mineral resources

Department:
Mineral Resources
REPUBLIC OF SOUTH AFRICA

BASIC ASSESSMENT REPORT & ENVIRONMENTAL MANAGEMENT PROGRAMME REPORT

The proposed Prospecting Right application without bulk sampling for the prospecting of Diamonds (Alluvial) near Bloemhof on Portion 3 (portion 1) of the farm Boschpan 339, the Remaining Extent of Portion 8 (portion 1), Portion 9 (portion 1), Portion 10 (portion 1) and Portion 17 (portion 1) of the farm Panfontein 270, Registration Division: HO, North West province.

NAME OF APPLICANT	**Xanado Trade or Invest 184 (Pty) Ltd**
PREPARED BY	**Milnex CC**
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SAMRAD REF NUMBER:	**NW30/5/1/1/2/12734PR**

PROJECT INFORMATION

Project Name:	Application for an Environmental Authorisation for the proposed Prospecting Right application without bulk sampling for the prospecting of Diamonds (Alluvial) near Bloemhof on Portion 3 (portion 1) of the farm Boschpan 339, the Remaining Extent of Portion 8 (portion 1), Portion 9 (portion 1), Portion 10 (portion 1) and Portion 17 (portion 1) of the farm Panfontein 270, Registration Division: HO, North West province.
Report Title:	BAR & EMPr
Prepared By:	Milnex CC
Date:	October 2020

QUALITY CONTROL:

	Report Author:	**Report Reviewer:**
Name:	Lizanne Esterhuizen	N/A
Signature:		

DISCLAIMER:

The DEA screening tool was used in compiling this document

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 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.

BASIC ASSESSMENT REPORT PROCESS

1) The environmental outcomes, impacts and residual risks of the proposed activity must be set out in the basic assessment report.

OBJECTIVE OF THE BASIC ASSESSMENT PROCESS

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

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

CONTENTS

SCOPING OF ASSESSMENT AND CONTENT OF BASIC ASSESSMENT REPORT

1) Contact Person and correspondence address

A) DETAILS OF:

i) THE EAP WHO PREPARED THE REPORT

ii) EXPERTISE OF THE EAP

Name of Practitioner	Qualifications	Contact details
Lizanne Esterhuizen	Honours Degree in Environmental Science (refer to **Appendix 1**)	Tel No.: (018) 011 1925 Fax No. : (053) 963 2009 e-mail address: lizanne@milnex-sa.co.za
Percy Sehaole Pr. Nat Sci	Master's Degree in Environmental Science (refer to **Appendix 1**)	Tel No.: (018) 011 1925 Fax No.: (053) 963 2009 e-mail address: percy@milnex-sa.co.za

Summary of the EAP's past experience. (Attach the EAP's curriculum vitae as **Appendix 2**)

Milnex CC was contracted by **Xanado Trade or Invest 184 (Pty) Ltd** as the independent environmental consultant to undertake the BAR and EMPr process for a Prospecting Right application without bulk sampling for the prospecting of Diamonds (Alluvial) near Bloemhof on Portion 3 (portion 1) of the farm Boschpan 339, the Remaining Extent of Portion 8 (portion 1), Portion 9 (portion 1), Portion 10 (portion 1) and Portion 17 (portion 1) of the farm Panfontein 270, Registration Division: HO, North West province. The property is located 50km South of Schweizer-Reneke in the district of Bloemhof. Milnex CC does not have any interest in secondary developments that may arise out of the authorisation of the proposed project.

Milnex CC is a specialist environmental consultancy with extensive experience in the mining industry which provides a holistic environmental management service, including environmental assessment and planning to ensure compliance with relevant environmental legislation. Milnex CC benefits from the pooled resources, diverse skills and experience in the environmental and mining field held by its team that has been actively involved in undertaking environmental studies for a wide variety of mining related projects throughout South Africa. The Milnex CC team has considerable experience in environmental impact assessment and environmental management, especially in the mining industry.

Percy Sehaole and Lizanne Esterhuizen have experience consulting in the environmental field. Their key focus is on environmental assessment, advice and management and ensuring compliance to legislation and guidelines. They are currently involved in undertaking EIAs for several projects across the country (refer to **Appendix 2** for CV)

B) DESCRIPTION OF THE PROPERTY.

Farm Name:	**1)** Portion 3 (portion 1) of the farm Boschpan 339 Extent: 158.9847 Ha Title deed: T23868/1953 **2)** The remaining extent of portion 8 (portion 1) of the farm Panfontein 270 Extent: 686.4247 Ha Title deed: T9603/1953 **3)** Portion 9 (portion 1) of the farm Panfontein 270 Extent: 947.1930 Ha Title deed: T16054/1944 **4)** Portion 10 (portion 1) of the farm Panfontein 270 Extent: 976.0211 Ha Title deed: T16054/1944 **5)** Portion 17 (portion 1) of the farm Panfontein 270 Extent: 406.0529 Title deed: T27758/1962
Application area (Ha)	3174.6764 hectares
Magisterial district:	Dr Ruth Segomotsi Mompati District Municipality
Local Municipality	Lekwa-Teemane Local Municipality
Registration Division	HO
Distance and direction from nearest town	The property is located 50km South of Schweizer-Reneke in the district of Bloemhof.
21 digit Surveyor General Code for each farm portion	**1)** T0HO00000000033900003 **2)** T0HO00000000027000000 **3)** T0HO00000000027000009 **4)** T0HO00000000027000010 **5)** T0HO00000000027000017
Minerals Applied for	Diamonds (Alluvial)

III. FARM CO-ORDINATES

Farm	Longitude	Latitude
1) Portion 3 (portion 1) of the farm Boschpan 339 2) The remaining extent of portion 8 (portion 1) of the farm Panfontein 270 3) Portion 9 (portion 1) of the farm Panfontein 270 4) Portion 10 (portion 1) of the farm Panfontein 270 5) Portion 17 (portion 1) of the farm Panfontein 270	25° 25' 40.617" E	27° 36' 2.829" S
	25° 26' 5.764" E	27° 35' 42.684" S
	25° 27' 17.835" E	27° 34' 45.230" S
	25° 28' 24.314" E	27° 33' 54.604" S
	25° 28' 56.386" E	27° 33' 30.272" S
	25° 28' 47.751" E	27° 35' 53.679" S
	25° 28' 39.612" E	27° 36' 5.034" S
	25° 28' 21.876" E	27° 36' 31.174" S
	25° 27' 57.114" E	27° 37' 7.631" S
	25° 28' 26.210" E	27° 37' 52.467" S
	25° 26' 40.348" E	27° 37' 11.767" S
	25° 26' 4.567" E	27° 37' 13.231" S
	25° 27' 10.583" E	27° 36' 46.136" S
	25° 26' 58.957" E	27° 37' 11.237" S
	25° 27' 35.605" E	27° 37' 9.078" S
	25° 29' 51.602" E	27° 34' 35.128" S
	25° 29' 58.611" E	27° 34' 38.192" S
	25° 31' 54.061" E	27° 35' 20.103" S
	25° 31' 19.186" E	27° 35' 37.638" S
	25° 29' 58.550" E	27° 34' 42.435" S

C) LOCALITY MAP (show nearest town, scale not smaller than 1:250000 attached as **Appendix 3).**

A Locality map is attached in **Appendix 3** and on figure 1 below.

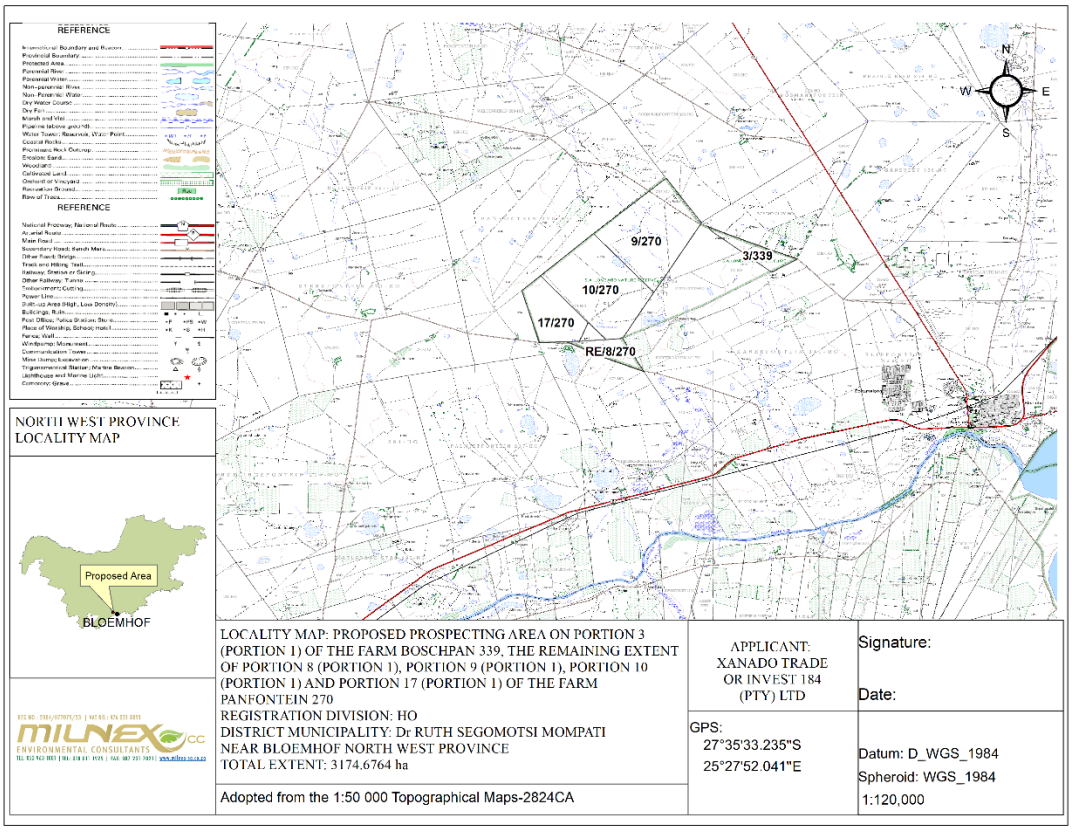

Figure 1: Locality Map

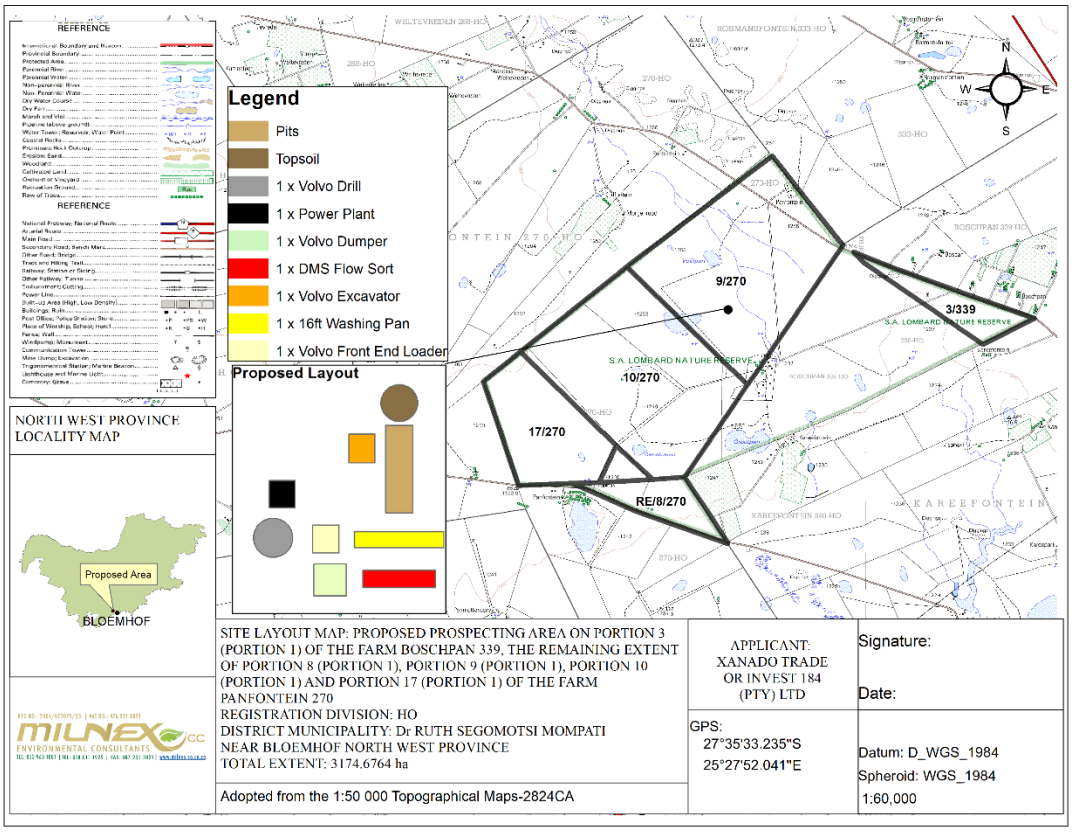

Figure 2: Site Plan Map

D) DESCRIPTION OF THE SCOPE OF THE PROPOSED OVERALL ACTIVITY.

i) LISTED AND SPECIFIED ACTIVITIES

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 m²**	**LISTED ACTIVITY** (Mark with an **X** where applicable or affected).	**APPLICABLE LISTING NOTICE** **(GNR 324, GNR 325 or GNR 326)**	**WASTE MANAGEMENT AUTHORISATION** (Indicate whether an authorisation is required in terms of the Waste Management Act). **(Mark with an X)**
Prospecting Right without bulk sampling: **<u>Drilling</u>** 400 boreholes shall be drilled by the appointed contractor. Percussion drilling methods will be used to drill boreholes at varying depths ranging from 90-150m with hole diameters of at least 150mm. **<u>Pitting</u>** Pits shall be dug, locked, sampled and backfilled 80 pits: 3m (length) x 2m (breath) x 4m (depth).	3174.6764 ha	**X**	**GNR. 327 Activity 20**	**-**
Clearance of indigenous vegetation: **<u>Drilling</u>** 400 boreholes shall be drilled by the appointed contractor. Percussion drilling methods will be used to drill boreholes at varying depths ranging from 90-150m with hole diameters of at least 150mm. **<u>Pitting</u>** Pits shall be dug, locked, sampled and backfilled 80 pits: 3m (length) x 2m (breath) x 4m (depth).	Disturbance of vegetation while drilling.	**X**	**GNR. 327 Activity 27**	**-**

Listed activities

Description of the overall activity. (Indicate Mining Right, Mining Permit, Prospecting right, Bulk Sampling, Production Right, Exploration Right, Reconnaissance permit, Technical co-operation permit, Additional listed activity)	1. ***Listing Notice GNR 327, Activity 27:*** "*The clearance of an area of 1 hectares or more, but less than 20 hectares of indigenous vegetation."* 2. **Listing Notice GNR 327, Activity 20**: "*Any activity including the operation of that activity which requires a prospecting right in terms of section 16 of the Mineral and Petroleum Resources Development Act, 2002 (Act No. 28 of 2002), including—* *a) associated infrastructure, structures and earthworks, directly related to prospecting of a mineral resource[,]; or [including activities for which an exemption has been issued in terms of section 106 of the Mineral and Petroleum Resources Development Act, 2002 (Act No. 28 of 2002)]* b) *the primary processing of a mineral resource including winning, extraction, classifying, concentrating, crushing, screening or washing*; Prospecting right for the mining of **Diamonds Alluvial** including associated infrastructure, structure and earthworks. Application of Prospecting right without bulk sampling.

ii) DESCRIPTION OF THE ASSOCIATED STRUCTURES AND INFRASTRUCTURE RELATED TO THE DEVELOPMENT

(Describe Methodology or technology to be employed, and for a linear activity, a description of the route of the activity

Xanado Trade or Invest 184 (Pty) Ltd has embarked on a process for applying for a Prospecting Right application without bulk sampling for the prospecting of Diamonds (Alluvial) near Bloemhof on Portion 3 (portion 1) of the farm Boschpan 339, the Remaining Extent of Portion 8 (portion 1), Portion 9 (portion 1), Portion 10 (portion 1) and Portion 17 (portion 1) of the farm Panfontein 270, Registration Division: HO, North West province. These portions are preferred due to the sites expected mineral resources. **Xanado Trade or Invest 184 (Pty) Ltd** requires a prospecting right without bulk sampling in terms of NEMA and the Mineral and Petroleum Resources Development Act to prospect for minerals mentioned above within the Mamusa Local Municipality, North West Province (refer to a locality map attached in **Appendix 3**).

Access road

Access will be obtained from existing gravel roads off the R34 ad N12

Water Supply

Additional water requirements related to the portable water supply for employees and workers will be supplied.

Ablution

Chemical toilets shall be used, no french drains and pits shall be permitted.

Storage of dangerous goods

During the prospecting activities, limited quantities of diesel and fuel, oil and lubricants if any will be stored on site. These goods should be placed in a bunded area one and a half times the volume of the total amount of goods to be stored. Less than 30 cubic metres of dangerous good will be stored on site.

Prospecting activities and phases

Please find the Prospecting Work Programme attached as **Appendix 8**.

-List of equipment's & infrastructure

List of equipment
1 x Volvo Excavator 1 x Volvo Front-end Loader 1 x Volvo Dumper 1 x Power plant 1 x Volvo Drill The applicant is the owner of the equipment.

(i) DESCRIPTION OF PLANNED NON-INVASIVE ACTIVITIES: (These activities do not disturb the land where prospecting will take place e.g. aerial photography, desktop studies, aeromagnetic surveys, etc.).

Site Visit (Phase 1)

The applicant will appoint Pierre de Jager, representative of the mineral consultants and as appointed geologist to conduct the site visit with him. It is foreseen that more than one site visit will be conducted. The purpose of the site visit shall be to familiarize the parties of the area including the topography and the general geology before invasive prospecting activities shall be commenced with.

During the site visit, the applicant shall assess the roads, the infrastructure that may be used and if it will be necessary to construct any infrastructure needed for the prospecting activities. From a site visit much more details shall be obtained about the process to be followed to properly conduct the prospecting activities than from near desktop studies.

Site visit shall assist the applicant to make a better assessment of the prospecting work to be done during the respective phases where the prospecting work shall be commenced with and what additional equipment may be required to properly conduct the prospecting activities.

The site visit shall also assist the applicant to assess prospecting information of earlier prospecting activities. During this process the applicant shall also review all documentation that has received in relation to the geology of the area.

A site visit will be done within 90 days after the prospecting right was executed.

Desktop Studies (Phase 2)

Desktops studies would be undertaken after the site visit has been done to determine the target areas including the identification of any infrastructure to be built and any potential problems that may need to be addressed during the prospecting activities.

Both these two phases will be Non-Invasive and restricted to a desktop study which will include literature survey, Interpretation of aerial photographs, satellite images and ground validation of targets.

During the desktop studies the applicant with the appointed geologist shall study all available geological information and historical data about the previous prospecting and mining activities.

During desktop studies, a preliminary analysis of the operating environment shall be obtained. The desktop studies may improve in project efficiency and reduced the cost by providing a clearer understanding of the challenges the prospecting activities may entail.

The desktop studies shall be finalized by the compilation and the analysis of pre-existing relevant data. The preliminary operating areas shall be identified for these studies. A working document shall be drafted by the geologist after the finalization of the desktop studies.

Consolidation and interpretation of results data (Phase 5)

The project geologist Pierre de Jager shall monitor the program and consolidate and process the data and amend the program depending on the results received after each phase of prospecting. The DMR shall be updated of any amendments made. This shall be a continuous process throughout the prospecting work program.

Each physical phase of prospecting shall be followed by desktop studies involving interpretation and modeling of all data gathered. These studies will determine the manner in which the work programme is to be proceeded with in terms of the activity, quantity, resources, expenditure and duration.

A GIS data base will be constructed capturing all the exploration data. All data shall be consolidated and processed to determine the diamond bearing resource on the property.

(ii) DESCRIPTION OF PLANNED INVASIVE ACTIVITIES: (These activities result in land disturbances e.g. sampling, drilling, bulk sampling, etc.)

Drilling (Phase 3)

It is estimated that 400 boreholes shall be drilled by the appointed contractor. Percussion drilling methods will be used to drill boreholes at varying depths ranging from 90-150m with hole diameters of at least 150mm. The drilling program shall be done in accordance with procedures and protocols drawn up by the appointed geologist. Drilling shall be carried out by using a Volvo drilling machine. The drill will be under constant observation to determine the depth estimates of the lithological contacts. Each sample shall be logged based upon macroscopic examination of the drill cuttings.

Drilling will commence on the areas that the geologist is of the opinion the geology may prove the presence of diamond bearing indicators. The holes will be drilled on a 100m by 100m grid on the target areas identified during phase 1 and phase 2.

The results shall be noted in a field note book. Observations in the field shall include grainsize, color, degree of roundness (quartzite and chert clasts) and end-of-hole lithology bedrock. These logs will later be summarized and the gravel deposit types will be assigned based upon their stratigraphic and sedimentological characteristics. All drill hole positions will be surveyed and each borehole will be rehabilitated after completion of drilling.

It is estimated that the drilling will take approximately two years after the prospecting right has been executed and the EMP approved.

Calculation

According to the PWP the diameter of the borehole will be 150mm and 400 boreholes will be drilled.

- 150mm / 1000 = 0.15m (from mm to m)
- 0.15m /10 000 = 0.000015ha (from m to ha)
- 0.000015ha x 400 boreholes = 0.006ha (total area of vegetation clearance for boreholes in ha)

The total vegetation clearance for 400 boreholes is 0.006ha for 24 months & 0.003ha in 12 months

Pitting (Phase 4)

Invasive prospecting pits may be dug, depending on the results obtained from the previous phases if deemed necessary by the appointed geologist.

These pits will be positioned as determined by the geologist and after the geologist has assessed information obtained from the earlier prospecting activities.

A trial pit / test pit or inspection pit investigation is a highly effective way of obtaining data on the sub surface soil and rock conditions which underlie a prospecting sight. It allows for the various soils and rock types to be locked, the soil to be sampled and a preliminary assessment to be made.

Pits shall be dug, locked, sampled and backfilled.

To dug the pits, the applicant shall make use of the systems of the appointed geologist.

The applicant shall at the end of the pitting process have locked the pits with the following information:

- A description of the soil and rock types from ground level to the base of the pits;
- Record of rock head depth and refusal depth, a list of where the samples will be taken, a record of where ground water seepage will be recorded;
- A general note of the geologist and conditions in the vicinity of the test pit.

It is planned that 80 pits will be dug (it may be less depending on the results) at an extent of 3m (length) x 2m (breath) x 4m (depth).

- (80 pits / 24 months) x 12 months = 40 pits dug per year for two years.
- Total area to be disturbed per year =40 pits x (3m x 2m) / 10 000 = 0.024 Ha disturbed per year
- Total area disturbed for 24 months = 80 pits x (3m x 2m) / 10 000 = 0.048 Ha disturbed for 24 months

(iii) **DESCRIPTION OF PRE-FEASIBILITY STUDIES** (Activities in this section includes but are not limited to: initial, geological modeling, resource determination, possible future funding models, etc.)

All data will be consolidated and processed to determine the diamond bearing resource on the property. This will be a continuous process throughout the prospecting work program.

E) POLICY AND LEGISLATIVE CONTEXT

Title of legislation, policy or guideline:	Administering authority:	Promulgation Date:
National Environmental Management Act No. 107 of 1998 as amended.	Department of Environmental Affairs	27 November 1998
Constitution of South Africa Act 108 of 1996	National	18 December 1996
The National Heritage Resources Act (Act No. 25 of 1999)	SAHRA	1999
Mineral and Petroleum Resources Development Act (Act No. 28 of 2002)	Department of Mineral Resources & Energy (DMRE)	2002
National Infrastructure Plan	National	
National Environmental Management: Biodiversity Act No. 10 of 2004	Department of Environmental Affairs	7 June 2004
National Environmental Management Waste Act, 2008 (Act No. 59 of 2008)	National & Provincial	1 July 2009
EIA regulations under NEMA	Department of Environmental Affairs	14 December 2014
Conservation of Agricultural Resources Act,1983 (Act No. 43 of 1983)	Department of Agriculture Forestry and Fisheries	1 June 1984
National Environmental Management Air Quality Act, 2004 (Act No. 39 of 2004).	National and Provincial	11 September 2004
National Water Act, 1998 (Act No. 36 of 1998).	National	20 August 1998

North West Province Growth and Development Strategy	Provincial	11 August 2013
Dr Ruth Segomotsi Mompati District Municipality Integrated Development Plan (IDP)	Municipal	
Lekwa-Teemane Local Municipality Integrated Development Plan (IDP)	Municipal	
National Forest Act (Act 84 of 1998) (NFA)	National	30 October 1998
National Veld & Forest Fires Act (Act 101 of 1998)	National	27 November 1998

POLICY AND LEGISLATIVE CONTEXT

Legislation/Policy	Description
The Convention of Biological Diversity (Rio de Janeiro, 1992).	The purpose of the Convention on Biological Diversity is to conserve the variability among living organisms, at all levels (including diversity between species, within species and of ecosystems). Primary objectives include (i) conserving biological diversity, (ii) using biological diversity in a sustainable manner and (iii) sharing the benefits of biological diversity fairly and equitably.
South African Constitution 108 of 1996	The Constitution is the supreme law of the land and includes the Bill of rights which is the cornerstone of democracy in South Africa and enshrines the rights of people in the country. It includes the right to an environment which is not harmful to human health or well-being and to have the environment protected for the benefit of present and future generations through reasonable legislative and other measures.
Strategic Framework for Sustainable Development in South Africa	The development of a broad framework for sustainable development was initiated to provide an overarching and guiding National Sustainable Development Strategy. The Draft Strategic Framework for Sustainable Development (SFSD) in South Africa (September 2006) is a goal orientated policy framework aimed at meeting the Millennium Development Goals. Biodiversity has been identified as one of the key crosscutting trends in the SFSD. The lack of sustainable practices in managing natural resources, climate change effects, loss of habitat and poor land management practices were raised as the main threats to biodiversity.
National Environmental Management Act 107 of 1998	This is a fundamentally important piece of legislation and effectively promotes sustainable development and entrenches principles such as the 'precautionary approach', 'polluter pays' principle, and requires responsibility for impacts to be taken throughout the life cycle of a project NEMA provides the legislative backing (Including Impact Assessment Regulations) for regulating development and ensuring that a risk-averse and cautious approach is taken when making decisions about activities.
Environmental Impact Assessment (EIA) regulations	New regulations have been promulgated in terms of Chapter 5 of NEMA and were published on 08 December 2014 in Government Notice No. R. 985. Development and land use activities which require Environmental Authorisation in terms of the NEMA EIA Regulations, 2014, are in Listing Notice 3 (GG No. R.983, LN3) identified via geographic areas with the intention being that activities only require Environmental Authorisation when located within designated sensitive areas. These sensitive/geographic areas were identified and published for each of the nine (9) Provinces.
National Environmental Management: Biodiversity Act No 10 of 2004	The Biodiversity Act provides listing threatened or protected ecosystems, in one of four categories: Critically Endangered (CR), Endangered (EN), Vulnerable (VU) or Protected (Government Gazette, 2011). The main purpose of listing threatened ecosystems is to reduce the rate of ecosystem and species extinction and includes the prevention of further degradation and loss of structure, function and composition of threatened ecosystems.

Conservation of Agricultural Resources Act 43 of 1967	The intention of this Act is to control the over-utilization of South Africa's natural agricultural resources, and to promote the conservation of soil and water resources and natural vegetation. The CARA has categorised a large number of invasive plants together with associated obligations of the land owner, including the requirement to remove categorised invasive plants and taking measures to prevent further spread of alien plants.
National Forest Act 84 of 1998	The protection, sustainable management and use of forests and trees within South Africa are provided for under the National Forests Act (Act 84 of 1998). **Prohibition on destruction of trees in natural forests** (1) No person may - (a) cut, disturb, damage or destroy any indigenous tree in a natural forest; or (b) possess, collect, remove, transport, export, purchase, sell, donate or in any other manner acquire or dispose of any tree, or any forest product derived from a tree contemplated in paragraph (a), except in terms of- (i) a licence issued under subsection (4) or section 23; or (ii) an exemption from the provisions of this subsection published by the Minister in the *Gazette* on the advice of the Council.
National Environmental Management: Protected Areas Act 57 of 2003	This Act provides for the protection and conservation of ecologically viable areas representative of South Africa's biological diversity and its natural landscapes and seascapes. It also seeks to provide for the sustainable utilization of protected areas and to promote participation of local communities in the management of protected areas.
Mine, Health and Safety Act 29 of 1996	The Mine Health and Safety Inspectorate was established in terms of the Mine Health and Safety Act, 1996 (Act No. 29 of 1996), as amended, for the purpose of executing the statutory mandate of the Department of Mineral Resources to safeguard the health and safety of mine employees and communities affected by mining operations.
National Environmental Management: Waste Act 59 of 2008	The Act reform the law regulating waste management in order to protect health and the environment by providing reasonable measures for the prevention of pollution and ecological degradation and for securing ecologically sustainable development; to provide for institutional arrangements and planning matters; to provide for national norms and standards for regulating the management of waste by all spheres of government; to provide for specific waste management measures; to provide for the licensing and control of waste management activities; to provide for the remediation of contaminated land; to provide for the national waste information system; to provide for compliance and enforcement; and to provide for matters connected therewith.

National Environmental Management: Biodiversity Act 10 of 2004	This Act provides for the management and conservation of South Africa's biodiversity within the framework of the National Environmental Management Act, 1998; the protection of species and ecosystems that warrant national protection; the sustainable use of indigenous biological resources; the fair and equitable sharing of benefits arising from bioprospecting involving indigenous biological resources; the establishment and functions of a South African National Biodiversity Institute; and for matters connected therewith

F) 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).

Mining has played a vital role in the economy of South Africa for over 100 years. In 2015 the mining industry contributed R286 billion towards South African Gross Domestic Product (GDP) representing 7.1% of overall GDP. Mining is a significant contributor to employment in the nation, with 457 698 individuals directly employed by the sector in 2015. This represents just over 3% of all employed nationally. Diamond mining has 17 885 direct employees.

Diamonds, arguably the ultimate luxury mineral, comprise an intricate lattice of carbon atoms, a crystalline structure that makes them harder than any other form in nature. This characteristic makes diamonds not only popular in jewellery, but also desirable in high-tech cutting, grinding and polishing tools (Chamber of Mines, South Africa, 12:2016).

According to the Chamber of Mines the country's diamond sector is far from reaching the end of its life even though diamond mining has been taking place in South Africa for almost a century and a half. The primary sources of all of South Africa's diamonds are kimberlites in ancient, vertically dipping volcanic pipes most of which were located in the vicinity of the city of Kimberley and which were initially amenable to open-cast.

Economic growth - South Africa's total reserves remain some of the world's most valuable, with an estimated worth of R20.3-trillion. Overall, the country is estimated to have the world's fifth-largest mining sector in terms of GDP value.

It has the world's largest reserves of manganese and platinum group metals (PGMs), according to the US Geological Survey, and among the largest reserves of gold, diamonds, chromite ore and vanadium.

With South Africa's economy built on gold and diamond mining, the sector is an important foreign exchange earner, with gold accounting for more than one-third of exports. In 2009, the country's diamond industry was the fourth largest in the world.

Mining is a cornerstone of the economy, making a significant contribution to economic activity, job creation and foreign exchange earnings. Mining and its related industries are critical to South Africa's socio-economic development.

G) MOTIVATION FOR THE PREFERRED DEVELOPMENT FOOTPRINT WITHIN THE APPROVED SITE INCLUDING A FULL DESCRIPTION OF THE PROCESS FOLLOWED TO REACH THE PROPOSED DEVELOPMENT FOOTPRINT WITHIN THE APPROVED SITE.

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.

Location of the site

The property is located 50km South of Schweizer-Reneke in the district of Bloemhof.

Preferred activity

The proposed prospecting area falls within the S.A. Lombard Nature Reserve. The use of the area as a nature reserves is the preferred activity.

S.A. Lombard Nature Reserve was one of the earliest wildlife conservation research centres in South Africa and is credited with having saved the black wildebeest from extinction in the wild. The reserve is an important breeding centre for plains animals, including springbok, black wildebeest, red hartebeest and zebra. The reserve conserves a small area of open Kalahari grassland on an unusual flood plain. Game viewing is made simple by the almost total lack of trees.(North West Parks Board website)

Technology alternatives

In terms of the technologies proposed, these have been chosen based on the long term success of their prospecting history. The prospecting activities proposed in the Prospecting Works Programme (**Appendix 9**) is dependent on the preceding phase as previously discussed, therefore no alternatives are indicated, but rather a phased approach of trusted prospecting techniques.

H) A FULL DESCRIPTION OF THE PROCESS FOLLOWED TO REACH THE PROPOSED DEVELOPMENT FOOTPRINT WITHIN THE APPROVED SITE, INCLUDING:

i) DETAILS OF THE DEVELOPMENT FOOTPRINT ALTERNATIVES CONSIDERED;

- **Consideration of alternatives**

The DEAT 2006 guidelines on 'assessment of alternatives and impacts' proposes the consideration of four types of alternatives namely, the no-go, site, activity, and technology alternatives. It is however, important to note that the regulation and guidelines specifically state that only 'feasible' and 'reasonable' alternatives should be explored. It also recognizes that the consideration of alternatives is an iterative process of feedback between the developer, the EAP and Interested and affected parties, which in some instances culminates in a single preferred project proposal. The following sections explore each type of alternative in relation to the proposed activity.

- **Location alternatives**

This alternative asks the question, if there is not, from an environmental perspective, a more suitable location for the proposed activity. Also, it is expected that the applied for minerals have been deposited on this farm and therefore the applicant would like to commence with their prospecting activities.

Land capability is the combination of soil suitability and climate factors. The proposed development falls within Land in Class 5. (refer to Land capability map on **figure 5** and attached as **Appendix 5).**

- **Activity alternatives**

The environmental impact assessment process also needs to consider if the development of Diamonds (Alluvial), prospecting would be the most appropriate land use for the particular site.

Prospecting of other commodities – from the surface and desktop assessment there are no indications that there are other commodities to be mined on the site except Diamonds (Alluvial).

According to HP Nel from NWPB, the North West Parks Board believes that the management of the wildlife resources within the reserve can yield more sustainable and long-term benefits to the region. The Board is in the process of aligning the management of SALombard to focus on the breeding of high value game species to support the transformation of the game industry. The Board also aims to improve income generation by focusing on sustained use of the wildlife resources and at the same time, improve the efficiency of the reserve to achieve its objectives. Please see **Appendix 6.**

- **Design and layout alternatives**

The location of activities will be determined based on the location of the prospecting activities, which is outlined on the PWP. All the infrastructure will be temporary and/or mobile.

- **Operational alternatives**

Due to the nature of the prospecting activities, no permanent services in terms of water supply, electricity, or sewerage services are required.

The objective of the prospecting work programme is to target all minerals in question seams available with a view of increasing the geological confidence factor to assess its bulk sampling potential.

- **No-go alternative**

This alternative considers the option of 'do nothing' and maintaining the status quo. The description provided in section H of this report could be considered the baseline conditions (status quo) to persist should the no-go alternative be preferred. Should the proposed activity not proceed, the site will remain unchanged

- **Technology alternatives**

In terms of the technologies proposed, these have been chosen based on the long term success of their prospecting history. The prospecting activities proposed in the Prospecting Works Programme (**Appendix 9**) is dependent on the preceding phase as previously discussed, therefore no alternatives are indicated, but rather a phased approach of trusted prospecting techniques.

The preferred technology for the proposed prospecting activity, will be to drill boreholes and dig pits.

Percussion drilling methods will be used to drill boreholes at varying depths ranging from 90-150m with hole diameters of at least 150mm. The drilling programme shall be done in accordance with procedures and protocols drawn up by the appointed geologist. Drilling shall be carried out by using a Volvo drilling machine. The drill will be under constant observation to determine the depth estimates of the lithological contacts. Each sample shall be logged based upon macroscopic examination of the drill cuttings.

Invasive prospecting pits may be dug, depending on the results obtained from the previous phases if deemed necessary by the appointed geologist. These pits will be positioned as determined by the geologist and after the geologist has assessed information obtained from the earlier prospecting activities.

All data will be consolidated and processed to determine the diamond bearing resource on the property. This will be a continuous process throughout the prospecting work program. Please find the Prospecting Work Programme attached as **Appendix 9**.

