GA Environment

QUARRY 4- DRAFT BASIC ASSESSMENT REPORT

BASIC ASSESSMENT REPORT FOR THE PROPOSED MINING OF QUARRY 4 ASSOCIATED WITH THE UPGRADE OF NATIONAL ROAD R573 (MOLOTO ROAD), GAUTENG PROVINCE

September 2021

SANRAL

KBK ENGINEERS

Environmental best practice, safety and sustainability

DRAFT BASIC ASSESSMENT REPORT
for

THE PROPOSED MINING OF QUARRY 4 ASSOCIATED WITH THE UPGRADE OF NATIONAL ROAD R573 (MOLOTO ROAD), GAUTENG PROVINCE

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29 September 2021

PROJECT INFORMATION

Title:	Draft Basic Assessment Report for the Proposed Mining of Quarry 4 associated with the upgrade of National road R573 (Moloto Road), Gauteng Province
Competent Authority:	Department of Mineral Resources and Energy
Reference No.:	To be assigned
Applicant:	South African National Roads Agency SOC Ltd
Environmental Assessment Practitioner:	GA Environment (Pty) Ltd.
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Date:	29 September 2021

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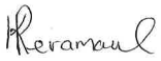
Version 1	Signature: 	Signature: 	Signature: 

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AFFIRMATION OF ENVIRONMENTAL ASSESSMENT PRACTITIONER (EAP)

I ***Kirthi Peramaul***, an EAP employed by ***GA Environment (Pty) Ltd*** declare that the information provided in this report is correct and relevant to the activity/ project, that comments from Interested and Affected Parties have been incorporated into this report, that the report has included inputs from Specialists and that all relevant project information was made available to Interested and Affected Parties.

SIGNATURE OF EAP **DATE** 29 September 2021

LIST OF ABBREVIATIONS / ACRONYMS

CBA	Critical Biodiversity Area
EA	Environmental Authorisation
EIA	Environmental Impact Assessment
EAPASA	Environmental Assessment Practitioners Association of South Africa
ESA	Ecological Support Area
CA	Competent Authority
COT	City of Tshwane
DEFF	Department of Environment, Forestry and Fisheries
DFFE	Department of Forestry Fisheries and Environment
DBAR	Draft Basic Assessment Report
DWS	Department of Water and Sanitation
GDARD	Gauteng Department of Agriculture and Rural Development
EMPR	Environmental Management Programme
I&APs	Interested and Affected Parties
NFEPA	National Freshwater Ecosystem Protected Area
NEM:BA	National Environmental Management: Biodiversity Act (Act 10 of 2004)
NEMA	National Environmental Management Act (NEMA), 1998 (Act No. 107 of 1998)
PPP	Public Participation Process
SACNASP	South African Council for Natural Scientific Professions
SANBI	South African National Biodiversity Institute
SDF	Spatial Development Framework

GLOSSARY OF TERMS

This section provides a catalogue of terms and definitions, which may be used in this report.

