEMBA. The topsoil that is stripped and piled on surrounding areas can be eroded by wind and rain. The soil will be carried away during runoff. The declared areas will be rehabilitation, but full restoration of soil might only occur over a number of years, subsequent to the re-establishment of vegetation. Furthermore, improper stockpiling and soil compaction can result in soil sterilisation. Leaching can also occur, resulting in the loss of nutrients.

During the construction and operation of the mining there is a possibility that equipment might leak oil, thus causing surface spillages. The hydrocarbon soil contamination will render the soil unusual unless they are decontaminated. The storage of fuels on site might have an impact on soil if the tanks that are available on site are not properly monitored and maintained to avoid leakages. Then there is the potential that contaminated soil can be carried through runoff to contaminate water resources and soil stockpiled for rehabilitation. Soil pollution is therefore possible, but through mitigation it can be minimised.

The loss of land capability and land use can occur in two ways. Firstly, through topsoil removal, disturbances and loss of soil fertility; and secondly through the improper placement of infrastructure. The site has a land capability for grazing, but grazing activities can still be performed in areas not earmarked for mining, and with proper rehabilitation the land capabilities and land use potential can be restored.

If oil and fuel spillages occur, then it will seep into the underlying aquifers and contaminate ground water. Improper handling of hazardous material will cause contamination of nearby surface water resourced during runoff episodes. Lack of storm control structures will lead to erosion of stockpiles during heavy rains and runoff will carry suspended solids into the downstream environment. This might cause high silt load and affect stream flow.

Construction and mining activities on site will reduce the natural habitat for ecological systems to continue their operation. It is not expected that the areas of high ecological function will rehabilitation following disturbance events. Vehicle traffic generates lots of dust which can reduce the growth success and seed dispersal of many small plant species. It is expected that protected species will be destroyed during the prospecting operation.

While general clearing of the area and mining activities destroy natural vegetation, invasive plants can increase due to their opportunistic nature in disturbed areas. If invasive plants establish in disturbed areas, it may cause an impact beyond the boundaries of the mining site. These alien invasive species are thus a threat to surrounding natural vegetation and can result in the decrease of biodiversity and ecological value of the area. Therefore, if alien invasive species are not controlled and managed, their propagation into new areas could have a high impact on the surrounding natural vegetation in the long term. With proper mitigation, the impacts can be substantially reduced.

The transformation of natural habitats to mining and associated infrastructure will result in the loss of habitat affected individual species, and ecological processes. In turn this will result in the displacement of faunal species dependent upon such habitat. Increased noise and vibration due to mining activities will disturb and possibly displace birds and other wildlife. Fast moving vehicles take a heavy toll in the form of road kills of small mammals, birds, reptiles, amphibians and a large number of invertebrates. The construction of the mine and associated infrastructure will result in the loss of connectivity and fragmentation of natural habitat. Fragmentation of habitat will lead to the loss of migration corridors, in turn resulting in degeneration of the affected population's genetic make-up. This results in a subsequent loss of genetic variability between meta-populations occurring within the site. Pockets of fragmental natural habitats hinder the growth and development of populations.

During the mining operation the abovementioned activities have potential for dust generation. It is anticipated that the extent of dust emissions would vary substantially from day to day depending on the level of activity and the specific operations. The mining will add a certain amount of noise to the existing noise in the area. However, levels of noise generated by mining activities are low.

The impact of site generated trips on the traffic of the existing roads is experienced to be low. Nevertheless, if road safety is not administered it can have a high impact on the safety of fellow road users.

The mining operation, especially during construction, will create a limited number of new employment opportunities. The magnitude of this impact will depend on the number of people that will be employed and the number of contractors sourced. An influx of people into the rural area will possibly impact on safety and security of local residents. During the decommissioning and at closure of the mining, staff will most likely be retrenched. This can potentially flood the job market, resulting in people being unable to find new employment for a long period of time. It is normally more difficult for people with highly specialised skills to find employment immediately. Those with fewer skills have more flexibility in the job market.

Economic slump of the local towns after mine closure is an associated potential impact although this will only be at mining operation. Income streams from wage bills as well as goods and services contracts (at all geographical levels) will come to an end, reducing the monetary income of individuals and mine-related businesses. People who have derived income directly or indirectly from the project may be inclined to leave the region in search of employment or business opportunities. This could result in further decline of the economy of the region as well as the abandonment of infrastructure. The loss of the mine workforce income will also impact upon non-mine related industries within the local and regional areas, particularly the rental property market and retail and service industries who would have received income during the life of mine from the salaried workforce.

It is likely, however that there will be residual positive economic impacts that are not fully reversed with the closure of the mine, and that the economy will not decline to its original level prior to the development of this project. This is because the mine will generate substantial income for the regional and local economy, both directly and indirectly, during its life.

It is difficult to predict the actual impact of the mine closure in advance, but it is acceptable to assume that the mine closure will have a negative impact on the local and regional economy with a high probability of occurrence, a high severity and a high significance.

Positive impact include employment and training opportunities for people in the local community and local contractors; social upliftment and community development programmes; economic benefits.

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

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

#### Geology and Mineral Resource

Level of risk: Very low

#### Proposed Mitigation measures

- Ensure that optimal use is made of the available mineral resource through proper planning of the mining operation.
- The mining should be well planned and delineated first and all infrastructure positions should be selected with the main aim of avoiding sterilization of future resources.
- No dumping of materials prior to approval by exploration geologist.

#### Topography

Level of risk: Low

#### Proposed Mitigation measures

- Backfill all trenches/excavations continuously.
- Employ effective rehabilitation strategies to restore surface topography of excavations and plant site.
- Stabilise the mine residue deposits.
- All temporary infrastructure will be demolished during closure.

#### Soil Erosion

Level of risk: Low

#### Proposed Mitigation measures

- At no point may plant cover be removed within the no-development zones.
- All attempts must be made to avoid exposure of dispersive soils.
- Re-establishment of plant cover on disturbed areas must take place as soon as possible, once activities in the area have ceased.
- Ground exposure should be minimised in terms of the surface area and duration, wherever possible.
- The mining operation must co-ordinate different activities in order to optimise the utilisation of the excavated trenches and thereby prevent repeated and unnecessary excavations.
- Construction that required the clearing of large areas of vegetation and excavation should ideally occur during the dry season only.
- Construction during the rainy season (November to March) should be closely monitored and controlled.
- The run-off from the exposed ground should be controlled with the careful placement of flow retarding barriers.
- The soil that is excavated during construction should be stock-piled in layers and protected by berms to prevent erosion.
- All stockpiles must be kept as small as possible, with gentle slopes (18 degrees) in order to avoid excessive erosional induced losses.

- Excavated and stockpiled soil material are to be stored and bermed on them higher laying areas of the footprint area and not in any storm water run-off channels or any other areas where it is likely to cause erosion, or where water would naturally accumulate.
- Stockpiles susceptible to wind erosion are to be covered during windy periods.
- Audits must be carried out at regular intervals to identify areas where erosion is occurring.
- Appropriate remedial action, including the rehabilitation of the eroded areas, must occur.
- Rehabilitation of the erosion channels and gullies.
- The mining operation should land with steep slopes.
- Dust suppression must take place, without compromising the sensitive water balance of the area.
- Linear infrastructure such as roads and pipelines will be inspected at least monthly to check that the associated water management infrastructure is effective in controlling erosion.

## Soil Pollution

Level of risk: Low

### Proposed Mitigation measures

- Refuelling must take place in well demarcated areas and over suitable drip trays to prevent soil pollution.
- Spill kits to clean up accidental spills from earthmoving machinery must be well-marked and available on site.
- Workers must undergo induction to ensure that they are prepared for rapid clean-up procedures.
- All facilities where dangerous materials are stored must be contained in a bund wall.
- Vehicles and machinery should be regularly serviced and maintained.

## Land Capability and Land Use

Level of risk: Low

### Proposed Mitigation measures

- Ensure that optimal use is made of the available land through consultation with land owner and proper planning of mining activities.
- Surface agreement to be signed with land owners.
- Employ effective rehabilitation strategies to restore land capability and land use potential of the farm.
- All activities to be restricted within the demarcated areas.
- Ensure that land which is not used during construction is made available for grazing.

## Groundwater

Level of risk: Low

### Proposed Mitigation measures

- Refuelling must take place in well demarcated areas and over suitable drip trays to prevent soil pollution.
- Spill kits to clean up accidental spills from earthmoving machinery must be well-marked and available on site.
- Workers must undergo induction to ensure that they are prepared for rapid clean-up procedures.
- All facilities where dangerous materials are stored must be contained in a bund wall.
- Vehicles and machinery should be regularly serviced and maintained.
- Monitor the quality of the boreholes located down-gradient of the mining site.
- Sample according to the sampling method and parameters for analysis is indicated in the Geohydrological study.

## Surface Water

Level of risk: Low

### Proposed Mitigation measures

- Sufficient care must be taken when handling hazardous materials to prevent pollution.
- Under no circumstances may ablutions occur outside the provided facilities.
- No uncontrolled discharges from the staff camps to any surface water resources shall be permitted.
- If servicing and washing of the vehicles occur on site, there must be specific areas constructed for these activities, which must have concrete foundations, bunding as well as oil traps to contain any spillages.
- A walled concrete platform, dedicated store with adequate flooring or bermed area and ventilation must be used to accommodate chemicals such as fuels, oils, paints, herbicide and insecticides.
- Oil residue shall be treated with oil absorbent and this material removed to an approved waste site.
- Spill kits must be easily accessible and workers must undergo induction regarding the use thereof.
- At all times care should be taken not to contaminate surface water resources.
- Store all litter carefully to prevent it from washing away or blown into any of the water courses within the area.
- Provide bins for staff at appropriate locations, particularly where food is consumed.
  
- The mining site should be cleared daily and litter removed.
- Conduct on-going staff awareness programmes in order to reinforce the need to avoid littering, which contributes to surface water pollution.

## Indigenous Flora

Level of risk: Low to medium

### Proposed Mitigation measures

- Minimise the footprint of transformation.
- Encourage proper rehabilitation of mined areas.
- Encourage the growth of natural plant species.
- Ensure measures for the adherence to the speed limit.
- Footprint areas of the mining activities must be scanned for Red Listed and protected plant species prior to mining.
- It is recommended that these plants are identified and marked prior to mining.
- These plants should, where possible, be incorporated into the design layout and left in situ.
- However, if threatened of destruction by mining, these plants should be removed (with the relevant permits from DAFF and DENC) and relocated if possible.
- A management plan should be implemented to ensure proper establishment of ex situ individuals, and should include a monitoring programme for at least two years after re-establishment in order to ensure successful translocation.
- All those working on site must be educated about the conservation importance of the fauna and flora occurring on site.

## All Invasive Plants

Level of risk: Very low

### Proposed Mitigation measures

- Minimise the footprint of transformation.
- Encourage proper rehabilitation of mined areas.
- Encourage the growth of natural plant species.
- Mechanical methods (hand-pulling) of control to be implemented extensively.
- Annual follow-up operations to be implemented.