Reverse Circulation Drilling (RC drilling)

Drill Structure

RC drilling is usually a large piece of apparatus, that requires a lot of space, not just for the rig itself, but the supporting vehicles and the pit for collecting waste runoff.

The drill cutting is transferred to the surface inside drill rods, which are linked together to create a 'drill string'. Drill bits attached to the end of the hammer are made from tungsten-steel, and are usually around 13-20cm in diameter. These also have metal nodules attached at the end to allow cutting through particularly tough rock. Most RC drilling uses a dual-tube drill rods, with one tube inside another. The tubes inside overlap and provide a path for drilled rock from the ground to the surface. Inner tubes can be sealed together, meaning that the RC drill can sample up to very large depths, often around 500m.

Another type of RC drilling is 'centre sample' drilling. This is a modern variation, in which a central hammer, with a hollow centre, allows the sample to immediately enter the drill pipe, without the need to travel past the hammer (AZOMining, 2012)

Sample Extraction

The samples produced from RC drilling are dry chips of the drilled rock. To create the sample, the hammer acts like a pneumatic piston and pushes a tungsten-steel drill bit on to the rock, breaking it up. Before the drill bit hits the rock, it is dried out using an air compressor, so that the rock chips are dry at the surface.

Water is often used down the hole to cool the drill bit and reduce dust, as well as assisting with the transportation of sample bits to the surface. Air is blown down the drill rods to create a pressure difference, allowing the sample chips and water to rise through the inner tube. The sample then reaches a bell at ground level, which transports the sample to a cyclone where it dries out and is deposited into sacks (AZOMining, 2012).

Applications

RC drilling is a technique used in most stages of mine development.

As it is cheaper than diamond core drilling, it is often used in first stage exploration mining to delineate a potentially extractable ore body. It is also preferable to RAB or air-core drilling when trying to reach great depths, but RC drilling is slower and more expensive than either of these two methods.

RC drilling is also consistently used during in-pit grade control and the development stage of an ore body (AZOMining, 2012).

Pros & Cons of the alternative RC drilling

Advantages	Disadvantages
Direct drilling cost reductions in the range of 25% to 40%.	Less geological information from sample.
Faster completion of drill programs with quicker delivery of results.	Holes can deviate (Spiral Stabiliser Subs keep holes straighter)
Reduced man-hours at the drill with decreased exposure to potential accidents.	Diamond drill can usually drill to greater depth although depths up to 800m have been achieved with.
Reduced contractor activity in the mine reduces mine support burden.	
Indirect cost reductions gained from a simplified sampling process.	

Diamond Core Drilling

Diamond drilling allows the removal of solid cylinders of rock (core) from deep within the earth.

Drill Structure

Diamond core drilling is so called because it uses a 'diamond bit'. This drill bit is composed of group of small, industrial grade diamonds set into a metallic, soft matrix. As the ground is drilled, this matrix will wear away and expose more diamonds.

This is then attached to a drill rod, which is around 10 foot in length, and then more sections of pipe can be attached to the top of this, so a greater depth can be drilled. The depth that is drilled to is estimated by the number of rods attached to the top of the drill rod.

Inside the drill rod, a core tube is attached to a cable via a latching mechanism. The core tube is lifted to the surface using the cable, so the solid core can be removed.

There are two primary types of diamond drilling-rotary drilling and wineline drilling. Rotary drilling is used primarily for bore hole drilling, whereas wineline drilling is used for solid core sampling.

There a five standard tube sizes associated with wire line drilling. These are as follows:

- AQ (Hole diameter: 48mm)
- BQ (60mm)
- NQ (75.5mm)
- HQ (96mm)
- PQ (122.6mm)

The drill size used depends on the desired core diameter and the desired depth of drilling, and the wider the diameter of the tube, the more power that is required to drive the drilling (AZOMining, 2012).

Core Extraction

To extract core, the drill rod rotates the diamond bit, spinning it into the ground. As the drill bit bores through the rock, solid rock is taken into the circular opening at the end of the bit, into the core tube, and can then be recovered at the surface as it piles up. Once the core is recovered at the surface it is broken along natural fractures and stored in core trays to await analysis. A standard core tray can hold around 10 feet of core.

For optimum core extraction, the driller must listen to the drill to evaluate subsurface conditions. To keep drilling efficient, the rotation speed, pressure and water circulation must be strictly monitored.

Sometimes when drilling in highly fractured zones, overheating can occur due to a stuck bit. This issue is usually counteracted by the injection of mud or sawdust to plug fractures in the rock.

Application

Diamond core finds its primary function in the exploration mining sector. It is usually one of the last stages of exploration, during which the orebody is delineated in three dimensions. This will determine whether the prospect is economically viable. Using a diamond drill rig, long vertical sections of core can be extracted from deep in the ground, which can then be analysed at the surface by geologists.
The core can then be analysed using a wide range of petrologic, structural and mineralogical techniques to determine whether the potential mining site is economically viable.

Extracted core is first washed and macroscopic features are logged by an exploration geologist. The core is then cut and representative samples are sent for chemical analysis (AZOMining, 2012).

Pros & Cons of the alternative Diamond Core Drilling

Advantages	Disadvantages
Highly accurate cutting	Drill bits are often not very big and they are mostly able to cut through only stone, rock and cement.
A reduced risk of inadvertently causing structural damage	There is a powerful kick back from the machinery so caution needs to be applied when using diamond core drilling.
Less debris is produced	While dust will not accumulate in large quantities some dust is likely to go into the drilling machine which can have an effect on its functioning and effectiveness.
Suitable for just about any working environment	
Very little noise and no dust	
Equipment is lightweight and portable	
Can be done remotely which limits the safety hazards.	
Drill to great depth	

Percussion rotary air blast (RAB)

Percussion rotary air blast drilling is a commonly used drilling technique used for exploratory drilling i.e. when minerals are being searched for. Percussion rotary air blast drilling is also often used for water bore drilling and blasthole drilling of mines.

This drilling technique makes use of pneumatic pressure to drive the steel drill bit into the ground in order to create a hole. It is a hammer like process that is easily able to penetrate rock in order to find mineral and ore deposits. The drill bits used are hollow. The debris which results from the **drilling process** shoots out of the earth and lands next to the machine. The unwanted material will land on the surface, next to the machine, by the use of air compression that is forced into the mine shaft. This is method of drilling is not always the best method to use when it comes to exploratory drilling as the materials to be sampled can be damaged when the materials are blasted from the earth. The percussion rotary air blast drilling procedure can usually be completed within a day.

Percussion rotary air blast drilling is the perfect method to be used when the exploratory drilling needs to be done on hard material such as rock. The percussion rotary air blast drilling method can penetrate up to 25 metres. If a mining company simply wants to have a small sample of the product which they are mining, then this method is simple and cost effective to be use. When there is a rock layer sitting on top of the soil which needs to be analysed for mineral presence, percussion rotary air blast drilling can be used to break away the top layer of rock so that the underneath soil can be explored.

Pros & Cons of the alternative Percussion rotary air blast (RAB)**:**

Advantages	Disadvantages
Can be completed very quickly and easily through almost every different type of rock, this is the biggest advantage to percussion rotary air blast drilling.	The biggest disadvantages to percussion rotary air blast drilling are that for the effective use of the machinery, an experienced operator needs to be employed and while the machine can break through almost all types of rock, it cannot break through rock which is reinforced by steel.
Simple to operate and maintain	Slow, compared with other methds
Suitable for a wide variety of rock	Equipment can be heavy
Operation is possible above and below the water-table	Problems can occur with unstable rock formations.
Possible to drill to considerable depths	Water is needed for dry holes to help remove currinsgs.

According to the PWP (**Appendix 9**) the Percussion drilling methods will be used.

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.

Advertisement and Notices

1. **Newspaper advertisement**

An advertisement was placed in English in the local newspaper (**Overvaal**) on **22 November 2019** (see **Appendix 6**) notifying the public of the EIA process and requesting Interested and Affected Parties (I&APs) to register with, and submit their comments to Milnex CC. I&APs were given the opportunity to raise comments within 30 days of the advertisement.

2. **Site notices**

Site notices was placed (as anticipated on the coordinates below) on site in English to inform surrounding communities and immediately adjacent landowners of the proposed development. I&APs will be given the opportunity to raise comments. Photographic evidence of the site notices will be included in **Appendix 6**. Below are the coordinates where the site notices were placed.

3. **Direct notification and circulation of Basic Assessment Report to identified Landowners, Surrounding landowners, Occupiers and Stakeholders.**

Identified I&APs, including key Stakeholders representing various sectors, Landowners, Surrounding landowners and Occupiers are directly informed of the proposed development and the availability of the **Basic Assessment Report** via registered post on **2 December 2019** and were requested to submit comments by **23 January 2020**. A copy of the report is also available at the Milnex offices in Schweizer-Reneke, 4 Botha Street, Schweizer-Reneke and Potchefstroom (Waterberry Street, Waterberry Square, 1st floor, Office 5B, Potchefstroom), between 7:30AM and 5PM, Monday to Friday. For a complete list of stakeholder details and for proof of registered post see **Appendix 6**. The consultees included:

Stakeholder has a second opportunity to comment on the proposed application and draft BAR & EMPr. Letter were posted via registered post on **09 July 2020** and stakeholder were requested to submit comments by **08 August 2020.** Email was also sent on **13 July 2020** and stakeholder were requested to submit comments by **13 August 2020.** Please see **Appendix 6** for proof of correspondence.

Stakeholders	Landowners	Surrounding Landowner
Department of Economic Development, Environment, Conservation and Tourism (DEDECT)	National Government of The Republic of South Africa Department of Rural Development and Land Reform Moduku Khwene	National Government of The Republic of South Africa Department of Rural Development and Land Reform Moduku Khwene
Department of Human Settlements, Water & Sanitation (DHSWS)	SA. Lombard Nature Reserve	Dabula Manzi Farmers Pty Ltd
Department of Agriculture and Rural Development (DARD)	North West Parks Board	Hendrik Stefanus de Kock
Provincial Heritage Resources Agency (PHRA) North West		Cadsa Inv Pty Ltd
Department of Community Safety and Transport Management		Andries Jacobus Bezuidenhout
Department of Public Works and Roads		Frans Jakobus Fourie
Department of Mineral Resources and Energy – North West (DMR)		Shaun Van Niekerk
Department of Agriculture Forestry, and Fisheries (DAFF)		Willem Jacobus van Jaarsveld
Department of Environment, Forestry, and Fisheries (DEFF)		Current owner: Riaan Steyn
Department of Environmental Compliance and Enforcement		Previous Owner: Ockert Cornelius Vermeulen
WESSA		Hendrina Sophia Claassens
Dr. Ruth Segomotsi Mompati District Municipality		Smartheid Ebenhaezer Karsten
Municipal Manager at the Lekwa-Teemane Local Municipality		V D M Landgoed Pty Ltd
Local Councillor at the Lekwa-Teemane Local Municipality		Abraham Jakobus Smit
Interested & Affected Party (I&AP)		Scholtz Bees Boerdery Pty Ltd
Heinrich Kleyn		
Mr. Van der Westhuizen		

It is expected from I&APs to provide their inputs and comments within 30 days after receipt of the notification or Basic Assessment Report. When the comment period ends, all comments received were included in the final Basic Assessment Report & EMP Report.

4. Consultation

The Public Meeting is scheduled for **15 January 2020 at 10:00am–11:00am** approximately 10km from Bloemhof next to the road at the coordinates mention below.

Coordinates
27°35'20.01"S
25°31'54.21"E

Directions to Public Meeting

- In Bloemhof head towards Schweizer-Reneke on the R34.
- Continue on the R34 for approximately 6km until reaching the Holfontein turnoff.
- Turn onto the Holfontein gravel road and drive for approximately 5km where the public meeting will be held

Figure 3: Directions to the public meeting

The public meeting is an opportunity to share information regarding the proposed development and provide I&APs with an opportunity to raise any issues and provide comments. The following key stakeholders and surrounding landowners were also directly informed of the public meeting via registered post **2 December 2019**.

Stakeholders	Landowners	Surrounding Landowner
Department of Economic Development, Environment, Conservation and Tourism (DEDECT)	National Government of The Republic of South Africa Department of Rural Development and Land Reform Moduku Khwene	National Government of The Republic of South Africa Department of Rural Development and Land Reform Moduku Khwene
Department of Human Settlements, Water & Sanitation (DHSWS)	SA. Lombard Nature Reserve	Dabula Manzi Farmers Pty Ltd
Department of Agriculture and Rural Development (DARD)		Hendrik Stefanus de Kock
Provincial Heritage Resources Agency (PHRA) North West		Cadsa Inv Pty Ltd
Department of Community Safety and Transport Management		Andries Jacobus Bezuidenhout
Department of Public Works and Roads		Frans Jakobus Fourie
Department of Mineral Resources and Energy – North West (DMR)		Shaun Van Niekerk
Department of Agriculture Forestry, and Fisheries (DAFF)		Willem Jacobus van Jaarsveld
Department of Environment, Forestry, and Fisheries (DEFF)		Current owner: Riaan Steyn

Department of Environmental Compliance and Enforcement		Previous Owner: Ockert Cornelius Vermeulen
WESSA (National Office)		Hendrina Sophia Claassens
North West Parks Board		Smartheid Ebenhaezer Karsten
Dr. Ruth Segomotsi Mompati District Municipality		V D M Landgoed Pty Ltd
Municipal Manager at the Lekwa-Teemane Local Municipality		Abraham Jakobus Smit
Local Councillor at the Lekwa-Teemane Local Municipality		Scholtz Bees Boerdery Pty Ltd
Interested & Affected Party (I&AP)		
Heinrich Kleyn		

5. Public Meeting

Please note that the Stakeholders & Interested and Affected Parties were informed about the proposed project with the use of press advertisement and registered letters.

Milnex representative Mr. Jason Chabalala and Mr. Hennie Kotze, attended the meeting.

The following I&APs also attended the meeting:

- Shaun van Niekerk
- Poena van der Merwe
- Brink Borman
- AJ Smit
- HN du Plessis
- HN du Plessis

Attached as **Appendix 6** is the attendance register and minutes of the meeting. Below area some of the concerns raised during the meeting.

The objections and-or concerns that were raised:

- Impact on water on adjacent properties
- Lack of rehabilitation by right holders where activities occur
- If blasting were to occur, the impact it might have on adjacent properties
- Impact of stock theft as a result of mining activities
- Impact of mining fleet on the road as well as impact of the resulted dust
- Biodiversity should be protected
- Historical flood plain should be protected.

6. Site visit

A site visit was conducted on 13 August 2020 at 10:00am. Ms. Lizanne Esterhuizen was accompanied by Mr. Phuti Makhoko and Mr. Godfrey Moshweu from North West Parks Board. Please see **Appendix 10** of the plates and signed attendance register.

7. Issues Raised by Interested and Affected Parties

Comments received were included in the comments and response table/form (See Appendix 6 for comments and response form).

iii) SUMMARY OF ISSUES RAISED BY I&APS

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

Interested and Affected Parties **List the names of persons consulted in this column, and Mark with an X where those who must be consulted were in fact consulted.**		**Issues raised**	**EAPs response to issues as mandated by the applicant**	**Section and paragraph reference in this report where the issue and or response where incorporated**
Organisation	**Contact person**			
Landowner				
	National Government of The Republic of South Africa Department of Rural Development and Land Reform Moduku Khwene			
	SA Lombard Nature Reserve Park Manager: Modisa Daniel Khukhele			
Panfontein RE/8/270; 17/270; 10/270; 9/270 & Boschpan 3/339		Email received on 14/02/2020 request that he be registered as I&AP	Email sent on 14/02/2020 confirms he is registered as an I&AP.	
	North West Parks Board Godfrey Moshweu		Email sent 13/07/2020 states the following: *"Please find attached a letter for your attention. The letter is a request that you please send us comments on the draft Basic Assessment Report & Environmental Management Programme (draft BAR & EMPr), for the below application:* *The proposed Prospecting Right application without bulk sampling for the prospecting of Diamonds (Alluvial) near Bloemhof on Portion 3 (portion 1) of the farm Boschpan 339, the Remaining Extent of Portion 8 (portion 1), Portion 9 (portion 1), Portion 10 (portion 1) and Portion 17 (portion 1) of the farm*	

			Panfontein 270, Registration Division: HO, North West province. DMR ref: NW30/5/1/1/2/12734PR *The dropbox link for project information (draft BAR & EMPr and Appendixes) is available in the letter attached."*	
	HP Nel	Email received 07/08/2020 with document attached. The email states the following: *"Please find attached the response from the North West Parks Board on the application for prospecting and bulk sampling in SALombard"* The document states the following: <u>*Introduction:*</u> *SA Lombard Nature Reserve is a nature reserve declared according to Administrator's Notice No. 62/1967. The reserve is a state-owned nature reserve and the North-West Parks Board is responsible for the conservation and tourism management on the reserve. The reserve is further managed in terms of the North-West Parks Board Act (Act 3 of 2015), which amongst others compels the Board to "initiate, develop, administer, manage and maintain protected areas, in the Province and to conserve and preserve wildlife sector in protected areas in the Province". The North-West Parks Board primary mandate remains the conservation of biodiversity in protected areas in the province.* *SALombard is the oldest nature reserve in the NWP, and amongst the oldest in the country. The reserve encloses veld types and habitat types which have been included in an area categorised as Critical Biodiversity Area II, implying an area which need to be maintained as there are features that are approaching their limits of irreplaceability. The Dry Western Grasslands has been transformed extensively throughout its range and one of the original objectives for the reserve was the conservation of this habitat The reserve was further instrumental in ensuring the survival of the Black Wildebeest in the then Transvaal, as the original herd of Black Wildebeest*	Email sent on 06/08/2020 states the following: *"Following our telephonic conversation please find attached the comments and response form. Please send us your comments before or on 13 August 2020."*	

		and last free ranging herd in the then Transvaal is still kept in the reserve. *<u>Land capability map</u>* *I assume the Land capability map refers to capability of land to support a specific land uses, in this case probably agriculture? The legend is not clear, but I would further assume that SALombard scored a 5 for its capability to sustain agricultural activities, mostly grazing I would assume* *<u>Public participation</u>* *The Board agreed with Milnex to meet with them on the 16th Jan 2020, and 3 x North West Parks Board officials showed up at:* *Date: 16th January 2020* *Time : 11h00* *Venue: SA Lombard Main Entrance (Next to Dog Unit)* *However, there were no other person present, including from Milnex. Upon enquiry, we were told the meeting was the previous day, on the 15th January 2020. Milnex was made aware of our meeting, and they agreed to meet with the Board separately. That meeting however never materialised, but the fact is that the Board as management authority over SALombard didn't attend the public meeting. We would obviously have had substantial input at the meeting.* *<u>DEA Screening tool and ecological maps</u>* *All the ecological maps emphasize the importance of the area from an ecological perspective. These maps also stress the sensitivity of the area, as well as the fact that it encloses areas classified as Critical Biodiversity Areas in terms of the North West Province Biodiversity Sector plan* *This is further supported by the High sensitivity values in some parts of the reserve assigned in the Animal species sensitivity map, the Aquatic Biodiversity values, the Archaeological value, the Terrestrial Biodiversity values, etc. which in itself should be raises red flag for considering a damaging activity such as mining.*		

		Rehabilitation plan *After consideration of the proposed rehabilitation plan, there can be doubt that the proposed prospecting and bulk sampling will have a severe negative impact on the ecological integrity of the reserve. It has been our experience in other reserves that irreplaceable damage is done to the biodiversity in an area following these mining practices. These practices entail open cast mining which require removal of the top-layers of the soil surface, and rehabilitation of these areas, no matter how well-planned, are at best superficial and decorative and will never address the fine scale dynamics amongst the various elements of the ecosystem which are important for the healthy functioning of systems and process within these grassland systems.* *Future management of SALombard* *The North West Parks Board further believes that the management of the wildlife resources within the reserve can yield more sustainable and long-term benefits to the region. The Board is in the process of aligning the management of SALombard to focus on the breeding of high value game species to support the transformation of the game industry. The Board also aims to improve income generation by focusing on sustained use of the wildlife resources and at the same time, improve the efficiency of the reserve to achieve its objectives.* *Conclusion* *The North West Parks Board therefore does not support this application and will oppose any future mining in the SALombard Nature Reserve.*		
		Email received 12/08/2020 states the following: *"Unfortunately I am not available for the next few days. I will need to check for the availability of Mr Moshweu, Mr Coetzee and Mr Mahloko. Alternatively we could consider a meeting next week Wednesday or Thursday"*	Email sent on 12/08/2020 by Werner Broodryk from Milnex CC states the following: *"We refer to our telephone conversation on the 11th day of August 2020.* *We acknowledge receipt of your email below with comments received. We will record the said comments in the report and will respond accordingly.*	

			We request for a site visit to be conducted by Me Esterhuizen and request confirmation if we can attend to conduct such site visit tomorrow, 13 August 2020. *Should the site visit take place, kindly provide us details for access to the property and/or contact details of the relevant person to assist us with gaining access to the site."*	
	Phuti Mahloko	Email received 12/08/2020 states the following: *"We hereby confirm site visit tommorrow at 10h00am at SA Lombard. Your requested to bring attendance register"*	Email sent 12/08/2020 states the following: *"See you tomorrow, I'll be leaving Potchefstroom at 7:30am to be sure I'm on time for our appointment at 10:00am"*	
		Email received 15/08/2020 with documents attached. The email states the following: *"As per our discussion during the site visit dated 13 August 2020. Find attached previous Mining Application under SA Lombard Nature Reserve."*	Document received at site visit on 13/08/2020, declares SA Lombard Nature Reserve a protected area listed in the schedule hereunder in terms of Section 23(1)(a)(i) of the National Environmental and Management: Protected Areas Act, 2003 (Act no. 57 of 2003) and assigned North West Parks Board as Management Authority in terms of Section 38(2)(a) of the Act. The document was signed on 29/05/2020.	
	Phuti Mahloko & Godfrey Moshweu	Email received on 17/08/2020 with the species list of S.A. Lombard Nature Reserve, attached.	Email sent 17/08/2020 states the following: *"Thank you for your emails and the documents.* *Please find attached the signed site visit attendance register.* *May you also forward the ecological report of SA Lombard Nature reserves as discussed on the day of the site visit."*	
			Email sent 24/08/2020 follows up on the email sent on 17/08/2020.	
			Email sent 18/09/2020 follows up on the email sent on 24/08/2020.	
	Wilfred Seitlhamo		Email sent 02/10/2020 states the following: *"My name is Lizanne and I work for Milnex CC Environmental Consultants.* *We are busy with an Environmental Impact Assessment BAR-process for a prospecting right without bulk sampling application which were submitted on certain portions of SA Lombard Nature*	

			Reserve, as you may be aware of. Please see the project description below. *The proposed Prospecting Right application without bulk sampling for the prospecting of Diamonds (Alluvial) near Bloemhof on Portion 3 (portion 1) of the farm Boschpan 339, the Remaining Extent of Portion 8 (portion 1), Portion 9 (portion 1), Portion 10 (portion 1) and Portion 17 (portion 1) of the farm Panfontein 270, Registration Division: HO, North West province. DMRE ref: NW30/5/1/1/2/12734PR* *On 13 August 2020 I went for a site visit at SA Lombard Nature Reserve with Phuti Mahloko and Godfrey Moshweu. At the site visit Phuti said he will send me the Ecological Status report of the reserve to include in the BAR document.* *After following up a few times via email and finally getting hold of him via telephone, he mentioned he is no longer working at North West Parks Board and that I should contact you for the Ecological Status report. I tried calling but unfortunately could not get hold of you. The lady at your office provided me with your email address.* *May you please assist us with this matter and send us the Ecological Status report of SA Lombard Nature Reserve."*	
			Email sent 05/10/2020 follows up on the email sent on 02/05/2020.	
Surrounding Landowners				
Panfontein 13/270 & Boschpan RE/339	National Government of The Republic of South Africa Department of Rural Development and Land Reform Moduku Khwene			
Panfontein 18/270 & RE/1/270	Dabula Manzi Farmers Pty Ltd			

Panfontein 14/270	Hendrik Stefanus de Kock			
Panfontein RE/3/270	Cadsa Inv Pty Ltd			
Bosmansfontein 6/333	Andries Jacobus Bezuidenhout			
Boschpan RE/1/339	Frans Jakobus Fourie			
Boschpan 19/339	Shaun van Niekerk			
Boschpan 20/339	Willem Jacobus van Jaarsveld			
Boschpan 7/339	Current owner: Riaan Steyn	Email received 06/01/2020 states he is the new owner of Boschpan Portion 6 and 7 and ask if his portions are involved?	Email sent on 07/01/2020 by Danie Labuschagne from Milnex CC states he is a surrounding landowner.	
	Previous Owner: Ockert Cornelius Vermeulen			
Boschpan 8/339	Hendrina Sophia Claassens			
Boschpan 9/339	Smartheid Ebenhaezer Karsten			
Boschpan 4/339 & 11/339	V D M Landgoed Pty Ltd			
Boschpan 12/339	Abraham Jakobus Smit	Email received on 07/01/2020 states please find attached the Comments and Response form. The form states comments will be provided at the public Meeting		
Kareefontein 7/340	Scholtz Bees Boerdery Pty Ltd			
Panfontein 16/270 & RE/7/270	H C Trust			
Gansvley 1/338	Stefanus David Jacobs			
Kareefontein 9/340	Genade Dal Trust			
Kareefontein 4/340	Frederich Wilhelm Alexander Magnus			
The Municipality in which jurisdiction the development is located				
Lekwa-Teemane Local Municipality	Municipal Manager: Ndoda Mgengo			

Municipal councilor of the ward in which the site is located				
Lekwa-Teemane Local Municipality, Ward 4	To whom it may concern			
Organs of state having jurisdiction				
Department of Economic Development, Environment, Conservation and Tourism (DEDECT)	Reaobaka Molusi	Email received on 03/12/2019 states the following: *"Please liaise with Mr Robert Nemanashi (018 299 6696) and/or Mrs Thembi Makuwa (018 299 6583) regarding this."*	Email sent 02/12/2019 request comments on the draft BAR & EMPr	
	Mr. L. Tshikovhi		Letter where posted to DEDECT via registered post on 02/12/2019 and 09/07/2020 informing them of the application and requesting comments.	
Department of Human Settlements, Water & Sanitation (DHSWS)	Mr. Abe Abrahams			
Department of Agriculture and Rural Development (DARD)	Head of Department Dr P Mokaila			
Provincial Heritage Resources Agency (PHRA) North West	Mr. Motlhabane Mosiane			
Department of Community Safety and Transport Management	Head of Department Ms B Mofokeng			
Department of Public Works and Roads (DPWR)	Head of Department: Mr P Mothupi			
Department of Mineral Resources and Energy– North West (DMRE)	Klerksdorp office		An amended EA-application was submitted to the DMRE office on 13/12/2019 to amend the activities applied for.	
	Chris Tshisevhe	Email received on 21/01/2020 with letter attached dated 17/12/2019 which acknowledges receipt of the application. The letter states the following: <u>Comment 2</u> a) Your EA application was triggered as the result of section 12 of the MPRDA (Act no.49 of 2008) as amended which reads thus "any person who wishes to apply to the		

		Minister for a prospecting right must simultaneously apply for an environmental authorisation". However, on your application you have listed activity 21 which is triggered by section 16 of the MPRDA (Act no.49 of 2008) as amended hence you EA application form must be amended. b) Your EA is also referring to Mining Permit whereas your application is for prospecting right. c) Your application has specified that you are applying for a prospecting right without bulk sampling, however, this is contradicted by the equipment (DMS flow sort and 16ft Washing Pan) listed on your application which suggest that you have an intension to conduct bulk sampling. <u>Comment 3</u> In order for this office to effectively consider your application, you are hereby requested to amend such application taking into consideration the comments specified on paragraph in 2 above and any other advices contained in this letter. <u>Comment 4</u> Accordingly, in light of the fact that your application has been lodged over the area covered by S.A. Lombard Nature Reserve this may prejudice the success of an application. <u>Comment 8</u> In case the prospecting right is accepted you will be required to consult with every organ of state that administers a law relating to a matter affecting the environment relevant to this application (BAR) as required in term of Regulation 7(2) of the EIA Regulations, 2014. The organ of state which must be consulted includes but is not limited to the Local and District Municipaliets, National DAFF, DEDECT, DWS and SAHRA and/or PHRA.		
	Mashudu Mukhese	Letter dated 03/09/2020 states that the application has been accepted. The letter also states the following: The applied area falls within the sensitive area (Lombard Game Reserve) and in terms of Section 48(1) of the Act, no prospecting right may be issued in respects of:		

		a) Land comprising a residential area b) Any public road, railway or cemetery c) Any land being used for public or government purposes or reserved in terms of any other law or d) Areas identified by the minister by notice in the Gazette in terms of section 9 of the Act. You are therefore requested in terms of section 29(a) read with section 48(2) of the Act to submit the following on or before the 22nd day of April 2020 thirty (30) working days: • Proof that the mineral resources can be developed sustainably • A detailed motivation to prove that it will be desirable for the minister to issue the prospecting right having regard to the sustainable development of the mineral resources involved and the national interest. This is subject to all other requirements of section 17(1) of the Act having been meet.		
	Phumudzo Nethwadzi		Email sent 26/03/2020 with letter attached concerning the nation wide lockdown.	
	Desmond Makamu		Email sent on 11/06/2020 with public participation plan attached. The email states the following: *"Please find the attached Public Participation Plan for applications which will be submitted or are already submitted by Milnex CC to your office. This plan was drafted as a requirement outlined by the directions gazetted by Minister of Forestry, Fisheries and Environment on 05/06/2020* *Your swift response will be highly appreciated"*	
		Email received 26/06/2020 *"Reference is hereby made to your letter dated 11 June 2020 and your plan has been noted.* *You are kindly being advise to undertake the Public Participation Process in accordance to the guidelines stipulated in the Government Gazette published by the*	Email sent 26/06/2020 follows up on the email sent on 11/06/2020.	

		Minister of Environment, Forestry and Fisheries on the 5 June 2020. *Your Public Participation Plan must be in accordance with annexure 3 of the said Government Gazette. At all times you are required to ensure that all reasonable measures are taken to identify potential I&APs for purpose of conducting public participation on the applications in respect of 3 cases indicated in your plan".*		
	Chris Tshisevhe		Email sent 13/08/2020 with letter attached requesting timeframe extension.	
			Email sent by Werner Broodryk from Milnex CC on 20/08/2020 with Section 48 application attached. The email states the following: *"We refer to the abovementioned matter and attach hereto the section 48 application for Xanado Trade or Invest (Pty) Ltd.* *Kindly inform us if we should also submit the said application to another department, within the DMRE.* *Kindly acknowledge receipt of the said application."*	
			Email sent 21/09/2020 follows up on the email sent 20/08/2020.	
		Email received 03/09/2020 with letter attached. The letter states that the timeframe extension is granted until 5 October 2020.		
Department of Agriculture Forestry, and Fisheries (DAFF)	Mr. Maurice Vukeya & Mrs Mpho Gumula			
Department of Environment, Forestry, and Fisheries (DEFF)	To whom it may concern			
Department of Environmental Compliance and Enforcement	To whom it may concern			

Department of Agriculture, Land Reform and Rural development (DALRRD)	Agnes Montwedi	Email received 30/01/2020 with two letters attached: <u>Fist letter – Boschpan 339</u> The department confirms that as at the date of this letter no land claims appears on their database in respect of the abovementioned property. This includes the database for claims lodged by 31 December 1998; and those lodged between 1 July 2014 and 27 July 2016 in terms of the Restitution of Land Rights Amendment Act, 2014. <u>Second letter – Panfontein 270</u> The department confirms that there is an existing land claim against Panfontein 270 HO. The claim was lodged under Lekwa Teemane Local Municipality within Dr. Ruth Segomotso Mompati District. The information reflects on the database of claims lodged between 1 July 2014 and 27 July 2016 in terms of the Restitution of Land Rights Amendment Act, pf 2014. The Constitutional Court ordered that the claims that were lodged between 1 July 2014 and 27 July 2016 are validly lodged, but it interdicted the Commission from processing those claims until the Commision has finalised the claims lodged by 31 December 1998 or until Parliament passes a new law providing for the re-opening of lodgement of land claims. Parliament was given until 27 Jyy 2018 to pass such a law. The Commission will therefore not be processing the above claims until it finishes claims lodged by 31 December 1998 or until Parliament passes a new law providing for re-opening of lodgement of claims. It is important to note that provisions of section 11(7) of the Restitution of Land Rights Act, 1994 do not apply until the Commission has accepted the claim for investigation and published its details in the Government Gazette. That will only be done once either event in the previous paragraph has been finalized.	Email sent 21/01/2020 is proof of land claims consultation.	
Other–				

Dr Ruth Segomotsi Mompati District Municipality	Municipal Manager: Mr Jerry Mononela			
WESSA	Johan Wesson	Email received 13/07/2020 acknowledges email.	Email sent 13/07/2020 states the following: *"Please find attached a letter for your attention. The letter is a request that you please send us comments on the draft Basic Assessment Report & Environmental Management Programme (draft BAR & EMPr), for the below application:* *The proposed Prospecting Right application without bulk sampling for the prospecting of Diamonds (Alluvial) near Bloemhof on Portion 3 (portion 1) of the farm Boschpan 339, the Remaining Extent of Portion 8 (portion 1), Portion 9 (portion 1), Portion 10 (portion 1) and Portion 17 (portion 1) of the farm Panfontein 270, Registration Division: HO, North West province. DMR ref: NW30/5/1/1/2/12734PR* *The dropbox link for project information (draft BAR & EMPr and Appendixes) is available in the letter attached."*	
South African Heritage Resources Agency (SAHRA)	Website		Proof of BAR & EMPr uploaded onto the SAHRA website for comments on 06/10/2020.	
I&AP	Heinrich Kleyn	Email received on 23/01/2020 with a photo of the site notice attached, states the following: *"I would like to lodge an appeal against the application for the prospecting rights and subsequent basic impact assessment to be carried out or to be approved. If you take a look at the impact that these miners left all around this same area in the district of Bloemhof it is shocking. No environmental repairs or recoveries has been done after they have finished mining an area. What guarantee have the people of Bloemhof got that everything will be returned to its original state after they finished with an area mining. This is a town that relies on tourism and the area that is going to be mined is right at one of South Africa oldest nature reserves with a research facility that is wonder by wonder still operating and bringing in tourists to the area!*	Email sent 23/01/2020 states the following: *"Thank you for sending us your objection, it will be included in the documents to be submitted to the Department of Mineral Resources and Energy (DMRE).* *Please note that you will be registered as an Interested and Affected Party (I&AP) to receive future correspondence with regards to this application.* *Hope you find the above in order."*	

		So please do not approve this application".		
I&AP	Mr. Van der Westhuizen		Email sent 09/01/2020 states the following: With reference to the telephonic conversation between Mr. Van der Westhuizen and Mr. Loubser and Mr Broodryk from Milnex CC on the 08 and 09 January 2020. Attached is a to illustrate the surrounding landowners of the application area. If there is any enquiries with regards to the map and/or the application he can contact Mr. Broodryk.	

iv) THE ENVIRONMENTAL ATTRIBUTES ASSOCIATED WITH THE SITES

Baseline Environment

The baseline environment is described with specific reference to geotechnical conditions, ecological habitat and landscape features, Soil, land capability and agricultural potential, climate and the visual landscape.

Type of environment affected by the proposed activity.

(its current geographical, physical, biological, socio- economic, and cultural character).

Geology and Soils

Ra: Tholelitic and calk-alkaline basalt and andesite; tuff and pyroclastic breccia

Classification

The allanridge formation underlies the Bothaville Formation conformably but where the latter pinches out the Allanridge verstemps onto diverse older lithologies.

The formation consists mainly of two types of lava, i.e. a dark-green amygdaloidal lava and light green-grey porphyritic lava.

Mineralogy

The dark-green lava, which is by far the most prominent unit in the Allanridge formation, also constitutes the greater part of the Ventersdorp supergrouop in the area. The lava is fine to medium grained in texture and the plagioclase and augite in it have been replaced by secondary minerals, such as chlorite, eqidote, calcite sericite and uralite. The amygdales in the lava consist of quartz, chalcedony, calcite, chlorite or eqidote, or any combination of these minerals. Where more than one mineral makes up an amygdale, the minerals commonly form concetric zones.