Term	Definition
Alien Invasive Species	Species of plants, animals or other organisms that are not indigenous to a region and which easily spread and destroy the indigenous plant species, taking over an area and causing biological and socio-economic harm.
Borrow Pit	An area where material usually soil, gravel, sand, or weathered rock, has been dug for use as a natural granular material for use in road construction.
Buffer	A strip of land surrounding a wetland or riparian area in which activities are controlled or restricted
Basic Assessment Process	An environmental assessment process that is undertaken in line with Listing Notices 1 and 3 in terms of the NEMA EIA Regulations with the aim of obtaining Environmental Authorisation.
Competent Authority	An organ of state charged by the National Environmental Management Act (NEMA) with evaluating the environmental impact of an activity and, where appropriate, with granting or refusing an environmental authorisation in respect of that activity.
Conservation Plan Areas (C-Plan Areas)-	A tool developed by the Gauteng Department of Agriculture and Rural Development (GDARD) to identify sensitive areas. The main purposes of this tool is to: • serve as the primary decision support tool for the biodiversity component of the Environmental Impact Assessment (EIA) process. • inform protected area expansion and biodiversity stewardship programmes in the province; and serve as a basis for development of Bioregional Plans in municipalities within the province. Some of the aspects that inform the identification of C-Plan Areas include Critical Biodiversity Areas (CBAs), Ecological Support Areas (ESA's), Watercourses, Ridges, Protected Areas, etc
Critical Biodiversity Area	Areas that are deemed important to conserve ecosystems and species. For this reason, these areas require protection.
Cultural significance	Means aesthetic, architectural, historical, scientific, social, spiritual, linguistic, or technological value or significance.
Development	Means the building, erection, construction or establishment of a facility, structure, or infrastructure, including associated earthworks or Quarries, that is necessary for the undertaking of a listed or specified activity, but excludes any modification, alteration or expansion of such a facility, structure or infrastructure, including associated earthworks or quarries, and excluding the redevelopment of the same facility in the same location, with the same capacity and footprint.
Ecological Support Area	Areas that support the ecological functioning of protected areas or CBAs or provide important ecological infrastructure.
Environmental Assessment Practitioner	Individual responsible for the planning, management, coordination or review of environmental impact assessments, strategic environmental assessments, environmental management programmes or any other appropriate environmental instruments introduced through regulations.
Environmental Authorisation	This is a decision by a Competent Authority to authorise a listed activity in terms of the National Environmental Management Act (NEMA). The authorisation means that a project, either in totality or partially, can commence subject to certain conditions. The Competent Authority has a right to refuse to grant authorisation for a project in totality or partially.
Environmental Impact Assessment Process:	An environmental assessment process that is undertaken in line with Listing Notice 2 the NEMA EIA Regulations with the aim of obtaining Environmental Authorisation.
Environmental Management Programme:	A programme with set objectives and timeframes that seek to achieve a required end state and describes how activities that have or could have an adverse impact on the environment will be mitigated, controlled, and monitored.
Flora	Plant life that occurs in a specific geographical region and/habitat.
Fauna	Animal life that occurs in a specific geographical region and/habitat.

Term	Definition
Heritage Resource	Means any place or object of cultural significance.
Indigenous Vegetation	plant species occurring naturally in an area, regardless of the level of alien infestation and where the topsoil has not been lawfully disturbed during the preceding ten years.
Interested and Affected Party	in relation to an application for Environmental Authorisation, this refers to an interested and affected party whose name is recorded in the register opened for that application in terms of regulation 42 of the NEMA EIA Regulations. This party will ideally be interested in the development but also affected by the proposed application and have a certain interest in the application.
Quarry	An open excavation from where rock is obtained, usually by blasting, in order to produce rock aggregate for use in road construction.
Regulated area of a watercourse:	• The outer edge of the 1:100-year flood line and /or delineated riparian habitat whichever is the greatest measured from the middle of a river, spring, natural channel, lake or dam. • In the absence of a determined 1:100-year flood line or riparian area, the area within 100m from the edge of a watercourse where the edge of the watercourse is the first identifiable annual bank fill flood bench (subject to compliance to section 144 of the Act). • 500m radius from the delineated boundary of any wetland or pan.
Threatened or Protected Species	These refers to either plants or animals that are at a threat of Extinction or are protected due to their high conservation value or national importance.
Watercourse	(a) a river or spring; (b) a natural channel in which water flows regularly or intermittently; (c) a wetland, lake or dam into which, or from which, water flows; and (d) any collection of water which the Minister may, by notice in the Gazette, declare to be a watercourse, and a reference to a watercourse includes, where relevant, its bed and banks;
Wetland	Land which is transitional between terrestrial and aquatic systems where the water table is usually at or near the surface, or the land is periodically covered with shallow water, and which land in normal circumstances supports or would support vegetation typically adapted to life in saturated soil.

Appendices

Appendix A: EAP Details & Affirmation

Appendix B: Site Maps

Appendix C: Site Plans

Appendix D: Public Participation

- Appendix D1: Notification Letter
- Appendix D2: Newspaper Advert
- Appendix D3: Site Notice
- Appendix D4: I&AP database
- Appendix D5: Comments and Response Report
- Appendix D6: Focus Group Meetings
- Appendix D7: Correspondence with I&APs
- Appendix D8: Knock & Drop Register

Appendix E: Correspondence with the Competent Authority

Appendix F: Specialist Reports

Appendix G: Environmental Management Programme & Management Plans

Appendix H: DFFE Screening Tool

Appendix I: Other

mineral resources
Department:
Mineral Resources
REPUBLIC OF SOUTH AFRICA

BASIC ASSESSMENT REPORT
AND
ENVIRONMENTAL MANAGEMENT PROGRAMME REPORT

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

NAME OF APPLICANT: South African National Road Agency Soc Ltd (SANRAL)