#### Fauna

Level of risk: Very low

#### Proposed Mitigation measures

- Careful consideration is required when planning the placement for stockpiling topsoil and the creation of access routes in order to avoid the destruction of pristine habitats and minimise the overall mining footprint.
- The appointment of a full-time ECO must render guidance to the staff and contractors with respect to suitable areas for all related disturbance.
- The extent of the mine should be demarcated on site layout plans, and no construction personnel or vehicles may leave the demarcated area except those authorised to do so. Those areas surrounding the mine site that are not part of the demarcated development area should be considered as a no go zone for employees, machinery or even visitors.
- All those working on site must be educated about the conservation importance of the fauna and flora occurring on site.
- The ECO must ensure that all contractors and workers undergo environmental induction prior to commencing with work on site.
- The environmental induction should occur in the appropriate languages for the workers who may require translation.
- Reptiles and amphibians that are exposed during the clearing operations should be captured for later release or translocation by a qualified expert.
- Employ measures that ensure adherence to the speed limit.

#### Habitat

Level of risk: Low

#### Proposed Mitigation measures

- Mining activities must be planned, where possible in order to encourage faunal dispersal and should minimise dissection or fragmentation of any important faunal habitat type.
- The extent of the mining area should be demarcated on site layout plans (preferably on disturbed areas or those identified with low conservation importance). No construction personnel or vehicles may leave the demarcated area except those authorised to do so.

#### Air Quality

Level of risk: Very low

#### Proposed Mitigation measures

- Vegetation must be removed when soil stripping is required only. These areas should be limited to include those areas required for prospecting only, hereby reducing the surface area exposed to wind erosion. Adequate demarcation of these areas should be undertaken.
- Control options pertaining to topsoil removal, loading and dumping are generally limited to wet suppression.

- Where it is logistically possible, control methods for gravel roads should be utilised to reduce the re-suspension of particulates. Feasible methods include wet suppression, avoidance of unnecessary traffic, speed control and avoidance of track-on of material onto paved and treated roads.
- The length of time where open areas are exposed should be restricted. Mining should not be delayed after vegetation has been cleared and topsoil removed.
- Dust suppression methods should, where logistically possible, must be implemented at all areas that may/are exposed for long periods of time.
- For all mining activities management should undertake to implement health measures in terms of personal dust exposure, for all its employees.

#### Noise and Vibration

Level of risk: Low

#### Proposed Mitigation measures

- Restrict mining activities to daytime unless agreements are obtained to do 24hr operations.
- Systematic maintenance of all forms of equipment, training of personnel to adhere to operational procedures that reduce the occurrence and magnitude of individual noisy events.
- Where possible material stockpiles should be placed so as to protect the boundaries from noise to individual operations.
- Standardised noise measurements should be carried out on individual equipment at the delivery to site to construct a reference data-base and regular checks carried out to ensure that equipment is not deteriorating and to detect increases which could lead to increase in the noise impact over time and increased complaints.
- Environmental noise monitoring should be carried out at regularly to detect deviations from predicted noise levels and enable corrective measures to be taken where warranted.

#### Visual Impacts

Level of risk: Very low

#### Proposed Mitigation measures

- Infrastructure should be placed to optimise the natural screening capacity of the vegetation.
- Where practical, protect existing vegetation clumps during in order to facilitate screening during the mining operation.
- Remove rubble and other building rubbish off site as soon as possible or place it in a container in order to keep the mining site free from additional unsightly elements.
- Locate the staff camps and the material stockpiles outside of the visual field of sensitive visual receptors.
- Dust suppression procedures should be implemented especially on windy days during earth works.
- Rehabilitation should aim to establish a diverse and self-sustaining surface cover that is visually and ecologically representative of naturally occurring vegetation species.
- Implement a management plan for the post-mining site in order to control the invasion of alien vegetation and to manage erosion, until the site is fully rehabilitated.

#### Traffic and Road Safety

Level of risk: Low

#### Proposed Mitigation measures

- Implement measures that ensure the adherence to traffic rules.



## Heritage Resources

Level of risk: High

### Proposed Mitigation measures

- The heritage and cultural resources (e.g. graveyards, ruins, historic structures, etc.) must be protected and preserved by the delination of a no go zone if any of these areas are to be found in the mining area.
- Intact bedrock strata should be avoided during mining of terrace gravels where possible.
- Stone tools should be avoided where possible and fresh exposure should be recorded before destruction. All stone tool artefacts should be recorded, mapped and collected before destruction.
- Should development necessitate impact on any building structures, the developer should apply for a SAHRA Site Destruction Permit prior to commencement of construction.
- A buffer zone 100 m away from the heritage resources identified may be created.

## Socio-Economic

Level of risk: Medium

### Proposed Mitigation measures

- The mine must ensure that false expectations are not created regarding job creation.
- Jobs must be allocated as advertised and in so far as is possible to local inhabitants.
- Contractors and employees should not be permitted to wander outside the mining area.
- Uncontrolled settlement of contractors and workers outside of the site will be prevented.
- The expectations of what benefits can accrue to the community must be managed from the initiation of the project.
- Commitments as set out in the SLP must be attained.

## Interested and Affected Parties

Level of risk: Low

### Proposed Mitigation measures

- Maintain active communications with IAP's.
- Ensure transparent communication with IAP's at all times.
- IAPs must be kept up to date on any changes in the mining operation.
- A complaints management system should be maintained by the mine to ensure that all issues raised by community members are followed up and addressed appropriately.

### **Motivation where no alternative sites were considered.**

The locality of the mining operation is based on the location of the possible diamond deposits that have been identified through extensive exploration activities. There is therefore no other alternative with regard to the overall operation footprint.

The location of the central mining site and associated infrastructure is primarily based on proximity to the access roads, proximity to the areas earmarked for mining and limited additional impact on the environment and heritage resource.

The mining activities and methodologies associated with diamond mining (i.e. open pits with continued backfilling) is the only economic viable method currently being used by the diamond fraternity.

**ix) Statement motivating the alternative development location within the overall site. (Provide a statement motivating the final site layout that is proposed)**

The site layout would have to be determined by taking into consideration factors such as specialist report inputs, spatial and practical mining operation aspects. Considering the nature of commodities of interest, security measures will be considered in order to determine the final site layout.

**e. Full description of the process undertaken to identify, assess and rank the impacts and risks the activity will impose on the preferred site (In respect of the final site layout plan) through the life of the activity. (Including (i) a description of all environmental issues and risks that are identified during the environmental impact assessment process and (ii) an assessment of the significance of each issue and risk and an indication of the extent to which the issue and risk could be avoided or addressed by the adoption of mitigation measures.)**

Not applicable. There is no alternative development location for the site and therefore the initial site locality is considered to be the final site locality. The impact assessment provided in section h(v) is therefore sufficient and the process undertaken to identify impacts is the same as in section h(vi).

**f. Assessment of each identified potentially significant impact and risk**

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

Table 11: Assessment of each identified potentially significant impact and risk

<p><b>NAME OF ACTIVITY</b></p> <p>(E.g. For prospecting - drill site, site camp, ablution facility, accommodation, equipment storage, sample storage, site office, access route etc...etc...etc</p> <p>E.g. For mining,- excavations, blasting, stockpiles, discard dumps or dams, Loading, hauling and transport, Water supply dams and boreholes, accommodation, offices, ablution, stores, workshops, processing plant, storm water control, berms, roads, pipelines, power lines, conveyors, etc...etc...etc.)</p>	<p><b>POTENTIAL IMPACT</b></p> <p>(Including the potential impacts for cumulative impacts)</p> <p>(e.g. dust, noise, drainage surface disturbance, fly rock, surface water contamination, groundwater contamination, air pollution etc....etc...)</p>	<p><b>ASPECTS AFFECTED</b></p>	<p><b>PHASE</b></p> <p>In which impact is anticipated</p> <p>(e.g. Construction, commissioning, operational Decommissioning, closure, post-closure)</p>	<p><b>SIGNIFICANCE if not mitigated</b></p>	<p><b>MITIGATION TYPE</b></p> <p>(modify, remedy, control, or stop) through</p> <p>(e.g. noise control measures, storm-water control, dust control, rehabilitation, design measures, blasting controls, avoidance, relocation, alternative activity etc. etc)</p> <p>E.g. Modify through alternative method. Control through noise control Control through management and monitoring through rehabilitation..</p>	<p><b>SIGNIFICANCE if mitigated</b></p>
<p><b>ROADS</b></p>	<p>Air Quality</p>	<p>Nuisance dust will be created by the mining equipment hauling material between the open excavation areas and the plant area.</p>	<p>Construction</p>	<p>High</p>	<p>Dust control Water spraying. Well maintained equipment</p>	<p>Medium</p>

	Ground water	No impact to groundwater is expected from the roads that	Construction	No significance	Pollution control and good Housekeeping practise	No significance
		will be used by the planned mining operation.				
	Flora	Where new haulage roads will be created the vegetation will be disturbed and/or destroyed.	Construction	High	Stripping of topsoil and concurrent rehabilitation	Low
	Fauna	Where new haulage roads will be created the natural habitat of the animals will be disturbed and/or destroyed.	Construction	High	Speed limits Environmental Awareness	Medium
	Noise	Noise from the mining equipment on the haulage roads will be created.	Construction	Medium	Noise control Well maintained equipment	Low

	Surface water	No impact to surface water is expected from roads that will be used by the planned prospecting	Construction	No significance	Pollution control and on-going housekeeping	No significance
		activities				
	Visibility	The haulage roads will be visible to some extent from the immediate surroundings.	Construction	No significance	Concurrent Rehabilitation	No significance
	Soil	No impact to soil is expected from the roads that will be used by the planned mining operation.	Construction	No significance	Stripping of topsoil and concurrent rehabilitation	No significance
	Topography	No impact to topography is expected from the roads that will be used by the planned mining operation.	Construction	No significance	Concurrent Rehabilitation	No significance

**Pitting/Excavating**

Air Quality	Nuisance dust will be created by the mining equipment excavating	Operational	High	Dust control Water spraying. Well maintained equipment.	Medium
	material the mining pits				
Ground water	No impact to groundwater is expected from the roads that will be used by the planned prospecting operation.	Operational	No significance	Pollution control and good housekeeping practice	No significance
Flora	Where new haulage roads will be created the vegetation will be disturbed and/or destroyed.	Operational	High	Stripping of topsoil and concurrent rehabilitation	Low

	Fauna	Where new haulage roads will be created the natural habitat of the animals will be disturbed and/or destroyed.	Operational	High	Speed limits Environmental Awareness	Medium
	Noise	Noise from the mining equipment will be created.	Operational	High	Noise control Well maintained equipment.	Low
	Surface water	No impact to surface water is expected from roads that will be used by the planned prospecting activities	Operational	No significance	Pollution control and on-going housekeeping	No significance
	Visibility	The haulage roads will be visible to some extent from the immediate surroundings.	Operational	No significance	Concurrent Rehabilitation	No significance