Sedimentary Rocks

The sedimentary rocks of the Allanridge formation consist of a mixture of tuff, agglomerate and volcanic breccia occur interbedded with the lava towards the top of the formation.

Ecological habitat and landscape features

Vegetation

The result obtained by plotting the coordinates are as follow:

The proposed area falls within vegetation unit SVk 4, which is known as the Kimberley Thornveld. The Kimberly Thornveld is part of the Eastern Kalahari Bushveld Bioregion, which is a sub-bioregion for the Savanna Biome.

According to Mucina and Rutherford (2006:516), the Kimberley Thornveld vegetation covers the North West, Free State and Northern Cape Provinces: Most of the Kimberley, Hartswater, Bloemhof and Hoopstad Districts as well as substantial parts of the Warrenton, Christiana, Taung, Boshof and to some extent the Barkley West District. This thornveld is situated on an altitude of 1050m – 1400m.

The area often has slightly irregular plains with a well-developed tree layer with *Acacia Erioloba*, *A. tortillis, A. karoo* and *Boscia albitrunca* and a well-developed shrub layer with occasional dense stands of *Tarchonanthus camphoratus* and *A. mellifera*. Grass layer open with much uncovered soil.

Some other important Taxa found on in the area:

Tall Tree: *Acacia erioloba* (d).

Small Trees: *Acacia karroo* (d), *A mellifera* subsp. *detinens* (d), *A. tortilis* subsp. *heteracantha* (d), Rhus lancea.

Tall Shrubs: *Tarchonanthus camphoratus* (d), *Diospyros pallens*, *Ehretia rigida* subsp. *rigida, Euclea crispa* subsp. *ovato Grewia flava, Lycium arenicola, L. hirsutum, Rhus tridactyla.*

Low Shrubs: *Acacia hebeclada,* subsp. *hebclada* (d), *Anthospermum rigidum subsp. pumilum, Helichrysum zeyheri, Hermannia comosa, Lycium pilifolium, Melolobium microphyllum, Pavonia burchelli, Peliostomum leucorrhizum, Plinthus sericeus, Wahlenbergia nodosa.*

Succulent Shrubs: *Aloe hereroensis var. hereroensis, Lycium cinereum*

Graminoids: *Eragrotis lehmanniana* (d), *Aristida canescens, A. congesta, A. mollissima subsp. argentea, Cymbopogon pospischilli, Digitaria argyrograpta, D. eriantha subsp. eriantha, Enneapogon cenchroides, E. scoparius, Eragrostis rigidior, Heteropogon contortus, Themeda triandra.*

Herbs: *Barleria macrotegia, Dicoma schinzii, Harpagophytum* procumbens subsp. *procumbens, Helichrysum cerastioides, Hermbstaedtia odorata, Hibiscus marlothianus, Jamesbrittenia aurantiaca, Lippia scaberrima, Osteospermum muricatum, Vahlia capensis* subsp. *vulgaris.*

Succulent Herbs: *Aloe grandidentata, Piaranthus decipiens.*

Mucina and Rutherford (2006:517) also states that the conservation of this thornveld type, is Least Threatened with a target of 16%. Only 2% of this thornveld is statutorily conserved in Vaalbos National Park and in Sanveld, Bloemhof Dam and S.A. Lombard Nature Reserve. As much as 18% is already transformed, mostly by cultivation. Low erosion is associated with this type of thornveld. The area is mostly used for cattle farming or game ranching. Overgrazing leads to encroachment of *Acacia mellifera* subsp. *detinens*.

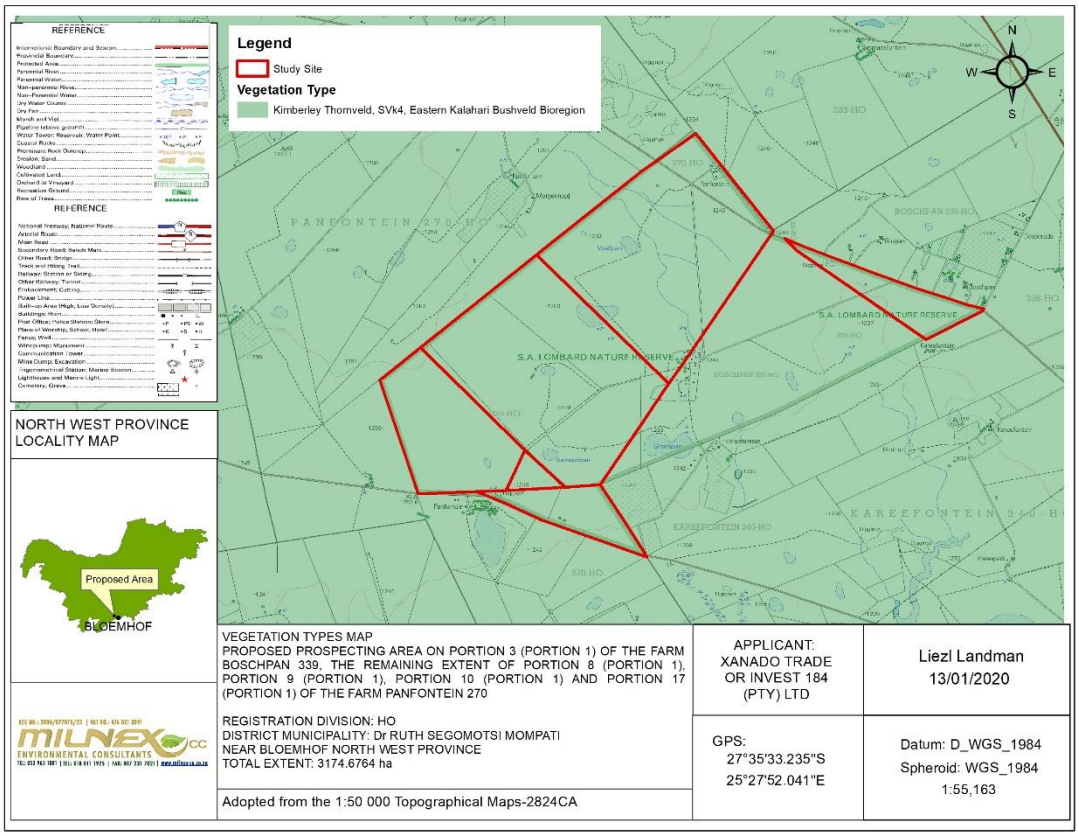

Figure 4: Vegetation types associated with the study site (Mucina & Rutherford 2006/2018).

According to HP Nel from NWPB the reserve encloses veld types and habitat types which have been included in an area categorised as Critical Biodiversity Area II, implying an area which need to be maintained as there are features that are approaching their limits of irreplaceability. The Dry Western Grasslands has been transformed extensively throughout its range and one of the original objectives for the reserve was the conservation of this habitat. Please see **Appendix 6.**

Map of relative Plant Species theme sensitivity according to the DEA Screening Tool. Please see **Appendix 7** for the colour map. According to the map the Relative Plant Species Theme Sensitivity is Medium and Low.

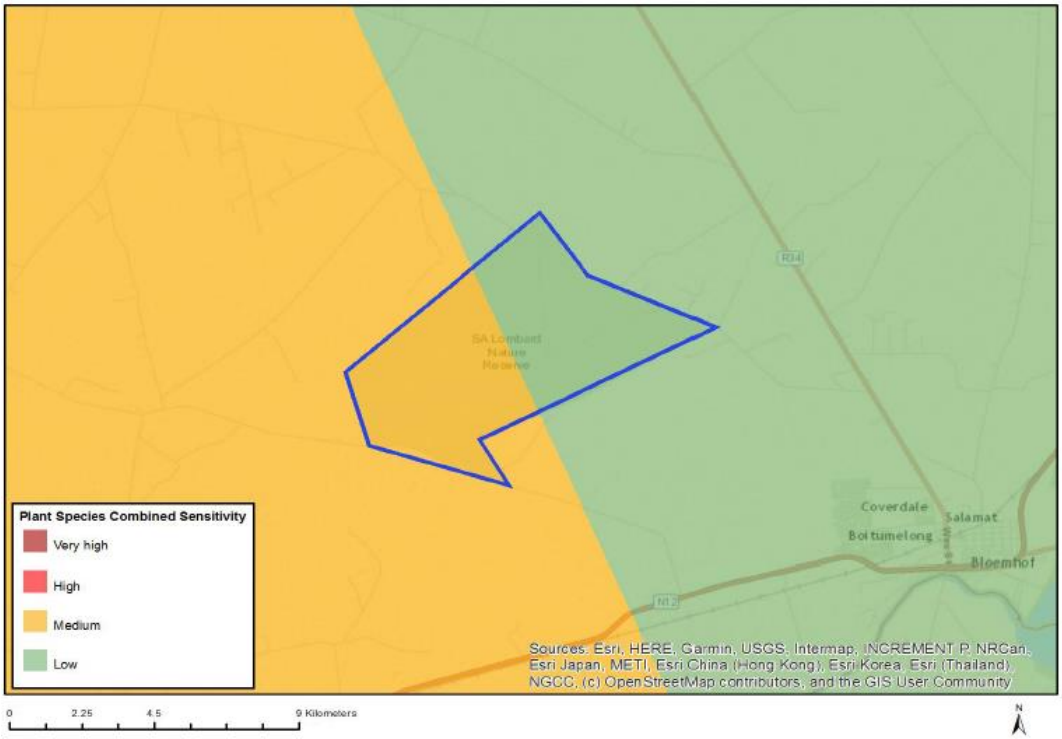

Figure 5: Plant Species Combined Sensitivity

Agricultural / land capability

Land capability is the combination of soil suitability and climate factors. The site and surrounds have a land capability classification, on the 8 category scale, of Class 5 (refer to Land capability map attached as Appendix 5.)

Refer to Land capability map attached as **Appendix 7 & figure 6 below.**

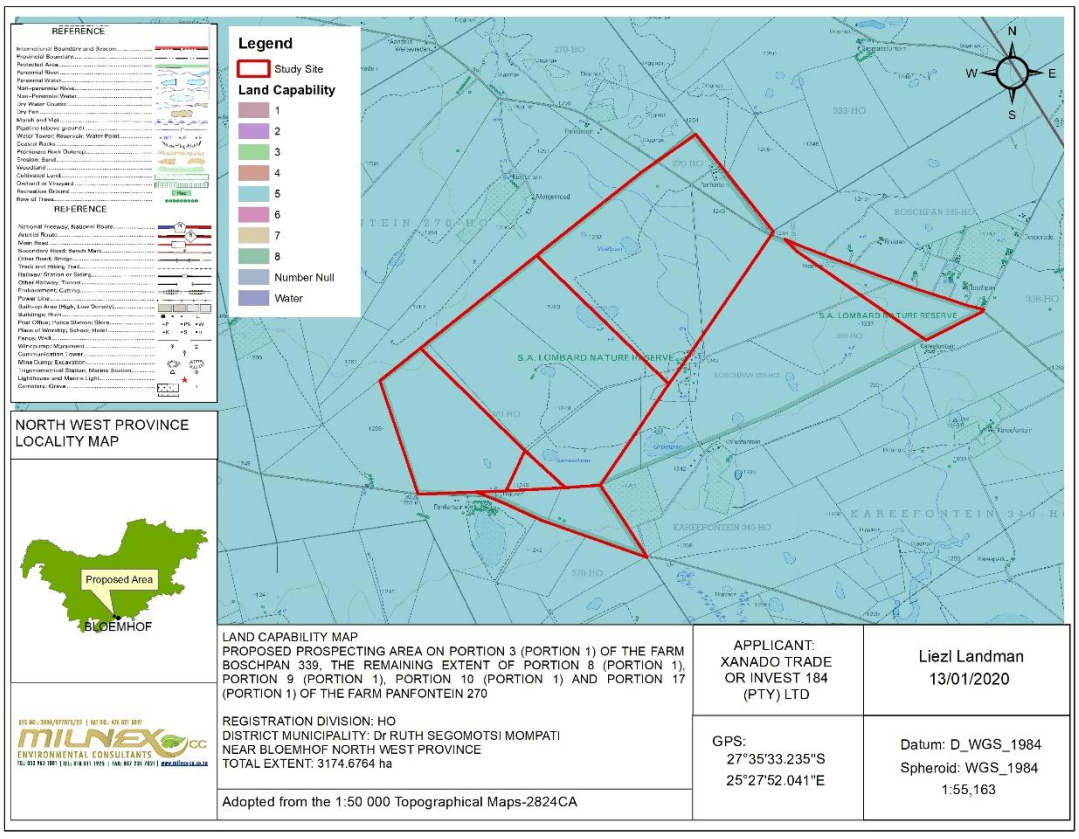

Figure 6: Land capability

Agriculture Theme Sensitivity

Map of relative Agriculture theme sensitivity according to the DEA Screening Tool, which illustrates the Agriculture Theme Sensitivity are high and medium, refer to **Figure 7** below.

Please see **Appendix 7** for the colour map.

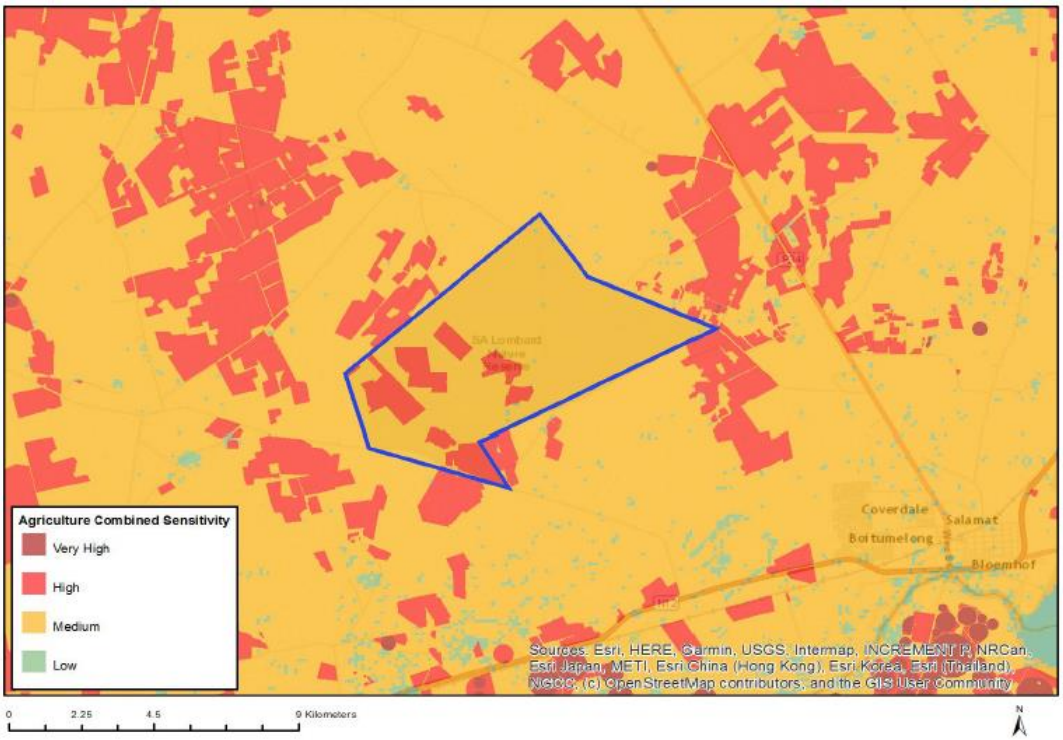

Figure 7: Agriculture Combined Sensitivity map

Threatened Ecosystems

Ecosystem threat status outlines the degree to which ecosystems are still intact or alternatively losing vital aspects of their structure, function and composition, on which their ability to provide ecosystem services ultimately depends (Driver et al. 2011). Datasets have been developed by SANBI (2016) in order to outline threatened ecosystems, with the primary objective of limiting the rate of ecosystem extinctions. Four established categories group these ecosystems namely: Critically Endangered (CR), Endangered (EN), Vulnerable (VU) and Protected.

According to **Figure 8**, the proposed area falls within the Kimberley Thornveld which falls within the least threatened Ecosystem status.

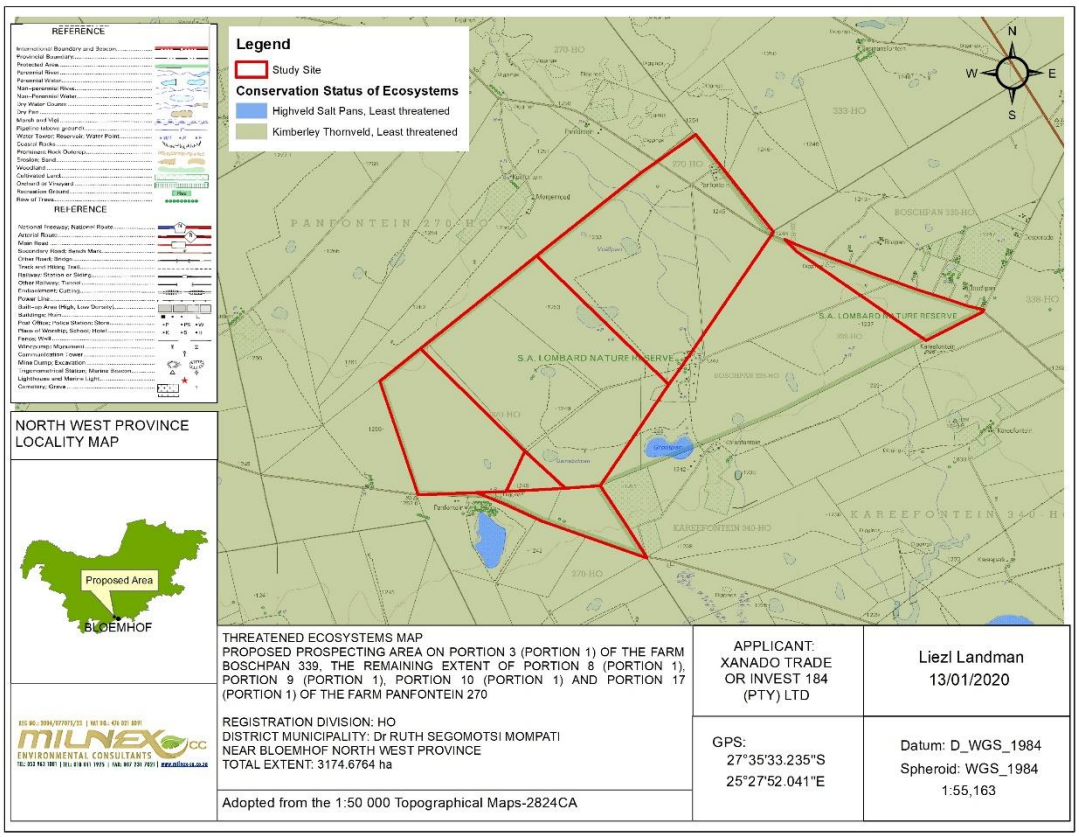

Figure 8: Threatened Ecosystems.

Protected Areas

Formally protected areas are protected either by national or provincial legislation. Based on the SANBI (2010) Protected Areas Map (**Figure 9**), the study site fall within the S.A. Lombard Nature Reserve and therefore do overlap with a formal protected area Therefore, the location of the study site is expected to have an impact on any formally protected areas.

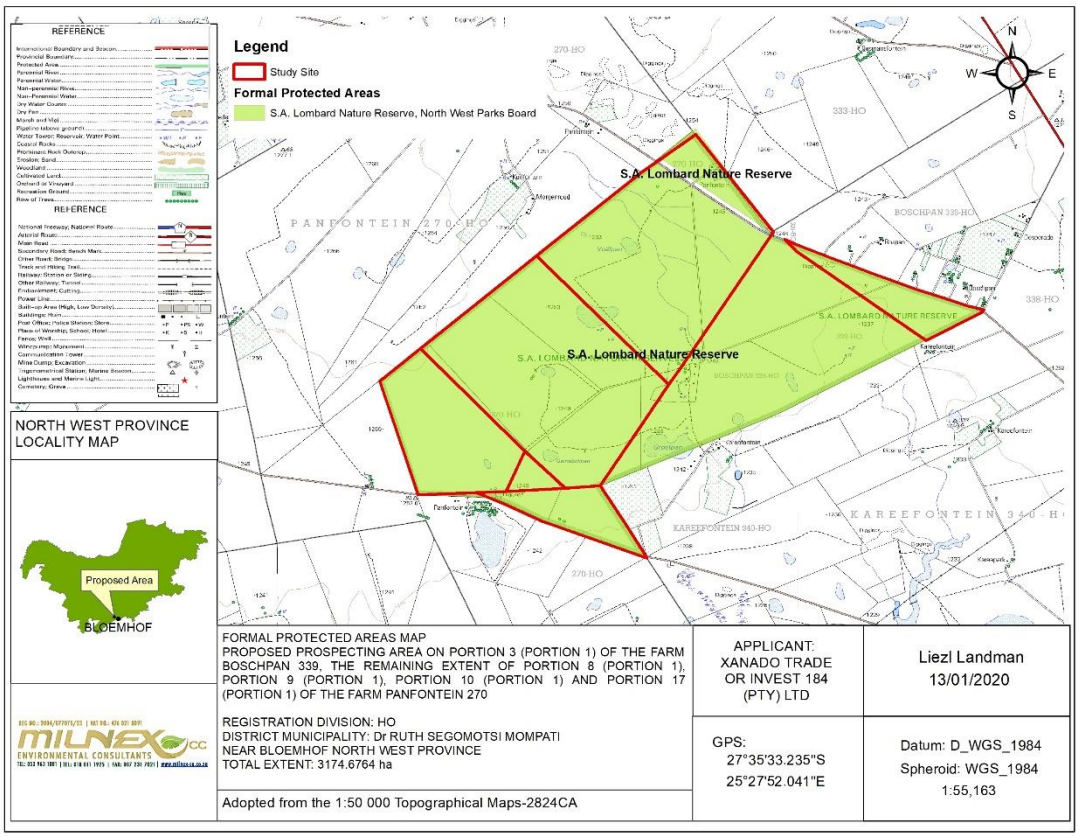

Figure 9: Protected areas.

According to a document received from NWPB at the site visit on 13/08/2020, SA Lombard Nature Reserve is declared a protected area listed in the schedule hereunder in terms of Section 23(1)(a)(i) of the National Environmental and Management: Protected Areas Act, 2003 (Act no. 57 of 2003). Please see **Appendix 6**.

Critical Biodiversity Area

Critical Biodiversity Areas (CBAs) are terrestrial and aquatic areas of high biodiversity value that need to be conserved and maintained in a natural or near-natural state to ensure the continued existence and functioning of species and ecosystems and the delivery of ecosystem services (MTPA, 2014). According to the National Environmental Management Act (NEMA) (Act no. 107 of 1998) certain activities have strict guidelines or are prohibited within CBAs and ESAs. Refer to the listed activities under the NEMA: Environmental Impact Assessment Regulations of 2014 (GNR 982) as promulgated in terms of the National Environmental Management Act (Act 107 of 1998) (NEMA) [as amended] for a comprehensive breakdown. The following terms are used to categorise the various land used types according to their biodiversity and environmental importance:

- Critical Biodiversity Area One (CBA1);
- Critical Biodiversity Area Two (CBA2);
- Ecological Support Area (ESA);
- Other Natural Areas (ONA); and
- Protected Area (PA).

The proposed area can be seen as a CBA area since it falls within a Nature Reserve and Protected Area, even though it is not illustrated on the map below (**Figure 10**).

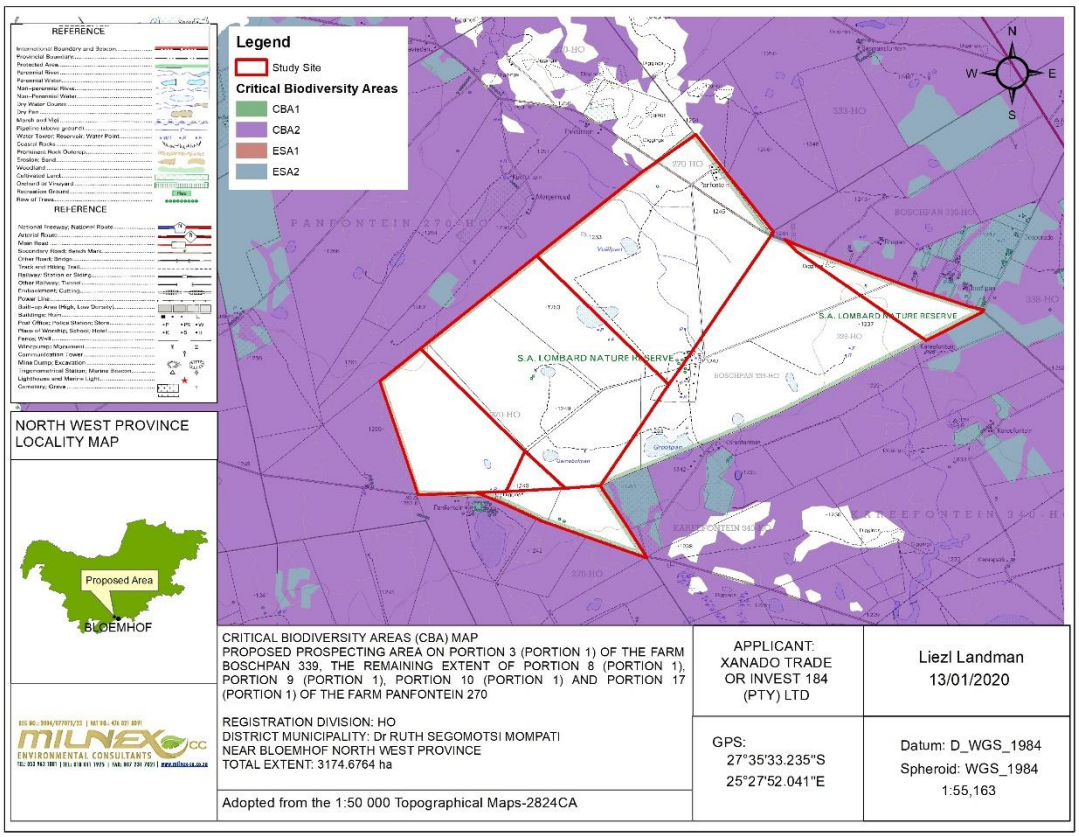

Figure 10: Critical Biodiversity Areas (CBAs) associated with the study site.

However, according to HP Nel from NWPB the reserve encloses veld types and habitat types which have been included in an area categorised as Critical Biodiversity Area II, implying an area which need to be maintained as there are features that are approaching their limits of irreplaceability. Please see **Appendix 6.**

The Aquatic Biodiversity Theme Sensitivity of the area is low, and some patches of the application area have a very high and low Aquatic Biodiversity Sensitivity as depicted on **Figure 11** below.

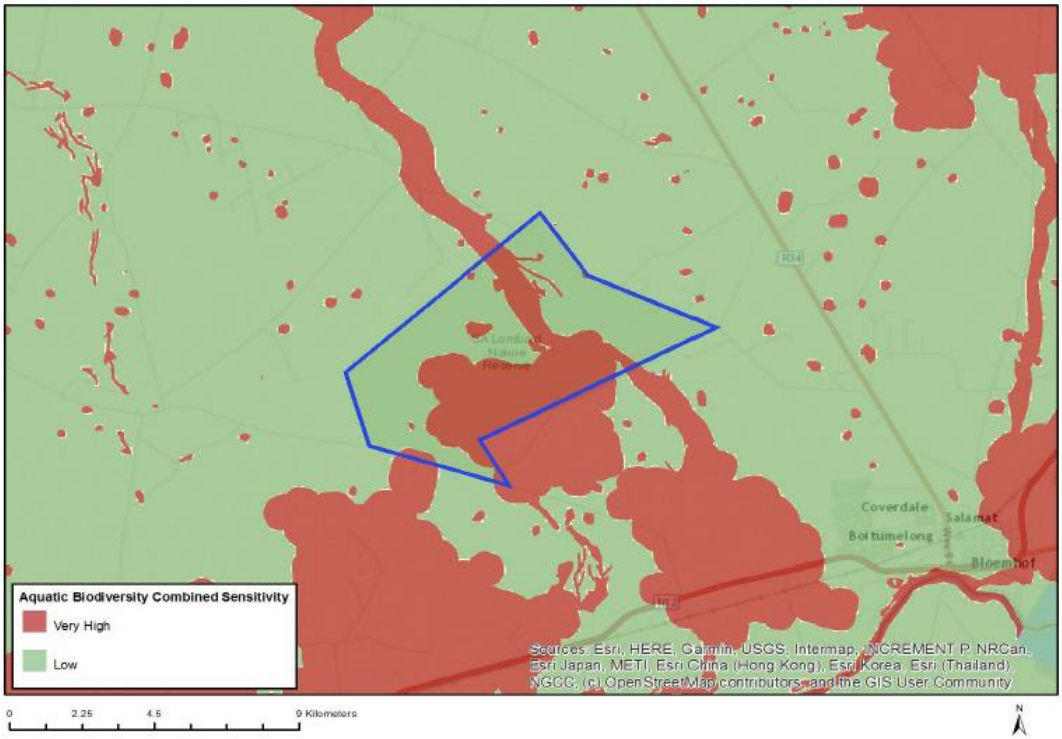

Figure 11: Aquatic Biodiversity Theme Sensitivity

According to the screening tool as implemented by DEA and attached as appendix 8, the application area is within a Low Terrestrial Biodiversity Theme Sensitivity (See **Figure 12**).

Figure 12: Terrestrial Biodiversity Theme Sensitivity

Map of relative Animal Species theme sensitivity according to the DEA Screening Tool, which illustrates the Animal Species theme sensitivity is mostly low and a smaller area medium and high. Please see **Appendix 7** for the colour map

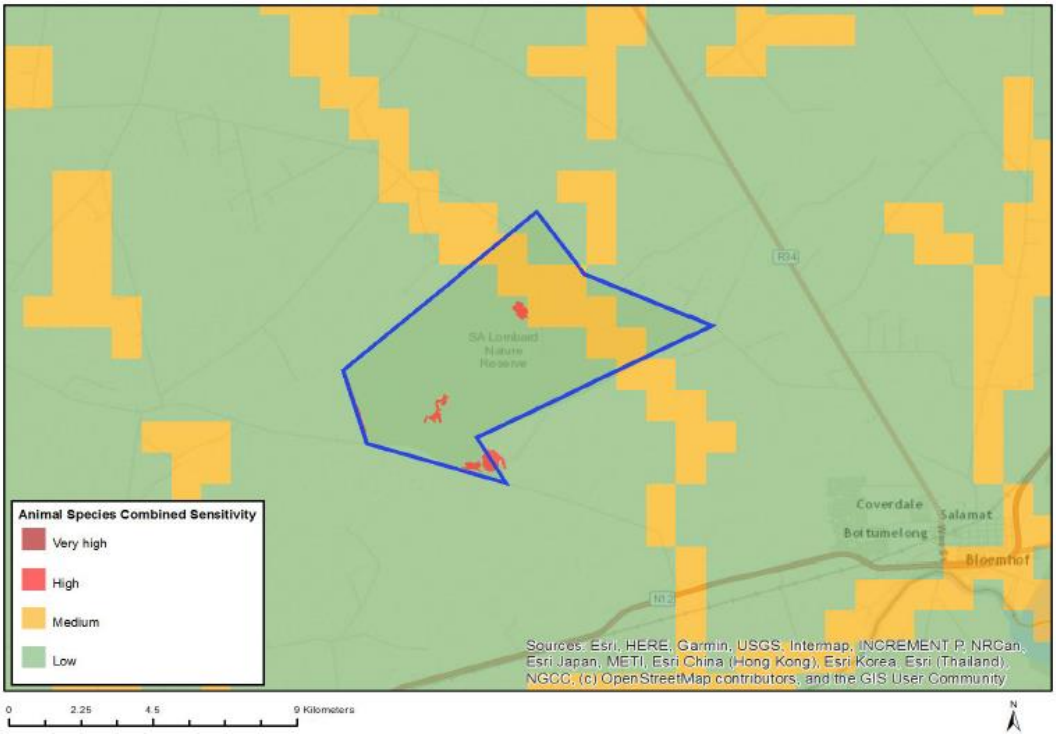

Figure 13: Animal Species theme sensitivity

Biodiversity Priority Areas for Mining

The Mining and Biodiversity Guideline was developed in 2013 for the purpose of mainstreaming biodiversity management practices into the mining sector (DEA, DMR, Chamber of Mines, SAMBF & SANBI 2013). This Guideline provides explicit direction in terms of where mining-related impacts are legally prohibited, where biodiversity priority areas may present high risks for mining projects, and where biodiversity may limit the potential for mining. The Guideline distinguishes between four categories of biodiversity priority areas in relation to their importance from a biodiversity and ecosystem service perspective as well as the implications for mining in these areas (**Table 2**).

Table: Four categories of biodiversity priority areas in relation to their biodiversity importance and implications for mining.

Category	Biodiversity Priority Areas	Risks for Mining	Implications for Mining
A. Legally Protected	• Protected areas (including National Parks, Nature Reserves, World Heritage Sites, Protected Environments, Nature Reserves) • Areas declared under Section 49 of the Mineral and Petroleum Resources Development Act (No. 28 of 2002)	**Mining Prohibited**	Mining projects cannot commence as mining is legally prohibited. Although mining is prohibited in Protected Areas, it may be allowed in Protected Environments if both the Minister of Mineral Resources and Minister of Environmental Affairs approve it. In cases where mining activities were conducted lawfully in protected areas before Section 48 of the Protected Areas Act (No. 57 of 2003) came into effect, the Minister of Environmental Affairs may, after consulting with the Minister of Mineral Resources, allow such mining activities to continue, subject to

			prescribed conditions that reduce environmental impacts.
B. Highest Biodiversity Importance	• Critically endangered and endangered ecosystems • Critical Biodiversity Areas (or equivalent areas) from provincial spatial biodiversity plans • River and wetland Freshwater Ecosystem Priority Areas (FEPAs) and a 1km buffer around these FEPAs • Ramsar Sites	**Highest Risk for Mining**	Environmental screening, environmental impact assessment (EIA) and their associated biodiversity specialist studies should focus on confirming the presence and significance of these biodiversity features, and to provide site-specific basis on which to apply the mitigation hierarchy to inform regulatory decision-making for mining, water use licences, and environmental authorisations. If they are confirmed, the likelihood of a fatal flaw for new mining projects is very high because of the significance of the biodiversity features in these areas and the associated ecosystem services. These areas are viewed as necessary to ensure protection of biodiversity, environmental sustainability, and human well-being. An EIA should include the strategic assessment of optimum, sustainable land use for an area and will determine the significance of the impact on biodiversity. This assessment should fully consider the environmental sensitivity of the area, the overall environmental and socio-economic costs and benefits of mining, as well as the potential strategic importance of the minerals to the country. Authorisations may well not be granted. If granted, the authorisation may set limits on allowed activities and impacts and may specify biodiversity offsets that would be written into licence agreements and/or authorisations.
C. High Biodiversity Importance	• Protected area buffers (including buffers around National Parks, World Heritage Sites* and Nature Reserves) • Transfrontier Conservation Areas (remaining areas outside of formally proclaimed protected areas) • Other identified priorities from provincial spatial biodiversity plans • High water yield areas • Coastal Protection Zone • Estuarine functional zone *Note that the status of buffer areas of World Heritage Sites is subject to a current intra-governmental process	**High Risk for Mining**	These areas are important for conserving biodiversity, for supporting or buffering other biodiversity priority areas, and for maintaining important ecosystem services for communities or the country. An EIA should include an assessment of optimum, sustainable land use for an area and will determine the significance of the impact on biodiversity. Mining options may be limited in these areas, and limitations for mining projects are possible. Authorisations may set limits and specify biodiversity offsets that would be written into licence agreements and/or authorisations.

D. Moderate Biodiversity Importance	• Ecological support areas • Vulnerable ecosystems • Focus areas for protected area expansion (land-based and offshore protection)	**Moderate Risk for Mining**	These areas are of moderate biodiversity value. EIAs and their associated specialist studies should focus on confirming the presence and significance of these biodiversity features, identifying features (e.g. threatened (land-based and offshore protection) species) not included in the existing datasets, and on providing site-specific information to guide the application of the mitigation hierarchy. Authorisations may set limits and specify biodiversity offsets that would be written into licence agreements and/or authorisations.

Based on **Figure 14,** the proposed area overlaps with Category A, Legally Protected, and therefore Mining is prohibited.