TEL NO: (012) 426 6234
FAX NO: (012) 348 1512
POSTAL ADDRESS: Private Bag X 17, Lynnwood Ridge, 0040
PHYSICAL ADDRESS: 38 Ida Street, Menlo Park, Pretoria, , 0081
FILE REFERENCE NUMBER SAMRAD: To be assigned

1. IMPORTANT NOTICE

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

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

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

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

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

2. OBJECTIVE OF THE BASIC ASSESSMENT PROCESS

The object 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 content;

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 theses 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 managed, avoided or mitigated;

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 manage, avoid or mitigate identified impacts; and

(iii) Identify residual risks that need to be managed and monitored

_____

PART A: SCOPE OF ASSESSMENT AND BASIC ASSESSMENT REPORT

3. Contact Person and correspondence address

a) Details of:

i) The EAP who prepared the report

Name of the Practitioner: Kirthi Peramaul
Tel No.: 011 312 2537
Fax No. : 011 805 1950
e-mail address: environment@gaenvironment.com/ kirthip@gaenvironment.com

ii) Expertise of the EAP.

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

Mrs Peramaul holds a BSc (Hons) degree in Environmental Monitoring and Modelling. She is currently registered with the South African Council of Natural Scientific Professions (SACNASP) as a Professional Natural Scientist (Registration No 400012/18: Environmental Science) and as a Registered Environmental Assessment Practitioner with the Environmental Assessment Practitioners Association of South Africa (EAPASA) (Registration No 2020/1537). The qualifications are attached to **Appendix A** of this report.

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

Mrs Peramaul is an Environmental Assessment Practitioner with twelve (12) years of professional experience in the water and environmental sector. Kirthi specialises in environmental authorisations, environmental compliance monitoring, environmental management plans, water use authorisation, stakeholder engagement, risk assessments and blue and green drop auditing. She has been involved in projects related to Waste Management, Linear Infrastructure, as well as Mixed-Use developments. Her contribution as an auditor in South Africa's incentive-based regulation programmes (blue and green drop) allowed her to be part of water safety planning (water treatment) and the wastewater risk abatement planning processes of various municipalities within South Africa.

b) Location of the overall Activity

Table 1:Description of the Property

Farm Name:	Portion 2 of the Farm Jakkalsdans 243 JR
Application area (Ha)	19.4 hectares
Magisterial district:	City of Tshwane Metropolitan Municipality
Distance and direction from nearest town	Approximately 13 km southwest from KwaMhlanga (Mpumalanga Province) and approximately 60km from Pretoria City (Gauteng Province)
21-digit Surveyor General Code for each farm portion	T0JR00000000024300002