	Soil	The disturbance of the soil structure during excavating activities.	Operational	High	Stripping of topsoil and concurrent rehabilitation	Medium
	Topography	Changing of natural slopes by mining pitting activities.	Operational	Medium	Concurrent Rehabilitation	Low
<b>Temporary waste dump area &amp; topsoil storage area</b>	Air Quality	Nuisance dust will be created by the mining equipment when the material is dumped/stockpiled in these areas.	Commissioning	High	Dust control Well maintained equipment	Medium



	Ground water	No impact is expected.	Commissioning	No significance	Pollution control and good housekeeping practice	No significance
	Flora	The vegetation will be disturbed and/or destroyed in these areas.	Commissioning	High	Stripping of topsoil and concurrent rehabilitation	Low
	Fauna	The natural habitat of animals will be disturbed and/or destroyed when the mine is created.	Commissioning	High	Speed limits Environmental Awareness	Medium
	Noise	Noise impact from the mining equipment on the haulage roads will be created.	Commissioning	High	Noise control Well maintained equipment	Low

	Surface water	No impact to surface water is expected.	Commissioning	No significance	Pollution control and on-going housekeeping	No significance
	Visibility	These temporary storage areas will be visible to the immediate surroundings.	Commissioning	No significance	Concurrent Rehabilitation	No significance
	Soil	The disturbance of the soil structure.	Commissioning	High	Stripping of topsoil and concurrent rehabilitation	Low
	Topography	Changes of natural slopes.	Commissioning	Medium	Concurrent Rehabilitation	Low

# Mine residue disposal dam

Air Quality	No impact to air quality is expected.	Commissioning	No significance	Dust control and well maintained equipment	No significance
Ground water	No impact to air quality is expected.	Commissioning	No significance	Pollution control and good housekeeping practice	No significance
Flora	The vegetation will be disturbed and/or destroyed when the mine residue dam is created.	Commissioning	High	Stripping of topsoil and concurrent rehabilitation	Low
Fauna	The natural habitat of animals will be disturbed and/or destroyed when the mine is created.	Commissioning	High	Speed limits Environmental Awareness	Medium

	Noise	No noise is expected.	Commissioning	No significance	Noise control Well maintained equipment	No significance
	Surface water	No impact to air quality is expected.	Commissioning	No significance	Pollution control and on-going housekeeping	No significance
	Visibility	The mine residue dam will be visible to the immediate surroundings.	Commissioning	No significance	Concurrent Rehabilitation	No significance
	Soil	The disturbance of soil structure during excavation activities.	Commissioning	No significance	Stripping of topsoil and concurrent rehabilitation	No significance

	Topography	Changing of natural slopes	Commissioning	Medium	Concurrent Rehabilitation	Low
<b>Plant &amp; processing area</b>	Air Quality	Nuisance dust will be created by the mining equipment.	Operational	High	Dust control Water spraying. Well maintained equipment	Medium
	Ground water	No impact to groundwater is expected.	Operational	No significance	Pollution control and good housekeeping practice	No significance
	Flora	Where the plant and processing area will be created the vegetation will be disturbed and/or destroyed.	Operational	High	Stripping of topsoil and concurrent rehabilitation	Low

	Fauna	Where new haulage roads will be created the natural habitat of the animals will be disturbed and/or destroyed.	Operational	High	Speed limits Environmental Awareness	Medium
	Noise	Noise from the plant and processing equipment will be created.	Operational	High	Noise control Well maintained equipment	Low
	Surface water	The utilization of water from boreholes for the washing of diamond material.	Operational	High	Pollution control and on-going housekeeping	Low
	Visibility	The plant and processing area will be visible to some extent from the immediate surroundings.	Operational	No significance	Concurrent Rehabilitation	No significance

	Soil	The disturbance of the soil structure when the plant and processing area is created. mining operation.	Operational	High	Stripping of topsoil and concurrent rehabilitation	Medium
	Topography	No impact to the topography is expected from the plant and processing area.	Operational	No significance	Concurrent Rehabilitation	No significance
Demolition and / or removal of mobile camping units or infrastructure or equipment	Establishment and spread of alien plant species.	Fauna and Flora	Decommissioning Phase Post Closure	Moderate	Manage and control through Alien Invasive Management Plan.	Low
	Destruction of vegetation.	Fauna and Flora	Decommissioning Phase	Moderate	Manage and Minimise through Management Plan and Rehabilitation Plan	Low
	Soil and water resources contamination.	Soils Groundwater	Decommissioning Phase	Low	Monitor and remedy through Emergency Response Plan.	Very low

	Impact on upstream tributaries and water in the catchment.	Surface water	Decommissioning Phase	Moderate	Manage and Minimise through Management Plan and Rehabilitation Plan.	Low
	Topography and visual Alteration.	Topography and Visual Environment	Decommissioning Phase	Low	Remedy through Rehabilitation and Closure Plan.	No significance
	Noise generation.	Noise receptors	Decommissioning Phase	Very low	Manage through Noise Reduction Measures and Regular Vehicle Inspections.	No significance
	Air quality and dust emissions.	Air quality	Decommissioning Phase	Very low	Monitor and manage through Dust Management Plan and Measures.	No significance



Final rehabilitation and restoration of disturbed areas	Land capability reduction.	Soils Vegetation	Decommissioning Phase Post Closure	Moderate (Negative)	Manage, minimise through Post-closure Management Plan and Rehabilitation Plan.	Low
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**g. Summary of specialist reports.**

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

Table 12: Specialist Reports

LIST OF STUDIES UNDERTAKEN	RECOMMENDATIONS OF SPECIALIST REPORTS	SPECIALIST RECOMMENDATIONS THAT HAVE BEEN INCLUDED IN THE EIA REPORT (Mark with an X where applicable)	REFERENCE TO APPLICABLE SECTION OF REPORT WHERE SPECIALIST RECOMMENDATIONS HAVE BEEN INCLUDED.
See message written below			

Attach copies of Specialist Reports as appendices



## **h. Environmental impact statement**

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

The proposed development is an open cast small-scale diamond mine. The piece of land under which this proposed development is to take place is undisturbed pasteurable land. The nature of impacts can vary widely depending on the type of physical environment, the size of the activity and the perceptions and values of each of the affected parties. It is the objective of this kind of assessments to identify to all possible impacts a reasonable practicable manner. The planned development, related activities and associated infrastructure was used as reference to assess potential impacts.

In general, the environmental impacts associated to the mining operation are rather negative, while the social impacts are more beneficial. Impacts on vegetation are likely to be most profound, because the mining operation will constitute clearance of indigenous vegetation and most likely also the removal of protected species. Protected trees should be avoided as far as possible during invasive mining activities. Placement of small access roads and or any other associated infrastructure such as office area and storage areas should avoid slow growing protected trees as far as possible. Areas with high density protected trees should be regarded as “sensitive” it should be mapped and avoided as far as possible. If protected trees cannot be avoided, a licence must be applied for and obtained prior to disturbance of such species.

A search and rescue of plants of special concern (i.e. endemic species; provincially protected or specially protected species; CITES listed species and TOPS listed species) prior to disturbance of natural vegetation will be done. Succulents such as Aloe species should be rescued and transplanted after obtaining the necessary Flora Permit from the Provincial Department of Environment and Nature Conservation (DENC).

The developer may also need a Flora Permit from the DENC for destruction of natural indigenous, protected or specially protected plant species under the Northern Cape Nature Conservation Act, Act 9 of 2009 (NCNCA). The same applies to TOPS or CITES listed plant species under the NEMBA.

Storage of material and equipment on site, movement of TMM's and vehicles, stockpiles of topsoil and general excavation to mine minerals from the ground will, with certainty, alter the general topography and visual environment in the area of application. All proposed and other reasonable measures should be implemented in order to manage these impacts.

Mining activities on site will result in soil erosion. Soil erosion and surface water deterioration are likely to be possible important impacts if appropriate management strategies are not practised.

Noise pollution is going to occur as a result of machinery, equipment and vehicles that are going to be utilised in the mine during operations. These impacts are likely to affect life in the nearby Longlands community. All proposed and other reasonable mitigating measures should be implemented in order to effectively manage these kind of impacts.

Positive impacts include the demarcation and subsequent protection of heritage resources and the eradication of alien invasive species. Positive social impacts include the creation of jobs, social upliftment, training opportunities, community development and numerous economic benefits.

It is expected that environmental impacts on groundwater will occur as result of potential contaminants being on site. The significance is expected to be of low significance and thus low risk of groundwater contamination on a local scale; however this impact may increase to moderate at a regional scale. Mining operations may also influence groundwater recharge as a result of excavations. Ground water dewatering is expected to be of very low risk, due to the fact that the proposed mining activities will occur above the groundwater levels.

The Harts River is in the proximity of these proposed mining operations. The river that is present within the immediate vicinity of the proposed mine, will likely be contaminated. Surface water impacts are therefore considered moderate risk if not mitigated.

Monitoring and the implementation of the recommended mitigation measures can reduce the potential hydrogeological impacts to the environment.

Based on the environmental assessment presented in this report with outstanding specialists' reports, it is the provisional conclusion of this Basic Assessment that the proposed project will have relatively low impacts on the environment. With effective implementation management and mitigation measures, as well as recommended monitoring plans suggested in this report and those of the specialists', if any will be made, the significance of most potential environmental impacts on site from an environmental perspective will be reduced to low. There will be potential impacts on vegetation and habitat, groundwater, soil, dust, air quality and visual environment as a result of earthworks associated with the activity, influx and movement of vehicles, infrastructure, waste and waste water generated by the project as a whole.

To conclude, it must be accepted that any activities will have both physical and social impacts. Therefore the destruction of the natural environmental features within the mining area is inevitable. The significance of the impacts will however be affected by the success of the mitigation measures implemented and the rehabilitation programme for the mining area.

## ii. Final Site Map

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

The final site map below indicates some parts of mining right application area in one site of which not all mining will take place. Existing roads are also depicted. The associated infrastructure relating to the mining site will be placed in the area marked as the "mine infrastructure footprint". The only buffers that must be implemented is the 100m away from any fixed infrastructure like the road that cuts through the farm and the out buildings in terms of the Mine Health and Safety Act, 1996 (Act no 29 of 1996) Regulations relating to surveying, mapping and mine plans.