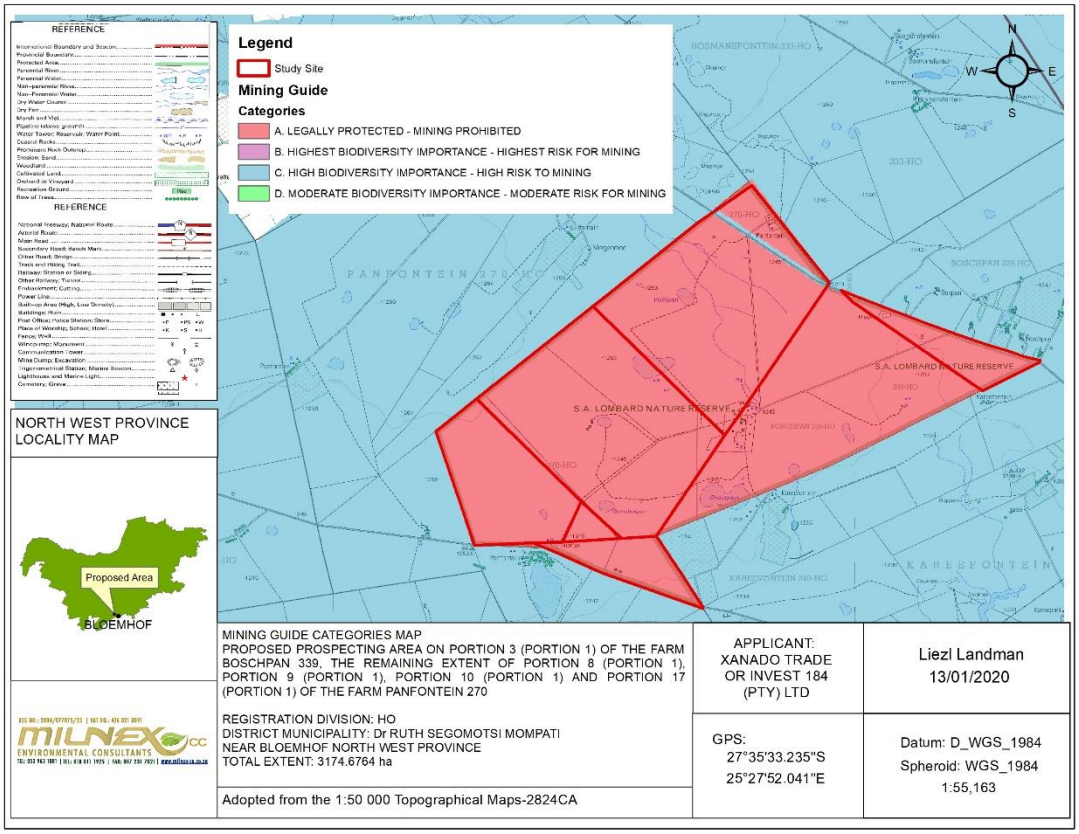

Figure 14: Biodiversity priority areas, in accordance with the Mining of Biodiversity Guidelines, associated with the study site.

Wetland Areas

In terms of Section 1 of the National Water Act (No. 36 of 1998) (NWA), wetlands are legally defined as: "*land which is transitional between terrestrial and aquatic systems where the water table is usually at or near the surface, or the land is periodically covered with shallow water, and which land in normal circumstances supports or would support vegetation typically adapted to life in saturated soil*" (NWA 1998).

Wetlands are defined by the presence of unique soils and vegetation that do not occur in terrestrial and purely aquatic environments (Edwards *et al.* 2018). Wetland soils are referred to as hydric soils that develop under anaerobic conditions

(condition where oxygen is virtually absent from the soil). Wetlands are also typically characterized by relatively large and dense stands of plants sticking out of shallow water or wet soil. Plants adapted to such waterlogged conditions are referred to as hydrophytes. Wetlands are distinct from true aquatic ecosystems like river ecosystems, which are characterized by fast flowing water within channels, and lake ecosystems, that are flooded to great depth; both of which are not primarily characterized by the occurrence of hydric soils and hydrophytes.

A wide variety of wetland types are present in South Africa, and can be classified into six broad types, namely floodplain wetlands, unchannelled valley bottom wetlands, channelled valley bottom wetlands, seeps, depressions and wetland flats. Owing to the large variations in climate and topography across South Africa, vegetation and habitat associated with these wetland types vary tremendously from subtropical reed beds and tall swamp forests to arid salt pans, which all support unique and varied animal life.

Figure 15 illustrates all wetland types associated with the study site. On the proposed area there are Depressions, a Valleyhead seep and a Flat wetland. The wetland vegetation forms part of the Eastern Kalahari Bushveld Group 3 (**Figure 16**).

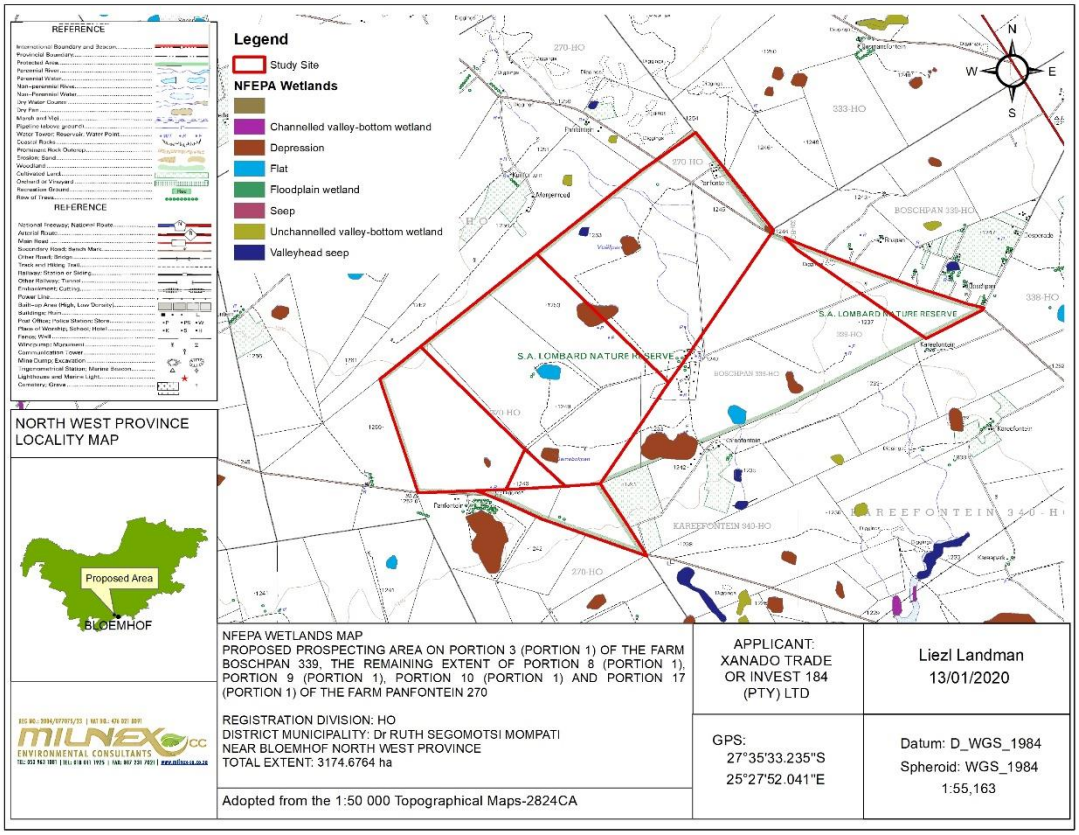

Figure 15: Wetland types located within or near the study site.

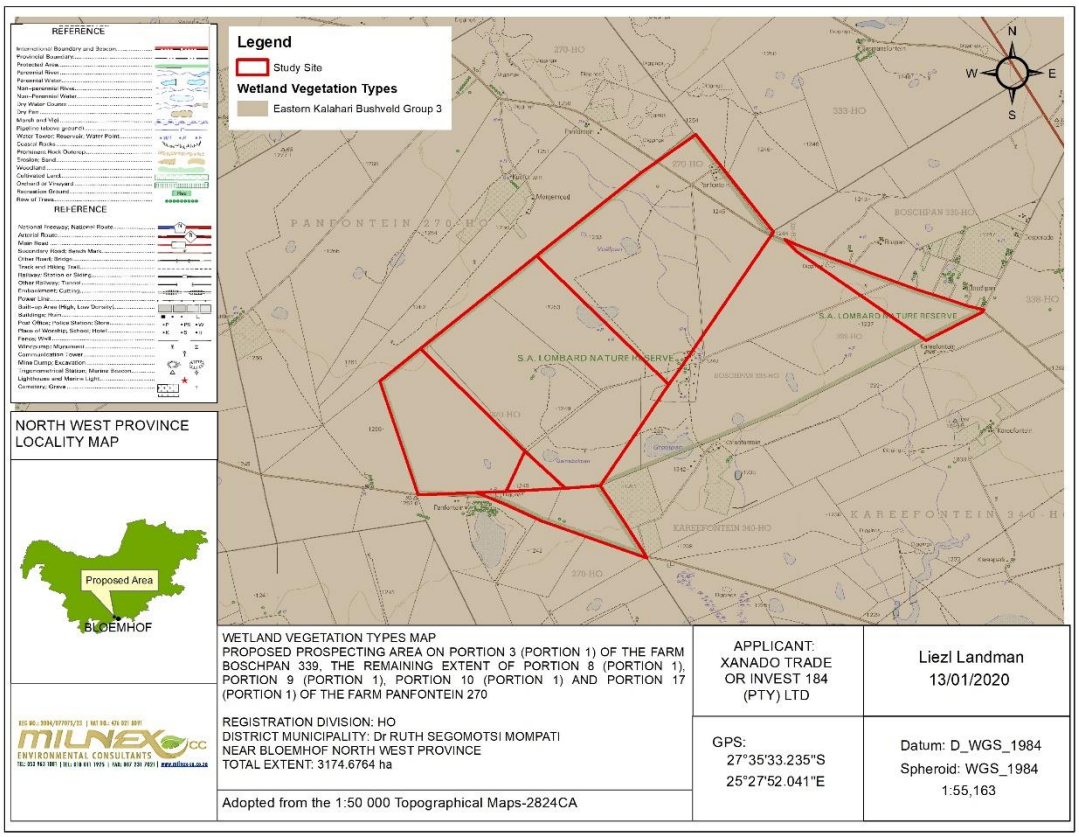

Figure 16: Wetland vegetation types associated with the study site.

Important Bird and Biodiversity Areas

Important Bird and Biodiversity Areas (IBAs) are a network of sites that are significant for the long-term viability of naturally occurring bird populations (Birdlife 2019). Many sites are also important for other forms of biodiversity; therefore, the conservation of Important Bird & Biodiversity Areas ensures the survival of a correspondingly large number of other animals and plants.

No IBAs were identified within the vicinity of the study site (**Figure 17**).

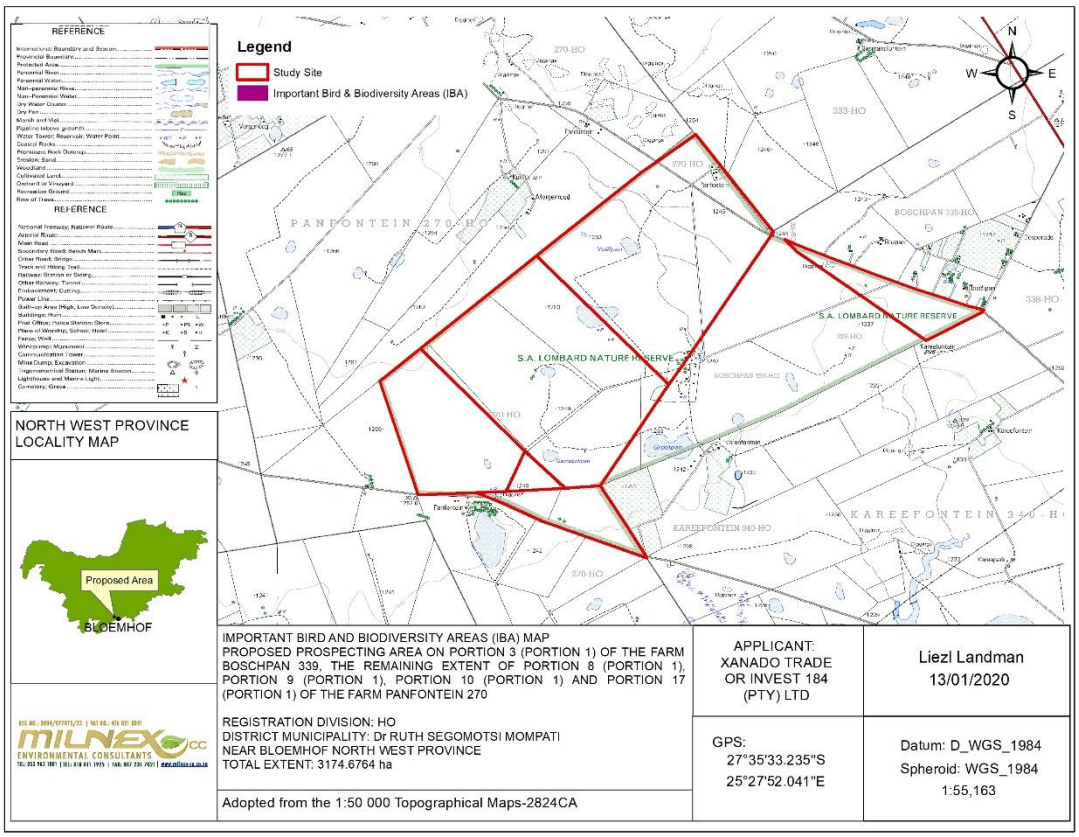

Figure 17: Important Bird and Biodiversity Areas associated with the study site.

Land capability and agricultural potential

- Climate and water availability

Lekwa - Teemane LM normally receives about 344mm of rain per year, with most rainfall occurring mainly during mid-summer. It receives the lowest rainfall (0mm) in June and the highest (70mm) in January. The monthly distribution of average daily maximum temperatures shows that the average midday temperatures for Lekwa- Teemane LM range from 19°C in June to 32.9°C in January. The municipal area is the coldest during June when the temperature drops to 0°C on average at night.

The municipal area is semi-arid, with occasional hail and frost. The area receives variable rain with scattered thunder storms and flooding. During hot summers there is high evaporation and elevated temperature.

The area normally receives about 350mm of rain per year. A limited part of the geographical area adjacent to the eastern boundary has slightly higher rainfall averages between 340 to 344mm per year. The average rainfall per annum is being calculated at 450mm. Thunderstorms and hails do occur but are lower than the figures obtained for the Highveld region.

(Lekwa-Teemane Local Municipality "NW396" Integrated Development Plan 2017-2022)

Description of the socio-economic environment

Geographic Profile of the Municipality

Lekwa-Teemane Local Municipality (NW396) is approximately 3 681 km² in extent. This land mass makes up 7, 75% of the total area of the Dr Ruth S Mompati District Municipality area. The administrative centre of the municipality is in the rural area of Christiana. The other offices are located in Bloemhof. The major towns are Bloemhof and Christiana, which are predominantly farming towns, hence the major private-sector employers are farmers. Both of these towns can be described as

rural to semi-rural and spreads. Apart from these two rural towns, most of the residents live in villages and townships. Christiana and Bloemhof are about 60 km away from each other. The Christiana area is composed of Christiana town, Geluksoord Township, Christiana farms and the Utlwanang Township, whereas the Bloemhof area is composed of Bloemhof town, Bloemhof farms and the Coverdale Township, Salamat Township and Boitumelong Township.

With a total of 14 930 households, Lekwa-Teemane Local Municipality has the smallest population in the Dr RSM district. The average population density for Lekwa-Teemane Local Municipality has increased from 13, 5 people per km2 in 2001 to 14, 5 people per km2 in 2011. The municipality is divided into eight administration wards and has a total of 16 councillors (both ward councillors and PR councillors).

Population Size

Global insight 2016, records 58 536 as the total population of LekwaTeemane Local Municipality. This is 9.94% of the total population of Dr Ruth S Mompati District Municipality of about 500,365 people. Below diagram show estimated population within Lekwa - Teemane Local Municipality

Table 1: Global insight 2016 population estimates by Local Municipality

Population estimate 2016	Households total population
58 536	16 524

Global insight 2016

Population Groups

The Community Survey (2016) conducted by STATSA, depicts that Africans are in the majority and constitute about 45 538 people (81.3%) of the total population of Lekwa- Teemane LM). The Whites group is about 7951 (14.2%) of the total population of Lekwa-Teemane LM), Coloureds constitute 2408 (4.3%) of the total population of LekwaTeemane LM) and the total number of Asians is 128 (0.2%) of the total population of Lekwa-Teemane LM

Unemployment

According Global Insight 2016, the LTLM unemployment rate stands at 23.5%. This percentage is moderate and the municipality needs to continue to create job opportunities within Lekwa-Teemane. Programmes such as the EPWP and CWP needs to be increased. The high number of coloureds unemployed is a challenge as this could lead to social problems like crime, drug abuse and further depress the upliftment of the racial group in LTLMA. The table below depicts the different races unemploymentrate

Employment by sector

11 Agriculture and hunting	35 830
12 Forestry and logging	806
13 Fishing, operation of fish farms	305
21 Mining of coal and lignite	33
23 Mining of gold and uranium ore	1 692
24 Mining of metal ores	9 844
25-29 Other mining and quarrying (incl 22)	27 435
30 Food, beverages and tobacco products	122 126
31 Textiles, clothing and leather goods	348
32 Wood and wood products	3 846
33 Fuel, petroleum, chemical and rubber products	16 640
34 Other non-metallic mineral products	2 589
35 Metal products, machinery and household appliances	6 496
36 Electrical machinery and apparatus	176
37 Electronic, sound/vision, medical & other appliances	445
38 Transport equipment	1 922
39 Furniture and other items NEC and recycling	4 841
41 Electricity, gas, steam and hot water supply	5 695
42 Collection, purification and distribution of water	3 680
50 Construction	61 681
61 Wholesale and commission trade	71 329
62 Retail trade and repairs of goods	55 991
63 Sale and repairs of motor vehicles, sale of fuel	30 596
64 Hotels and restaurants	12 512
71-72 Land and Water transport	82 010
73-74 Air transport and transport supporting activities	322
75 Post and telecommunication	20 032
81-83 Finance and Insurance	78 252
84 Real estate activities	3 248
85-88 Other business activities	26 560
91 Public administration and defence activities	218 120
92 Education	129 557
93 Health and social work	70 902
94-99 Other service activities	104 622
Total Industries	1 210 484

Cultural and heritage aspects

According to HP Nel from NWPB SA Lombard Nature Reserve is the oldest nature reserve in the North West Province, and amongst the oldest in the country. The reserve was instrumental in ensuring the survival of the Black Wildebeest in the then Transvaal, as the original herd of Black Wildebeest and last free ranging herd in the then Transvaal is still kept in the reserve. Please see **Appendix 6.**

According to the map of relative Archaeological and Cultural Heritage Theme Sensitivity in the DEA Screening Report, the proposed area falls within high sensitivity. Please see map colour map under **Appendix 7.**

Two specialist studies were conducted a Palaeontological Desktop Assessment and a Phase 1 Heritage Impact Assessment. The finding of the studies is below Figure 18 and 19, and the reports are available under **Appendix 11**.

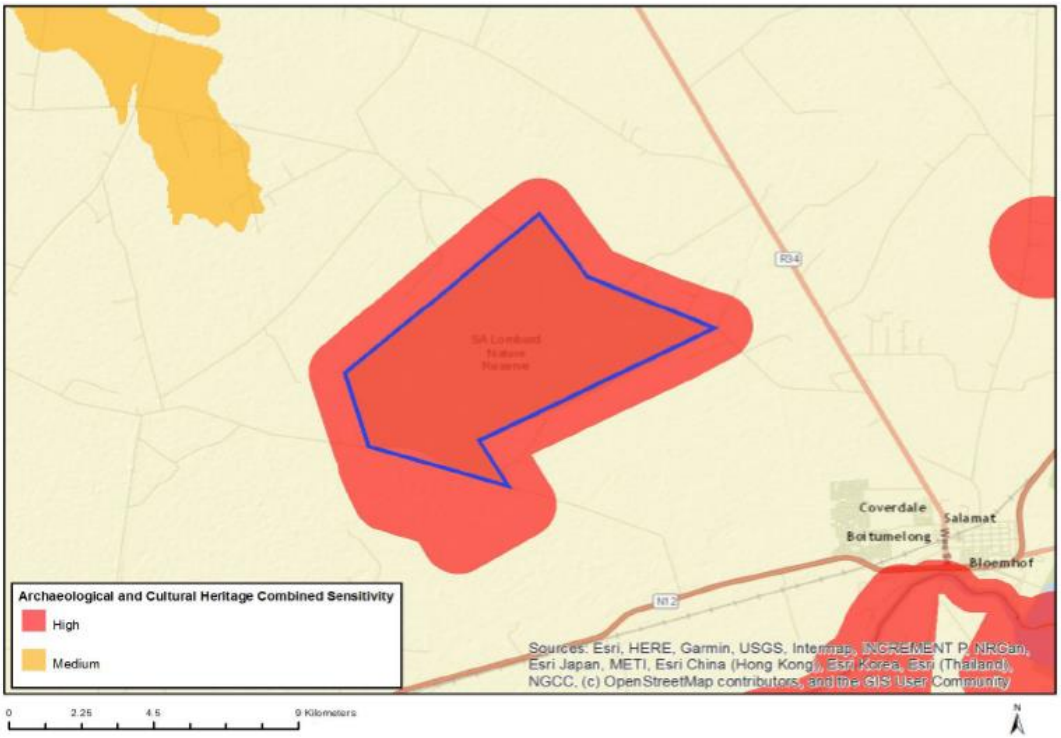

Figure 18: Archaeological and Cultural Heritage Combined Sensitivity

According to the map of relative Paleontology Theme Sensitivity in the DEA Screening Report, the proposed area falls within medium sensitivity and a small area in high. Please see map colour map under **Appendix 7.**

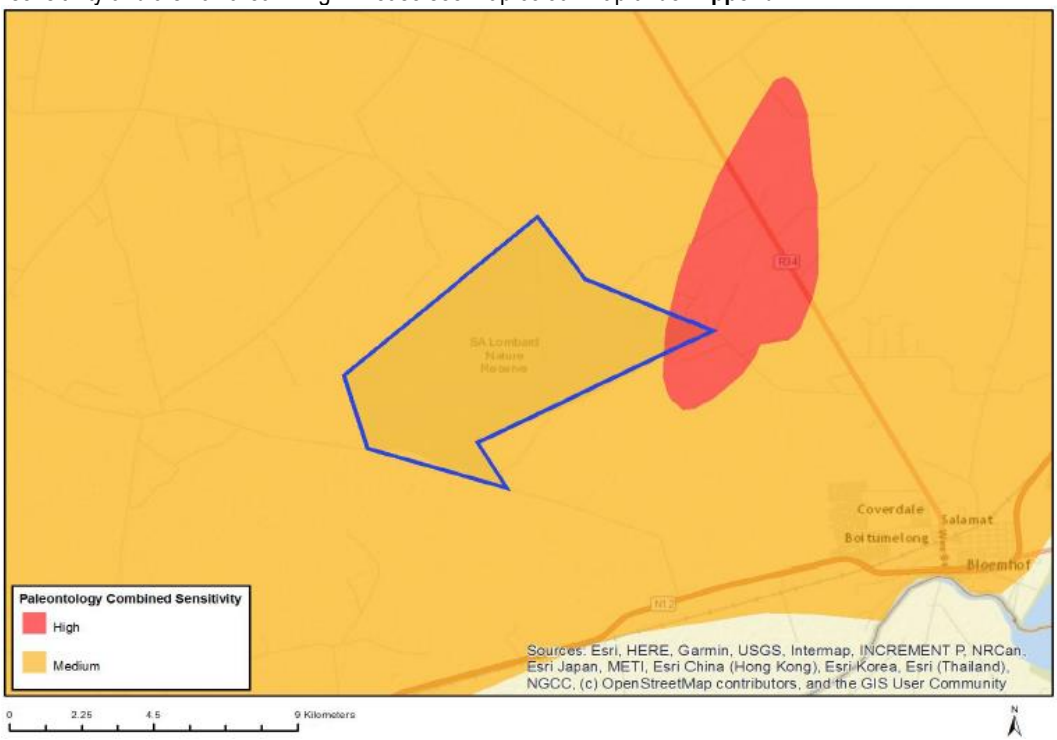

Figure 19: Relative Paleontology Theme Sensitivity

Two specialist studies were conducted a Palaeontological Desktop Assessment and a Phase 1 Heritage Impact Assessment. The finding of the studies is summarised below, and the reports are available under **Appendix 11**.

Palaeontological Desktop Assessment

Elize Butler from Banzai Environmental conducted the Palaeontological Desktop Assessment and made the following findings.

The Geological Map indicates that the development footprint is covered by Late Tertiary to Quaternary calcretes (T-Qc), the Allanridge Formation and the Rietgat Formation (Rr) (Ventersdorp Supergroup). According to the PalaeoMap of South African Heritage Resources Information System the Palaeontological Sensitivity of the Late Tertiary to Quaternary calcrete are locally High but the diversity of organisms are low, while that of the Allanridge Formation is Low and the Rietgat Formation has a moderate Palaeontological Sensitivity (Almond and Pether 2008, SAHRIS website).

The 2724 Christiana Geological Map indicates that the development footprint is covered by Late Tertiary to Quaternary calcretes (T-Qc), the Allanridge Formation and the Rietgat Formation (Rr) (Ventersdorp Supergroup). According to the PalaeoMap of South African Heritage Resources Information System the Palaeontological Sensitivity of the Late Tertiary to Quaternary calcrete are locally High but the diversity are low, while that of the Allanridge Formation is Low and the Rietgat Formation has a moderate Palaeontological Sensitivity (Almond and Pether 2008, SAHRIS website).

If fossil remains are discovered during any phase of construction, either on the surface or exposed by excavations the ***Chance Find Protocol*** *must be implemented by the Environmental Control Officer (ECO) in charge of these developments. The Chance find protocol provides guidelines that must be followed when a fossil is accidentally uncovered during any stage of construction. These discoveries ought to be protected (if possible, in situ) and the ECO must report to the South African Heritage Resources Association (SAHRA) (Contact details: SAHRA, 111 Harrington Street, Cape Town. PO Box 4637, Cape Town 8000, South Africa. Tel: 021 462 4502. Fax: +27 (0)21 462 4509. Web: www.sahra.org.za) so that correct mitigation (recording and collection) can be carried out by a palaeontologists.*

Preceding any collection of fossil material, the specialist would need to apply for a collection permit from SAHRA. Fossil material must be curated in an accredited collection (museum or university collection), while all fieldwork and reports should meet the minimum standards for palaeontological impact studies suggested by SAHRA.

Phase 1 Heritage Impact Assessment

The Phase 1 Heritage Impact Assessment was conducted by Dr. J A van Schalkwyk and the following findings were made.

The cultural landscape qualities of the region are made up of a pre-colonial element consisting of Stone Age and a much later colonial (farmer) component, which eventually gave rise to an urban component which manifest in a number of towns.

Identified sites

During the survey, the following sites, features or objects of cultural significance were identified.

- *7.1.1 Change finds: Stone Age artefacts, dating to the Middle Stone Age occur in low numbers along the rims of the various pans located in the project area. The tools are mostly made from hardened shale, although some are of quartzite. Typical tools include points and some side-struck tools.*

- *7.3.1 Informal burial site with approximately 12 graves. The graves are only marked with stone cairns and no headstones with inscriptions were identified. The graves probably belong to former farm labourers and date to the period prior to 1950 when the Nature Reserve was established.*

- *7.3.2 An unknown number of graves marked only with stone cairns. The remains of what seems to be the foundations of a number of rectangular structures also occur adjacent to the graves. A large excavation, either for diamond mining or a borrow pit, is located on the southern side. This site can possibly be linked to the old Panfontein farmstead, now located just on the outside of the nature reserve, across a regional road.*

Impact assessment and proposed mitigation measures

Impact analysis of cultural heritage resources under threat of the proposed prospecting activities is based on the present understanding of the project:

Site No.	Site type	NHRA category	Field rating	Impact rating: Before/After mitigation
7.1.1	Archaeological resources	Section 35	Generally protected 4C: Low significance - Requires no further recording before destruction.	Low (14) Low (14)
Mitigation: (5) No further action required				

Site No.	Site type	NHRA category	Field rating	Impact rating: Before/After mitigation
7.3.1	Graves, cemeteries and burial grounds	Section 36	Generally protected: High significance – Grade IV-A	Medium (48)
				Low (16)
7.3.2	Graves, cemeteries and burial grounds	Section 36	Generally protected: High significance – Grade IV-A	Low (30)
				Low (16)
Mitigation: (1) Avoidance/Preserve: This is viewed to be the primary form of mitigation and the site should be retained *in situ* and a buffer zone should be created around it, either temporary (by means of danger tape) or permanently (wire fence or built wall).				

Legal requirements

The legal requirements related to heritage specifically are specified in Section 3 of this report. For this proposed project, the assessment has determined that sites, features or objects of heritage significance occur in the project area.

- *If the identified graves are to be relocated for the purposes of the diamond prospecting activities, proper procedures must be followed after obtaining all the necessary permits – see Section 12.4.*
- *If heritage features are identified during construction, as stated in the management recommendation, these finds would have to be assessed by a specialist, after which a decision will be made regarding the application for relevant permits.*

Reasoned opinion as to whether the proposed activity should be authorised:

- *From a heritage point of view, it is recommended that the proposed prospecting activities be allowed to continue on acceptance of the mitigation measures and the conditions proposed below.*

Conditions for inclusion in the environmental authorisation:

- *The Palaeontological Sensitivity Map (https://sahris.sahra.org.za/map/palaeo) indicate that most of the eastern section of the project area has a high sensitivity of fossil remains to be found and therefore a desktop study is required. Based on the outcome of that, a field assessment is likely. The western section has a low sensitivity of fossil remains to be found and therefore no palaeontological assessment is required. However, a protocol for finds is required.*
- *Should archaeological sites or graves be exposed during construction work, it must immediately be reported to a heritage practitioner so that an investigation and evaluation of the finds can be made.*

Description of the current land uses.

According Land Use Map (**Figure 20**) the proposed area is mostly covered in Grassland and Low shrubland.

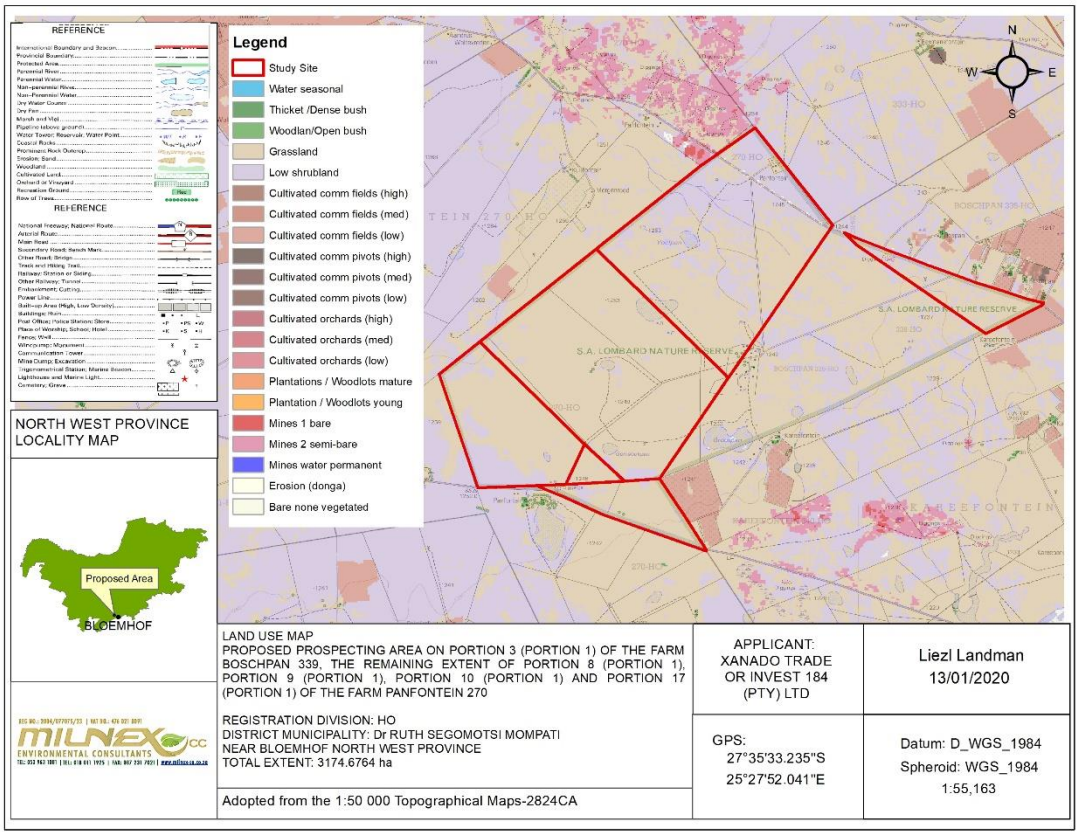

Figure 20: Current Land Use associated with the study site and surrounding areas.

v) IMPACTS AND RISKS IDENTIFIED INCLUDING THE NATURE, SIGNIFICANCE, CONSEQUENCE, EXTENT, DURATION AND PROBABILITY OF THE IMPACTS, INCLUDING THE DEGREE TO WHICH THESE IMPACTS -

(aa) can be reversed;
(bb) may cause irreplaceable loss of resources; and
(cc) can be avoided, managed or mitigated;

Significance of potential impacts

The following sections present the outcome of the significance rating exercise. The results suggest that the prospecting activities will have an impact on the natural vegetation and the agricultural activities, if not properly mitigated.

INITIAL CLEARANCE AND SITE PREPARATION PHASE

Direct impacts: During this phase minor negative impacts are foreseen over the short term. The latter refers to a period of weeks. The site preparation may result in the loss or fragmentation of indigenous natural fauna and flora, loss or fragmentation of habitats, soil erosion, hydrology, and temporary noise disturbance, generation of waste, visual intrusions, increase in heavy vehicle traffic, and risk to safety, livestock / game and farm / reserve infrastructure, and increased risk of veld fires. The abovementioned impacts are discussed in more detail below:

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

According to Mucina & Rutherford (2006:516) the proposed area falls within vegetation unit SVk 4, which is known as the Kimberley Thornveld. The Kimberly Thornveld is part of the Eastern Kalahari Bushveld Bioregion, which is a sub-bioregion for the Savanna Biome.

The Kimberley Thornveld vegetation covers the North West, Free State and Northern Cape Provinces: Most of the Kimberley, Hartswater, Bloemhof and Hoopstad Districts as well as substantial parts of the Warrenton, Christiana, Taung, Boshof and to some extent the Barkley West District. This thornveld is situated on an altitude of 1050m – 1400m.

Mucina and Rutherford (2006:517) also states that the conservation of this thornveld type, is Least Threatened with a target of 16%. Only 2% of this thornveld is statutorily conserved in Vaalbos National Park and in Sanveld, Bloemhof Dam and S.A. Lombard Nature Reserve. As much as 18% is already transformed, mostly by cultivation. Low erosion is associated with this type of thornveld. The area is mostly used for cattle farming or game ranching. Overgrazing leads to encroachment of Acacia mellifera subsp. detinens.

According to website of the North West Parks Board the S.A. Lombard Nature Reserve is an important breeding centre for plains animals, including springbok, black wildebeest, red hartebeest and zebra. The reserve conserves a small area of open Kalahari grassland on an unusual flood plain.