c) Locality map

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

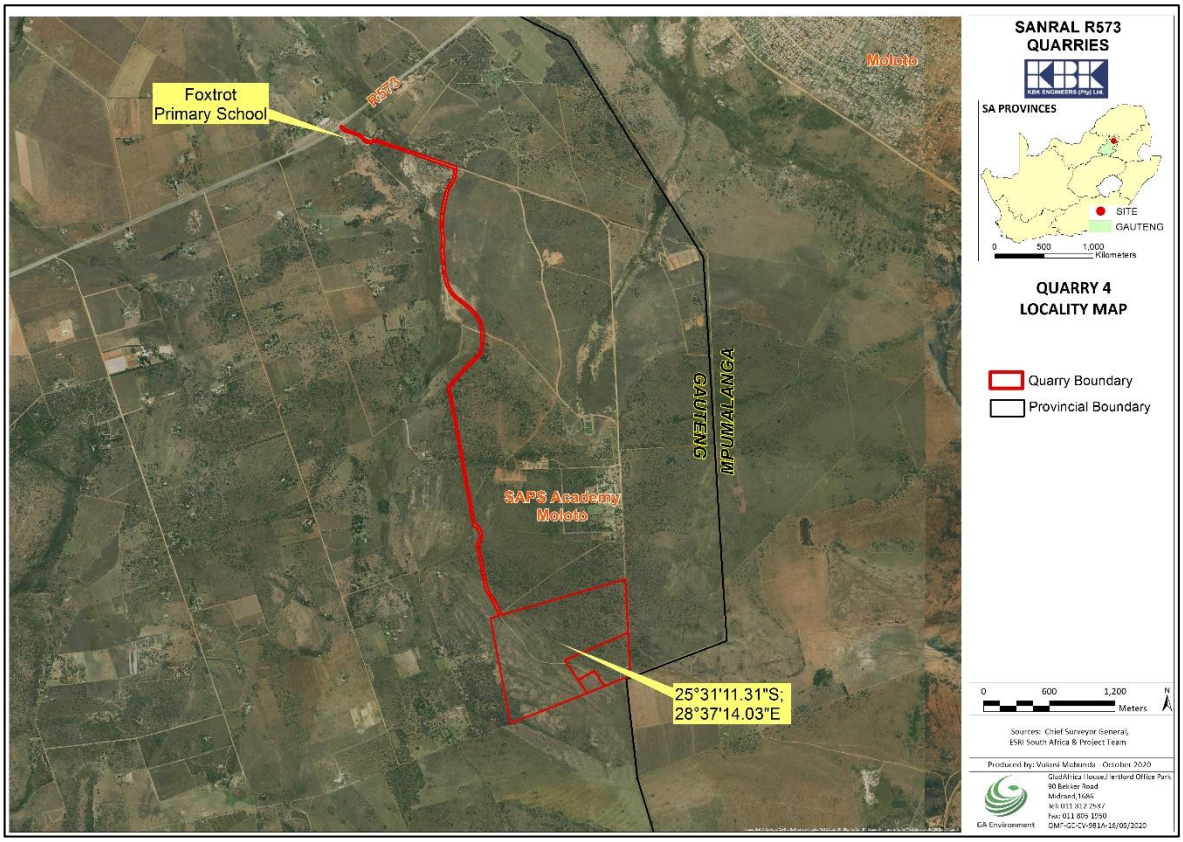

Figure 1:Project Locality Map showing nearest towns

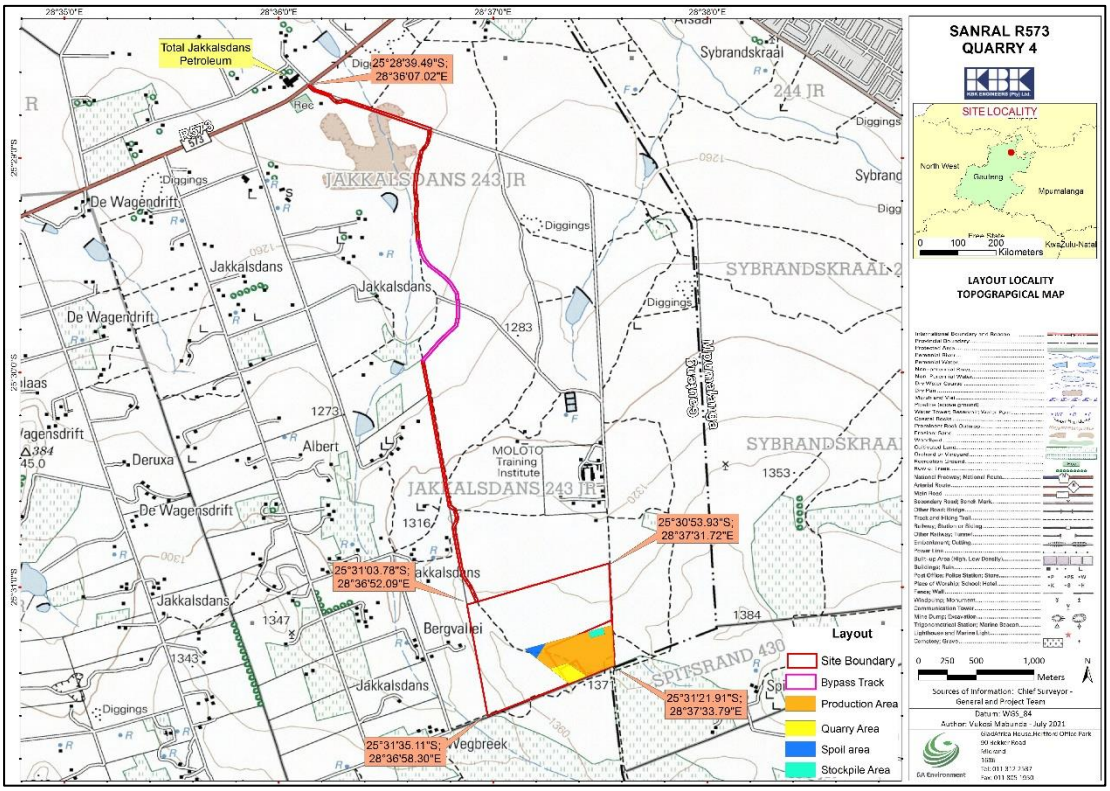

Figure 2: Topographic Project Locality Map

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

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

It is noted that in terms of Section 106 of the MPRDA, SANRAL is exempted from applying for a Mining Permit to develop a quarry for the purposes of sourcing road building material. However, SANRAL is still required to obtain an Environmental Authorisation in terms of the National Environmental Management Act (107 of 1998) to authorise the clearance of vegetation and the undertaking of activities within identified geographical areas for the construction of the Quarry.

Project Background

It is the intention of the South African National Roads Agency SOC Ltd to establish various Quarries to provide the necessary construction materials for the proposed upgrading of National Road R573-1 (K139) from Baviaanspoort Road in Tshwane (km 0,00) to the Gauteng / Mpumalanga Provincial Border (± 48.00 km). The upgrading of the R573 Moloto Road includes the following projects:

- Upgrading of the entire length of the R573/1 Moloto Road to a 4-lane barrier-divided dual carriageway from Stormvoël Road to the Gauteng border.
- Construction of the southern link between Stormvoël Road and Baviaanspoort Road.
- Construction of the new PWV2 link between the N1/N4 Interchange and the R573/1 Moloto Road.
- Construction of the Moloto/Sefako Makgatho Interchange.
- Construction of the Big Tree Mall Interchange.
- Construction of the De Wagendrift bypass along the R573/1; and
- Various upgrades to local roads and upgrading of intersections to small interchanges (Moepel Overpass; Baviaanspoort Road East extension; Dewar, Sakabuka and Maroela interchanges and road developments).

The SANRAL appointed KBK Engineers to provide engineering services for the proposed development. KBK Engineers appointed GA Environment (Pty) Ltd on behalf of SANRAL as independent Environmental Consultants to undertake the required Environmental approvals for the mining of four Quarries for the purpose of the proposed development. All four Quarries are situated along the R573 Moloto Road and are as follows:

- Quarry 6A;
- Quarry 6B;
- ***Quarry 4*** and
- Quarry 5.

This Basic Assessment report serves to present the identified environmental impacts for **Quarry 4** which is hereafter referred to as the study area. Separate Environmental applications will be submitted for each of the Quarries identified above and will be submitted to the Department of Mineral Resources and Energy (DMRE). The Final EIR for Quarries 6A and 6B has been submitted to the DMRE for decision making.