These regulations states that a mine must take reasonable measures to ensure that-

*No mining operations are carried out within a horizontal distance of 100 (one hundred) metres from reserve land, buildings, roads, railways, dams, waste dumps, or any other structure whatsoever including such structures beyond the mining boundaries, or any surface, which it may be necessary to protect in order to prevent any significant risk, unless a lesser distance has been determined safe*

by risk assessment and all restrictions and conditions determined in terms of the risk assessment are complied with;

Please see final site map below:

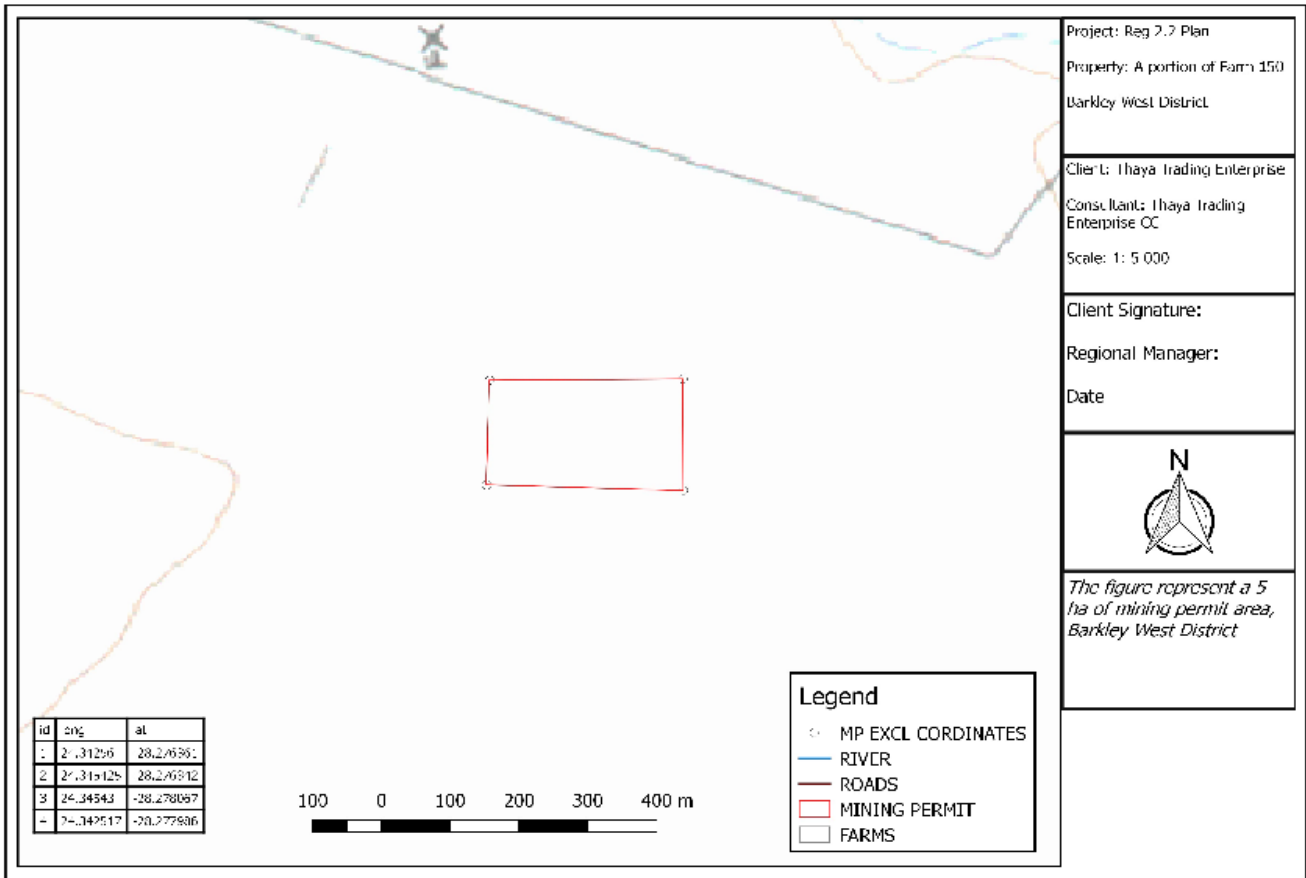


Figure 5: Final Site Map

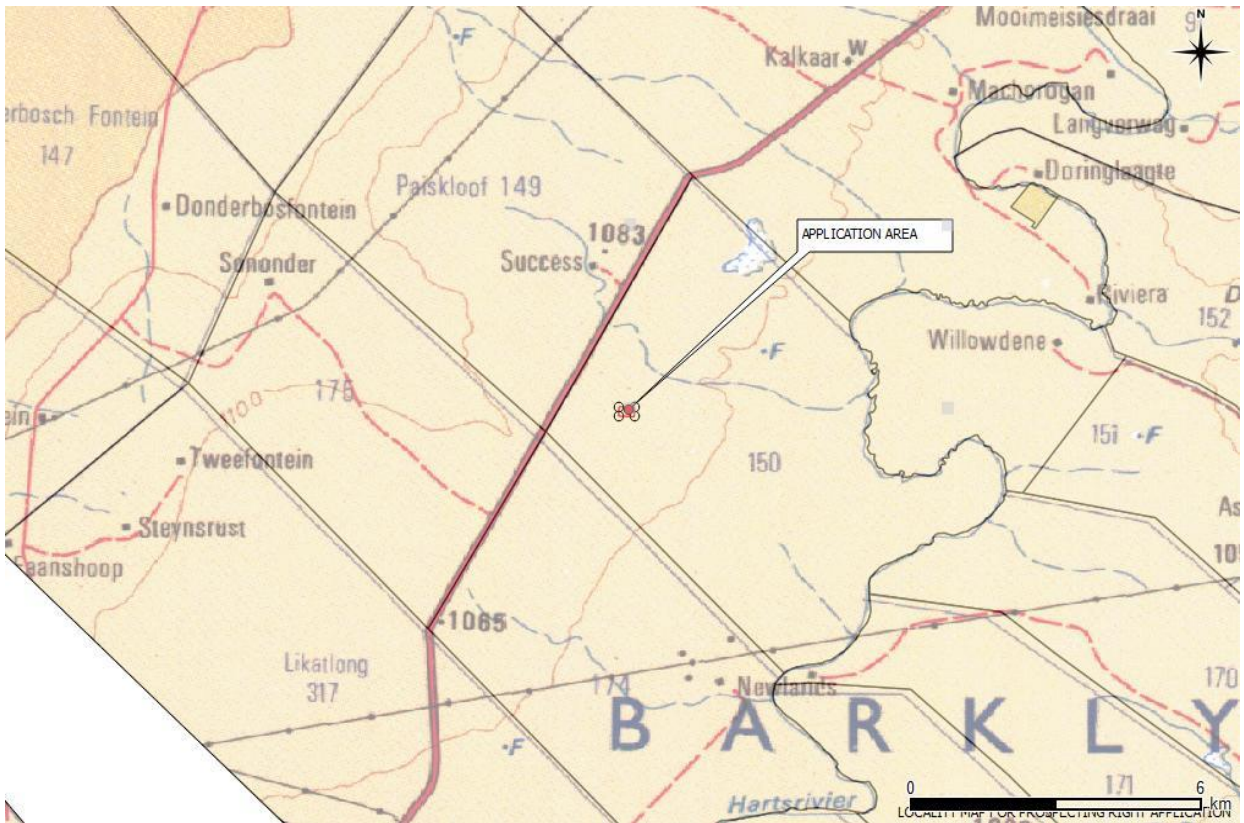


Figure 6: Final Site Map

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

As mentioned before, the specific occurrence of diamonds in the area dictates the selection of the specific mining site and there are no alternatives in terms of project location.

The mining operation/Rehabilitation operation will provide  $\pm 15$  jobs and will also add to the increased economic activity and the area surrounding the farm.

Negative impacts on the area are expected to be temporary and can be mitigated to a large extent if the recommendations of the EMPr area adhered to e.g. rehabilitation.

### i. Proposed impact management objectives and the impact management outcomes for inclusion in the EMPr;

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

The EMPr addresses the environmental impacts associated with the project during all Phases of the proposed project. The objectives of the EMPr will be to provide detailed information that will advise the planning design of Thaya Trading Enterprise mining activities in order to avoid and/or reduce impacts that may be detrimental to the environment.

The impact management objective for Thaya Trading Enterprise mining operation should include:-

- To ensure efficient extraction of the diamond resource.
- To limit the alteration of the surrounding topography.



- To manage and preserved sensitive soil types.
- To prevent the loss of land capability.
- To ensure the continuation of economically viable land use.
- To ensure that the surrounding ground water resources are not adversely affected to the detriment of the health and welfare of nearby communities; and to ensure suitable quality of ground water resources.
- To ensure that the surrounding surface water resources are not adversely affected to the detriment of the health and welfare of nearby communities; and to ensure suitable quantity and quality of surface water resources.
- To contain soils and materials within demarcated areas and prevent contamination of storm water run-off.
- To minimise the loss of natural vegetation.
- Avoid impact on possible heritage finds.
- To prevent the proliferation of alien invasive plants species.
- To protect the wildlife and bird species.
- To promote health and safety of workers.
- To protect the natural habitat of wildlife and bird species.
- To maintain visual integrity; and to minimise the extent of the generation of dust in order to minimise the aspect of nuisance and health impacts to sensitive receptors.
- To minimise noise and vibration to a level that disturbances felt by the communities are limited.
- To reduce the impact on visual quality due to intrusive mine infrastructure, activities and facilities.

**j. Aspects for inclusion as conditions of Authorisation.**

Any aspects which must be made conditions of the Environmental Authorisation

Specialists are yet to be commissioned for the proposed development.

**k. Description of any assumptions, uncertainties and gaps in knowledge.**

(Which relate to the assessment and mitigation measures proposed)

Uncertainties form part of any proposed development pertaining the accuracy of the actual degree of impact on the environment that the proposed development will have. This report was compiled by incorporating information provided by the applicant and the various project specific employees/directors and no warranty or guarantee, whether expressed or implied, is made by the EAP with respect to the completeness, accuracy or truth or any aspect of this document with reference to the instructions, information and data supplied by the aforementioned parties.

The impact assessment was conducted based on the EAP's knowledge and experience. The probability, intensity/severity and significance pertaining to the criteria used to assess the significance of the impacts were based on rule-of-thumb and experience.

It was assumed that, by and large in this particular landscape segment, with its relatively sparse vegetation, surface archaeological traces would be relatively visible. However, it was likely that where artefacts are present, they would tend to occur in buried gravel deposits.

A proviso is routinely given, that should sites or features of significance be encountered during mining on the site (this could include an unmarked burial, an ostrich eggshell water flask cache, or a high density of stone tools, for instance), specified steps are necessary (beginning with immediate suspension of work, and reporting to the heritage authority).

The impact assessment was conducted based on the EAP's knowledge and experience. The probability, intensity/severity and significance pertaining to the criteria used to assess the significance of the impacts were based on rule-of-thumb and experience.

## **I. Reasoned opinion as to whether the proposed activity should or should not be authorised**

### **i. Reasons why the activity should be authorized or not.**

Mining is one of the most important economic activities in the Northern Cape. There are no significant reasons why the activity should not be authorized. However, if the proposed management and mitigation measures are not properly applied or if the mining operation intentionally disregards any of these measures, it will negatively affect the environment and have more long-term consequences. Therefore, the competent authority should take all the necessary steps to ensure that the mining operation complies with the conditions set out in the approval of the EMPr.

### **ii. Conditions that must be included in the authorisation**

Apart from ensuring that the necessary permits are obtained for restricted activities, all recommendations and mitigation measures as set out in the EMPr should be adhered to or other reasonable mitigating measures should be implemented.