Loss or fragmentation of indigenous natural fauna and flora	Pre-mitigation impact rating	Post mitigation impact rating
Status (positive or negative)	Negative	Negative
Extent	Local/district (2)	Local/district (2)
Probability	Definite (4)	Probable (3)
Duration	Long term (3)	Medium term (2)
Magnitude	Very High (4)	High (3)
Reversibility	Barley reversible (3)	Partly reversible (2)
Irreplaceable loss of resources	Significant loss of resource (3)	Marginal loss of resource (2)
Cumulative impact	High cumulative impacts (4)	
Significance	**Negative high (76)**	**Negative high (45)**
Can impacts be mitigated?	If the development is approved, contractors must ensure that no mammalian species are disturbed, trapped, hunted or killed. If the	

	development is approved, every effort should be made to confine the footprint to the blocks allocated for the development and have the least possible edge effects on the surrounding area. The EMPr also provides numerous mitigation measures – refer to section (f) of the EMPr. The potential impacts associated with damage to and loss of farmland should be effectively mitigated. The aspects that should be covered include: • The site should be fenced off prior to commencement of construction activities; • The footprint associated with the construction related activities (access roads, construction platforms, workshop etc.) should be confined to the fenced off area and minimised where possible; • An Environmental Control Officer (ECO) should be appointed to monitor the establishment phase of the construction phase; • All areas disturbed by construction related activities, such as access roads on the site, construction platforms, workshop area etc., should be rehabilitated at the end of the construction phase; • The implementation of a rehabilitation programme should be included in the terms of reference for the contractor/s appointed. Specifications for the rehabilitation are provided throughout the EMPr – section (f) of the EMPr. • The implementation of the Rehabilitation Programme should be monitored by the ECO.

- Loss destruction or fragmentation of habitats –The proposed prospecting site is located on S.A. Lombard Nature Reserve. Fauna and Flora species will primarily be affected by the overall loss of habitat. Even though the prospecting right is without bulk sampling the impact will still be significant.

  According to website of the North West Parks Board the S.A. Lombard Nature Reserve is an important breeding centre for plains animals, including springbok, black wildebeest, red hartebeest and zebra. The reserve conserves a small area of open Kalahari grassland on an unusual flood plain.

Loss or fragmentation of habitats	Pre-mitigation impact rating	Post mitigation impact rating
Status (positive or negative)	Negative	Negative
Extent	Local/district (2)	Local/district (2)
Probability	Definite (4)	Probable (3)
Duration	Long term (3)	Medium term (2)
Magnitude	Very high (4)	High (3)
Reversibility	Barley reversible (3)	Partly reversible (2)
Irreplaceable loss of resources	Significant loss of resource (3)	Marginal loss of resource (2)
Cumulative impact	Medium cumulative impacts (3)	
Significance	**Negative high (72)**	**Negative high (42)**
Can impacts be mitigated?	Exotic and invasive plant species should not be allowed to establish, if the development is approved. Where exotic and invasive plant species are found at the site continuous eradication should take place. If the development is approved, every effort should be made to confine the footprint to the blocks allocated for development – section (f) of the EMPr also provides numerous mitigation measures related to fauna and flora.	

- Loss of topsoil –Topsoil may be lost due to poor topsoil management (burial, erosion, etc.). The effect will be the loss of soil fertility on disturbed areas after rehabilitation. This will result in potential grazing areas being lost. Even though this application

is only for a prospecting right without bulk sampling, (only drilling and pitting will take place) it will still affect the grazing areas of S.A. Lombard Nature Reserve.

Loss of topsoil	Pre-mitigation impact rating	Post mitigation impact rating
Status (positive or negative)	Negative	Negative
Geographical extent	Site (1)	Site (1)
Probability	Probable (3)	Possible (2)
Duration	Long term (3)	Medium term (2)
Magnitude	Medium (2)	Medium (2)
Reversibility	Partly reversible (2)	Completely reversible (1)
Irreplaceable loss of resources	Marginal loss of resource (2)	No loss of resource (1)
Cumulative impact	Medium cumulative impacts (3)	
Significance	**Negative medium (30)**	**Negative low (20)**
Can impacts be mitigated?	The following mitigation or management measures are provided: • If an activity will mechanically disturb below surface in any way, then any available topsoil should first be stripped from the entire surface and stockpiled for re-spreading during rehabilitation. • Topsoil stockpiles must be conserved against losses through erosion by establishing vegetation cover on them. • Dispose of all subsurface spoils from excavations where they will not impact on undisturbed land. • During rehabilitation, the stockpiled topsoil must be evenly spread over the entire disturbed surface. • Erosion must be controlled where necessary on top soiled areas. Establish an effective record keeping system for each area where soil is disturbed for constructional purposes. These records should be included in environmental performance reports, and should include all the records below. • Record the GPS coordinates of each area. • Record the date of topsoil stripping. • Record the GPS coordinates of where the topsoil is stockpiled. • Record the date of cessation of constructional (or operational) activities at the particular site. • Photograph the area on cessation of constructional activities. • Record date and depth of re-spreading of topsoil. • Photograph the area on completion of rehabilitation and on an annual basis thereafter to show vegetation establishment and evaluate progress of restoration over time. Section (f) of the EMPr also provide mitigation measures related to topsoil management.	

- Soil erosion – Soil erosion due to alteration of the land surface run-off characteristics. Alteration of run-off characteristics may be caused by construction related land surface disturbance, vegetation removal and the establishment of roads. Erosion will cause loss and deterioration of soil resources. This will result in grazing potential being lost.

Soil erosion	Pre-mitigation impact rating	Post mitigation impact rating
Status (positive or negative)	Negative	Negative
Geographical extent	Site (1)	Site (1)

Probability	Possible (2)	Possible (2)
Duration	Medium term (2)	Short term (1)
Magnitude	Medium (2)	Medium (2)
Reversibility	Party reversable (2)	Completely reversable (1)
Irreplaceable loss of resources	Marginal (2)	Marginal (2)
Cumulative impact	Low cumulative impact (2).	
Significance	**Negative Medium (22)**	**Negative low (18)**
Can impacts be mitigated?	• The following mitigation or management measures are provided: Implement an effective system of run-off control, where it is required, that collects and safely disseminates run-off water from all hardened surfaces and prevents potential down slope erosion. • Monitor the area regularly after larger rainfall events to determine where erosion may be initiated and then mitigate by modifying the soil micro-topography and revegetation or soil erosion control efforts accordingly. Include periodical site inspection in environmental performance reporting that inspects the effectiveness of the run-off control system and specifically records the occurrence any erosion on site or downstream – refer to section (f) of the EMPr..	

- Temporary noise disturbance - Preparation activities will result in the generation of noise over a period of months. Sources of noise are likely to include vehicles, the use of machinery such as back actors and people working on the site. The noise impact is likely to be significant; but activities should be limited to normal working days and hours (6:00 – 18:00).

Temporary noise disturbance	Pre-mitigation impact rating	Post mitigation impact rating
Status (positive or negative)	Negative	Negative
Extent	Local (2)	Local (2)
Probability	Definite (4)	Probable (3)
Duration	Short term (1)	Short term (1)
Magnitude	High (3)	Medium (2)
Reversibility	Completely reversible (1)	Completely reversible (1)
Irreplaceable loss of resources	High loss of resource (3)	Marginal loss of resource (2)
Cumulative impact	High cumulative impact (3). Noise will influence the number of tourists/visitors to the S.A. Lombard Nature Reserve which will in return influence the nature reserves income.	
Significance	**Negative high (42)**	**Negative medium (24)**
Can impacts be mitigated?	Yes, management actions related to noise pollution are included in section (f) of the EMPr.	

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

Generation of waste	Pre-mitigation impact rating	Post mitigation impact rating
Status (positive or negative)	Negative	Negative
Extent	Local/district (2)	Local/district (2)
Probability	Probable (3)	Possible (2)
Duration	Medium term (2)	Medium term (2)
Magnitude	Low (1)	Low (1)

Reversibility	Partly reversible (2)	Partly reversible (2)
Irreplaceable loss of resources	No loss of resource (1)	No loss of resource (1)
Cumulative impact	Low cumulative impact (2) - An additional demand for landfill space could result in significant cumulative impacts if services become unstable or unavailable, which in turn would negatively impact on the local community. If general waste is left on site game could mistakenly eat it, which might in turn harm or kill them.	
Significance	**Negative low (12)**	**Negative low (11)**
Can impacts be mitigated?	Yes, it is therefore important that all management actions and mitigation measures included in section (f) of the EMPr are implemented.	

Impacts on heritage objects – The proposed area falls within the S.A. Lombard Nature Reserve. According to website of the North West Parks Board the S.A. Lombard Nature Reserve was one of the earliest wildlife conservation research centres in South Africa and is credited with having saved the black wildebeest from extinction in the wild

Two specialist studies were conducted a Palaeontological Desktop Assessment and a Phase 1 Heritage Impact Assessment. The finding of the studies is summarised below, and the reports are available under **Appendix 11**.

Palaeontological Desktop Assessment
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The Geological Map indicates that the development footprint is covered by Late Tertiary to Quaternary calcretes (T-Qc), the Allanridge Formation and the Rietgat Formation (Rr) (Ventersdorp Supergroup). According to the PalaeoMap of South African Heritage Resources Information System the Palaeontological Sensitivity of the Late Tertiary to Quaternary calcrete are locally High but the diversity of organisms are low, while that of the Allanridge Formation is Low and the Rietgat Formation has a moderate Palaeontological Sensitivity (Almond and Pether 2008, SAHRIS website).

The 2724 Christiana Geological Map indicates that the development footprint is covered by Late Tertiary to Quaternary calcretes (T-Qc), the Allanridge Formation and the Rietgat Formation (Rr) (Ventersdorp Supergroup). According to the PalaeoMap of South African Heritage Resources Information System the Palaeontological Sensitivity of the Late Tertiary to Quaternary calcrete are locally High but the diversity are low, while that of the Allanridge Formation is Low and the Rietgat Formation has a moderate Palaeontological Sensitivity (Almond and Pether 2008, SAHRIS website).

*If fossil remains are discovered during any phase of construction, either on the surface or exposed by excavations the **Chance Find Protocol** must be implemented by the Environmental Control Officer (ECO) in charge of these developments. The Chance find protocol provides guidelines that must be followed when a fossil is accidentally uncovered during any stage of construction. These discoveries ought to be protected (if possible, in situ) and the ECO must report to the South African Heritage Resources Association (SAHRA) (Contact details: SAHRA, 111 Harrington Street, Cape Town. PO Box 4637, Cape Town 8000, South Africa. Tel: 021 462 4502. Fax: +27 (0)21 462 4509. Web: www.sahra.org.za) so that correct mitigation (recording and collection) can be carried out by a palaeontologists.*

Preceding any collection of fossil material, the specialist would need to apply for a collection permit from SAHRA. Fossil material must be curated in an accredited collection (museum or university collection), while all fieldwork and reports should meet the minimum standards for palaeontological impact studies suggested by SAHRA.

Phase 1 Heritage Impact Assessment
The Phase 1 Heritage Impact Assessment was conducted by Dr. J A van Schalkwyk and the following findings were made.

The cultural landscape qualities of the region are made up of a pre-colonial element consisting of Stone Age and a much later colonial (farmer) component, which eventually gave rise to an urban component which manifest in a number of towns.

Identified sites
During the survey, the following sites, features or objects of cultural significance were identified.

- *7.1.1 Change finds: Stone Age artefacts, dating to the Middle Stone Age occur in low numbers along the rims of the various pans located in the project area. The tools are mostly made from hardened shale, although some are of quartzite. Typical tools include points and some side-struck tools.*

- *7.3.1 Informal burial site with approximately 12 graves. The graves are only marked with stone cairns and no headstones with inscriptions were identified. The graves probably belong to former farm labourers and date to the period prior to 1950 when the Nature Reserve was established.*

- *7.3.2 An unknown number of graves marked only with stone cairns. The remains of what seems to be the foundations of a number of rectangular structures also occur adjacent to the graves. A large excavation, either for diamond mining or a borrow pit, is located on the southern side. This site can possibly be linked to the old Panfontein farmstead, now located just on the outside of the nature reserve, across a regional road.*

Impact assessment and proposed mitigation measures

Impact analysis of cultural heritage resources under threat of the proposed prospecting activities is based on the present understanding of the project:

Site No.	Site type	NHRA category	Field rating	Impact rating: Before/After mitigation
7.1.1	Archaeological resources	Section 35	Generally protected 4C: Low significance - Requires no further recording before destruction.	Low (14) Low (14)
Mitigation: (5) No further action required				

Site No.	Site type	NHRA category	Field rating	Impact rating: Before/After mitigation
7.3.1	Graves, cemeteries and burial grounds	Section 36	Generally protected: High significance – Grade IV-A	Medium (48) Low (16)
7.3.2	Graves, cemeteries and burial grounds	Section 36	Generally protected: High significance – Grade IV-A	Low (30) Low (16)
Mitigation: (1) Avoidance/Preserve: This is viewed to be the primary form of mitigation and the site should be retained *in situ* and a buffer zone should be created around it, either temporary (by means of danger tape) or permanently (wire fence or built wall).				

Legal requirements
The legal requirements related to heritage specifically are specified in Section 3 of this report. For this proposed project, the assessment has determined that sites, features or objects of heritage significance occur in the project area.

- *If the identified graves are to be relocated for the purposes of the diamond prospecting activities, proper procedures must be followed after obtaining all the necessary permits – see Section 12.4.*
- *If heritage features are identified during construction, as stated in the management recommendation, these finds would have to be assessed by a specialist, after which a decision will be made regarding the application for relevant permits.*

Reasoned opinion as to whether the proposed activity should be authorised:
- *From a heritage point of view, it is recommended that the proposed prospecting activities be allowed to continue on acceptance of the mitigation measures and the conditions proposed below.*

Conditions for inclusion in the environmental authorisation:
- *The Palaeontological Sensitivity Map (https://sahris.sahra.org.za/map/palaeo) indicate that most of the eastern section of the project area has a high sensitivity of fossil remains to be found and therefore a desktop study is required. Based on the outcome of that, a field assessment is likely. The western section has a low sensitivity of fossil remains to be found and therefore no palaeontological assessment is required. However, a protocol for finds is required.*
- *Should archaeological sites or graves be exposed during construction work, it must immediately be reported to a heritage practitioner so that an investigation and evaluation of the finds can be made.*

Impacts on heritage objects	Pre-mitigation impact rating	Post mitigation impact rating
Status (positive or negative)	Negative	Negative
Extent	Site (1)	Site (1)
Probability	Possible (2)	Possible (2)

Duration	Permanent (4)	Permanent (4)
Magnitude	Medium (2)	Medium (2)
Reversibility	Irreversible (4)	Partly reversible (3)
Irreplaceable loss of resources	Complete loss of resources (4)	Marginal loss of resource (2)
Cumulative impact	The impact would result in Medium cumulative impact (3).	
Significance	**Negative medium (36)**	**Negative medium (30)**
Can impacts be mitigated?	If archaeological sites or graves are exposed during construction work, it should immediately be reported to a heritage practitioner so that an investigation and evaluation of the finds can be made. Also refer to section (f) of the EMPr.	

Indirect impacts: The nuisance aspects generally associated with the installation of infrastructure or ground preparation will also be applicable to this development, which relates primarily to the increase in vehicle traffic associated with prospecting practices, the influx of job seekers to the area, risk to safety, livestock / game and farm / reserve infrastructure, and increased risk of veld fires.

- Increase in vehicle traffic – The movement of heavy vehicles have the potential to damage local farm roads and create dust and safety impacts for other road users in the area. Since the application is for a prospecting right without bulk sampling, only drilling and pitting sampling will take place. Access will be obtained from existing gravel roads off the R34 and N12. The volume of traffic along this road is **medium to very high** and the movement of heavy vehicles along this road is likely to damage the road surface and impact on other road users.

Increase in vehicle traffic	Pre-mitigation impact rating	Post mitigation impact rating
Status (positive or negative)	Negative	Negative
Extent	Local (2)	Local (2)
Probability	Possible (2)	Unlikely (1)
Duration	Medium term (2)	Medium term (2)
Magnitude	Low (1)	Low (1)
Reversibility	Completely reversible (1)	Completely reversible (1)
Irreplaceable loss of resources	No loss of resource (1)	No loss of resource (1)
Cumulative impact	Low cumulative impact (2). If damage to roads is not repaired, then this will affect the farming activities in the area, the number of visitors to the reserve and result in higher maintenance costs for vehicles of local farmers and other road users. The costs will be borne by road users who were no responsible for the damage.	
Significance	**Negative Low (10)**	**Negative low (9)**
Can impacts be mitigated?	The potential impacts associated with heavy vehicles can be effectively mitigated. The mitigation measures include: • The contractor must ensure that damage caused by construction on the off-gravel roads. The costs associated with the repair must be borne by the contractor; • Dust suppression measures must be implemented for heavy vehicles such as wetting of gravel roads on a regular basis and ensuring that vehicles used to transport sand and building materials are fitted with tarpaulins or covers; • All vehicles must be road-worthy and drivers must be qualified and made aware of the potential road safety issues and need for strict speed limits.	

	Also refer section (f) of the EMPr. For mitigation measures related to traffic.

- Risk to safety, livestock / game and infrastructure - The presence on and movement of workers on and off the site poses a potential safety threat to local famer's, farm workers, reverse personnel, reserve visitors and the communities in the vicinity of the site. In addition, reserve infrastructure, such as fences and gates, may be damaged and game losses may also result from gates being left open and/or fences being damaged or game theft and poaching linked either directly or indirectly to the presence of mine workers on the site.

Risk to safety, livestock / game and infrastructure	Pre-mitigation impact rating	Post mitigation impact rating
Status (positive or negative)	Negative	Negative
Extent	Local (2)	Site (1)
Probability	Possible (2)	Unlikely (1)
Duration	Medium term (2)	Medium term (2)
Magnitude	Medium (2)	Low (1)
Reversibility	Completely reversible (1)	Completely reversible (1)
Irreplaceable loss of resources	Marginal loss of resource (2)	No loss of resource (1)
Cumulative impact	Low cumulative effects (2), provided losses are compensated for.	
Significance	**Negative low (22)**	**Negative low (8)**
Can impacts be mitigated?	Key mitigation measures include: • **Xanado Trade or Invest 184 (Pty) Ltd** should enter into an agreement with the reserve management and local farmers in the area whereby damages to farm property etc. during the construction phase will be compensated for. The agreement should be signed before the construction phase commences; • The construction area should be fenced off prior to the commencement of the construction phase. The movement of construction workers on the site should be confined to the fenced off area; • Contractors appointed by **Xanado Trade or Invest 184 (Pty) Ltd** should provide daily transport for low and semi-skilled workers to and from the site. This would reduce the potential risk of trespassing on the remainder of the farm and adjacent properties. • **Xanado Trade or Invest 184 (Pty) Ltd** should hold contractors liable for compensating the nature reserve in full for any game losses and/or damage to reserve infrastructure that can be linked to construction workers. This should be contained in the Code of Conduct to be signed between the proponent, the contractors and neighbouring landowners. The agreement should also cover loses and costs associated with fires caused by construction workers or construction related activities (see below); • The Environmental Management Programme (EMPr) should outline procedures for managing and storing waste on site, specifically plastic waste that poses a threat to livestock/game if ingested. • Contractors appointed **Xanado Trade or Invest 184 (Pty) Ltd** must ensure that all workers are informed at the outset of the construction phase of the conditions contained on the Code of Conduct, specifically consequences of stock theft and trespassing on adjacent farms. • Contractors appointed by **Xanado Trade or Invest 184 (Pty) Ltd** must ensure that construction workers who are found guilty of	

	trespassing, stealing livestock/game, poaching game and/or damaging reserve infrastructure are dismissed and charged. This should be contained in the Code of Conduct. All dismissals must be in accordance with South African labour legislation; • The housing of construction workers on the site should be strictly limited to security personnel (if any).

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

Increased risk of veld fires	Pre-mitigation impact rating	Post mitigation impact rating
Status (positive or negative)	Negative	Negative
Extent	Region (3)	Local (2)
Probability	Probable (3)	Possible (2)
Duration	Medium term (2)	Medium term (2)
Magnitude	Very high (4)	Medium (2)
Reversibility	Irreversible (4)	Partly reversible (2)
Irreplaceable loss of resources	Significant loss of resource (3)	Marginal loss of resource (2)
Cumulative impact	Negligible cumulative effects (1), provided losses are compensated for.	
Significance	**Negative high (64)**	**Negative low (22)**
Can impacts be mitigated?	The mitigation measures include: • A fire-break should be constructed around the perimeter of the site prior to the commencement of the construction phase; • Contractor should ensure that open fires on the site for cooking or heating are not allowed except in designated areas; • Contractor to ensure that construction related activities that pose a potential fire risk, such as welding, are properly managed and are confined to areas where the risk of fires has been reduced. Measures to reduce the risk of fires include avoiding working in high wind conditions when the risk of fires is greater. In this regard special care should be taken during the high risk dry, windy winter months; • Contractor to provide adequate firefighting equipment on-site, including a fire fighting vehicle; • Contractor to provide fire-fighting training to selected construction staff; • No construction staff, with the exception of security staff, to be accommodated on site over night; • As per the conditions of the Code of Conduct, in the advent of a fire being caused by construction workers and or construction activities, the appointed contractors must compensate farmers for any damage caused to their farms and / or compensate the reserve for any damage to the nature reserve. The contractor should also compensate the firefighting costs borne by reserve/farmers and local authorities.	

OPERATIONAL PHASE

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

- Soil erosion – There is a low to no risk factor for soil erosion for drilling and pitting. The conditions of the EMP will be adhered to throughout the prospecting operation and commitment to rehabilitation is of paramount importance in order to obtain a closure certificate from DMR.

Soil erosion	Pre-mitigation impact rating	Post mitigation impact rating
Status (positive or negative)	Negative	Negative
Extent	Local (2)	Site (1)
Probability	Possible (2)	Unlikely (1)
Duration	Medium term (2)	Medium term (2)
Magnitude	Medium (2)	Low (1)
Reversibility	Partly reversible (2)	Completely reversible (1)
Irreplaceable loss of resources	Marginal loss of resource (2)	No loss of resource (1)
Cumulative impact	Low cumulative effects (2), should these impacts occur, there will be a cumulative impact on the air and water resources in the study area in terms of pollution.	
Significance	**Negative medium (24)**	**Negative Low (8)**
Can impacts be mitigated?	Yes, to avoid soil erosion it will be a good practice to not remove all the vegetation at once but to only clear the area as it becomes necessary and to implement concurrent rehabilitation. • The following mitigation or management measures are provided: Implement an effective system of run-off control, where it is required, that collects and safely disseminates run-off water from all hardened surfaces and prevents potential down slope erosion. • Monitor the area regularly after larger rainfall events to determine where erosion may be initiated and then mitigate by modifying the soil micro-topography and revegetation or soil erosion control efforts accordingly Also refer to section (f) of the EMPr.	

- Change in land-use – The proposed prospecting right application was submitted on S.A. Lombard Nature Reserve.

Change in land use	Pre-mitigation impact rating	Post mitigation impact rating
Status (positive or negative)	Negative	Negative
Extent	Local (2)	Local (2)
Probability	Probable (3)	Possible (2)
Duration	Short term (1)	Short term (1)
Magnitude	Medium (2)	Medium (2)
Reversibility	Completely reversible (1)	Completely reversible (1)
Irreplaceable loss of resources	Marginal loss of resource (2)	Marginal loss of resource (2)

Cumulative impact	Low cumulative effects (2) – the right holder should enter into a surface use agreement with the S.A. Lombard Nature Reserve to compensate for any financial losses.	
Significance	**Negative low (22)**	**Negative low (22)**
Can impacts be mitigated?	The proponent should establish a Rehabilitation Fund to be used to rehabilitate the area once the proposed facility has been decommissioned. The fund should be funded by revenue generated during the operational phase of the project. The motivation for the establishment of a Rehabilitation Fund is based on the experience in the mining sector where many mines on closure have not set aside sufficient funds for closure and decommissioning. Also refer to section (f) of the EMPr.	

- Generation of alternative land use income – Income generated through the potential prospecting of the minerals applied for will provide the reserve enterprise with increased cash flow and rural livelihood. However, according to HP Nel from NWPB, the North West Parks Board believes that the management of the wildlife resources within the reserve can yield more sustainable and long-term benefits to the region. The Board is in the process of aligning the management of SALombard to focus on the breeding of high value game species to support the transformation of the game industry. The Board also aims to improve income generation by focusing on sustained use of the wildlife resources and at the same time, improve the efficiency of the reserve to achieve its objectives. Please see Appendix 6.

Generation of alternative land use income	Pre-mitigation impact rating	Post mitigation impact rating
Status (positive or negative)	Negative	Negative
Geographical extent	Local (2)	Local (2)
Probability	Probable (3)	Possible (2)
Duration	Medium term (2)	Medium term (2)
Magnitude	Medium (2)	Medium (2)
Reversibility	Partly reversible (2)	Partly reversible (2)
Irreplaceable loss of resources	Marginal loss of resource (2)	Marginal loss of resource (2)
Cumulative impact	Medium cumulative impact (3).	
Significance	**Negative medium (28)**	**Negative Low (26)**
Can impacts be mitigated?	No mitigation required.	

- Increase in storm water runoff – The development will unlikely result in an increase in storm water run-off that needs to be managed to prevent soil erosion.

Increase in storm water runoff	Pre-mitigation impact rating	Post mitigation impact rating
Status (positive or negative)	Negative	Negative
Extent	Site (1)	Site (1)
Probability	Possible (2)	Unlikely (1)
Duration	Medium term (2)	Medium term (2)
Magnitude	Medium (2)	Low (1)
Reversibility	Barley reversible (3)	Partly reversible (2)
Irreplaceable loss of resources	Marginal loss of resource (2)	No loss of resource (1)
Cumulative impact	Low cumulative impact (2) - Should these impacts occur, there will be cumulative impacts on the wider area.	
Significance	**Negative medium (24)**	**Negative low (9)**
Can impacts be mitigated?	Yes. It is therefore important that all management actions and mitigation measures included in section (f) of the EMPr. are implemented to ensure that these impacts do not occur	

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

Increased consumption of water	Pre-mitigation impact rating	Post mitigation impact rating
Status (positive or negative)	Negative	Negative
Extent	Site (1)	Site (1)
Probability	Definite (4)	Definite (4)
Duration	Short term (1)	Short term (1)
Magnitude	Medium (2)	Medium (2)
Reversibility	Irreversible (4)	Irreversible (4)
Irreplaceable loss of resources	Marginal loss of resources (2)	Marginal loss of resources (2)
Cumulative impact	Low cumulative impacts (2) - An additional demand on water sources could result in a significant cumulative impact with regards to the availability of water.	
Significance	**Negative medium (28)**	**Negative medium (28)**
Can impacts be mitigated?	Yes, management actions and mitigation measures related to the use of water are included in section (f) of the EMPr.	

- Generation of waste –Workers will be present on site from 6:00 – 18:00, Monday to Saturday. Sources of general waste will be waste food, packaging, paper, etc. General waste will be stored on the site and removed on a weekly basis.

Generation of waste	Pre-mitigation impact rating	Post mitigation impact rating
Status (positive or negative)	Negative	Negative
Extent	Local (2)	Local (2)
Probability	Definite (4)	Definite (4)
Duration	Medium term (2)	Medium term (2)
Magnitude	Low (1)	Low (1)
Reversibility	Partly reversible (2)	Partly reversible (2)
Irreplaceable loss of resources	Marginal loss of resources (2)	No loss of resource (1)
Cumulative impact	Medium cumulative impact (3) - An additional demand for landfill space could result in significant cumulative impacts with regards to the availability of landfill space. If general waste is left on site game could mistakenly eat it, which might in turn harm or kill them.	
Significance	**Negative low (15)**	**Negative low (14)**
Can impacts be mitigated?	Yes, management actions related to waste management are included in section (f) of the EMPr.	

- Leakage of hazardous materials - The proposed prospecting activity will make use of machinery that use fuel and oil. Leakage of these oils and fuel can contaminate water supplies and must be prevented by constructing oil and diesel permeable bunds to ensure that any spills are suitably attenuated and not released into the environment.

Leakage of hazardous materials	Pre-mitigation impact rating	Post mitigation impact rating
Status (positive or negative)	Negative	Negative
Extent	Site (1)	Site (1)
Probability	Possible (2)	Unlikely (1)
Duration	Medium term (2)	Short term (1)
Magnitude	Medium (2)	Medium (2)
Reversibility	Partly reversible (2)	Completely reversible (1)
Irreplaceable loss of resources	Significant loss of resource (3)	Marginal loss of resource (2)
Cumulative impact	The impact would result in negligible to no cumulative effects (1) if mitigation measures and management plans are put in place.	
Significance	**Negative low (22)**	**Negative low (14)**

Can impacts be mitigated?	Yes. It is therefore important that all management actions and mitigation measures included in the section (f) of EMPr are implemented to ensure that these impacts do not occur.

- Noise disturbance - Prospecting activities will result in the generation of noise over a period of 2-3 years. Sources of noise are likely to include vehicles, the use of machinery such as drills and people working on the site; but prospecting activities should be limited to normal working days and some Saturdays and hours (6:00 – 18:00).

Temporary noise disturbance	Pre-mitigation impact rating	Post mitigation impact rating
Status (positive or negative)	Negative	Negative
Extent	Local (2)	Local (2)
Probability	Probable (3)	Possible (2)
Duration	Medium term (2)	Medium term (2)
Magnitude	High (3)	Medium (2)
Reversibility	Completely reversible (1)	Completely reversible (1)
Irreplaceable loss of resources	High loss of resource (3)	Marginal loss of resource (2)
Cumulative impact	High cumulative impact (3). Noise will influence the number of tourists/visitors to the S.A. Lombard Nature Reserve which will in return influence the nature reserves income.	
Significance	**Negative medium (42)**	**Negative low (24)**
Can impacts be mitigated?	Yes, management actions related to noise pollution are included in section (f) of the EMPr.	

Indirect impacts: The operational phase will have an indirect negative impact through the change in the sense of place and an indirect positive impact through the provision of additional electrical infrastructure.

- Potential impact on tourism – There are no tourist facilities in close proximity to the proposed area.

Potential impacts on tourism	Pre-mitigation impact rating	Post mitigation impact rating
Status (positive or negative)	Negative	Negative
Extent	Local (2)	Local (2)
Probability	Definite (4)	Definite (4)
Duration	Medium term (2)	Medium term (2)
Magnitude	High (4)	High (4)
Reversibility	Completely reversible (1)	Completely reversible (1)
Irreplaceable loss of resources	High loss of resource (3)	Medium loss of resource (3)
Cumulative impact	High cumulative impact (3). Prospecting Activities will influence the number of tourists/visitors to the S.A. Lombard Nature Reserve which will in return influence the nature reserves income.	
Significance	**Negative high (45)**	**Negative high (45)**
Can impacts be mitigated?	**Xanado Trade or Invest 184 (Pty) Ltd** should enter into a surface use agreement with the S.A. Lombard Nature Reserve and or North West Parks Board.	

DECOMMISIONING PHASE (MINE CLOSURE AND REHABILITATION)

Direct impacts: Typically, the major social impacts associated with the decommissioning phase are linked to the loss of jobs and associated income. This has implications for the households who are directly affected, the communities within which they live. If infrastructures are removed after a 3/5 year period, the site will be returned to its natural state. Therefore, the physical environment will benefit from the closure of the prospecting area.

- Rehabilitation of the physical environment – The physical environment will benefit from the closure of the prospecting area. Rehabilitation will be done concurrently with all activities

Rehabilitation of the physical environment	Pre-mitigation impact rating	Post mitigation impact rating
Status (positive or negative)	Positive	Positive
Extent	Local (2)	Local (2)
Probability	Definite (4)	Definite (4)
Duration	Long term (3)	Long term (3)
Magnitude	High (3)	High (3)
Reversibility	N/A	N/A
Irreplaceable loss of resources	N/A	N/A
Cumulative impact	The impact would result in negligible to no cumulative effects (1)	
Significance	**Positive low (27)**	**Positive low (27)**
Can impacts be mitigated?	No mitigation measures required.	

- Loss of employment - The decommissioning of the facility has the potential to have a negative social impact on the local community.

Loss of employment	Pre-mitigation impact rating	Post mitigation impact rating
Status (positive or negative)	Negative	Negative
Extent	Local (2)	Local (2)
Probability	Possible (2)	Possible (2)
Duration	Medium term (2)	Medium term (1)
Magnitude	Medium (2)	Medium (2)
Reversibility	Partly reversible (2)	Partly reversible (2)
Irreplaceable loss of resources	No loss of resource (1)	No loss of resource (1)
Cumulative impact	The impact would result in negligible to no cumulative effects (1)	
Significance	**Negative low (20)**	**Negative low (18)**
Can impacts be mitigated?	The following mitigation measures are recommended: • All structures and infrastructure associated with the proposed facility should be dismantled and transported off-site on decommissioning; • **Xanado Trade or Invest 184 (Pty) Ltd** should establish an Environmental Rehabilitation Trust Fund to cover the costs of decommissioning and rehabilitation of disturbed areas.	

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

vi) METHODOLOGY USED IN DETERMINING AND RANKING THE NATURE, SIGNIFICANCE, CONSEQUENCES, EXTENT, DURATION AND PROBABILITY OF POTENTIAL ENVIRONMENTAL IMPACTS AND RISKS

Method of environmental assessment

The environmental assessment aims to identify the various possible environmental impacts that could results from the proposed development. Different impacts need to be evaluated in terms of its significance and in doing so highlight the most critical issues to be addressed.

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

Significance is an indication of the importance of the impact in terms of both physical extent and time scale, and therefore indicates the level of mitigation required. The total number of points scored for each impact indicates the level of significance of the impact.

Impact Rating System

Impact assessment must take account of the nature, scale and duration of impacts on the environment whether such impacts are positive or negative. Each impact is also assessed according to the following project phases:

- Construction
- Operation
- Decommissioning

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

Table: The rating system

NATURE		
Include a brief description of the impact of environmental parameter being assessed in the context of the project. This criterion includes a brief written statement of the environmental aspect being impacted upon by a particular action or activity.		
GEOGRAPHICAL EXTENT		
This is defined as the area over which the impact will be experienced.		
1	Site	The impact will only affect the site.
2	Local/district	Will affect the local area or district.
3	Province/region	Will affect the entire province or region.
4	International and National	Will affect the entire country.
PROBABILITY		
This describes the chance of occurrence of an impact.		
1	Unlikely	The chance of the impact occurring is extremely low (Less than a 25% chance of occurrence).
2	Possible	The impact may occur (Between a 25% to 50% chance of occurrence).
3	Probable	The impact will likely occur (Between a 50% to 75% chance of occurrence).
4	Definite	Impact will certainly occur (Greater than a 75% chance of occurrence).

DURATION		
This describes the duration of the impacts. Duration indicates the lifetime of the impact as a result of the proposed activity.		
1	Short term	The impact will either disappear with mitigation or will be mitigated through natural processes in a span shorter than the construction phase (0 – 1 years), or the impact will last for the period of a relatively short construction period and a limited recovery time after construction, thereafter it will be entirely negated (0 – 2 years).
2	Medium term	The impact will continue or last for some time after the construction phase but will be mitigated by direct human action or by natural processes thereafter (2 – 10 years).
3	Long term	The impact and its effects will continue or last for the entire operational life of the development, but will be mitigated by direct human action or by natural processes thereafter (10 – 30 years).
4	Permanent	The only class of impact that will be non-transitory. Mitigation either by man or natural process will not occur in such a way or such a time span that the impact can be considered indefinite.
INTENSITY/ MAGNITUDE		
Describes the severity of an impact.		
1	Low	Impact affects the quality, use and integrity of the system/component in a way that is barely perceptible.
2	Medium	Impact alters the quality, use and integrity of the system/component but system/component still continues to function in a moderately modified way and maintains general integrity (some impact on integrity).
3	High	Impact affects the continued viability of the system/ component and the quality, use, integrity and functionality of the system or component is severely impaired and may temporarily cease. High costs of rehabilitation and remediation.
4	Very high	Impact affects the continued viability of the system/component and the quality, use, integrity and functionality of the system or component permanently ceases and is irreversibly impaired. Rehabilitation and remediation often impossible. If possible rehabilitation and remediation often unfeasible due to extremely high costs of rehabilitation and remediation.
REVERSIBILITY		
This describes the degree to which an impact can be successfully reversed upon completion of the proposed activity.		
1	Completely reversible	The impact is reversible with implementation of minor mitigation measures.
2	Partly reversible	The impact is partly reversible but more intense mitigation measures are required.
3	Barely reversible	The impact is unlikely to be reversed even with intense mitigation measures.
4	Irreversible	The impact is irreversible and no mitigation measures exist.
IRREPLACEABLE LOSS OF RESOURCES		
This describes the degree to which resources will be irreplaceably lost as a result of a proposed activity.		
1	No loss of resource	The impact will not result in the loss of any resources.
2	Marginal loss of resource	The impact will result in marginal loss of resources.

3	Significant loss of resources	The impact will result in significant loss of resources.
4	Complete loss of resources	The impact is result in a complete loss of all resources.