Project Location

The proposed Quarry 4 is located within the Moloto training facility of the South African Police Service (SAPS), between 4km and 6km southwest of the Moloto township near the Gauteng/ Mpumalanga provincial border. The Foxtrot Primary School is situated west of the entrance of the site, and with the Total Jakkalsdans fuel station situated across of the R573 roadway which borders entry and exit points of the site in the north. The project area is located in a region characterised by mostly undeveloped land and small holdings, interspersed with gravel roads and occasional agricultural fields, within a rural setting. The site centre geographic coordinates are 25°31'11.31" S, 28°37'14.03" E (**Figure 1** & **Figure 2**). The project area is located on Portion 2 of the Farm Jakkalsdans 243 JR. The site earmarked for the proposed mining activities is owned by the South African Government and is currently zoned as agricultural. A ridge is situated in the southern and south western section of the site. Further details of the ridge are provided under **Section h (iv 1a)** . Pictures showing the proposed site are provided in **Figures 3 to 7**.

Figure 3: R573 Moloto Road, Total Jakkalsdans fuel station, Foxtrot Primary school and the entrance and exit of the site (shown with the red arrow)

Figure 4: R573 Moloto Road in relation to the proposed site entrance(site entrance indicated by red arrow)

Figure 5: Security access point for the SAPS training facility

Figure 6: The existing access road currently being used on site

Figure 7: Ridge System situated towards the south and south western section of the site

Project Description

The proposed study area where Quarry 4 is located, is considered as a potential source of rock material. According to the material investigation report, the unweathered quartzite bedrock was proven to be suitable for the production of crushed G1 aggregate material. In addition, the weathered sandstone bedrock can be crushed as a source of G7 material, provided a suitable grading envelope can be maintained. Approximately, 56 500m^3 of overburden overlies the site. The overburden overlies weathered sandstone bedrock with an estimated volume of 230 000m^3, which can potentially be used for the production of crushed rock G7. A total of 624 000m^3 of unprocessed quartzite is available for crushing and production of G1 aggregate. The rock material will only be stored temporarily in stockpiles on site before being crushed and taken off site. The commodity to be mined is aggregates.