## **m. Period for which the Environmental Authorisation is required.**

Environmental Authorisation is required for 5 years.

## **n. Undertaking**

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

The undertaking required to meet the requirements of this section is provided at the end of the EMP and is applicable to both the Basic Assessment Report and the Environmental Management Report.

**o. Financial Provision**

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

**i. Explain how the aforesaid amount was derived.**

The quantum of the financial provision contemplated in Regulation 54 of the Mineral and Petroleum Resources Development Act, 2002 (Act No. 28 of 2002) will be revised and adjusted accordingly annually, based on a survey assessment of the environmental liability of Thaya Trading Enterprise. Surveys of excavations are conducted by a registered surveyor and results are forwarded to the Environmental Manager who calculates the outstanding rehabilitation as per the agreed rate in the DMR Guideline. A bank guarantee is prepared for the amount and submitted to the DMR.

Financial provision for the rehabilitation or management of negative environmental impacts caused by the mining operation [as required by Section 41 of the Mineral and Petroleum Resources Development Act, 2002 (Act No. 28 of 2002)] will be made in the form of a financial guarantee from a South African registered bank. This document will guarantee the financial provision relating to the Environmental Management Programme in a format as approved by the Director-General.

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

Thaya Trading Enterprise does require external funding for purposes of conducting the mining activities.

**p. Specific Information required by the competent Authority**

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

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

The mining process is going to have a positive impact as approximately 15 jobs are going to be created.

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

No known sites of archaeological and cultural interest of high significance occur on or within close proximity to the mining area. Where and when level of significance of impacts before mitigation is high, the Department of Mineral Resources, SAHRA and heritage specialist will be notified.

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

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

There are no alternatives, as the application area applied for is the area identified with potential for dolerite and diamond mining operation.

## PART B

# ENVIRONMENTAL MANAGEMENT PROGRAMME REPORT

### 1) Draft environmental management programme.

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

I hereby confirm that the requirements for the provision of the details and expertise of the EAP are already included in PART A, section 1(a).

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

I hereby confirm that the requirements to describe the aspects of the activity that are covered by the draft environmental management programme is already included in PART A, section 1(h, i, j & k).

### c) Composite Map

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

The final site map below indicates the mining permit application area in which all mining operations will take place. Existing roads are also depicted. The associated infrastructure relating to the mining site will be placed in the area marked as the “mine infrastructure footprint”.

The only buffers that must be implemented is the 100 m away from any fixed infrastructure like the tar road and the out buildings in terms of the Mine Health and Safety Act, 1996 (Act No. 29 of 1996) Regulations relating to surveying, mapping and mine plans.

These regulations states that a mine must take reasonable measures to ensure that:

No mining operations are carried out within a horizontal distance of 100 (one hundred) metres from reserve land, buildings, roads, railways, dams, waste dumps, or any other structure whatsoever including such structures beyond the mining boundaries, or any surface, which it may be necessary to protect in order to prevent any significant risk, unless a lesser distance has been determined safe by risk assessment and all restrictions and conditions determined in terms of the risk assessment are complied with.

Please see Final Site Map below:

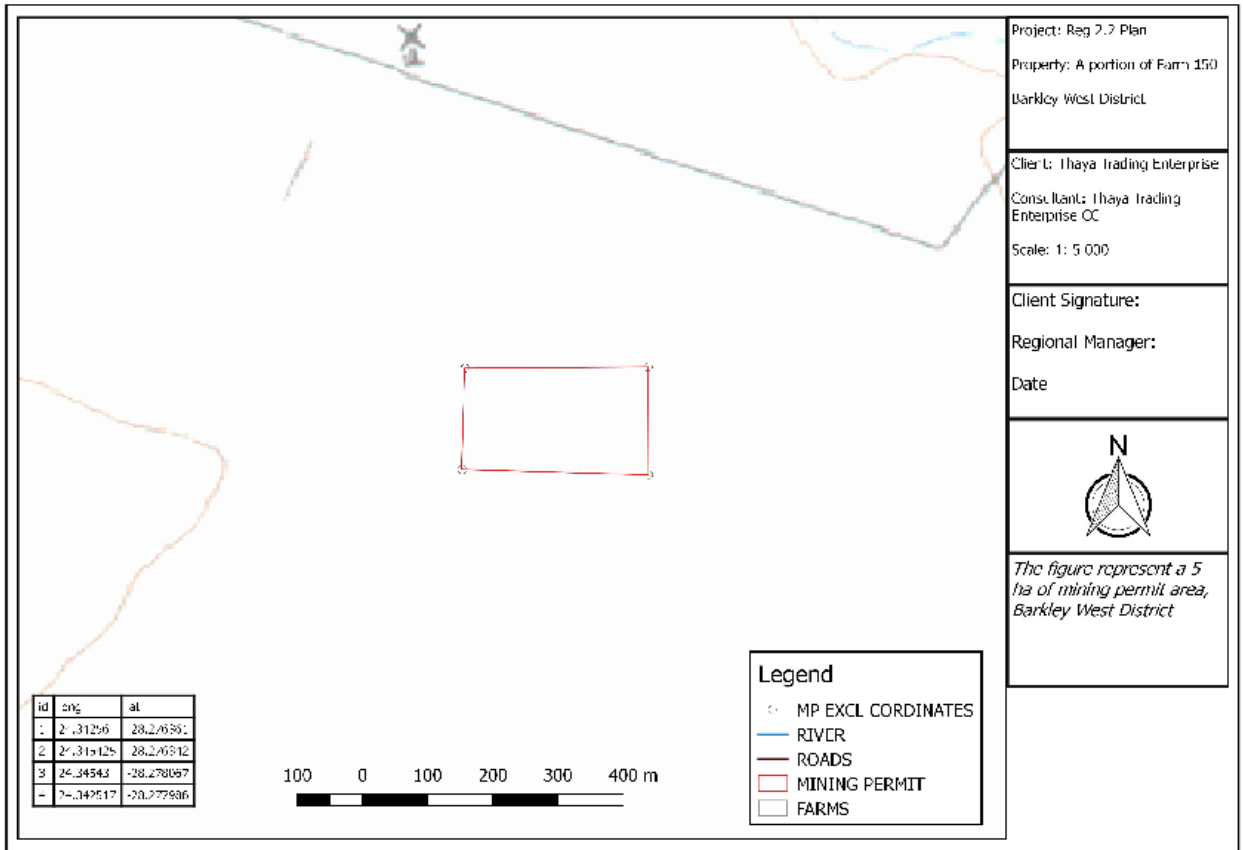
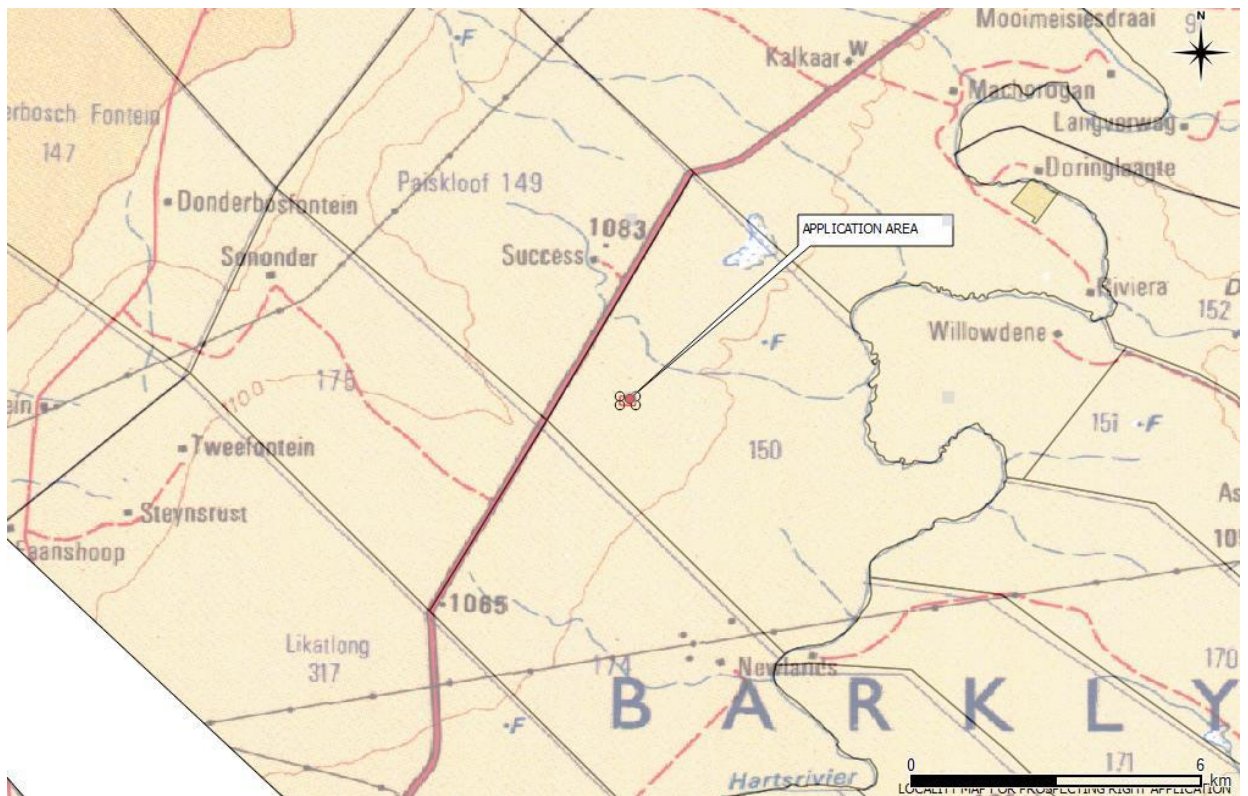


Figure 7: Final Site Map



#### d) **Description of Impact management objectives including management statements**

The proposed impact management objectives and management statements are informed by the environmental setting of the proposed mining site, as well as the desired state during closure and post closure of the mine.

##### i) **Determination of closure objectives.** (ensure that the closure objectives are informed by the type of environment described)

Thaya Trading Enterprise will be using a mobile camp site for its mining activities, and therefore no infrastructure associated with the camp site will require breaking down or demolishing at closure. The areas disturbed as a result of the mining operation will be rehabilitated by maintaining the general topography of the surrounding area, ensuring that there are no remnants of the structures. The closure objectives aim to return the affected area to a land use condition or desired state similar to that of the pre-mining state. Closure and rehabilitation of pits will be undertaken during the operational phase when the activities are completed in those pits, to achieve a desired land condition as early as possible. The pollution control dams (PCD) will be removed at closure and the plastic lining will be removed and recycled.

The key aim decommissioning and closure is to ensure that all the significant impacts are ameliorated. All rehabilitated areas should be left in a stable, self-sustainable state. Proof of this should be submitted at closure.

Specific objectives include:

Rehabilitation of infrastructure areas

The objective for the removal of infrastructure and the subsequent rehabilitation of the areas they occupied include:

- To ensure that infrastructure identified for removal is successfully demolished and removed.
- To ensure that infrastructure identified to remain after mine closure is maintained until the issue of a closure certificate.