CUMULATIVE EFFECT

This describes the cumulative effect of the impacts. A cumulative impact is an effect which in itself may not be significant but may become significant if added to other existing or potential impacts emanating from other similar or diverse activities as a result of the project activity in question.

1	Negligible cumulative impact	The impact would result in negligible to no cumulative effects.
2	Low cumulative impact	The impact would result in insignificant cumulative effects.
3	Medium cumulative impact	The impact would result in minor cumulative effects.
4	High cumulative impact	The impact would result in significant cumulative effects

SIGNIFICANCE

Significance is determined through a synthesis of impact characteristics. Significance is an indication of the importance of the impact in terms of both physical extent and time scale, and therefore indicates the level of mitigation required. The calculation of the significance of an impact uses the following formula:

(Extent + probability + reversibility + irreplaceability + duration + cumulative effect) x magnitude/intensity.

The summation of the different criteria will produce a non-weighted value. By multiplying this value with the magnitude/intensity, the resultant value acquires a weighted characteristic which can be measured and assigned a significance rating.

Points	Impact significance rating	Description
6 to 28	Negative low impact	The anticipated impact will have negligible negative effects and will require little to no mitigation.
6 to 28	Positive low impact	The anticipated impact will have minor positive effects.
29 to 50	Negative medium impact	The anticipated impact will have moderate negative effects and will require moderate mitigation measures.
29 to 50	Positive medium impact	The anticipated impact will have moderate positive effects.
51 to 73	Negative high impact	The anticipated impact will have significant effects and will require significant mitigation measures to achieve an acceptable level of impact.
51 to 73	Positive high impact	The anticipated impact will have significant positive effects.
74 to 96	Negative very high impact	The anticipated impact will have highly significant effects and are unlikely to be able to be mitigated adequately. These impacts could be considered "fatal flaws".
74 to 96	Positive very high impact	The anticipated impact will have highly significant positive effects.

vii) 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)

- Increased ambient noise levels resulting from geophysic surveys site fly-overs and increased traffic movement during all prospecting phases.
- Potential water and soil pollution impacts resulting from hydrocarbon spills and soil erosion which may impact on environmental resources utilized by communities, landowners and other stakeholders.
- Potential water and soil pollution impacts resulting from hydrocarbon spills and soil erosion which may impact on ecosystem functioning.
- Potential decrease in water levels due to abstraction.
- Increased vehicle activity with in the area resulting in the possible destruction and disturbance of fauna and flora.
- Poor access control to farms which may impact on game movement, breeding and grazing practices.
- Influx of persons (job seekers) to site as a result of increased activity and the possible resultant increase in opportunistic crime.
- Potential visual impacts caused by prospecting activities.
- Prospecting will be undertaken by specialist sub - contractors and it is not anticipated that employment opportunities for local and / or regional communities will result from the prospecting activities.
- Prospecting activities may result in localised visual impacts.

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).

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

<u>Noise</u>

Site activities must take place during the day (06:00 – 18:00) to avoid night time noise disturbances and night time collisions with fauna.

<u>Visual impact</u>

Dust suppression measures must be implemented.

<u>Soil</u>

- Disturbances to soil should be limited as far as possible.
- Erosion control measures should be implemented if necessary.
- Oils and lubricants must be stored in lined containment structures.
- Drip trays should be used where necessary.
- Waste bins should be provided and waste should be removed and disposed of at a licensed landfill site.
- Rehabilitation should be done concurrently.

<u>Water</u>

- Before any water is abstracted, a geo-hydro study should be conducted in order to determine the specific yield.
- Oils and lubricants must be stored in lined containment structures.
- Drip trays should be used where necessary.

- Erosion control measures should be implemented if necessary.

ix) MOTIVATION WHERE NO ALTERNATIVE SITES WERE CONSIDERED.

As discussed in the previous section, the possibility to encounter further Diamonds (Alluvial) near Bloemhof on Portion 3 (portion 1) of the farm Boschpan 339, the Remaining Extent of Portion 8 (portion 1), Portion 9 (portion 1), Portion 10 (portion 1) and Portion 17 (portion 1) of the farm Panfontein 270, Registration Division: HO, North West province, was identified.

x) STATEMENT MOTIVATING THE ALTERNATIVE DEVELOPMENT LOCATION WITHIN THE OVERALL SITE. (Provide a statement motivating the final site layout that is proposed)

The site is preferred due to its possibility of having Diamonds (Alluvial), the property is also used as a Nature Reserve.

I) 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.

i. A description of all environmental issues and risks that are identified during the environmental impact assessment process

Process for the identification of key issues

The methodology for the identification of key issues aims, as far as possible, to provide a user-friendly analysis of information to allow for easy interpretation.

- Checklist: The checklist consists of a list of structured questions related to the environmental parameters and specific human actions. They assist in ordering thinking, data collection, presentation and alert against the omission of possible impacts.
- Matrix: The matrix analysis provides a holistic indication of the relationship and interaction between the various activities, development phases and the impact thereof on the environment. The method aims at providing a first order cause and effect relationship between the environment and the proposed activity. The matrix is designed to indicate the relationship between the different stressors and receptors which leads to specific impacts. The matrix also indicates the specialist studies, which will be submitted as part of the Environmental Impact Report in order to address the potentially most significant impacts.

Checklist analysis

The site visit was conducted to ensure a proper analysis of the site specific characteristics of the study area. The table below provides a checklist, which is designed to stimulate thought regarding possible consequences of specific actions and so assist scoping of key issues. It consists of a list of structured questions related to the environmental parameters and specific human actions. They assist in ordering thinking, data collection, presentation and alert against the omission of possible impacts. The table highlights certain issues, which are further analysed in matrix format.

Table: Environmental checklist

Question	YES	NO	Un-sure	Description
1. Are any of the following located on the site earmarked for the development?				
I. A river, stream, dam or wetland	✕			According the River Ecosystem Classification Map there is an Unnamed, Non-Perennial River that runs through the proposed area that falls within Class D: Largely Modified. According to the NFEPA Wetlands map there are three Depressions on site, one is called Voëlpan and the other Gemsbokpan. There is also a Valleyhead seep and Flat wetland.
II. A conservation or open space area	✕			The proposed application falls within the S.A. Lombard Nature reserve, which is a Formal Protected Areas.
III. An area that is of cultural importance		✕		According to the Phase 1 Heritage Impact Assessment, from a heritage point of view, it is recommended that the proposed prospecting activities be allowed to continue on acceptance of the mitigation measures and the conditions proposed below.
IV. Site of geological significance		✕		According to the desktop paleontological Impact Assessment, if fossil remains are discovered during any phase of construction, either on the surface or exposed by excavations the Chance Find Protocol must be implemented
V. Areas of outstanding natural beauty	✕			The proposed area falls within the S.A. Lombard Nature Reserve.
VI. Highly productive agricultural land		✕		The proposed area is used as a Nature Reserve, it is covered in natural vegetation.
VII. Floodplain		✕		Not according to the NFEPA Wetlands map.
VIII. Indigenous forest		✕		
IX. Grass land	✕			According to the Land Use map the proposed areas is mostly covered in Grassland and Low Shrubland. According to the Vegetation map the area falls within the Kimberley Thornveld.
X. Bird nesting sites		✕		According to the Important Bird and Biodiversity Areas (IBA) map it does not fall within an IBA.
XI. Red data species			✕	There are protected species on the proposed area.
XII. Tourist resort	✕			The proposed area falls within the S.A. Lombard Nature Reserve.
2. Will the project potentially result in potential?				
I. Removal of people		✕		None.
II. Visual Impacts	✕			The proposed area falls within the S.A. Lombard Nature Reserve.
III. Noise pollution	✕			The proposed area falls within the S.A. Lombard Nature Reserve. Noise may affect visitors, game, surrounding infrastructure and people
IV. Construction of an access road		✕		Access will be obtained from a gravel road of the R34 and N12.
V. Risk to human or valuable ecosystems due to explosion/fire/ discharge of waste into water or air.		✕		

VI. Accumulation of large workforce (>50 manual workers) into the site.		X		Employment opportunities will be created during the different phase of the project.
VII. Utilisation of significant volumes of local raw materials such as water, wood etc.		X		Additional water requirements related to the portable water supply for employees, workers, to keep the drill cool and dust suppression.
VIII. Job creation	X			Employment opportunities will be created during the different phase of the project.
IX. Traffic generation		X		None.
X. Soil erosion		X		The application is for a prospecting right without bulk sampling, only drilling and pitting sampling will take place.
XI. Installation of additional bulk telecommunication transmission lines or facilities		X		None.
3. Is the proposed project located near the following?				
I. A river, stream, dam or wetland	X			According the River Ecosystem Classification Map there is an Unnamed, Non-Perennial River that runs through the proposed area that falls within Class D: Largely Modified. According to the NFEPA Wetlands map the following wetland are near the proposed area: Depressions, Valleyhead Seeps, Unchannelled valley-bottom wetlands and Flat wetlands,
II. A conservation or open space area	X			The proposed application falls within the S.A. Lombard Nature reserve, which is a Formal Protected Areas.
III. An area that is of cultural importance			X	
IV. A site of geological significance			X	
V. An area of outstanding natural beauty			X	
VI. Highly productive agricultural land			X	According to the land capability map the area falls within land capability Class 5.
VII. A tourist resort	X			The proposed area falls within the S.A. Lombard Nature Reserve.
VIII. A formal or informal settlement		X		

Matrix analysis

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

In order to conceptualise the different impacts the matrix specify the following:

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

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

LISTED ACTIVITY (The Stressor)	ASPECTS OF THE DEVELOPMENT /ACTIVITY	POTENTIAL IMPACTS			SIGNIFICANCE AND MAGNITUDE OF POTENTIAL IMPACTS			MITIGATION OF POTENTIAL IMPACTS	SPECIALIST STUDIES / INFORMATION
		Receptors		Impact description	Minor	Major	Duration	Possible Mitigation	
CONSTRUCTION PHASE									
Listing Notice GNR 327, *Activity 27:"The clearance of an area of 1 hectares or more, but less than 20 hectares of indigenous vegetation."*	<u>Site clearing and preparation</u> Areas earmarked for prospecting will need to be cleared, topsoil will be stockpiled separately.	BIOPHYSICAL ENVIRONMENT	Fauna & Flora	• Loss or fragmentation of indigenous natural vegetation. • Loss of sensitive species. • Loss or fragmentation of habitats.	-		M	Yes	-
			Air	• Air and dust pollution due to the increase of traffic of construction vehicles.	-		S	Yes	-
			Soil	• Soil degradation, including erosion. • Loss of topsoil. • Disturbance of soils and existing land use (soil compaction).		-	S	Yes	-
			Geology	• It is not foreseen that the removal of indigenous vegetation will impact on the geology or vice versa.	N/A	N/A	N/A	N/A	-
			Existing services infrastructure	• Generation of waste that need to be accommodated at a licensed landfill site. • Generation of sewage that need to be accommodated by the local sewage plant.	-		S	Yes	-
			Ground water	• Pollution due to construction vehicles.	-		S	Yes	-
			Surface water	• Increase in storm water run-off. • Pollution of water sources due to soil erosion. • Destruction of watercourses (pans/dams/streams).	-	-	S	Yes	-
		SOCIAL/ECONOMIC ENVIRONMENT	Local unemployment rate	• Job creation. • Business opportunities. • Skills development.	+		S	Yes	-
			Visual landscape	• Potential visual impact on residents of farmsteads and motorists in close proximity to proposed facility. • Visitors to the S.A. Lombard Nature Reserve.		-	S	Yes	-
			Traffic volumes	• Increase in construction vehicles.	-		S	Yes	-
			Health & Safety	• Air/dust pollution. • Road safety. • Increased risk of veld fires.	-		S	Yes	-
			Noise levels	• The generation of noise as a result of construction vehicles, the use of machinery such as drills, excavators and people working on the site.	-		S	Yes	-
			Tourism industry	• Since there are tourism facilities in close proximity to the site, the construction activities will have an impact on tourism in the area. • Visitors to the S.A. Lombard Nature Reserve.		-	S	Yes	-

			Heritage resources	• Removal or destruction of archaeological and/or paleontological sites. • Removal or destruction of buildings, structures, places and equipment of cultural significance. • Removal or destruction of graves, cemeteries and burial grounds.		-	S	Yes	-
Listing Notice GNR 327, *Activity 27:"The clearance of an area of 1 hectares or more, but less than 20 hectares of indigenous vegetation."* ***Listing Notice GNR 327, Activity 20:*** *"Any activity including the operation of that activity which requires a prospecting right in terms of section 16 of the Mineral and Petroleum Resources Development Act, 2002 (Act No. 28 of 2002), including—*	<u>Site clearing and preparation</u> Areas earmarked for prospecting will need to be cleared, topsoil will be stockpiled separately. This will inevitably result in the removal of indigenous vegetation located on the site.	BIOPHYSICAL ENVIRONMENT	Fauna & Flora	• Loss or fragmentation of indigenous natural vegetation. • Loss of sensitive species. • Loss or fragmentation of habitats.	-		M	Yes	-
			Air quality	• Air and dust pollution due to the increase of traffic.	-		M	Yes	-
			Soil	• Soil degradation, including erosion. • Disturbance of soils and existing land use (soil compaction). • Loss of grazing potential (low significance relative to grazing potential of the site).		-	M	Yes	-
			Geology	• It is not foreseen that the removal of indigenous vegetation will impact on the geology or vice versa.	-		L	Yes	-
			Existing services infrastructure	• Generation of waste that need to be accommodated at a licensed landfill site. • Generation of sewage that need to be accommodated by the local sewage plant.	-		M	Yes	-
			Ground water	• Pollution due to construction vehicles	-		S	Yes	-
			Surface water	• Increase in storm water run-off. • Pollution of water sources due to soil erosion. • Destruction of watercourses (pans/dams/streams).	-	-	M	Yes	-
		SOCIAL/ECONOMIC ENVIRONMENT	Local unemployment rate	• Job creation. • Skills development.	+		S	N/A	-
			Visual landscape	• Potential visual impact on visual receptors in close proximity to proposed facility.		-	M	Yes	-
			Traffic volumes	• Increase in construction vehicles.	-		S	Yes	-
			Health & Safety	• Air/dust pollution. • Road safety.	-		S	Yes	-
			Noise levels	• The generation of noise as a result of construction vehicles, and people working on the site.	-		S	Yes	-
			Tourism industry	• Since there are tourism facilities in close proximity to the site, the construction activities will have an impact on tourism in the area. • Visitors to the S.A. Lombard Nature Reserve.		-	S	Yes	-
			Heritage resources	• Removal or destruction of archaeological and/or paleontological sites. • Removal or destruction of buildings, structures, places and equipment of cultural significance. • Removal or destruction of graves, cemeteries and burial grounds.	-		S		-

OPERATIONAL PHASE									
Listing Notice GNR 325, Activity 15:"*The clearance of an area of 20 hectares or more, of indigenous vegetation* ***Listing Notice GNR 327, Activity 20:*** *"Any activity including the operation of that activity which requires a prospecting right in terms of section 16 of the Mineral and Petroleum Resources Development Act, 2002 (Act No. 28 of 2002), including—*	The key components of the proposed project are described below: • Supporting Infrastructure - A control facility with basic services such as water and electricity will be constructed on the site and will have an approximate footprint 50m² or less. Other supporting infrastructure includes a site office and workshop area. • Roads – Access will be obtained from gravel roads of the R34 and N12. • Fencing - For health, safety and security reasons, the facility will be required to be fenced off from the surrounding farm.	BIOPHYSICAL ENVIRONMENT	Fauna & Flora	• Fragmentation of habitats. • Establishment and spread of declared weeds and alien invader plants (operations).		-	S	Yes	-
			Air quality	• Air pollution due to the prospecting activity	-		M	Yes	-
			Soil	• Soil degradation, including erosion. • Disturbance of soils and existing land use (soil compaction). • Loss of grazing potential (low-medium significance relative to grazing potential of the site).		-	M	Yes	-
			Geology	• Collapsible soil. • Seepage (shallow water table). • Active soil (high soil heave). • Erodible soil. • The presence of undermined ground. • Instability due to soluble rock. • Steep slopes or areas of unstable natural slopes. • Areas subject to seismic activity. • Areas subject to flooding.		-	L	Yes	-
			Existing services infrastructure	• Generation of waste that need to be accommodated at a licensed landfill site. • Generation of sewage that need to be accommodated by the municipal sewerage system and the local sewage plant. • Increased consumption of water.	-		M	Yes	-
			Ground water	• Leakage of hazardous materials. The machinery on site require oils and fuel to function. Leakage of these oils and fuels can contaminate water supplies.	-		L	Yes	-
			Surface water	• Increase in storm water runoff. The development will potentially result in an increase in storm water run-off that needs to be managed to prevent soil erosion. • Destruction of watercourses (pans/dams/streams). • Leakage of hazardous materials. The machinery on site require oils and fuel to function. Leakage of these oils and fuels can contaminate water supplies.		-	L	Yes	-
		SOCIAL/ECONOMIC ENVIRONMENT	Local unemployment rate	• Skills development.	+		L	Yes	-
			Visual landscape	• The proposed portions are used as a nature reserve, which will still take place simultaneously with the prospecting activity, however this depends on the location of the activity.		-	L	Yes	-
			Traffic volumes	• Increase in vehicles collecting gravel for distribution.	-		S	Yes	-
			Health & Safety	• Air/dust pollution. • Road safety.			S	Yes	-
			Noise levels	• The proposed development will result in noise pollution during the operational phase.			M	Yes	-

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

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

K) WHERE APPLICABLE, A SUMMARY OF THE FINDINGS AND IMPACTS MANAGEMENT MEASURES IDENTIFIED IN AN SPECIALIST REPORT COMPLYING WITH APPENDIX 6 OF THESE REGULATIONS AND AN INDICATION AS TO HOW THESE FINDINGS AND RECOMMENDATIONS HAVE BEEN INCLUDED IN THE FINAL REPORT;

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 RECOMMENDATIOS HAVE BEEN INCLUDED.
Palaeontological Desktop Assessment	**10) FINDINGS AND RECOMMENDATIONS** The Geological Map indicates that the development footprint is covered by Late Tertiary to Quaternary calcretes (T-Qc), the Allanridge Formation and the Rietgat Formation (Rr) (Ventersdorp Supergroup). According to the PalaeoMap of South African Heritage Resources Information System the Palaeontological Sensitivity of the Late Tertiary to Quaternary calcrete are locally High but the diversity of organisms are low, while that of the Allanridge Formation is Low and the Rietgat Formation has a moderate Palaeontological Sensitivity (Almond and Pether 2008, SAHRIS website). The 2724 Christiana Geological Map indicates that the development footprint is covered by Late Tertiary to Quaternary calcretes (T-Qc), the Allanridge Formation and the Rietgat Formation (Rr) (Ventersdorp Supergroup). According to the PalaeoMap of South African Heritage Resources Information System the Palaeontological Sensitivity of the Late Tertiary to Quaternary calcrete are locally High but the diversity are low, while that of the Allanridge Formation is Low and the Rietgat Formation has a moderate Palaeontological Sensitivity (Almond and Pether 2008, SAHRIS website). If fossil remains are discovered during any phase of construction, either on the surface or exposed by excavations the **Chance Find Protocol** must be implemented by the Environmental Control Officer (ECO) in charge of these developments. The Chance find protocol provides guidelines that must be followed when a fossil is accidentally uncovered during any stage of construction. These discoveries ought to be protected (if possible, *in situ*) and the ECO must report to the South African Heritage Resources Association (SAHRA) (Contact details: SAHRA, 111 Harrington Street, Cape Town. PO Box 4637, Cape Town 8000, South Africa. Tel: 021 462 4502. Fax: +27 (0)21 462 4509. Web: www.sahra.org.za) so that correct mitigation (recording and collection) can be carried out by a palaeontologists.	**X**	

	Preceding any collection of fossil material, the specialist would need to apply for a collection permit from SAHRA. Fossil material must be curated in an accredited collection (museum or university collection), while all fieldwork and reports should meet the minimum standards for palaeontological impact studies suggested by SAHRA. **11) CHANCE FINDS PROTOCOL** A following procedure will only be followed if fossils are uncovered during excavation. **11.1) Legislation** Cultural Heritage in South Africa (includes all heritage resources) is protected by the **National Heritage Resources Act (Act 25 of 1999) (NHRA).** According to Section 3 of the Act, all Heritage resources include **"all objects recovered from the soil or waters of South Africa, including archaeological and palaeontological objects and material, meteorites and rare geological specimens**". Palaeontological heritage is unique and non-renewable and is protected by the NHRA and are the property of the State. It is thus the responsibility of the State to manage and conserve fossils on behalf of the citizens of South Africa. Palaeontological resources may not be excavated, broken, moved, or destroyed by any development without prior assessment and without a permit from the relevant heritage resources authority as per section 35 of the NHRA. **11.2) Background** A fossil is the naturally preserved remains (or traces) of plants or animals embedded in rock. These plants and animals lived in the geologic past millions of years ago. Fossils are extremely rare and irreplaceable. By studying fossils, it is possible to determine the environmental conditions that existed in a specific geographical area millions of years ago. **11.3) Introduction** This informational document is intended for workmen and foremen on construction sites. It describes the actions to be taken when mining or construction activities accidentally uncovers fossil material. It is the responsibility of the Environmental Site Officer (ESO) or site manager of the project to train the workmen and foremen in the procedure to follow when a fossil is accidentally uncovered. In the absence of the ESO, a member of the staff must be appointed to be responsible for the proper implementation of the chance find protocol as not to compromise the conservation of fossil material.		

	11.4) Chance Find Procedure • If a chance find is made the person responsible for the find must immediately stop working and all work that could impact that finding must cease in the immediate vicinity of the find. • The person who made the find must immediately report the find to his/her direct supervisor which in turn must report the find to his/her manager and the ESO or site manager. The ESO or site manager must report the find to the relevant Heritage Agency (South African Heritage Research Agency, SAHRA). (Contact details: SAHRA, 111 Harrington Street, Cape Town. PO Box 4637, Cape Town 8000, South Africa. Tel: 021 462 4502. Fax: +27 (0)21 462 4509. Web: www.sahra.org.za). The information to the Heritage Agency must include photographs of the find, from various angles, as well as the GPS co-ordinates. • A preliminary report must be submitted to the Heritage Agency within 24 hours of the find and must include the following: 1) date of the find; 2) a description of the discovery and a 3) description of the fossil and its context (depth and position of the fossil), GPS co-ordinates. • Photographs (the more the better) of the discovery must be of high quality, in focus, accompanied by a scale. It is also important to have photographs of the vertical section (side) where the fossil was found. Upon receipt of the preliminary report, the Heritage Agency will inform the ESO (or site manager) whether a rescue excavation or rescue collection by a palaeontologist is necessary. • The site must be secured to protect it from any further damage. No attempt should be made to remove material from their environment. The exposed finds must be stabilized and covered by a plastic sheet or sand bags. The Heritage agency will also be able to advise on the most suitable method of protection of the find. • In the event that the fossil cannot be stabilized the fossil may be collected with extreme care by the ESO (site manager). Fossils finds must be stored in tissue paper and in an appropriate box while due care must be taken to remove all fossil material from the rescue site. • Once Heritage Agency has issued the written authorization, the developer may continue with the development on the affected area.		
Phase 1 Cultural Heritage Impact Assessment	**CONCLUSIONS AND RECOMMENDATIONS** The cultural landscape qualities of the region are made up of a pre-colonial element consisting of Stone Age and a much later colonial (farmer) component, which eventually gave rise to an urban component which manifest in a number of towns. <u>Identified sites</u>	**X**	

During the survey, the following sites, features or objects of cultural significance were identified.

- 7.1.1 Change finds: Stone Age artefacts, dating to the Middle Stone Age occur in low numbers along the rims of the various pans located in the project area. The tools are mostly made from hardened shale, although some are of quartzite. Typical tools include points and some side-struck tools.
- 7.3.1 Informal burial site with approximately 12 graves. The graves are only marked with stone cairns and no headstones with inscriptions were identified. The graves probably belong to former farm labourers and date to the period prior to 1950 when the Nature Reserve was established.
- 7.3.2 An unknown number of graves marked only with stone cairns. The remains of what seems to be the foundations of a number of rectangular structures also occur adjacent to the graves. A large excavation, either for diamond mining or a borrow pit, is located on the southern side. This site can possibly be linked to the old Panfontein farmstead, now located just on the outside of the nature reserve, across a regional road.

<u>Impact assessment and proposed mitigation measures</u>

Impact analysis of cultural heritage resources under threat of the proposed prospecting activities is based on the present understanding of the project:

Site No.	Site type	NHRA category	Field rating	Impact rating: Before/After mitigation
7.1.1	Archaeological resources	Section 35	Generally protected 4C: Low significance - Requires no further recording before destruction.	Low (14) Low (14)
Mitigation: (5) No further action required				

Site No.	Site type	NHRA category	Field rating	Impact rating: Before/After mitigation
7.3.1	Graves, cemeteries and burial grounds	Section 36	Generally protected: High significance – Grade IV-A	Medium (48) Low (16)
7.3.2	Graves, cemeteries and burial grounds	Section 36	Generally protected: High significance – Grade IV-A	Low (30) Low (16)
Mitigation: (1) Avoidance/Preserve: This is viewed to be the primary form of mitigation and the site should be retained *in situ* and a buffer zone should be created around it, either temporary (by means of danger tape) or permanently (wire fence or built wall).				

<u>Legal requirements</u>

The legal requirements related to heritage specifically are specified in Section 3 of this report. For this proposed project, the assessment has determined that sites, features or objects of heritage significance occur in the project area.

- If the identified graves are to be relocated for the purposes of the diamond prospecting activities, proper procedures must be followed after obtaining all the necessary permits – see Section 12.4.

	• If heritage features are identified during construction, as stated in the management recommendation, these finds would have to be assessed by a specialist, after which a decision will be made regarding the application for relevant permits. <u>Reasoned opinion as to whether the proposed activity should be authorised:</u> • From a heritage point of view, it is recommended that the proposed prospecting activities be allowed to continue on acceptance of the mitigation measures and the conditions proposed below. <u>Conditions for inclusion in the environmental authorisation:</u> • The Palaeontological Sensitivity Map (https://sahris.sahra.org.za/map/palaeo) indicate that most of the eastern section of the project area has a high sensitivity of fossil remains to be found and therefore a desktop study is required. Based on the outcome of that, a field assessment is likely. The western section has a low sensitivity of fossil remains to be found and therefore no palaeontological assessment is required. However, a protocol for finds is required. • Should archaeological sites or graves be exposed during construction work, it must immediately be reported to a heritage practitioner so that an investigation and evaluation of the finds can be made.		

L) ENVIRONMENTAL IMPACT STATEMENT

i) SUMMARY OF THE KEY FINDINGS

This section provides a summary of the assessment and conclusions drawn from the proposed prospecting area. In doing so, it draws on the information gathered as part of the environmental impact assessment process and the knowledge gained by the environmental consultant during the course of the process and presents an informed opinion on the environmental impacts associated with the proposed project. The following conclusions can be drawn for the proposed prospecting activity:

- Potential impacts on biodiversity: It is expected that some vegetation might be lost but through implementing mitigation measures. It should be kept in mind that this application is for a prospecting right without bulk sampling, only drilling and pitting sampling will take place. However, the proposed area falls within the S.A. Lombard Nature Reserve which is a protected area.

- Potential impact on heritage resources: According to HP Nel from NWPB SA Lombard Nature Reserve is the oldest nature reserve in the North West Province, and amongst the oldest in the country. The reserve was instrumental in ensuring the survival of the Black Wildebeest in the then Transvaal, as the original herd of Black Wildebeest and last free ranging herd in the then Transvaal is still kept in the reserve. Please see Appendix 6.

Phase 1 Heritage Impact Assessment
The Phase 1 Heritage Impact Assessment was conducted by Dr. J A van Schalkwyk and the following findings were made.

The cultural landscape qualities of the region are made up of a pre-colonial element consisting of Stone Age and a much later colonial (farmer) component, which eventually gave rise to an urban component which manifest in a number of towns.

Identified sites
During the survey, the following sites, features or objects of cultural significance were identified.

- *7.1.1 Change finds: Stone Age artefacts, dating to the Middle Stone Age occur in low numbers along the rims of the various pans located in the project area. The tools are mostly made from hardened shale, although some are of quartzite. Typical tools include points and some side-struck tools.*

- *7.3.1 Informal burial site with approximately 12 graves. The graves are only marked with stone cairns and no headstones with inscriptions were identified. The graves probably belong to former farm labourers and date to the period prior to 1950 when the Nature Reserve was established.*

- *7.3.2 An unknown number of graves marked only with stone cairns. The remains of what seems to be the foundations of a number of rectangular structures also occur adjacent to the graves. A large excavation, either for diamond mining or a borrow pit, is located on the southern side. This site can possibly be linked to the old Panfontein farmstead, now located just on the outside of the nature reserve, across a regional road.*

Reasoned opinion as to whether the proposed activity should be authorised:
- *From a heritage point of view, it is recommended that the proposed prospecting activities be allowed to continue on acceptance of the mitigation measures and the conditions proposed below.*

- Potential impact on Palaeontological resources:

Palaeontological Desktop Assessment
Elize Butler from Banzai Environmental conducted the Palaeontological Desktop Assessment and made the following findings.

The Geological Map indicates that the development footprint is covered by Late Tertiary to Quaternary calcretes (T-Qc), the Allanridge Formation and the Rietgat Formation (Rr) (Ventersdorp Supergroup). According to the PalaeoMap of South African Heritage Resources Information System the Palaeontological Sensitivity of the Late Tertiary to Quaternary calcrete are locally High but the diversity of organisms are low, while that of the Allanridge Formation is Low and the Rietgat Formation has a moderate Palaeontological Sensitivity (Almond and Pether 2008, SAHRIS website).

The 2724 Christiana Geological Map indicates that the development footprint is covered by Late Tertiary to Quaternary calcretes (T-Qc), the Allanridge Formation and the Rietgat Formation (Rr) (Ventersdorp Supergroup). According to the PalaeoMap of South African Heritage Resources Information System the Palaeontological Sensitivity of the Late Tertiary to Quaternary calcrete are locally High but the diversity are low, while that of the Allanridge Formation is Low and the Rietgat Formation has a moderate Palaeontological Sensitivity (Almond and Pether 2008, SAHRIS website).

If fossil remains are discovered during any phase of construction, either on the surface or exposed by excavations the ***Chance Find Protocol*** *must be implemented by the Environmental Control Officer (ECO) in charge of these developments. The Chance find protocol provides guidelines that must be followed when a fossil is accidentally uncovered during any stage of construction. These discoveries ought to be protected (if possible, in situ) and the ECO must report to the South African Heritage Resources Association (SAHRA) (Contact details: SAHRA, 111 Harrington Street, Cape Town. PO Box 4637, Cape Town 8000, South Africa. Tel: 021 462 4502. Fax: +27 (0)21 462 4509. Web: www.sahra.org.za) so that correct mitigation (recording and collection) can be carried out by a palaeontologists.*

- Potential impacts on land use: The proposed areas are being used as a Nature Reserve. The proposed prospecting activities will negatively impact the game and the number of visitors to the Nature Reserve. The activity which will be subject to concurrent rehabilitation may have significant impact on the land use and might change the sense of place of the area.

- Potential social impacts: The presence of construction workers poses a potential risk to family structures and social networks. While the presence of construction workers does not in itself constitute a social impact, the manner in which construction workers conduct themselves can impact on local communities. The most significant negative impact is associated with the disruption of existing family structures and social networks.

- Potential negative impacts: (noise, dust, soil degradation, storm water, traffic, health and safety) associated with the operation of the facility are expected to be of low - high impact, of medium terms and site specific. These can be mitigated or negated through the implementation of practical and appropriate mitigation measures. However, it falls within the S.A. Lombard Nature Reserve which is protected.

- Positive impacts: The prospecting of Diamonds (Alluvial) without bulk sampling, may result in socio-economic benefit to the area.

All possible negative impacts and risks that have been identified in this report can be effectively mitigated and managed by implementing the migratory measures as set out in the Environmental Management Programme (EMPr) attached in Part B.

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.

Refer to Locality Map attached in **Appendix 4**.

iii) SUMMARY OF THE POSITIVE AND NEGATIVE IMPLICATIONS AND RISKS OF THE PROPOSED ACTIVITY AND IDENTIFIED ALTERNATIVES

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

All possible negative impacts and risks that have been identified in this report can be effectively mitigated and managed by implementing the mitigation measures as set out in the Environmental Management Programme (EMPr) attached in Part B.

M) PROPOSED IMPACT MANAGEMENT OBJECTIVES AND THE IMPACT MANAGEMENT OUTCOMES FOR INCLUSION IN THE EMPR (Based on the assessment and where applicable the recommendations from specialist reports, the recording of proposed impact management objectives, and the impact management outcomes for the development for inclusion in the EMPr as well as for inclusion as conditions of authorisation)

Management objectives include:

- Ensure that the prospecting activity does not cause pollution to the environment or harm to persons.
- Minimise production of waste.
- All prospecting activities must be conducted in a manner that minimises noise impact, litter, environmental degradation and health hazards i.e. injuries.
- The mine must be kept neat and tidy during waste handling to prevent unsightliness and accidents.

Expected outcomes include:

- Minimum impacts on the environment as a result of prospecting without bulk sampling.
- Compliance with legislative requirements.
- Mine is neat and tidy and well managed.

FINAL PROPOSED ALTERNATIVES

(Provide an explanation for the final layout of the infrastructure and activities on the overall site as shown on the final site map together with the reasons why they are the final proposed alternatives which respond to the impact management measures, avoidance, and mitigation measures identified through the assessment)

This alternative asks the question, if there is not, from an environmental perspective, a more suitable location for the proposed activity. Due to the expected mineral resources, **Xanado Trade or Invest 184 (Pty) Ltd** would like to potentially prospect without bulk sampling for Diamonds (Alluvial) near Bloemhof on Portion 3 (portion 1) of the farm Boschpan 339, the Remaining Extent of Portion 8 (portion 1), Portion 9 (portion 1), Portion 10 (portion 1) and Portion 17 (portion 1) of the farm Panfontein 270, Registration Division: HO, North West province, therefore there will be no other alternative (i.e. to facilitate the movement of machinery, equipment, infrastructure).

N) ASPECTS FOR INCLUSION AS CONDITIONS OF AUTHORISATION.

Any aspects which have not formed part of the EMPr that must be made conditions of the Environmental Authorisation

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

O) DESCRIPTION OF ANY ASSUMPTIONS, UNCERTAINTIES AND GAPS IN KNOWLEDGE. (Which relate to the assessment and mitigation measures proposed)

The uncertainties in results are mostly related to the availability of information, time available to gather the relevant information as well as the sometimes-subjective nature of the assessment methodology. If the authority feels that specialists' studies need to be conducted, such will be corresponded to the applicant.

P) REASONED OPINION AS TO WHETHER THE PROPOSED ACTIVITY SHOULD OR SHOULD NOT BE AUTHORISED

Reasons why the activity should be authorized or not.

According to the PWP, the possibility to encounter the mineral applied for were identified.

The option of not approving the activities will result in a significant loss of possible valuable minerals being exploited. And all economic benefits will be lost.

The proposed area falls within the S.A. Lombard Nature Reserve which is a protected area.

Q) CONDITIONS THAT MUST BE INCLUDED IN THE AUTHORISATION

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

The EMPr should be binding on all managers and contractors operating/utilizing the site.

Period for which the Environmental Authorisation is required.

For a minimum of 5 years.

R) 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 EMPr and is applicable to both the Environmental Impact Assessment report and the Environmental Management Programme report.

I, **Lizanne Esterhuizen** (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. the acceptability of the project in relation to the finding of the assessment and level of mitigation proposed; ☒

Signature of the environmental assessment practitioner:

Milnex CC – Environmental Consultants

Name of company:

26/11/2020

Date:

S) FINANCIAL PROVISION

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

XXXXX

Drilling

It is estimated that the drilling will take approximately two years after the prospecting right has been executed and the EMP approved.

Calculation

According to the PWP the diameter of the borehole will be 150mm and 400 boreholes will be drilled.

- 150mm / 1000 = 0.15m (from mm to m)
- 0.15m /10 000 = 0.000015ha (from m to ha)
- 0.000015ha x 400 boreholes = 0.006ha (total area of vegetation clearance for boreholes in ha)

The total vegetation clearance for 400 boreholes is 0.006ha for 24 months & 0.003ha in 12 months

Pitting

It is planned that 80 pits will be dug (it may be less depending on the results) at an extent of 3m (length) x 2m (breath) x 4m (depth).