The proposed development of Quarry 4 includes the following proposed infrastructure areas **(Figure 8)**

- Quarry area (approximately 2.3 ha).
- Production area which includes the crushing area, fuel storage area, generator, and temporary toilets & the proposed bypass access track (17.1 ha).

The material that will be excavated from the Quarry would be processed at the crushing plant which will be situated within the study area. Once processed, the material will be stockpiled and transported to the construction sites by haul vehicles. The potential environmental impacts associated with the quarry, crushing areas, spoil areas, generators, fuel storage area and temporary toilets will be assessed in this Environmental study.

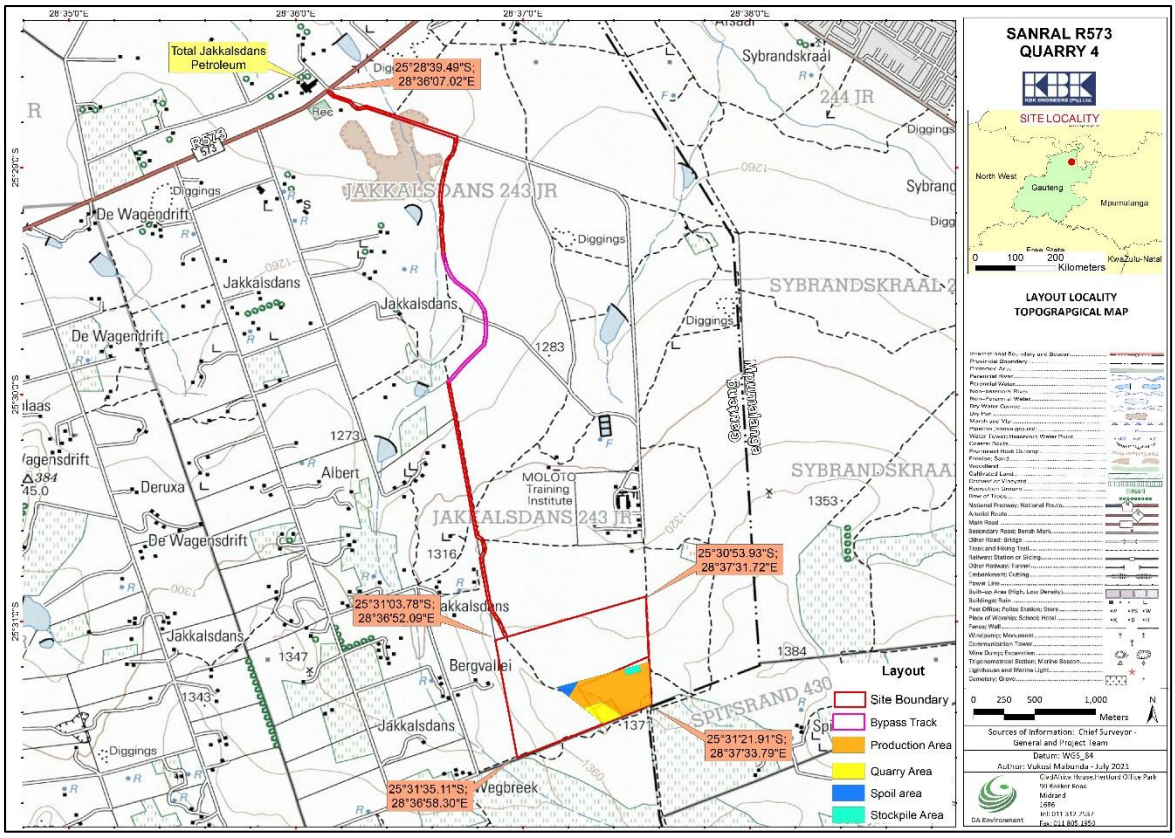

Figure 8: Site Layout Plan

It is important to note that SANRAL will procure the entire area of approximately 112 hectares (shown as the red boundary markings in **Figure 8**). However only 19.4 hectares will be used for the Quarry and associated infrastructure (shown as the multi colour block), including the access road diversion. Specialist assessments undertaken as part of the Basic Assessment process, did

however cover the entire area to be procured, hence maps used in this report will show the entire area to be procured.