The removal, decommissioning and disposal of all mining infrastructure, will comply with all conditions contained in the MRPDA. To this end, decommissioning and rehabilitation of all infrastructure areas will follow the following principles:-

- The plant and associated disused infrastructure will be dismantled or demolished. Any building foundations will be removed and land exposed to the demolition and dismantling of infrastructure and all other disturbed land will be rehabilitated
- Rubble will be disposed of at a suitable site. The site will be selected in consultation with DENC.
- Any surface water management infrastructure will be maintained to ensure they are stable and functional.
- Just before closure, when disturbed land has been rehabilitated and erosion is controlled by vegetation cover, all disused surface water management facilities will be decommissioned.

Mine residue deposits

The mine residue deposits will comprise of a slimes dam. The objectives pertaining to the effective management and rehabilitation of the slimes dam include:

- To ensure that the mine residue deposits are stable and that there is an acceptably low risk of failure of these deposits during the decommissioning phase and following mine closure.

- To establish self-sustainable vegetation cover on the slimes dam so that the visual impact of the slimes dam improves and in order to prevent erosion.

Management principle pertaining to the slimes dam includes:

- The slimes dams will continuously be inspected by a suitable qualified professional engineer to ensure their stability. If they are unstable, the appropriate remedial measures will be implemented.
- Inspection and monitoring should continue until a suitable qualified professional engineer has confirmed the long-term stability of the slimes dam.
- Any infrastructure or facilities that serve the slimes dam will be maintained to ensure that they are both stable and functional.

#### Maintenance

The necessary agreements and arrangement will be made by Thaya Trading Enterprise to ensure that all natural physical, chemical and biological processes for which a closure condition were specified are monitored until they reach a steady state or for three (3) years after closure or as long as deemed necessary at the time.

- Such processes include erosion of the slimes dams, rehabilitated surfaces, surface water drainage, air quality, surface water quality, ground water quality, vegetative re-growth, weed encroachment.
- The closure plan will be reviewed yearly.
- Rehabilitation of the land will be maintained until a closure certificate is granted or until the land use is regarded as sustainable.
- All rehabilitated areas will be monitored and maintained until such time as required to enable the mine to apply for closure of these different areas.

#### Performance assessments

As per the MPRDA and associated Regulations, this Environmental Management Programme will be continually assessed in terms of its appropriateness and adequacy. In order to achieve this, Thaya Trading Enterprise will undertake the following:

- Implement the necessary monitoring programmes, as discussed as part of this EMP;
- Conduct performance assessments of this EMP as required by the MPRDA and associated Regulations; and
- Compile and submit the afore-mentioned performance assessment reports to the DMR. The frequency of the performance assessments will occur every year. An independent and competent person will undertake all performance assessments.

#### Decommissioning and closure objectives

The key aim decommissioning and closure is to ensure that all the significant impacts are ameliorated. All rehabilitated areas will be left in a stable, self-sustainable state. Proof of this will be submitted at closure.

Specific objectives include:

- To identify potential post-closure land uses in consultation with the surrounding land owners and land users. This should be done during the operational phase of the mine.
- Rehabilitate disturbed land to a state suitable for its post-closure uses.
- Rehabilitate disturbed land and mine residue deposits to a state that facilitates compliance with applicable environmental quality objectives.
- Limit the impact on staff whose positions become redundant at the time of mine closure, as addressed in the SLP.



- Keep relevant authorities informed of the progress of the decommissioning phase.
- Submit monitoring data to the relevant authorities.
- Maintain required pollution control facilities and rehabilitated land until closure.

Negative economic impacts

The objective is to alleviate the negative socio-economic impacts that will result from mine closure.

Management principles to achieve this include:

- Thaya Trading Enterprise will undertake a carefully planned stepwise decommissioning process.
- Closure planning will form an integral part of mine planning.
- Strategies for sustainable development of surrounding towns have been and will continue to be developed by the project in collaboration with district and local authorities, local businesses and other interested parties. Early warning of impending closure will be given to IAP's.
- In conjunction with long-term closure planning, the mine will actively participate in regional and local planning to enhance the economic benefits of the project through development of alternative forms of income generation.
- Thaya Trading Enterprise will initiate and participate in regional planning exercises that will mitigate the impacts of closure of the mine, the local and regional economies and associated abandonment of community infrastructures surrounding the mine.

The mine will fulfil the requirements for closure and the management of downscaling.

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

The operation would require about 17 000 litres per day over the 5 year mining operation.

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

The water use license application license will be lodged with the competent authority.



iv) Impacts to be mitigated in their respective phases

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

Table 13:

ACTIVITIES	PHASE	SIZE AND SCALE of disturbance	MITIGATION MEASURES	COMPLIANCE WITH STANDARDS	TIME PERIOD FOR IMPLEMENTATION
<p>(E.g. For prospecting - drill site, site camp, ablution facility, accommodation, equipment storage, sample storage, site office, access route etc...etc...etc)</p> <p>E.g. For mining,- excavations, blasting, stockpiles, discard dumps or dams, Loading, hauling and transport, Water supply dams and boreholes, accommodation, offices, ablution, stores, workshops, processing plant, storm water control, berms, roads, pipelines, power lines, conveyors, etc...etc...etc.)</p>	<p>(of operation in which activity will take place.</p> <p>State; Planning and design, Pre-Construction, Construction, Operational, Rehabilitation, Closure, Post closure).</p>	<p>(volumes, tonnages and hectares or m<sup>2</sup>)</p>	<p>(describe how each of the recommendations in herein will remedy the cause of pollution or degradation and migration of pollutants)</p>	<p>(A description of how each of the recommendations herein will comply with any prescribed environmental management standards or practices that have been identified by Competent Authorities)</p>	<p>Describe the time period when the measures in the environmental management programme must be implemented Measures must be implemented when required.</p> <p>With regard to Rehabilitation specifically this must take place at the earliest opportunity. .With regard to Rehabilitation, therefore state either:-</p> <p>..</p> <p>Upon cessation of the individual activity</p> <p>or.</p> <p>Upon the cessation of mining, bulk sampling or alluvial diamond prospecting as the case may be.</p>
See Tables 4, 6, 11 & 12					

### e) Impact Management Outcomes

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

Table 14:

<b>ACTIVITY</b> (whether listed or not listed).  (E.g. Excavations, blasting, stockpiles, discard dumps or dams, Loading, hauling and transport, Water supply dams and boreholes, accommodation, offices, ablution, stores, workshops, processing plant, storm water control, berms, roads, pipelines, power lines, conveyors, etc...etc...etc.).	<b>POTENTIAL IMPACT</b>  (e.g. dust, noise, drainage surface disturbance, fly rock, surface water contamination, groundwater contamination, air pollution etc....etc...)	<b>ASPECTS AFFECTED</b>	<b>PHASE</b> In which impact is anticipated  (e.g. Construction, commissioning, operational Decommissioning, closure, post-closure)	<b>MITIGATION TYPE</b>  (modify, remedy, control, or stop) through (e.g. noise control measures, storm-water control, dust control, rehabilitation, design measures, blasting controls, avoidance, relocation, alternative activity etc. etc)  E.g. <ul style="list-style-type: none"> <li>• Modify through alternative method.</li> <li>• Control through noise control</li> <li>• Control through management and monitoring</li> <li>• Remedy through rehabilitation..</li> </ul>	<b>STANDARD TO BE ACHIEVED</b>  (Impact avoided, noise levels, dust levels, rehabilitation standards, end use objectives) etc.
See Tables 4, 6, 11 & 12					

**f) Impact Management Actions**

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

Table 15

ACTIVITY	POTENTIAL IMPACT	MITIGATION TYPE	TIME PERIOD FOR IMPLEMENTATION	COMPLIANCE WITH STANDARDS
<p>whether listed or not listed.</p> <p>(E.g. Excavations, blasting, stockpiles, discard dumps or dams, Loading, hauling and transport, Water supply dams and boreholes, accommodation, offices, ablution, stores, workshops, processing plant, storm water control, berms, roads, pipelines, power lines, conveyors, etc...etc...etc.).</p>	<p>(e.g. dust, noise, drainage surface disturbance, fly rock, surface water contamination, groundwater contamination, air pollution etc....etc...)</p>	<p>(modify, remedy, control, or stop) through</p> <p>(e.g. noise control measures, storm-water control, dust control, rehabilitation, design measures, blasting controls, avoidance, relocation, alternative activity etc. etc)</p> <p>E.g.</p> <ul style="list-style-type: none"> <li>• Modify through alternative method.</li> <li>• Control through noise control</li> <li>• Control through management and monitoring</li> </ul> <p>Remedy through rehabilitation..</p>	<p>Describe the time period when the measures in the environmental management programme must be implemented Measures must be implemented when required.</p> <p>With regard to Rehabilitation specifically this must take place at the earliest opportunity. .With regard to Rehabilitation, therefore state either:-..</p> <p>Upon cessation of the individual activity</p> <p>or.</p> <p>Upon the cessation of mining, bulk sampling or alluvial diamond prospecting as the case may be.</p>	<p>(A description of how each of the recommendations in 2.11.6 read with 2.12 and 2.15.2 herein will comply with any prescribed environmental management standards or practices that have been identified by Competent Authorities)</p>
See Tables 4, 6, 11 & 12				



**i) Financial Provision**  
**(1) Determination of the amount of Financial Provision.**

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

Thaya Trading Enterprise will be using a mobile camp site for its mining activities, and therefore no infrastructure associated with the camp site will require breaking down or demolishing at closure. The areas disturbed as a result of the mining operation will be rehabilitated by maintaining the general topography of the surrounding area, ensuring that there are no remnants of the structures. The closure objectives aim to return the affected area to a land use condition or desired state similar to that of the pre-mining state. Closure and rehabilitation of pits will be undertaken during the operational phase when the activities are completed in those pits, to achieve a desired land condition as early as possible. The pollution control dams (PCD) will be removed at closure and the plastic lining will be removed and recycled.

The key aim decommissioning and closure is to ensure that all the significant impacts are ameliorated. All rehabilitated areas should be left in a stable, self-sustainable state. Proof of this should be submitted at closure. Specific objectives include:

Rehabilitation of infrastructure areas

The objective for the removal of infrastructure and the subsequent rehabilitation of the areas they occupied include:

- To ensure that infrastructure identified for removal is successfully demolished and removed.
- To ensure that infrastructure identified to remain after mine closure is maintained until the issue of a closure certificate.

The removal, decommissioning and disposal of all mining infrastructure, will comply with all conditions contained in the MRPDA. To this end, decommissioning and rehabilitation of all infrastructure areas will follow the following principles:-

- The plant and associated disused infrastructure will be dismantled or demolished. Any building foundations will be removed and land exposed to the demolition and dismantling of infrastructure and all other disturbed land will be rehabilitated
- Rubble will be disposed of at a suitable site. The site will be selected in consultation with DENC.
- Any surface water management infrastructure will be maintained to ensure they are stable and functional.
- Just before closure, when disturbed land has been rehabilitated and erosion is controlled by vegetation cover, all disused surface water management facilities will be de-commissioned.