- (80 pits / 24 months) x 12 months = 40 pits dug per year for two years.
- Total area to be disturbed per year =40 pits x (3m x 2m) / 10 000 = 0.024ha disturbed per year
- Total area disturbed for 24 months = 80 pits x (3m x 2m) / 10 000 = 0.048ha disturbed for 24 months

PHASES	TIMEFRAME	DISTURBANCE
PHASE 3 – DRILLING		
24 months (7 -21)	1st year: 12 months	0.003ha
	2nd year: 12 months	0.003ha
PHASE 4 – PITTING		
24 months (months 22 - 41)	3rd year: 12 months	0.024ha
	4th year: 12 months	0.024ha
TOTAL	**48 months**	**0.054ha**

Calculation

0.054ha / 4 years = **0.0135ha**

The average disturbance per year for the 48months (4 years) will be **0.054ha**

i) Explain how the aforesaid amount was derived.

The closure cost estimate provided above is aligned with the Guideline Document for the Evaluation of Quantum of Closure related Financial Provision Provided by a Mine, by the DMR (January, 2005). The amount was calculated by Milnex CC.

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).

Financial Guarantee

The financial guarantee for the rehabilitation for land disturbed by **Xanado Trade or Invest 184 (Pty) Ltd**, will be submitted to the department on request

Rehabilitation Fund

Xanado Trade or Invest 184 (Pty) Ltd will also make provision for rehabilitation during closure by establishing a rehabilitation trust.

iii) Motivation for the deviation.

Not applicable

T) OTHER INFORMATION REQUIRED BY THE COMPETENT AUTHORITY

COMPLIANCE WITH THE PROVISIONS OF SECTIONS 24(4)(A) AND (B) READ WITH SECTION 24 (3) (A) AND (7) OF THE NATIONAL ENVIRONMENTAL MANAGEMENT ACT (ACT 107 OF 1998). THE EIA REPORT MUST INCLUDE THE:

i. 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 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 **Appendix 2.19.1** and confirm that the applicable mitigation is reflected in 2.5.3; 2.11.6.and 2.12.herein).

The following impacts may be regarded as community impacts:

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

Indirect socio-economic benefits are expected to be associated with the creation of employment.

ii. 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 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).

According to HP Nel from NWPB SA Lombard Nature Reserve is the oldest nature reserve in the North West Province, and amongst the oldest in the country. The reserve was instrumental in ensuring the survival of the Black Wildebeest in the then Transvaal, as the original herd of Black Wildebeest and last free ranging herd in the then Transvaal is still kept in the reserve. Please see **Appendix 6.**

According to the map of relative Archaeological and Cultural Heritage Theme Sensitivity in the DEA Screening Report, the proposed area falls within high sensitivity and the relative Paleontology Theme Sensitivity falls within medium sensitivity and a small area in high. Please see map colour map under **Appendix 7.**

Two specialist studies were conducted a Palaeontological Desktop Assessment and a Phase 1 Heritage Impact Assessment. The finding of the studies is summarised below, and the reports are available under **Appendix 11**.

Palaeontological Desktop Assessment
Elize Butler from Banzai Environmental conducted the Palaeontological Desktop Assessment and made the following findings.

The Geological Map indicates that the development footprint is covered by Late Tertiary to Quaternary calcretes (T-Qc), the Allanridge Formation and the Rietgat Formation (Rr) (Ventersdorp Supergroup). According to the PalaeoMap of South African Heritage Resources Information System the Palaeontological Sensitivity of the Late Tertiary to Quaternary calcrete are locally High but the diversity of organisms are low, while that of the Allanridge Formation is Low and the Rietgat Formation has a moderate Palaeontological Sensitivity (Almond and Pether 2008, SAHRIS website).

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*If fossil remains are discovered during any phase of construction, either on the surface or exposed by excavations the **Chance Find Protocol** must be implemented by the Environmental Control Officer (ECO) in charge of these developments. The Chance find protocol provides guidelines that must be followed when a fossil is accidentally uncovered during any stage of construction. These discoveries ought to be protected (if possible, in situ) and the ECO must report to the South African Heritage Resources Association (SAHRA) (Contact details: SAHRA, 111 Harrington Street, Cape Town. PO Box 4637, Cape Town 8000, South Africa. Tel: 021 462 4502. Fax: +27 (0)21 462 4509. Web: www.sahra.org.za) so that correct mitigation (recording and collection) can be carried out by a palaeontologists.*

Preceding any collection of fossil material, the specialist would need to apply for a collection permit from SAHRA. Fossil material must be curated in an accredited collection (museum or university collection), while all fieldwork and reports should meet the minimum standards for palaeontological impact studies suggested by SAHRA.

Phase 1 Heritage Impact Assessment
The Phase 1 Heritage Impact Assessment was conducted by Dr. J A van Schalkwyk and the following findings were made.

The cultural landscape qualities of the region are made up of a pre-colonial element consisting of Stone Age and a much later colonial (farmer) component, which eventually gave rise to an urban component which manifest in a number of towns.

Identified sites
During the survey, the following sites, features or objects of cultural significance were identified.

- *7.1.1 Change finds: Stone Age artefacts, dating to the Middle Stone Age occur in low numbers along the rims of the various pans located in the project area. The tools are mostly made from hardened shale, although some are of quartzite. Typical tools include points and some side-struck tools.*

- *7.3.1 Informal burial site with approximately 12 graves. The graves are only marked with stone cairns and no headstones with inscriptions were identified. The graves probably belong to former farm labourers and date to the period prior to 1950 when the Nature Reserve was established.*

- *7.3.2 An unknown number of graves marked only with stone cairns. The remains of what seems to be the foundations of a number of rectangular structures also occur adjacent to the graves. A large excavation, either for diamond mining or a borrow pit, is located on the southern side. This site can possibly be linked to the old Panfontein farmstead, now located just on the outside of the nature reserve, across a regional road.*

Impact assessment and proposed mitigation measures

Impact analysis of cultural heritage resources under threat of the proposed prospecting activities is based on the present understanding of the project:

Site No.	Site type	NHRA category	Field rating	Impact rating: Before/After mitigation
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Mitigation: (5) No further action required				

Site No.	Site type	NHRA category	Field rating	Impact rating: Before/After mitigation
7.3.1	Graves, cemeteries and burial grounds	Section 36	Generally protected: High significance – Grade IV-A	Medium (48) Low (16)
7.3.2	Graves, cemeteries and burial grounds	Section 36	Generally protected: High significance – Grade IV-A	Low (30) Low (16)
Mitigation: (1) Avoidance/Preserve: This is viewed to be the primary form of mitigation and the site should be retained *in situ* and a buffer zone should be created around it, either temporary (by means of danger tape) or permanently (wire fence or built wall).				

Legal requirements

The legal requirements related to heritage specifically are specified in Section 3 of this report. For this proposed project, the assessment has determined that sites, features or objects of heritage significance occur in the project area.

- *If the identified graves are to be relocated for the purposes of the diamond prospecting activities, proper procedures must be followed after obtaining all the necessary permits – see Section 12.4.*
- *If heritage features are identified during construction, as stated in the management recommendation, these finds would have to be assessed by a specialist, after which a decision will be made regarding the application for relevant permits.*

Reasoned opinion as to whether the proposed activity should be authorised:

- *From a heritage point of view, it is recommended that the proposed prospecting activities be allowed to continue on acceptance of the mitigation measures and the conditions proposed below.*

Conditions for inclusion in the environmental authorisation:

- *The Palaeontological Sensitivity Map (https://sahris.sahra.org.za/map/palaeo) indicate that most of the eastern section of the project area has a high sensitivity of fossil remains to be found and therefore a desktop study is required. Based on the outcome of that, a field assessment is likely. The western section has a low sensitivity of fossil remains to be found and therefore no palaeontological assessment is required. However, a protocol for finds is required.*
- *Should archaeological sites or graves be exposed during construction work, it must immediately be reported to a heritage practitioner so that an investigation and evaluation of the finds can be made.*

U) 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)**.

From a local perspective, the prospecting of Diamonds (Alluvial) Diamonds (Alluvial) near Bloemhof on Portion 3 (portion 1) of the farm Boschpan 339, the Remaining Extent of Portion 8 (portion 1), Portion 9 (portion 1), Portion 10 (portion 1) and Portion 17 (portion 1) of the farm Panfontein 270, Registration Division: HO, North West province, is preferred because the geological formation supports the possibility that the minerals applied for could be found on the proposed area. Please see PWP attached as **Appendix 9**.

However, the proposed area falls within the S.A. Lombard Nature Reserve which as a protected area.

PART B

ENVIRONMENTAL MANAGEMENT PROGRAMME REPORT

1) Draft environmental management programme.

A) DETAILS OF THE EAP

i) The EAP who prepared the report

ii) Expertise of the EAP

Name of Practitioner	Qualifications	Contact details
Percy Sehaole	Master's Degree in Environmental Science (refer to **Appendix 1**)	Tel No.: (018) 011 1925 Fax No: (053) 963 2009 e-mail address: percy@milnex-sa.co.za
Lizanne Esterhuizen	Honours Degree in Environmental Science (refer to **Appendix 1**)	Tel No.: (018) 011 1925 Fax No: (053) 963 2009 e-mail address: lizanne@milnex-sa.co.za

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).

It is hereby confirmed that the requirements to describe the aspects of the activity that are required by the EMP is already included in Part A, section 1(h).

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)

Refer to Locality Map, attached as **Appendix 4**.

D) DESCRIPTION OF IMPACT MANAGEMENT OBJECTIVES INCLUDING MANAGEMENT STATEMENTS

i. **Determination of closure objectives.** (ensure that the closure objectives are informed by the type of environment described in 2.4 herein)

Closure objectives for the prospecting right without bulk sampling will aim to ensure that the residual post-closure impacts be minimized and be acceptable to relevant parties. To achieve these closure objectives, the following will be implemented:

- All prospecting related infrastructure, foundations and concrete areas will be decommissioned, removed from the site and appropriately disposed of. Reclaimable structures such as metal, electrical installations or equipment will be sold for re-use or as scrap.

- All disturbed areas within the site not already vegetated will be re-vegetated with appropriate indigenous, ecologically adapted species appropriate to the area and the final land use as soon as possible after operation ceases. Progress of vegetation growth/establishment, stability and drainage/erosion will be monitored and, in the event of adverse trends being identified, corrective measures will be implemented.

- Vegetation monitoring will consider, inter alia, the establishment of perennial ground cover and infestation by alien invasive plant species. The encroachment of indigenous vegetation into the area will be used as an indication of a stable, self-sustaining vegetation cover with little risk of retrogressing to a situation where are and water pollution may occur.

- Final landforms must be resilient to perturbation and also be self-sustaining to obviate/limit further/ongoing interventions and maintenance by **Xanado Trade or Invest 184 (Pty) Ltd.** The remaining impacts be of an acceptable nature with minimal deterioration over time.
- The final outcome of the mine site rehabilitation would be productive systems, where required sustaining either livestock and/or game/wildlife.
- Environmental and human quality of life, including health and safety requirements in general, would not be compromised; and
- Closure is achieved in an efficient and cost-effective manner as possible and with minimum socioeconomic changes.

The above goal is underpinned by more specific objectives listed below.

1. Upfront planning/development

To provide overall guidance and direction to closure planning and/or the implementation of progressive closure measures over the remaining over the prospecting life.

2. Physical stability

To ensure that surface infrastructure and prospecting residue and/or disturbances that are present at processing plant decommissioning will be removed and/or stabilised in a manner that these will not compromise post-closure land use and be sustainable long-term landforms.

- Closure, removal and disposal of all surface infrastructure that has no beneficial post-closure use.
- Shaping and vegetating the remaining earth embankments, trenches, etc. to stabilise slopes and integrate with surrounding topography.

3. Environmental quality

To ensure that local environmental quality is not adversely affected by possible physical effects arising from prospecting operations and the prospecting site after closure. This will be achieved by:

- Avoiding and/or limiting the following during prospecting operations which could result in adverse effects that could not be readily addressed and/or mitigated at mine closure.
  - Dust fall-out areas surrounding the prospecting site.
  - Wash-off and/or mobilisation of chemically contaminated soils and sediments from the prospecting site that could have long term adverse effects on local aquatic health and/or other water uses.
  - Possible shallow groundwater contamination adversely affecting the quality of the local water resource and its beneficial use.
- Limiting the potential for dust generation on the rehabilitated prospecting site that could cause nuisance and/or health effects to surrounding landowners;
- Limiting the possible adverse water quality and quantity effects arising from the rehabilitated prospecting site to ensure that long term beneficial use of local resources is not compromised;
- Conducting soil clean-up/remediation to ensure that the planned land use could be implemented and maintained;

4. Health and safety

To limit the possible health and safety treats due to terrain hazards to humans and animals utilizing the rehabilitated prospecting site after closure by:

- Demonstrating through upfront soil testing that any resultant inorganic and organic pollution present on the site is acceptable;
- Removal of potential contaminants such as hydrocarbons and chemicals off site;
- Shaping of embankments and trenches to safe slopes and reintegrating of these into surrounding topography.
- Ensuring that the environmental quality as reflected above is achieved.

5. Land capability / land use

To ensure that the required land capability to achieve and support the planned land use can be achieved over the prospecting site by:

- Clean-up and reclamation of contaminated soil areas in order not to compromise the above land use planning earmarked for implementation;
- To ensure that the overall rehabilitated prospecting site is free draining
- Transferring prospecting related surface infrastructure to third parties for beneficial use after closure.

6. Aesthetic quality

To ensure that the rehabilitated prospecting site will display, at a minimum, an acceptable aesthetic appearance that would not compromise the planned land use by leaving behind:

- A prospecting area that is properly cleared-up with no fugitive/scattered waste piles
- Rehabilitated prospecting area that is free draining and disturbed areas that are suitably vegetated.
- Rehabilitated prospecting residues that are suitably landscaped, blending with the surrounding environment as far as possible.
- Shaped and rehabilitated terrace and hard stand areas, roughly emulating the local natural surface topography.

7. Landscape viability

To create a landscape that is self-sustaining and over time will evolve/converge to the desired ecosystem structure, function and composition by:

- Conducing surface profiling, with associated material movement optimisation, to obtain a landscape resembling the natural landscapes to support the succession trajectory towards a climax ecological system.
- Establishing woody patches and create “rough and loose” areas for pioneer specie establishment around the respective patches.
- Establishing pioneer species as follows:
- Collected and prepared seeds for broad casting;
- Seedlings grown on on-site nursery;
- Cuttings collected from surrounding veld areas;
- Conducting rehabilitation monitoring and corrective action as required.

8. Biodiversity

To encourage, where appropriate, the re-establishment of native vegetation on the rehabilitated mine site such the terrestrial biodiversity is largely re-instated over time, by:

- Stabilising disturbed areas to prevent erosion in the short- to medium term until a suitable vegetation cover has established; and
- Establishing viable self-sustaining vegetation communities of local fauna, as far as possible.

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.

The Rehabilitation & Closure Plan is attached as **Appendix 8.**

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

XXXXX

Drilling

According to the PWP the diameter of the borehole will be 150mm and 400 boreholes will be drilled.

- 150mm / 1000 = 0.15m (from mm to m)
- 0.15m /10 000 = 0.000015ha (from m to ha)
- 0.000015ha x 400 boreholes = 0.006ha (total area of vegetation clearance for boreholes in ha)

The total vegetation clearance for 400 boreholes is 0.006ha for 24 months & 0.003ha in 12 months

Pitting

It is planned that 80 pits will be dug (it may be less depending on the results) at an extent of 3m (length) x 2m (breath) x 4m (depth).

- (80 pits / 24 months) x 12 months = 40 pits dug per year for two years.

- Total area to be disturbed per year =40 pits x (3m x 2m) / 10 000 = 0.024ha disturbed per year
- Total area disturbed for 24 months = 80 pits x (3m x 2m) / 10 000 = 0.048ha disturbed for 24 months

PHASES	TIMEFRAME	DISTURBANCE
PHASE 3 – DRILLING		
24 months (7 -21)	1st year: 12 months	0.003ha
	2nd year: 12 months	0.003ha
PHASE 4 – PITTING		
24 months (months 22 - 41)	3rd year: 12 months	0.024ha
	4th year: 12 months	0.024ha
TOTAL	**48 months**	**0.054ha**

Calculation
0.054ha / 4 years = **0.0135ha**

The average disturbance per year for the 48months (4 years) will be **0.054ha**

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

Financial Guarantee

The financial guarantee for the rehabilitation for land disturbed **Xanado Trade or Invest 184 (Pty) Ltd** will be submitted

Rehabilitation Fund

Xanado Trade or Invest 184 (Pty) Ltd will also make provision for rehabilitation during closure by establishing a rehabilitation trust.

E) IMPACTS TO BE MITIGATED IN THEIR RESPECTIVE PHASES

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

ACTIVITIES **(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.)	**PHASE** (of operation in which activity will take place. State; Planning and design, Pre-Construction' Construction, Operational, Rehabilitation, Closure, Post closure).	**SIZE AND SCALE of disturbance** (volumes, tonnages and hectares or m²)	**MITIGATION MEASURES** (describe how each of the recommendations in herein will remedy the cause of pollution or degradation and migration of pollutants)	**COMPLIANCE WITH STANDARDS** (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)	**TIME PERIOD FOR IMPLEMENTATION** Describe the time period when the measures in the environmental management programme must be implemented Measures must be implemented when required. With regard to Rehabilitation specifically this must take place at the earliest opportunity. .With regard to Rehabilitation, therefore state either:-.. Upon cessation of the individual activity Or. Upon the cessation of mining, bulk sampling or prospecting as the case may be.
Clearance of vegetation	Pitting & drilling phase - (construction and operation phase)	3174.6764 ha - Only the areas where prospecting takes place, might be cleared or the vegetation disturbed. Please refer to PWP (Appendix 9)	1. Site clearing must take place in a phased manner, as and when required. 2. Areas which are not to be prospected on within two months must not be cleared to reduce erosion risks. 3. The area to be cleared must be clearly demarcated and this footprint strictly maintained. 4. Spoil that is removed from the site must be removed to an approved spoil site or a licensed landfill site. 5. The necessary silt fences and erosion control measures must be implemented in areas where these risks are more prevalent.	Compliance with Duty of Care as detailed within NEMA	Duration of operations on the prospecting activities.
Construction of roads	Pitting &		1. Planning of access routes to the site for construction/prospecting purposes shall be done in conjunction with the Contractor and the	Compliance with Duty of Care as detailed within NEMA	Duration of operations on the prospecting activities.

	drilling phase - (construction and operation phase)		Landowner. All agreements reached should be documented and no verbal agreements should be made. The Contractor shall clearly mark all access roads. Roads not to be used shall be marked with a "NO ENTRY for prospecting vehicles" sign. 2. Construction routes and required access roads must be clearly defined. 3. Damping down of the un-surfaced roads must be implemented to reduce dust and nuisance. 4. Soils compacted by construction/prospecting activities shall be deep ripped to loosen compacted layers and re-graded to even running levels. 5. The contractor must ensure that damage caused by related traffic from a gravel road is repaired continuously. The costs associated with the repair must be borne by the contractor; 6. Dust suppression measures must be implemented for heavy vehicles such as wetting of gravel roads on a regular basis and ensuring that vehicles used to transport the gravel are fitted with tarpaulins or covers; 7. All vehicles must be road-worthy and drivers must be qualified and made aware of the potential road safety issues and need for strict speed limits.		
Prospecting Diamonds (Alluvial) – prospecting without bulk sampling – Soils and geology	Pitting & drilling phase - (construction and operation phase)	3174.6764 ha - Only the areas where prospecting takes place, might be cleared or the vegetation disturbed. Please refer to PWP (Appendix 9)	1. The Contractor should, prior to the commencement of earthworks determine the average depth of topsoil (If topsoil exists), and agree on this with the ECO. The full depth of topsoil should be stripped from areas affected by construction and related activities prior to the commencement of major earthworks. This should include the building footprints, working areas and storage areas. Topsoil must be	Compliance with Duty of Care as detailed within NEMA	Duration of operations on the mine

			reused where possible to rehabilitate disturbed areas. 2. Care must be taken not to mix topsoil and subsoil or any other material, during stripping. 3. The topsoil must be conserved on site in and around the pit/trench area. 4. Subsoil and overburden in the prospecting area should be stockpiled separately to be returned for backfilling in the correct soil horizon order. 5. If stockpiles are exposed to windy conditions or heavy rain, they should be covered either by vegetation or geofabric, depending on the duration of the project. Stockpiles may further be protected by the construction of berms, trenches or low brick walls around their bases. 6. Stockpiles should be kept clear of weeds and alien vegetation growth by regular weeding. 7. Where contamination of soil is expected, analysis must be done prior to disposal of soil to determine the appropriate disposal route. Proof from an approved waste disposal site where contaminated soils are dumped if and when a spillage/leakage occurs should be attained and given to the project manager. 8. The impact on the geology will be permanent. There is no mitigation measure.		
Prospecting Diamonds (Alluvial) – prospecting without bulk sampling	Pitting & drilling phase - (construction and operation phase)	3174.6764 ha - Only the areas where prospecting takes place, might be cleared or the vegetation disturbed. Please refer to PWP (Appendix 9)	1. The prospecting activities must aim to adhere to the relevant noise regulations and limit noise to within standard working hours in order to reduce disturbance of dwellings in close proximity to the development. 2. Mine, pans, workshops and other noisy fixed facilities should be located well away from noise sensitive areas. Once the proposed final layouts are made available by the Contractor(s), the	Compliance with Duty of Care as detailed within NEMA	Duration of operations on the prospecting area

			sites must be evaluated in detail and specific measures designed in to the system. 3. Truck traffic should be routed away from noise sensitive areas, where possible. 4. Noise levels must be kept within acceptable limits. 5. Noisy operations should be combined so that they occur where possible at the same time. 6. Mine workers to wear necessary ear protection gear. 7. Noisy activities to take place during allocated hours. 8. Noise from labourers must be controlled. 9. Noise suppression measures must be applied to all equipment. Equipment must be kept in good working order and where appropriate fitted with silencers which are kept in good working order. Should the vehicles or equipment not be in good working order, the Contractor may be instructed to remove the offending vehicle or machinery from the site. 10. The Contractor must take measures to discourage labourers from loitering in the area and causing noise disturbance. Where possible labour shall be transported to and from the site by the Contractor or his Sub-Contractors by the Contractors own transport. 11. Implementation of enclosure and cladding of processing plants. 12. Applying regular and thorough maintenance schedules to equipment and processes. An increase in noise emission levels very often is a sign of the imminent mechanical failure of a machine.		

IMPACT MANAGEMENT OUTCOMES

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

ACTIVITY (whether listed or not listed). **(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.)**.	**POTENTIAL IMPACT** **(e.g. dust, noise, drainage surface disturbance, fly rock, surface water contamination, groundwater contamination, air pollution etc….etc…)**	**ASPECTS AFFECTED**	**PHASE** In which impact is anticipated **(e.g. Construction, commissioning, operational Decommissioning, closure, post-closure)**	**MITIGATION TYPE** **(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.** • **Modify through alternative method.** • **Control through noise control** • **Control through management and monitoring** • **Remedy through rehabilitation..**	**STANDARD TO BE ACHIEVED** **(Impact avoided, noise levels, dust levels, rehabilitation standards, end use objectives) etc.**
Clearance of vegetation	Loss or fragmentation of habitats	Fauna & flora	(construction and operation phase)	**Existing vegetation** 1. Vegetation removal must be limited to the prospecting area. 2. Vegetation to be removed as it becomes necessary rather than removal of all vegetation throughout the site in one step. 3. No vegetation to be used for firewood. 4. Exotic and invasive plant species should not be allowed to establish, if the development is approved. 5. There should be a preconstruction walk-through of the development footprint/project site in order to locate individuals of plant species of conservation concern. A search and rescue exercise must be done to locate and relocate any protected species to a suitable and similar habitat where these plants can grow without any disturbance;	Minimisation of impacts to acceptable limits

				6. In case Camel Thorn or Shepherd's trees are found permits must be obtained from DAFF to remove these individuals. The contractor must apply for these permits in a phased manner as mining proceeds. **Rehabilitation** 7. All damaged areas shall be rehabilitated upon completion of the contract. 8. Re-vegetation of the disturbed site is aimed at approximating as near as possible the natural vegetative conditions prevailing prior to construction. 9. All natural areas impacted during construction/prospecting must be rehabilitated with locally indigenous grasses typical of the representative botanical unit. 10. Rehabilitation must take place in a phased approach as soon as possible. 11. Rehabilitation process must make use of species indigenous to the area. Seeds from surrounding seed banks can be used for re-seeding. 12. Rehabilitation must be executed in such a manner that surface run-off will not cause erosion of disturbed areas. 13. Planting of indigenous tree species in areas not to be cultivated or built on must be encouraged. **Demarcation of prospecting area** 14. All plants not interfering with prospecting operations shall be left undisturbed clearly marked and indicated on the site plan. 15. The prospecting area must be well demarcated and no construction/prospecting activities must be allowed outside of this demarcated footprint. 16. Vegetation removal must be phased in order to reduce impact of construction/prospecting.	

				17. Site office and laydown areas must be clearly demarcated and no encroachment must occur beyond demarcated areas. 18. Strict and regular auditing of the prospecting process to ensure containment of the prospecting and laydown areas. 19. Soils must be kept free of petrochemical solutions that may be kept on site during construction/prospecting. Spillage can result in a loss of soil functionality thus limiting the re-establishment of flora. **Utilisation of resources** 20. Gathering of firewood, fruit, muti plants, or any other natural material onsite or in areas adjacent to the site is prohibited unless with prior approval of the ECO. **Exotic vegetation** 21. Alien vegetation on the site will need to be controlled. 22. The Contractor should be responsible for implementing a programme of weed control (particularly in areas where soil has been disturbed); and grassing of any remaining stockpiles to prevent weed invasion. 23. The spread of exotic species occurring throughout the site should be controlled. 24. Weed control measures must be applied to eradicate any noxious weeds (category 1a &1b species) on disturbed areas. **Herbicides** 25. Herbicide use shall only be allowed according to contract specifications. The application shall be according to set specifications and under supervision of a qualified technician. The possibility of leaching into the surrounding environment shall be properly investigated and only environmentally friendly herbicides shall be used.	

				26. The use of pesticides and herbicides on the site must be discouraged as these impact on important pollinator species of indigenous vegetation. **Fauna** 27. Rehabilitation to be undertaken as soon as possible after the prospecting activities have been completed. 28. No trapping or snaring to fauna on the construction/prospecting site should be allowed. 29. No faunal species must be disturbed, trapped, hunted or killed by maintenance staff during any routine maintenance at the development. 30. Any fauna threatened by the construction and operation activities should be removed to safety by the ECO or appropriately qualified environmental officer. 31. All construction vehicles should adhere to a low speed limit (<30km/h) to avoid collisions with susceptible species such as snakes and tortoises. 32. If trenches need to be dug for electrical cabling or other purposes, these should not be left open for extended periods of time as fauna may fall in and become trapped in them. Trenches which are exposed should contain soil ramps allowing fauna to escape the trench.	
Prospecting Diamonds (Alluvial) – prospecting without bulk sampling	Loss of topsoil	Soil	(construction and operation phase)	1. The Contractor should, prior to the commencement of earthworks determine the average depth of topsoil, and agree on this with the ECO. The full depth of topsoil should be stripped from areas affected by construction and related activities prior to the commencement of major earthworks. This should include the building footprints, working areas and storage areas. Topsoil must be reused where possible to rehabilitate disturbed areas. 2. Care must be taken not to mix topsoil and subsoil or any other material, during stripping. 3. The topsoil must be conserved on site in and around the pit/trench area.	Minimisation of impacts to acceptable limits

				4. Subsoil and overburden in the prospecting area should be stockpiled separately to be returned for backfilling in the correct soil horizon order. 5. If stockpiles are exposed to windy conditions or heavy rain, they should be covered either by vegetation or geofabric, depending on the duration of the project. Stockpiles may further be protected by the construction of berms or low brick walls around their bases. 6. Stockpiles should be kept clear of weeds and alien vegetation growth by regular weeding. 7. Where contamination of soil is expected, analysis must be done prior to disposal of soil to determine the appropriate disposal route. Proof from an approved waste disposal site where contaminated soils are dumped if and when a spillage/leakage occurs should be attained and given to the project manager. Establish an effective record keeping system for each area where soil is disturbed for prospecting purposes. These records should be included in environmental performance reports, and should include all the records below. • Record the GPS coordinates of each area. • Record the date of topsoil stripping. • Record the GPS coordinates of where the topsoil is stockpiled. • Record the date of cessation prospecting activities at the particular site. • Photograph the area on cessation of prospecting activities. • Record date and depth of re-spreading of topsoil. • Photograph the area on completion of rehabilitation and on an annual basis thereafter to show vegetation establishment and evaluate progress of restoration over time.	

	Erosion	Soil Air Water	(construction and operation phase)	1. An effective system of run-off control should be implemented, where it is required, that collects and safely disseminates run-off water from all hardened surfaces and prevents potential down slope erosion. 2. Periodical site inspection should be included in environmental performance reporting that inspects the effectiveness of the run-off control system and specifically records the occurrence of any erosion on site or downstream. 3. Implement an effective system of run-off control, where it is required, that collects and safely disseminates run-off water from all hardened surfaces and prevents potential down slope erosion. 4. Monitor the area regularly after larger rainfall events to determine where erosion may be initiated and then mitigate by modifying the soil micro-topography and revegetation or soil erosion control efforts accordingly 5. Wind screening and stormwater control should be undertaken to prevent soil loss from the site. 6. The use of silt fences and sand bags must be implemented in areas that are susceptible to erosion. 7. Other erosion control measures that can be implemented are as follows: o Brush packing with cleared vegetation o Mulch or chip packing o Planting of vegetation o Hydroseeding/hand sowing 8. Sensitive areas need to be identified prior to construction/prospecting so that the necessary precautions can be implemented. 9. All erosion control mechanisms need to be regularly maintained. 10. Seeding of topsoil and subsoil stockpiles to prevent wind and water erosion of soil surfaces. 11. Retention of vegetation where possible to avoid soil erosion.	Minimisation of impacts to acceptable limits

				12. Vegetation clearance should be phased to ensure that the minimum area of soil is exposed to potential erosion at any one time. 13. Re-vegetation of disturbed surfaces should occur immediately after construction/prospecting activities are completed. This should be done through seeding with indigenous grasses. 14. No impediment to the natural water flow other than approved erosion control works is permitted. 15. To prevent stormwater damage, the increase in stormwater run-off resulting from construction/prospecting activities must be estimated and the drainage system assessed accordingly. 16. Stockpiles not used in three (3) months after stripping must be seeded or backfilled to prevent dust and erosion.	
	Air Pollution	Air	(construction and operation phase)	**Dust control** 1. Wheel washing and damping down of un-surfaced and un-vegetated areas. 2. Retention of vegetation where possible will reduce dust travel. 3. Clearing activities must only be done during agreed working times and permitting weather conditions to avoid drifting of sand and dust into neighbouring areas. 4. Damping down of all exposed soil surfaces with a water bowser or sprinklers when necessary to reduce dust. 5. The Contractor shall be responsible for dust control on site to ensure no nuisance is caused to the neighbouring communities. 6. A speed limit of 30km/h must not be exceeded on site. 7. Any complaints or claims emanating from the lack of dust control shall be attended to immediately by the Contractor. 8. Any dirt roads that are utilised by the workers must be regularly maintained to ensure that dust levels are controlled.	Minimisation of impacts to acceptable limits

				Odour control 9. Regular servicing of vehicles in order to limit gaseous emissions. 10. Regular servicing of onsite toilets to avoid potential odours. **Rehabilitation** 11. The Contractor should commence rehabilitation of exposed soil surfaces as soon as practical after completion of earthworks. **Fire prevention** 12. No open fires shall be allowed on site under any circumstance. All cooking shall be done in demarcated areas that are safe and cannot cause runaway fires. 13. The Contractor shall have operational fire-fighting equipment available on site at all times. The level of firefighting equipment must be assessed and evaluated through a typical risk assessment process.	
	Noise		(construction and operation phase)	1. The prospecting activities must aim to adhere to the relevant noise regulations and limit noise to within standard working hours in order to reduce disturbance of dwellings in close proximity to the development. 2. Mine, crushers, workshops and other noisy fixed facilities should be located well away from noise sensitive areas. Once the proposed final layouts are made available by the Contractor(s), the sites must be evaluated in detail and specific measures designed in to the system. 3. Truck traffic should be routed away from noise sensitive areas, where possible. 4. Noise levels must be kept within acceptable limits. 5. Noisy operations should be combined so that they occur where possible at the same time. 6. Mine workers to wear necessary ear protection gear.	Minimisation of impacts to acceptable limits

				7. Noisy activities to take place during allocated hours. 8. Noise from labourers must be controlled. 9. Noise suppression measures must be applied to all equipment. Equipment must be kept in good working order and where appropriate fitted with silencers which are kept in good working order. Should the vehicles or equipment not be in good working order, the Contractor may be instructed to remove the offending vehicle or machinery from the site. 10. The Contractor must take measures to discourage labourers from loitering in the area and causing noise disturbance. Where possible labour shall be transported to and from the site by the Contractor or his Sub-Contractors by the Contractors own transport. 11. Implementation of enclosure and cladding of processing plants. 12. Applying regular and thorough maintenance schedules to equipment and processes. An increase in noise emission levels very often is a sign of the imminent mechanical failure of a machine.	
	Impact on potential cultural, heritage artefacts and fossils.	Heritage and Palaeontology	(construction and operation phase)	1. Any finds must be reported to the nearest National Monuments office to comply with the National Heritage Resources Act (Act No 25 of 1999) and to DEA. 2. Local museums as well as the South African Heritage Resource Agency (SAHRA) should be informed if any artefacts/ fossils are uncovered in the affected area. 3. The Contractor must ensure that his workforce is aware of the necessity of reporting any possible historical, archaeological or palaeontological finds to the ECO so that appropriate action can be taken. 4. Known sites should be clearly marked in order that they can be avoided. The work force should also be informed that fenced-off areas are no-go areas. 5. The ECO must also survey for heritage and palaeontological artefacts during ground breaking and digging or drilling. He/she should familiarise themselves with formations and its fossils or a palaeontologist	Minimisation of impacts to acceptable limits

				should be appointed during the digging and excavation phase of the development. 6. All digging, excavating, drilling or blasting activities must be stopped if heritage and/or palaeontological artefacts are uncovered and a specialist should be called in to determine proper management, mitigation, excavation and/or collecting measures. 7. Any discovered artefacts or fossils shall not be removed under any circumstances. Any destruction of a site can only be allowed once a permit is obtained and the site has been mapped and noted. Permits shall be obtained from SAHRA should the proposed site affect any world heritage/palaeontology sites or if any heritage/palaeontology sites are to be destroyed or altered. 8. Under no circumstances shall any artefacts be removed, destroyed or interfered with by anyone on the site; and contractors and workers shall be advised of the penalties associated with the unlawful removal of cultural, historical, archaeological or palaeontological artefacts, as set out in the NHRA (Act No. 25 of 1999), Section 51. (1). 9. If anything of Archaeological and/or paleontological significance is found during the construction and operational phase of the mine the following applies: • NHRA 38(4)c(i) – If any evidence of archaeological sites or remains (e.g. remnants of stone-made structures, indigenous ceramics, bones, stone artefacts, ostrich eggshell fragments, charcoal and ash concentrations), fossils or other categories of heritage resources are found during the proposed development, SAHRA APM Unit (021 462 5402) must be alerted as per section 35(3) of the NHRA. Non-compliance with section of the NHRA is an offense in terms of section 51(1)e of the NHRA and item 5 of the Schedule; • NHRA 38(4)c(ii) – If unmarked human burials are uncovered, the SAHRA Burial Grounds and Graves (BGG) Unit (012 320 8490), must be alerted immediately as per section 36(6) of the NHRA. Non-compliance with section of the NHRA	

				is an offense in terms of section 51(1)e of the NHRA and item 5 of the Schedule; • NHRA 38(4)e – The following conditions apply with regards to the appointment of specialists: i) If heritage resources are uncovered during the course of the development, a professional archaeologist or palaeontologist, depending on the nature of the finds, must be contracted as soon as possible to inspect the heritage resource. If the newly discovered heritage resources prove to be of archaeological or palaeontological significance, a Phase 2 rescue operation may be required subject to permits issued by SAHRA; According to the Palaeontological Desktop Assessment the Chance find Procedure must be implemented: **Chance Find Procedure** • If a chance find is made the person responsible for the find must immediately stop working and all work that could impact that finding must cease in the immediate vicinity of the find. • The person who made the find must immediately report the find to his/her direct supervisor which in turn must report the find to his/her manager and the ESO or site manager. The ESO or site manager must report the find to the relevant Heritage Agency (South African Heritage Research Agency, SAHRA). (Contact details: SAHRA, 111 Harrington Street, Cape Town. PO Box 4637, Cape Town 8000, South Africa. Tel: 021 462 4502. Fax: +27 (0)21 462 4509. Web: www.sahra.org.za). The information to the Heritage Agency must include photographs of the find, from various angles, as well as the GPS co-ordinates. • A preliminary report must be submitted to the Heritage Agency within 24 hours of the find and must include the following: 1) date of the find; 2) a description of the discovery and a 3) description of the fossil and its context (depth and position of the fossil), GPS co-ordinates.	