Mine residue deposits

The mine residue deposits will comprise of a slimes dam. The objectives pertaining to the effective management and rehabilitation of the slimes dam include:

- To ensure that the mine residue deposits are stable and that there is an acceptably low risk of failure of these deposits during the decommissioning phase and following mine closure.

- To establish self-sustainable vegetation cover on the slimes dam so that the visual impact of the slimes dam is improved and in order to prevent erosion.

Management principle pertaining to the slimes dam includes:

- The slimes dam/s will continuously be inspected by a suitable qualified professional engineer to ensure their stability. If they are unstable, the appropriate remedial measures will be implemented.
- Inspection and monitoring should continue until a suitable qualified professional engineer has confirmed the long-term stability of the slimes dam.
- Any infrastructure or facilities that serve the slimes dam will be maintained to ensure that they are both stable and functional.

Maintenance

The necessary agreements and arrangements will be made by Thaya Trading Enterprise to ensure that all natural physical, chemical and biological processes for which a closure condition were specified are monitored until they reach a steady state or for two (2) years after closure or as long as deemed necessary at the time.

- Such processes include erosion of the slimes dams, rehabilitated surfaces, surface water drainage, air quality, surface water quality, ground water quality, vegetation regrowth, weed encroachment.
- The closure plan will be reviewed yearly.
- Rehabilitation of the land will be maintained until a closure certificate is granted or until the land use is regarded as sustainable.
- All rehabilitated areas will be monitored and maintained until such time as required to enable the mine to apply for closure of these different areas.

Performance assessments

As per the MPRDA and associated Regulations, this Environmental Management Programme will be continually assessed in terms of its appropriateness and adequacy. In order to achieve this, the Thaya Trading Enterprise will undertake the following:

- Implement the necessary monitoring programmes, as discussed as part of this EMP;
- Conduct performance assessments of this EMP as required by the MPRDA and associated Regulations; and
- Compile and submit the afore-mentioned performance assessment reports to the DMR. The frequency of the performance assessments will occur every year. An independent and competent person will undertake all performance assessments.

Decommissioning and closure objectives

The key aim decommissioning and closure is to ensure that all the significant impacts are ameliorated. All rehabilitated areas will be left in a stable, self-sustainable state. Proof of this will be submitted at closure.

Specific objectives include:

- To identify potential post-closure land uses in consultation with the surrounding land owners and land users. This should be done during the operational phase of the mine.
- Rehabilitate disturbed land to a state suitable for its post-closure uses.



- Rehabilitate disturbed land and mine residue deposits to a state that facilitates compliance with applicable environmental quality objectives.
- Limit the impact on staff whose positions become redundant at the time of mine closure, as addressed in the SLP.
- Keep relevant authorities informed of the progress of the decommissioning phase.
- Submit monitoring data to the relevant authorities.
- Maintain required pollution control facilities and rehabilitated land until closure.

#### Negative economic impacts

The objective is to alleviate the negative socio-economic impacts that will result from mine closure. Management principles to achieve this include:

- Thaya Trading Enterprise will undertake a carefully planned step-wise decommissioning process.
- Closure planning will form an integral part of mine planning.
- Strategies for sustainable development of surrounding towns have been and will continue to be developed by the project in collaboration with district and local authorities, local businesses and other interested parties. Early warning of impending closure will be given to IAP's.
- In conjunction with long-term closure planning, the mine will actively participate in regional and local planning to enhance the economic benefits of the project through development of alternative forms of income generation.
- Thaya Trading Enterprise will initiate and participate in regional planning exercises that will mitigate the impacts of closure of the mine, the local and regional economies and associated abandonment of community infrastructures surrounding the mine. The mine will fulfil the requirements for closure and the management of downscaling.

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

The consultation process with interested and affected parties (neighbouring farmers and land owners) will be completed. Regular contact sessions will be held with neighbouring farmers and land owners which are currently affected by the mining operations. Records will be kept of the complaints and the mitigation measures will be implemented. An advert in the DFA (Diamond Fields Advertiser) will also be placed in order for other interested parties to come forward and register as interested parties in the project.

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

#### Infrastructure Areas

On completion of the mining operations, the various surfaces, including the access road, the office area, storage areas and the screening plant site should finally be rehabilitated as follows:

- All remaining material on the surface should be removed to the original topsoil level. This material should then be backfilled into the depressions. Any compacted area should

be ripped to a depth of 300 mm, where possible, the topsoil or growth medium returned and landscaped.

- All infrastructures, equipment, screening plant, and other items used during the operational period should be removed from the site.
- On completion of operations, all buildings, structures or objects on the office site should be dealt with in accordance with Regulation 44 of the Minerals and Petroleum Resources Development Act, 2002.

#### Topsoil and Stockpile Deposits

**Disposal Facilities:** Waste material of all description inclusive of receptacles, scrap, rubble and tyres should be removed entirely from the mining area and disposed of at a recognized landfill facility. It should be permitted to be buried or burned on the site.

**Ongoing Seepage, Control of Rain Water:** It is not foreseen that any monitoring of ground or surface water should take place after mine closure, except if so requested by the DWS – Northern Cape.

**Long Term Stability and Safety:** It should be the objective of mine management to ensure the long term stability of all rehabilitated areas including the backfilled depressions. This should be done by the monitoring of all areas until a closure certificate has been issued.

**Final rehabilitation in respect of erosion and dust control:** Self-sustaining vegetation will result in the control of erosion and dust and no further rehabilitation is deemed necessary, unless vegetation growth is not returned to a desirable state by the time of mine closure.

#### Final Rehabilitation Roads

- After rehabilitation has been completed, all roads should be ripped or ploughed, fertilized and seeded, providing the landowner does not want them to remain that way and with written approval from the Director: Mineral Development of the Department of Mineral Resources.

#### Submission of Information

- Reports on rehabilitation and monitoring should be submitted annually to the Department of Mineral Resources  
– Northern Cape, as described in Regulation 55.

#### Maintenance (Aftercare)

- Maintenance after closure should include the regular inspection and monitoring and/or completion of the re-vegetation programme.
- The aim of the Environmental Management Programme is for rehabilitation to be stable and self-sufficient, so that the least possible aftercare is required.
- The aim with the closure of the mine should be to create an acceptable post-mine environment and land-use. Therefore all agreed commitments should be implemented by Mine Management.

#### After-effects Following Closure

**Long Term Impact on Ground Water:** No after effect on the groundwater yield or quality is expected.

Long Term Stability of Rehabilitated Land: One of the main aims of any rehabilitated ground should be to obtain a self-sustaining and stable end result. The concurrent cleaning of all tailings material and replacement of topsoil where available should be ensured.

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

The rehabilitation plan will be aligned to the closure objectives and tailor-made to ensure project achieves closure-associated objectives. It will include information about the site prior to the mining operation and provide information on the maintenance of resources required for the rehabilitation process, as well as to give detail on how rehabilitation will be undertaken. It will also provide information on the management and monitoring of disturbance to avoid or minimise detrimental impacts, as well as to give an estimate of the financial closure provision. It will also include information associated with post-closure environmental monitoring of the site to ensure that the rehabilitation plan is followed and its objectives are achieved.

The ultimate rehabilitation of the mining site that involves the sloping, levelling, replacement of topsoil and the seeding of an grass seed mix in areas that does not recover acceptably as agreed to by the land owner will ensure that the site could be regarded as safe for humans and animals and will also ensure that the site is stable from an erosion point of view and also ensuring that the site could be used for grazing again.

The removal of waste material of any description from the mining area and the disposal thereof at a recognised landfill facility is going to be facilitated.

- The removal of infrastructure, equipment, plant and other items from the site.
- The ripping of compacted areas to a level of 300 mm and the levelling of such areas in order to re-establish a growth medium for plants (such areas will furthermore be seeded with a vegetation seed mix adapted to reflect the local indigenous flora that was present prior to the mining operation, if the re-establishment of vegetation is unacceptably slow.

The backfilling of the final excavations with subsoil and the covering thereof with previously stored topsoil (where-after this area will also be seeded with a vegetation seed mix adapted to reflect the local indigenous flora that was present prior to the proposed operation, and seedlings protected for a period of one) if the re-establishment of vegetation is unacceptably slow.

The closure plan will assist the proposed mining development to achieve cost effective and efficient closure, including management and monitoring of the area post-closure.

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

Table 16

No.	Description	Unit	A Quantity	B Master Rate	C	D	E=A*B*C*D
1	Dismantling of processing plant and related structures (including overland conveyors and powerlines)	m3		12.21	1	1	0
2 (A)	Demolition of steel buildings and structures	m2		170.13	1	1	0
2 (B)	Demolition of reinforced concrete buildings and structures	m2		250.72	1	1	0
3	Rehabilitation of access roads	m2		30.44	1	1	0
4 (A)	Demolition and rehabilitation of electrified railway lines	m2		295.49	1	1	0
4 (B)	Demolition and rehabilitation of non-electrified railway lines	m2		161.18	1	1	0
5	Demolition of housing and/or administration facilities	m2		340.26	1	1	0
<b>6</b>	<b>Opencast rehabilitation including final voids and ramps</b>	<b>Ha</b>	<b>0.08</b>	<b>173174.97</b>	<b>2</b>	<b>1</b>	<b>27707.9952</b>
7	Sealing of shafts adits and inclines	m3		91.33	1	1	0
8 (A)	Rehabilitation of overburden and soils	Ha	0.04	118912.29	1	1	4756.4916
8 (B)	Rehabilitation of processing waste deposits and evaporation ponds (non-polluting potential)	Ha		148103.1	1	1	0
8 (C)	Rehabilitation of processing waste deposits and evaporation ponds (polluting potential)	Ha		430161.62	1	1	0
9	Rehabilitation of subsided areas	Ha		99571.13	1	1	0
10	General surface rehabilitation	Ha		94198.59	1	1	0
11	River diversions	Ha		94198.59	1	1	0
12	Fencing	M		107.45	1	1	0
13	Water management	Ha		35816.95	1	1	0
14	2 to 3 years of maintenance and aftercare	Ha		12535.93	1	1	0
15 (A)	Specialist study	Sum				1	0
15 (B)	Specialist study	Sum				1	0

1	Preliminary and General	3895.738416	weighting factor 2	3895.738416
2	Contingencies	3246.44868		3246.44868
			Subtotal	39606.67
			VAT (15%)	5941.00
			Grand Total	45548.00

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

It is hereby confirmed that financial provisions will be submitted with bank guarantees to the Department of Mineral Resources.

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

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

**Table 17:**

<b>SOURCE ACTIVITY</b>	<b>IMPACTS REQUIRING MONITORING PROGRAMMES</b>	<b>FUNCTIONAL REQUIREMENTS FOR MONITORING</b>	<b>ROLES AND RESPONSIBILITIES (FOR THE EXECUTION OF THE MONITORING PROGRAMMES)</b>	<b>MONITORING AND REPORTING FREQUENCY and TIME PERIODS FOR IMPLEMENTING IMPACT MANAGEMENT ACTIONS</b>
Air Quality	To control the incidence of unacceptable levels of dust pollution on site.	To ensure that the mine minimizes dust omissions, so that dust does not become a nuisance for affected parties and a health hazard.	ECO/Site Manager/Foreman appointed SHE Consultant	Visual inspections will be done and managed by dust suppression by a water tanker. Quarterly tests will also be conducted by a Safety Health and Environmental Consultant and submitted to Mine Health and Safety for monitoring purposes.
Fauna	To minimise vegetation destruction in areas, and therefore a habitat for wildlife; and To eliminate poaching and the extermination of animal species within the boundaries of the study area as well as	To ensure that the species diversity and abundance is not significantly reduces.	ECO/Site Manager/ Environmentalists	Monitoring will be done at rehabilitated area on an annual basis to investigate species diversity and abundance.

	the surrounding areas.			
Flora	To minimise the destruction of vegetation units; and To control invasion of exotic and invasive plant species.	To ensure that the rehabilitated areas become self-maintaining.	ECO/Site Manager/ Environmentalists	Monitoring will be done at the rehabilitated areas on a <i>twice a year basis</i> (mid-summer and mid-winter), where species diversity and vegetation cover will be investigated.
Topography	To minimise the reduction of land capability.	To ensure that rehabilitation post-mining slopes are stable, free draining and no slopes have an angle in excess of 20°.	ECO/Site Manager/ Environmentalists	Monitoring will be done on an <i>annual basis</i> to ensure that the levels and the slopes are in order.
Soil	To prevent soil pollution; To limit soil compaction; To curb soil erosion; and To reinstate a growth medium able to sustain plant life.	Soil depth and chemical composition will be tested and possible erosion damage will be assisted and rectified.	Site Manager/ EnvironmECO/Site Manager/ Environmentalists entalists	Monitoring will be done on an <i>annual basis</i> or after a heavy rain event.
Surface Water	To conserve water; and To eliminate the contamination of run-off and sources of surface water.	There is one source, Vaal River, in the vicinity of the mine.	Water Supply ECO/Site Manager/ Environmentalists	Monitoring may have to be done to monitor the quality of the surface water.
Ground Water	To minimise and prevent as far as practically possible the contamination of ground	No ground water is used at the beginning.	Water Supply ECO/Site Manager/ Environmentalists	Monitoring may have to be done to monitor the levels and quality.

	water.			
Noise	To control the incidence of unacceptable noise levels on site.	The management objective will be to reduce any level of noise, shock and lighting that may have an effect on persons or animals, both inside the plant and that which may migrate outside the plant area.	ECO/Site Manager/Foreman appointed SHE Consultant.	Quarterly reports on fallout noise monitoring will be conducted as required by legislation. If any complaints are received from the public or state department regarding noise levels the levels will be monitored at prescribed monitoring points.
Heritage Resources	To limit impacts associated with mining on Heritage Resources	The objective is to limit such impacts to the primary activities associated with the mining and hence to limit secondary impacts during the medium and longer term operational life of the operation.	ECO/Site Manager/Environmental Control Officer	





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

The Environmental Control Officer (ECO) should conduct audits in accordance to the EMP presented herein. Annual Performance Assessment and Environmental Audit reports should be conducted and submitted.

**m) Environmental Awareness Plan**

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

An environmental, health and safety induction programme will be provided to all employees prior to commencing work, and they will sign acknowledgement of the induction.

- A daily “toolbox talk” will be held prior to commencing work, which will include discussions on health, safety and environmental considerations. The toolbox talks should be led by the ECO or Site Manager.

Environmental Awareness Training Programme Procedure

Natural resources are limited and not always renewable and it is the responsibility of management to ensure that all employees are trained to understand the impacts of their tasks on the environment and to reduce them wherever possible.

Environmental awareness training must be given to new employees on site and any contractors who may come onto site for a short period of time. Refresher training must be given to permanent employees on an annual basis.

The objective of this procedure is to ensure that all employees on the, including contractors, are competent to perform their duties, thereby eliminating negative impacts on their safety, health and the environment.

The Environmental topics to be covered in awareness training should include the following:

- **RESOURCE MANAGEMENT**

- a. The importance of saving water

- i. South Africa is a water scarce country and rivers are polluted
- ii. Do not throw litter into river or water drains
- iii. Do not dispose of oils in sewers

- b. Air pollution - Climate change

- i. The use of fossil fuels is increasing the amount of greenhouse gases that are discharged to the atmosphere. Share transport or use public transport.
- ii. Don't burn any rubbish, the smoke pollutes the air
- iii. Plant trees, they clean the air, provide us with oxygen and remove the greenhouse gas carbon dioxide from the air.

- c. Soil conservation

- i. Prevent overgrazing of farmlands, keep vegetation on the surface of the land to prevent soil erosion

## ii. Plant trees

- HAZARDOUS SUBSTANCE USE AND STORAGE

a. Solvent, petrol, diesel, insecticides, chlorine, detergents, chemical fertilisers are harmful to the environment and to your health. Use them sparingly and do not let them get into the water systems. Containers must be disposed of to a licensed hazardous waste disposal facility.

b. Hazardous substances must be stored and used correctly.

c. Ensure that 16 point Material Substances Safety Data Sheets (MSDS) are available at point of store.

d. Compressed gas storage requirements.

e. Flammable substances store requirements.

- INCIDENT AND EMERGENCY REPORTING

a. The company must have an emergency/incident reporting system whereby environmental incidents can be reported and actioned to mitigate and follow up on.

- OIL / DIESEL / PETROL SPILL CLEAN UP

a. All employees who work with machines and vehicles must be instructed how to prevent and clean up an oil or diesel spill appropriately. Spill kits must be available on site, drip trays must be used when servicing vehicles.

- CONSERVATION OF WATER

a. Campaign to save water on site.

b. Clean water is expensive and potable water must be used carefully.

c. Prevent pollution of water by preventing spills and dispose of wastes properly.

- CONSERVATION OF VEGETATION

Plants, grasses and trees are very important to our existence on the earth, they provide food, fuel, shelter, raw materials and they clean the air. Indigenous plants are especially important for muti and the whole ecology of life. Human activities are destroying the natural forests of the earth. The natural forests are the “lungs” of the planet and unfortunately they are being cleared faster than they can be regenerated.

a. EMP's are to be done before virgin bush can be cleared.

b. Vegetation cover reduces water and topsoil loss from the ground, do not clear vegetation unnecessarily.

c. Indigenous trees provide shade, attract wild birds.

d. Do not chop down indigenous trees without good reason.

e. Implement a tree planting programme.

f. Remove alien invasive trees in your area such Prosopis, Syringa and Pepper trees, cactus plants.

- WASTE MANAGEMENT

a. Employees must be instructed on how to tell the difference between hazardous waste and general waste.

b. They must know how to separate hazardous and general waste and where to dispose of these wastes in the correct way.

c. Examples of hazardous waste which must be recycled or sent to Waste Tech for disposal:

i. Oil, diesel, batteries, acids, paint, thinners, electronic waste.

ii. Pesticides, Jik and Handy Andy.

iii. Old oil, old oil filters, old paint is hazardous and must not be disposed of to a general land fill. Enviroserv, InterWaste, Drizit or Oilkol of the Rose Foundation will collect old oil.

iv. Mercury in fluorescent light bulbs is hazardous, fluorescent lights must be handled with great care so as not to break the glass and release the mercury vapour into the air to breath.

d. Examples of general wastes which can go to the municipal landfill.

i. Wood, paper, plastic, glass, old PPE.

e. Recycle, Reuse, Reduce, and Recover wherever possible.

#### Heritage Resources

The planned mitigation of constructing buffers 100 m away from the engraved rocks is going to be followed. If that plan proves to be an obstruction to planned mining operations, a permit application to have them removed will be lodged. All employees of the planned operations will be made aware of the importance of protecting heritage resources.

- CONCLUSION

Thaya Trading Enterprise will utilize the Environmental Awareness Plan to assure that all employees and contractors are aware of the environment and know how to manage it correctly.

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

#### Air quality:

- To control the incidence of unacceptable levels of dust pollution on site.

#### Surface water:

- To conserve water; and
- To eliminate the contamination of run-off.

#### Ground water:

- To minimise and prevent as far as practically possible the contamination of ground water.

#### Natural flora:

- To minimise the destruction of vegetation units; and
- To control invasion by exotic and invasive plant species.

#### Fauna:

- To minimise vegetation destruction in areas, and therefore a habitat for wildlife; and
- To eliminate poaching and the extermination of animal species within the boundaries of the study area, as well as in the surrounding areas.

#### Noise:

- To control the incidence of unacceptable noise levels on site.
- To minimise aesthetic disturbance; and
- To reduce the visual impact of the proposed mining operation through a process of on-going rehabilitation and reclamation.

#### Soils:

- To prevent soil pollution;
- To limit soil compaction;
- To curb soil erosion; and
- To reinstate a growth medium able to sustain plant life.

Land capability:

- To minimise the reduction of land capability.

Sensitive landscapes:

- To protect sensitive landscapes from potential negative impacts.

Surface environment - waste management:

- To ensure that the discarding of any waste material produced as a result of the proposed mining operation, including rubble, litter, garbage, rubbish or discards of any description, whether solid or liquid, takes place only at a site or sites demarcated for such purposes.
- To prevent waste material from being dumped within the borders or the vicinity of the mining area.

Heritage Resources

- To ensure that heritage resources are preserved such as to construct buffers 100 m away from the fixed rocks with engravings. Alternatively, apply to the SAHRA for a permit to have the fixed rocks with engravings removed from site to a place that has proven to be appropriate.

**n) Specific information required by the Competent Authority**  
 (Among others, confirm that the financial provision will be reviewed annually).

Section 41 of the MPRDA and regulations 53 and 54 promulgated in terms of the MPRDA deal with financial provision for mine rehabilitation and closure.

The holder of a permit as described in the relevant sections of the MPRDA and its regulations must provide the Department of Mineral Resources (DMR) with sufficient financial provision. Officials in the DMR Regional Offices are required to assess, review and approve the quantum of financial provision submitted (that is, the monetary value of the financial provision that has been computed by the holder of a prospecting right, mining right or mining permit during the annual review) as being sufficient to cover the environmental liability at that time and for closure of the mine at that time.

The holder of a prospecting right, mining right or mining permit is required to annually assess the total quantum of environmental liability for the mining operation and ensure that financial provision are sufficient to cover the current liability (in the event of premature closure) as well as the end-of-mine liability.

It is hereby confirmed that the financial provision will be reviewed annually.

## 2) UNDERTAKING

The EAP herewith confirms

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



\_\_\_\_\_  
Signature of the environmental assessment practitioner:

Thaya Trading Enterprise CC

\_\_\_\_\_  
Name of company:

\_\_\_\_\_  
Date:

**-END-**