				• Photographs (the more the better) of the discovery must be of high quality, in focus, accompanied by a scale. It is also important to have photographs of the vertical section (side) where the fossil was found. Upon receipt of the preliminary report, the Heritage Agency will inform the ESO (or site manager) whether a rescue excavation or rescue collection by a palaeontologist is necessary. • The site must be secured to protect it from any further damage. No attempt should be made to remove material from their environment. The exposed finds must be stabilized and covered by a plastic sheet or sand bags. The Heritage agency will also be able to advise on the most suitable method of protection of the find. • In the event that the fossil cannot be stabilized the fossil may be collected with extreme care by the ESO (site manager). Fossils finds must be stored in tissue paper and in an appropriate box while due care must be taken to remove all fossil material from the rescue site. • Once Heritage Agency has issued the written authorization, the developer may continue with the development on the affected area. According to the Phase 1 Heritage Impact Assessment the following must be implemented: • Known sites should be clearly marked in order that they can be avoided during construction activities. • The contractors and workers should be notified that archaeological sites might be exposed during the construction activities. • Should any heritage artefacts be exposed during excavation, work on the area where the artefacts were discovered, shall cease immediately and the Environmental Control Officer shall be notified as soon as possible; • All discoveries shall be reported immediately to a heritage practitioner so that an investigation and evaluation of the finds can be made. Acting upon advice from these specialists, the Environmental	

				Control Officer will advise the necessary actions to be taken; • Under no circumstances shall any artefacts be removed, destroyed or interfered with by anyone on the site; and • Contractors and workers shall be advised of the penalties associated with the unlawful removal of cultural, historical, archaeological or palaeontological artefacts, as set out in the National Heritage Resources Act (Act No. 25 of 1999), Section 51. (1). In order to achieve the above mentioned the following must be in place: • A person or entity, e.g. the Environmental Control Officer, should be tasked to take responsibility for the heritage sites and should be held accountable for any damage. • Known sites should be located and isolated, e.g. by fencing them off. All construction workers should be informed that these are no-go areas, unless accompanied by the individual or persons representing the Environmental Control Officer as identified above. • In areas where the vegetation is threatening the heritage sites, e.g. growing trees pushing walls over, it should be removed, but only after permission for the methods proposed has been granted by SAHRA. A heritage official should be part of the team executing these measures.	
Waste management		Pollution	(construction and operation phase)	**Litter management** 1. Refuse bins must be placed at strategic positions to ensure that litter does not accumulate within the construction site. 2. The Contractor shall supply waste collection bins where such is not available and all solid waste collected shall be disposed of at registered/licensed landfill. 3. Good housekeeping practices should be implemented to regularly maintain the litter and rubble situation on the construction site.	Minimisation of impacts to acceptable limits

				4. If possible and feasible, all waste generated on site must be separated into glass, plastic, paper, metal and wood and recycled. An independent contractor can be appointed to conduct this recycling. 5. Littering by the employees of the Contractor shall not be allowed under any circumstances. The ECO shall monitor the neatness of the work sites as well as the Contractor campsite. 6. Skip waste containers should be maintained on site. These should be kept covered and arrangements made for them to be collected regularly. 7. All waste must be removed from the site and transported to a landfill site promptly to ensure that it does not attract vermin or produce odours. 8. Where a registered waste site is not available close to the construction site, the Contractor shall provide a method statement with regard to waste management. 9. A certificate of disposal shall be obtained by the Contractor and kept on file, if relevant. 10. Under no circumstances may solid waste be burnt on site. 11. All waste must be removed promptly to ensure that it does not attract vermin or produce odours. **Hazardous waste** 12. All waste hazardous materials must be carefully stored as advised by the ECO, and then disposed of offsite at a licensed landfill site, where practical. Incineration may be used where relevant. 13. Contaminants to be stored safely to avoid spillage. 14. Machinery must be properly maintained to keep oil leaks in check. 15. All necessary precaution measures shall be taken to prevent soil or surface water pollution from hazardous materials used during construction and any spills shall	

				immediately be cleaned up and all affected areas rehabilitated. **Sanitation** 16. The Contractor shall install mobile chemical toilets on the site. 17. Staff shall be sensitised to the fact that they should use these facilities at all times. No indiscriminate sanitary activities on site shall be allowed. 18. Toilets shall be serviced regularly and the ECO shall inspect toilets regularly. 19. Toilets should be no closer than 50m or above the 1:100 year flood line from any natural or manmade water bodies or drainage lines or alternatively located in a place approved of by the Engineer. 20. Under no circumstances may open areas, neighbours fences or the surrounding bush be used as a toilet facility. 21. The construction of "Long Drop" toilets is forbidden, but rather toilets connected to the sewage treatment plant. 22. Potable water must be provided for all construction staff. **Remedial actions** 23. Depending on the nature and extent of the spill, contaminated soil must be either excavated or treated on-site. 24. Excavation of contaminated soil must involve careful removal of soil using appropriate tools/machinery to storage containers until treated or disposed of at a licensed hazardous landfill site. 25. The ECO must determine the precise method of treatment for polluted soil. This could involve the application of soil absorbent materials as well as oil-digestive powders to the contaminated soil.	

				26. If a spill occurs on an impermeable surface such as cement or concrete, the surface spill must be contained using oil absorbent material. 27. If necessary, oil absorbent sheets or pads must be attached to leaky machinery or infrastructure. 28. Materials used for the remediation of petrochemical spills must be used according to product specifications and guidance for use. 29. Contaminated remediation materials must be carefully removed from the area of the spill so as to prevent further release of petrochemicals to the environment, and stored in adequate containers until appropriate disposal.	
Water Use and Quality	Water pollution	Water	(construction and operation phase)	**Water Use** 1. Develop a sustainable water supply management plan to minimise the impact to natural systems by managing water use, avoiding depletion of aquifers and minimising impacts to water users. 2. Water must be reused, recycled or treated where possible. **Water Quality** 3. The quality and quantity of effluent streams discharged to the environment including stormwater should be managed and treated to meet applicable effluent discharge guidelines. 4. Discharge to surface water should not result in contaminant concentrations in excess of local ambient water quality criteria outside a scientifically established mixing zone. 5. Efficient oil and grease traps or sumps should be installed and maintained at refueling facilities, workshops, fuel storage depots, and containment areas and spill kits should be available with emergency response plans.	

				Stormwater 6. The site must be managed in order to prevent pollution of drains, downstream watercourses or groundwater, due to suspended solids and silt or chemical pollutants. 7. Silt fences should be used to prevent any soil entering the stormwater drains. 8. Temporary cut off drains and berms may be required to capture stormwater and promote infiltration. 9. Promote a water saving mind set with construction/prospecting workers in order to Contractor ensure less water wastage. 10. Hazardous substances must be stored at least 40m from any water bodies on site to avoid pollution. 11. The installation of the stormwater system must take place as soon as possible to attenuate stormwater from the construction phase as well as the operation phase. 12. Earth, stone and rubble is to be properly disposed of, or utilized on site so as not to obstruct natural water path ways over the site. i.e. these materials must not be placed in stormwater channels, drainage lines or rivers. 13. There should be a periodic checking of the site's drainage system to ensure that the water flow is unobstructed. 14. If a batching plant is necessary, run-off should be managed effectively to avoid contamination of other areas of the site. Untreated runoff from the batch plant must not be allowed to get into the storm water system or nearby streams, rivers or erosion channels or dongas. **Groundwater resource protection** 15. Process solution storage ponds and other impoundments designed to hold non fresh water or non-treated process effluents should be lined and be equipped with sufficient wells to enable monitoring of water levels and quality.	

				Sanitation 16. Adequate sanitary facilities and ablutions must be provided for construction workers (1 toilet per every 15 workers). 17. The facilities must be regularly serviced to reduce the risk of surface or groundwater pollution. **Concrete mixing** 18. Concrete contaminated water must not enter soil or any natural drainage system as this disturbs the natural acidity of the soil and affects plant growth. **Public areas** 19. Food preparation areas should be provided with adequate washing facilities and food refuse should be stored in sealed refuse bins which should be removed from site on a regular basis. 20. The Contractor should take steps to ensure that littering by construction/prospecting workers does not occur and persons should be employed on site to collect litter from the site and immediate surroundings, including litter accumulating at fence lines. 21. No washing or servicing of vehicles on site.	

F) IMPACT MANAGEMENT ACTIONS

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

ACTIVITY Whether listed or not listed. **(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.)**.	**POTENTIAL IMPACT** **(e.g. dust, noise, drainage surface disturbance, fly rock, surface water contamination, groundwater contamination, air pollution etc….etc…)**	**MITIGATION TYPE** **(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.** • **Modify through alternative method.** • **Control through noise control** • **Control through management and monitoring** **Remedy through rehabilitation..**	**TIME PERIOD FOR IMPLEMENTATION** Describe the time period when the measures in the environmental management programme must be implemented Measures must be implemented when required. With regard to Rehabilitation specifically this must take place at the earliest opportunity. .With regard to Rehabilitation, therefore state either:-.. Upon cessation of the individual activity or. Upon the cessation of mining, bulk sampling or prospecting as the case may be.	**COMPLIANCE WITH STANDARDS** (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)
Clearance of vegetation	Loss or fragmentation of habitats	**Existing vegetation** 1. Vegetation removal must be limited to the prospecting site. 2. Vegetation to be removed as it becomes necessary rather than removal of all vegetation throughout the site in one step. 3. No vegetation to be used for firewood. 4. Exotic and invasive plant species should not be allowed to establish, if the development is approved. 5. There should be a preconstruction walk-through of the development footprint/project site in order to locate individuals of plant species of conservation concern. A search and rescue exercise must be done to locate and relocate any protected species to a suitable and similar habitat where these plants can grow without any disturbance; 6. In case Camel Thorn or Shepherd's trees are found permits must be obtained from DAFF to remove these individuals. The	Duration of operation	The implementation of the recommended mitigation measures will result in the minimisation of impacts to acceptable standards, thereby ensuring compliance with NEMA and Duty of Care as prescribed by NEMA.

		contractor must apply for these permits in a phased manner as mining proceeds. **Rehabilitation** 7. All damaged areas shall be rehabilitated upon completion of the contract. 8. Re-vegetation of the disturbed site is aimed at approximating as near as possible the natural vegetative conditions prevailing prior to construction. 9. All natural areas impacted during construction/prospecting must be rehabilitated with locally indigenous grasses typical of the representative botanical unit. 10. Rehabilitation must take place in a phased approach as soon as possible. 11. Rehabilitation process must make use of species indigenous to the area. Seeds from surrounding seed banks can be used for re-seeding. 12. Rehabilitation must be executed in such a manner that surface run-off will not cause erosion of disturbed areas. 13. Planting of indigenous tree species in areas not to be cultivated or built on must be encouraged. **Demarcation of prospecting area** 14. All plants not interfering with prospecting operations shall be left undisturbed clearly marked and indicated on the site plan. 15. The prospecting area must be well demarcated and no construction activities must be allowed outside of this demarcated footprint. 16. Vegetation removal must be phased in order to reduce impact of construction/prospecting. 17. Site office and laydown areas must be clearly demarcated and no encroachment must occur beyond demarcated areas. 18. Strict and regular auditing of the prospecting process to ensure containment of the prospecting and laydown areas. 19. Soils must be kept free of petrochemical solutions that may be kept on site during construction/prospecting. Spillage can result in		

		a loss of soil functionality thus limiting the re-establishment of flora. **Utilisation of resources** 20. Gathering of firewood, fruit, muti plants, or any other natural material onsite or in areas adjacent to the site is prohibited unless with prior approval of the ECO. **Exotic vegetation** 21. Alien vegetation on the site will need to be controlled. 22. The Contractor should be responsible for implementing a programme of weed control (particularly in areas where soil has been disturbed); and grassing of any remaining stockpiles to prevent weed invasion. 23. The spread of exotic species occurring throughout the site should be controlled. 24. Weed control measures must be applied to eradicate any noxious weeds (category 1a &1b species) on disturbed areas. **Herbicides** 25. Herbicide use shall only be allowed according to contract specifications. The application shall be according to set specifications and under supervision of a qualified technician. The possibility of leaching into the surrounding environment shall be properly investigated and only environmentally friendly herbicides shall be used. 26. The use of pesticides and herbicides on the site must be discouraged as these impact on important pollinator species of indigenous vegetation. **Fauna** 27. Rehabilitation to be undertaken as soon as possible after prospecting has been completed. 28. No trapping or snaring to fauna on the construction/prospecting site should be allowed.		

		29. No faunal species must be disturbed, trapped, hunted or killed by maintenance staff during any routine maintenance at the development. 30. Any fauna threatened by the construction and operation activities should be removed to safety by the ECO or appropriately qualified environmental officer. 31. All construction vehicles should adhere to a low speed limit (<30km/h) to avoid collisions with susceptible species such as snakes and tortoises. 32. If trenches need to be dug for electrical cabling or other purposes, these should not be left open for extended periods of time as fauna may fall in and become trapped in them. Trenches which are exposed should contain soil ramps allowing fauna to escape the trench.		
Prospecting Diamonds (Alluvial) – prospecting without bulk sampling	Loss of topsoil	1. The Contractor should, prior to the commencement of earthworks determine the average depth of topsoil, and agree on this with the ECO. The full depth of topsoil should be stripped from areas affected by construction/prospecting and related activities prior to the commencement of major earthworks. This should include the building footprints, working areas and storage areas. Topsoil must be reused where possible to rehabilitate disturbed areas. 2. Care must be taken not to mix topsoil and subsoil or any other material, during stripping. 3. The topsoil must be conserved on site in and around the pit/trench area. 4. Subsoil and overburden in the prospecting area should be stockpiled separately to be returned for backfilling in the correct soil horizon order. 5. If stockpiles are exposed to windy conditions or heavy rain, they should be covered either by vegetation or geofabric, depending on the duration of the project. Stockpiles may further be protected by the construction of berms or low brick walls around their bases. 6. Stockpiles should be kept clear of weeds and alien vegetation growth by regular weeding. 7. Where contamination of soil is expected, analysis must be done prior to disposal of soil to determine the appropriate disposal	Duration of operation	The implementation of the recommended mitigation measures will result in the minimisation of impacts to acceptable standards, thereby ensuring compliance with NEMA and Duty of Care as prescribed by NEMA.

		route. Proof from an approved waste disposal site where contaminated soils are dumped if and when a spillage/leakage occurs should be attained and given to the project manager. Establish an effective record keeping system for each area where soil is disturbed for prospecting purposes. These records should be included in environmental performance reports, and should include all the records below. • Record the GPS coordinates of each area. • Record the date of topsoil stripping. • Record the GPS coordinates of where the topsoil is stockpiled. • Record the date of cessation prospecting activities at the particular site. • Photograph the area on cessation of prospecting activities. • Record date and depth of re-spreading of topsoil. • Photograph the area on completion of rehabilitation and on an annual basis thereafter to show vegetation establishment and evaluate progress of restoration over time.		
	Erosion	1. An effective system of run-off control should be implemented, where it is required, that collects and safely disseminates run-off water from all hardened surfaces and prevents potential down slope erosion. 2. Periodical site inspection should be included in environmental performance reporting that inspects the effectiveness of the run-off control system and specifically records the occurrence of any erosion on site or downstream. 3. Implement an effective system of run-off control, where it is required, that collects and safely disseminates run-off water from all hardened surfaces and prevents potential down slope erosion. 4. Monitor the area regularly after larger rainfall events to determine where erosion may be initiated and then mitigate by modifying the soil micro-topography and revegetation or soil erosion control efforts accordingly 5. Wind screening and stormwater control should be undertaken to prevent soil loss from the site.	Duration of operation	The implementation of the recommended mitigation measures will result in the minimisation of impacts to acceptable standards, thereby ensuring compliance with NEMA and Duty of Care as prescribed by NEMA.

		6. The use of silt fences and sand bags must be implemented in areas that are susceptible to erosion. 7. Other erosion control measures that can be implemented are as follows: o Brush packing with cleared vegetation o Mulch or chip packing o Planting of vegetation o Hydroseeding/hand sowing 8. Sensitive areas need to be identified prior to construction/prospecting so that the necessary precautions can be implemented. 9. All erosion control mechanisms need to be regularly maintained. 10. Seeding of topsoil and subsoil stockpiles to prevent wind and water erosion of soil surfaces. 11. Retention of vegetation where possible to avoid soil erosion. 12. Vegetation clearance should be phased to ensure that the minimum area of soil is exposed to potential erosion at any one time. 13. Re-vegetation of disturbed surfaces should occur immediately after construction/prospecting activities are completed. This should be done through seeding with indigenous grasses. 14. No impediment to the natural water flow other than approved erosion control works is permitted. 15. To prevent stormwater damage, the increase in stormwater run-off resulting from construction/prospecting activities must be estimated and the drainage system assessed accordingly. A drainage plan must be submitted to the Engineer for approval and must include the location and design criteria of any temporary stream crossings. 16. Stockpiles not used in three (3) months after stripping must be seeded/backfilled to prevent dust and erosion.		
.	Air Pollution	**Dust control** 1. Wheel washing and damping down of un-surfaced and un-vegetated areas. 2. Retention of vegetation where possible will reduce dust travel.	Duration of operation	The implementation of the recommended mitigation measures will result in the minimisation of impacts to acceptable standards, thereby ensuring compliance with

		3. Clearing activities must only be done during agreed working times and permitting weather conditions to avoid drifting of sand and dust into neighbouring areas. 4. Damping down of all exposed soil surfaces with a water bowser or sprinklers when necessary to reduce dust. 5. The Contractor shall be responsible for dust control on site to ensure no nuisance is caused to the neighbouring communities. 6. A speed limit of 30km/h must not be exceeded on site. 7. Any complaints or claims emanating from the lack of dust control shall be attended to immediately by the Contractor. 8. Any dirt roads that are utilised by the workers must be regularly maintained to ensure that dust levels are controlled. **Odour control** 9. Regular servicing of vehicles in order to limit gaseous emissions. 10. Regular servicing of onsite toilets to avoid potential odours. **Rehabilitation** 11. The Contractor should commence rehabilitation of exposed soil surfaces as soon as practical after completion of earthworks. **Fire prevention** 12. No open fires shall be allowed on site under any circumstance. All cooking shall be done in demarcated areas that are safe and cannot cause runaway fires. 13. The Contractor shall have operational fire-fighting equipment available on site at all times. The level of firefighting equipment must be assessed and evaluated through a typical risk assessment process.		NEMA and Duty of Care as prescribed by NEMA.
	Noise	1. The prospecting activities must aim to adhere to the relevant noise regulations and limit noise to within standard working hours in order to reduce disturbance of dwellings in close proximity to the development. 2. Pans, power plants, crushers, workshops and other noisy fixed facilities should be located well away from noise sensitive areas. Once the proposed final layouts are made available by the	Duration of operation	The implementation of the recommended mitigation measures will result in the minimisation of impacts to acceptable standards, thereby ensuring compliance with NEMA and Duty of Care as prescribed by NEMA.

		Contractor(s), the sites must be evaluated in detail and specific measures designed in to the system. 3. Truck traffic should be routed away from noise sensitive areas, where possible. 4. Noise levels must be kept within acceptable limits. 5. Noisy operations should be combined so that they occur where possible at the same time. 6. Mine workers to wear necessary ear protection gear. 7. Noisy activities to take place during allocated hours. 8. Noise from labourers must be controlled. 9. Noise suppression measures must be applied to all equipment. Equipment must be kept in good working order and where appropriate fitted with silencers which are kept in good working order. Should the vehicles or equipment not be in good working order, the Contractor may be instructed to remove the offending vehicle or machinery from the site. 10. The Contractor must take measures to discourage labourers from loitering in the area and causing noise disturbance. Where possible labour shall be transported to and from the site by the Contractor or his Sub-Contractors by the Contractors own transport. 11. Implementation of enclosure and cladding of processing plants. 12. Applying regular and thorough maintenance schedules to equipment and processes. An increase in noise emission levels very often is a sign of the imminent mechanical failure of a machine.		
	Impact on potential cultural, heritage artefacts and fossils.	1. Any finds must be reported to the nearest National Monuments office to comply with the National Heritage Resources Act (Act No 25 of 1999) and to DEA. 2. Local museums as well as the South African Heritage Resource Agency (SAHRA) should be informed if any artefacts/ fossils are uncovered in the affected area. 3. The Contractor must ensure that his workforce is aware of the necessity of reporting any possible historical, archaeological or palaeontological finds to the ECO so that appropriate action can be taken.	Duration of operation	The implementation of the recommended mitigation measures will result in the minimisation of impacts to acceptable standards, thereby ensuring compliance with NEMA and Duty of Care as prescribed by NEMA.

		4. Known sites should be clearly marked in order that they can be avoided. The workeforce should also be informed that fenced-off areas are no-go areas. 5. The ECO must also survey for heritage and palaeontological artefacts during ground breaking and digging or drilling. He/she should familiarise themselves with formations and its fossils or a palaeontologist should be appointed during the digging and excavation phase of the development. 6. All digging, excavating, drilling or blasting activities must be stopped if heritage and/or palaeontological artefacts are uncovered and a specialist should be called in to determine proper management, mitigation, excavation and/or collecting measures. 7. Any discovered artefacts or fossils shall not be removed under any circumstances. Any destruction of a site can only be allowed once a permit is obtained and the site has been mapped and noted. Permits shall be obtained from SAHRA should the proposed site affect any world heritage/palaeontology sites or if any heritage/palaeontology sites are to be destroyed or altered. 8. Under no circumstances shall any artefacts be removed, destroyed or interfered with by anyone on the site; and contractors and workers shall be advised of the penalties associated with the unlawful removal of cultural, historical, archaeological or palaeontological artefacts, as set out in the NHRA (Act No. 25 of 1999), Section 51. (1). 9. If anything of Archaeological and/or paleontological significance is found during the construction and operational phase of the mine the following applies: • NHRA 38(4)c(i) – If any evidence of archaeological sites or remains (e.g. remnants of stone-made structures, indigenous ceramics, bones, stone artefacts, ostrich eggshell fragments, charcoal and ash concentrations), fossils or other categories of heritage resources are found during the proposed development, SAHRA APM Unit (021 462 5402) must be alerted as per section 35(3) of the NHRA. Non-compliance with section of the NHRA is an offense in terms of section 51(1)e of the NHRA and item 5 of the Schedule; • NHRA 38(4)c(ii) – If unmarked human burials are uncovered, the SAHRA Burial Grounds and Graves (BGG) Unit (012 320 8490), must be alerted immediately as per section 36(6) of the NHRA. Non-compliance with section of the NHRA is an		

		offense in terms of section 51(1)e of the NHRA and item 5 of the Schedule; • NHRA 38(4)e – The following conditions apply with regards to the appointment of specialists: i) If heritage resources are uncovered during the course of the development, a professional archaeologist or palaeontologist, depending on the nature of the finds, must be contracted as soon as possible to inspect the heritage resource. If the newly discovered heritage resources prove to be of archaeological or palaeontological significance, a Phase 2 rescue operation may be required subject to permits issued by SAHRA; According to the Palaeontological Desktop Assessment the Chance find Procedure must be implemented: **Chance Find Procedure** • If a chance find is made the person responsible for the find must immediately stop working and all work that could impact that finding must cease in the immediate vicinity of the find. • The person who made the find must immediately report the find to his/her direct supervisor which in turn must report the find to his/her manager and the ESO or site manager. The ESO or site manager must report the find to the relevant Heritage Agency (South African Heritage Research Agency, SAHRA). (Contact details: SAHRA, 111 Harrington Street, Cape Town. PO Box 4637, Cape Town 8000, South Africa. Tel: 021 462 4502. Fax: +27 (0)21 462 4509. Web: www.sahra.org.za). The information to the Heritage Agency must include photographs of the find, from various angles, as well as the GPS co-ordinates. • A preliminary report must be submitted to the Heritage Agency within 24 hours of the find and must include the following: 1) date of the find; 2) a description of the discovery and a 3) description of the fossil and its context (depth and position of the fossil), GPS co-ordinates. • Photographs (the more the better) of the discovery must be of high quality, in focus, accompanied by a scale. It is also important to have photographs of the vertical section (side) where the fossil was found.		

		Upon receipt of the preliminary report, the Heritage Agency will inform the ESO (or site manager) whether a rescue excavation or rescue collection by a palaeontologist is necessary. • The site must be secured to protect it from any further damage. No attempt should be made to remove material from their environment. The exposed finds must be stabilized and covered by a plastic sheet or sand bags. The Heritage agency will also be able to advise on the most suitable method of protection of the find. • In the event that the fossil cannot be stabilized the fossil may be collected with extreme care by the ESO (site manager). Fossils finds must be stored in tissue paper and in an appropriate box while due care must be taken to remove all fossil material from the rescue site. • Once Heritage Agency has issued the written authorization, the developer may continue with the development on the affected area. According to the Phase 1 Heritage Impact Assessment the following must be implemented: • Known sites should be clearly marked in order that they can be avoided during construction activities. • The contractors and workers should be notified that archaeological sites might be exposed during the construction activities. • Should any heritage artefacts be exposed during excavation, work on the area where the artefacts were discovered, shall cease immediately and the Environmental Control Officer shall be notified as soon as possible; • All discoveries shall be reported immediately to a heritage practitioner so that an investigation and evaluation of the finds can be made. Acting upon advice from these specialists, the Environmental Control Officer will advise the necessary actions to be taken; • Under no circumstances shall any artefacts be removed, destroyed or interfered with by anyone on the site; and • Contractors and workers shall be advised of the penalties associated with the unlawful removal of cultural, historical, archaeological or palaeontological artefacts, as set out in		

		the National Heritage Resources Act (Act No. 25 of 1999), Section 51. (1). In order to achieve the above mentioned the following must be in place: • A person or entity, e.g. the Environmental Control Officer, should be tasked to take responsibility for the heritage sites and should be held accountable for any damage. • Known sites should be located and isolated, e.g. by fencing them off. All construction workers should be informed that these are no-go areas, unless accompanied by the individual or persons representing the Environmental Control Officer as identified above. • In areas where the vegetation is threatening the heritage sites, e.g. growing trees pushing walls over, it should be removed, but only after permission for the methods proposed has been granted by SAHRA. A heritage official should be part of the team executing these measures.		
Waste Management		**Litter management** 1. Refuse bins must be placed at strategic positions to ensure that litter does not accumulate within the construction/prospecting site. 2. The Contractor shall supply waste collection bins where such is not available and all solid waste collected shall be disposed of at registered/licensed landfill. 3. Good housekeeping practices should be implemented to regularly maintain the litter and rubble situation on the construction/prospecting site. 4. If possible and feasible, all waste generated on site must be separated into glass, plastic, paper, metal and wood and recycled. An independent contractor can be appointed to conduct this recycling. 5. Littering by the employees of the Contractor shall not be allowed under any circumstances. The ECO shall monitor the neatness of the work sites as well as the Contractor campsite. 6. Skip waste containers should be maintained on site. These should be kept covered and arrangements made for them to be collected regularly.	Duration of operation	The implementation of the recommended mitigation measures will result in the minimisation of impacts to acceptable standards, thereby ensuring compliance with NEMA and Duty of Care as prescribed by NEMA.

		7. All waste must be removed from the site and transported to a landfill site promptly to ensure that it does not attract vermin or produce odours. 8. Where a registered waste site is not available close to the construction/prospecting site, the Contractor shall provide a method statement with regard to waste management. 9. A certificate of disposal shall be obtained by the Contractor and kept on file, if relevant. 10. Under no circumstances may solid waste be burnt on site. 11. All waste must be removed promptly to ensure that it does not attract vermin or produce odours. **Hazardous waste** 12. All waste hazardous materials must be carefully stored as advised by the ECO, and then disposed of offsite at a licensed landfill site, where practical. Incineration may be used where relevant. 13. Contaminants to be stored safely to avoid spillage. 14. Machinery must be properly maintained to keep oil leaks in check. 15. All necessary precaution measures shall be taken to prevent soil or surface water pollution from hazardous materials used during construction/prospecting and any spills shall immediately be cleaned up and all affected areas rehabilitated. **Sanitation** 16. The Contractor shall install mobile chemical toilets on the site. 17. Staff shall be sensitised to the fact that they should use these facilities at all times. No indiscriminate sanitary activities on site shall be allowed. 18. Toilets shall be serviced regularly and the ECO shall inspect toilets regularly. 19. Toilets should be no closer than 50m or above the 1:100 year flood line from any natural or manmade water bodies or drainage lines or alternatively located in a place approved of by the Engineer. 20. Under no circumstances may open areas, neighbours fences or the surrounding bush be used as a toilet facility.		

		21. The construction of "Long Drop" toilets is forbidden, but rather toilets connected to the sewage treatment plant. 22. Potable water must be provided for all construction staff. **Remedial actions** 23. Depending on the nature and extent of the spill, contaminated soil must be either excavated or treated on-site. 24. Excavation of contaminated soil must involve careful removal of soil using appropriate tools/machinery to storage containers until treated or disposed of at a licensed hazardous landfill site. 25. The ECO must determine the precise method of treatment for polluted soil. This could involve the application of soil absorbent materials as well as oil-digestive powders to the contaminated soil. 26. If a spill occurs on an impermeable surface such as cement or concrete, the surface spill must be contained using oil absorbent material. 27. If necessary, oil absorbent sheets or pads must be attached to leaky machinery or infrastructure. 28. Materials used for the remediation of petrochemical spills must be used according to product specifications and guidance for use. 29. Contaminated remediation materials must be carefully removed from the area of the spill so as to prevent further release of petrochemicals to the environment, and stored in adequate containers until appropriate disposal.		
Water Use and Quality	Water pollution	**Water Use** 1. Develop a sustainable water supply management plan to minimise the impact to natural systems by managing water use, avoiding depletion of aquifers and minimising impacts to water users. 2. Water must be reused, recycled or treated where possible. **Water Quality** 3. The quality and quantity of effluent streams discharged to the environment including stormwater should be managed and treated to meet applicable effluent discharge guidelines.		

		4. Discharge to surface water should not result in contaminant concentrations in excess of local ambient water quality criteria outside a scientifically established mixing zone. 5. Efficient oil and grease traps or sumps should be installed and maintained at refueling facilities, workshops, fuel storage depots, and containment areas and spill kits should be available with emergency response plans. **Stormwater** 6. The site must be managed in order to prevent pollution of drains, downstream watercourses or groundwater, due to suspended solids and silt or chemical pollutants. 7. Silt fences should be used to prevent any soil entering the stormwater drains. 8. Temporary cut off drains and berms may be required to capture stormwater and promote infiltration. 9. Promote a water saving mind set with construction/prospecting workers in order to Contractor ensure less water wastage. 10. New stormwater construction must be developed strictly according to specifications from engineers in order to ensure efficiency. 11. Hazardous substances must be stored at least 20m from any water bodies on site to avoid pollution. 12. The installation of the stormwater system must take place as soon as possible to attenuate stormwater from the construction phase as well as the operation phase. 13. Earth, stone and rubble is to be properly disposed of, or utilized on site so as not to obstruct natural water path ways over the site. i.e. these materials must not be placed in stormwater channels, drainage lines or rivers. 14. There should be a periodic checking of the site's drainage system to ensure that the water flow is unobstructed. 15. If a batching plant is necessary, run-off should be managed effectively to avoid contamination of other areas of the site. Untreated runoff from the batch plant must not be allowed to get		

		into the storm water system or nearby streams, rivers or erosion channels or dongas. **Groundwater resource protection** 16. Process solution storage ponds and other impoundments designed to hold non fresh water or un-treated process effluents should be lined and be equipped with sufficient wells to enable monitoring of water levels and quality. **Sanitation** 17. Adequate sanitary facilities and ablutions must be provided for construction workers (1 toilet per every 15 workers). 18. The facilities must be regularly serviced to reduce the risk of surface or groundwater pollution. **Concrete mixing** 19. Concrete contaminated water must not enter soil or any natural drainage system as this disturbs the natural acidity of the soil and affects plant growth. **Public areas** 20. Food preparation areas should be provided with adequate washing facilities and food refuse should be stored in sealed refuse bins which should be removed from site on a regular basis. 21. The Contractor should take steps to ensure that littering by construction workers does not occur and persons should be employed on site to collect litter from the site and immediate surroundings, including litter accumulating at fence lines. 22. No washing or servicing of vehicles on site.		

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

G) MONITORING OF IMPACT MANAGEMENT ACTIONS

H) MONITORING AND REPORTING FREQUENCY

I) RESPONSIBLE PERSONS

J) TIME PERIOD FOR IMPLEMENTING IMPACT MANAGEMENT ACTIONS

K) MECHANISM FOR MONITORING COMPLIANCE

SOURCE ACTIVITY	IMPACTS REQUIRING MONITORING PROGRAMMES	FUNCTIONAL REQUIREMENTS FOR MONITORING	ROLES AND RESPONSIBILITIES (FOR THE EXECUTION OF THE MONITORING PROGRAMMES)	MONITORING AND REPORTING FREQUENCY and TIME PERIODS FOR IMPLEMENTING IMPACT MANAGEMENT ACTIONS
Clearance of vegetation	Loss or fragmentation of habitats	• Conduct regular internal audits • Conduct regular external audits	• Environmental Manager • Suitable qualified environmental auditor	Monitoring should be undertaken for duration of operations. Internal audits should be undertaken at least every 6 months. External audits should be undertaken by a suitably qualified auditor on an annual basis. Reports should be made available to the competent authority if required.
Prospecting of the applied for minerals – drilling	Loss of topsoil Erosion Air Pollution Noise Impact on potential cultural, heritage artefacts and fossils	• Conduct regular internal audits • Conduct regular external audits	• Environmental Manager • Suitable qualified environmental auditor	Monitoring should be undertaken for duration of operations. Internal audits should be undertaken at least every 6 months. External audits should be undertaken by a suitably qualified auditor on an annual basis. Reports should be made available to the competent authority if required.
Waste management	Pollution	• Conduct regular internal audits • Conduct regular external audits	• Environmental Manager • Suitable qualified environmental auditor	Monitoring should be undertaken for duration of operations. Internal audits should be undertaken at least every 6 months. External audits should be undertaken by a suitably

				qualified auditor on an annual basis. Reports should be made available to the competent authority if required.
Water Use and Quality	Water pollution	• Conduct regular internal audits • Conduct regular external audits	• Environmental Manager • Suitable qualified environmental auditor	Monitoring should be undertaken for duration of operations. Internal audits should be undertaken at least every 6 months. External audits should be undertaken by a suitably qualified auditor on an annual basis. Reports should be made available to the competent authority if required.

L) CATE THE FREQUENCY OF THE SUBMISSION OF THE PERFORMANCE ASSESSMENT REPORT.

External audits should be undertaken by a suitably qualified auditor on an annual basis. Reports should be made available to the Competent Authority if required.

M) ENVIRONMENTAL AWARENESS PLAN

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

Xanado Trade or Invest 184 (Pty) Ltd will implement an Environmental Awareness Plan which will include various mechanisms for informing employees of environmental risks resulting from their work, including:

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

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

See the attached **Appendix 11** for the Awareness plan

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

Xanado Trade or Invest 184 (Pty) Ltd will implement an incident reporting and reporting procedure in order to identify risks timeously and implement actions to avoid or minimise environmental impacts.

N) SPECIFIC INFORMATION REQUIRED BY THE COMPETENT AUTHORITY

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

No specific information requirements have been detailed by the Competent Authority.

-END-