The plan is Attached to **Appendix C.**

i) Listed and specified activities

Table 2: Listed Activities in Terms of the NEMA EIA Regulations (2014) as amended

NAME OF ACTIVITY (All activities including activities 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.)**	**Aerial extent of the Activity Ha or m²**	**LISTED ACTIVITY** **Mark with an X where applicable or affected.**	**APPLICABLE LISTING NOTICE (*GNR 544, GNR 545 or GNR 546)/NOT LISTED***
Mining of material for the proposed R573 Moloto Construction. Site preparation including clearing and grubbing	2.4 ha	Listing Notice 1: Activity 19 The infilling or depositing of any material of more than 10 cubic metres into, or the dredging, excavation, removal or moving of soil, sand, shells, shell grit, pebbles or rock of more than 10 cubic metres from a watercourse. <u>Applicability</u> The proposed project will include the clearance of vegetation, for the use of an access track. The access track will be situated approximately between 12 m and 340m from the wetland on site. There is a potential that the nearby wetland will be impacted during the establishment of the Quarry.	G.N.R 983
	19.4 ha	Listing Notice 1: Activity 27 The clearance of an area of 1 hectare or more, but less than 20 hectares of indigenous vegetation <u>Applicability</u> Indigenous vegetation will be cleared for the mining activities, and temporary infrastructure.	G.N.R 983
	19.4	Listing Notice 1: Activity 30 Any process or activity identified in terms of section 53(1) of the National Environmental Management: Biodiversity Act, 2004 (Act No. 10 of 2004). <u>Applicability</u> The proposed site does not fall within a threatened ecosystem; however, mining activities is proposed in an area classified as a CBA.	
	19.4 ha	Listing Notice 3: Activity 12 The clearance of an area of 300 square metres or more of indigenous vegetation except where such clearance of indigenous vegetation is required for maintenance purposes undertaken in accordance with a maintenance management plan.	G.N.R 985

		c. Gauteng ii. Within Critical Biodiversity Areas or Ecological Support Areas identified in the Gauteng Conservation Plan or bioregional plans. Gauteng Conservation Plan or bioregional plans. <u>Applicability</u> The proposed site is situated within a Critical Biodiversity Area.	
	19.4 ha	Listing Notice 3: Activity 14 Activity 14 The development of (i) Infrastructure or structures with a physical footprint of 10 square meters or more; Where such development occurs – (c) if no development setback has been adopted within 32 metres of a watercourse measured from the edge of a watercourse. C Gauteng iv Sites identified as Critical Biodiversity Areas (CBAs) or Ecological Support Areas (ESAs) in the Gauteng Conservation Plan or in bioregional plans; Vi Sensitive areas identified in an Environmental Management Framework adopted by the relevant environmental authority. <u>Applicability</u> The existing access track will be graded where possible. The proposed new 1.3 km (approximate) access track will be situated approximately between 12 m and 340m from the wetland on site which has been identified to be located with a Critical biodiversity area. The GPEMF indicates that the proposed site is situated within a Special Control Zone a) Dinokeng.	

ii) Description of the activities to be undertaken

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

<u>Activities associated with the various mining phases</u>

Pre-Mining Phase

Activities associated with the pre-mining phase are provided below:

- Site preparation
  - Fencing of Quarry and associated production area.
  - Land clearing.
  - Stripping of topsoil/overburden and temporary stockpiling in areas to be excavated only.

Mining Phase

Activities associated with the mining phase are provided below:

- Excavations
    - The material will be excavated from the Quarry area by the use of an excavator in order to remove required volumes of construction material.
- Processing of Material (crushing and screening)
    - The mined material will be crushed and screened utilising a mobile crushing and screening plant.
- Stockpiling
    - Subsequent to processing, all material will be transferred to the demarcated stockpiling area. Specific stockpiles for overburden and topsoil removed during the pre-mining and mining phase, will be stored separately, and used as backfilling during the rehabilitation and closure of the borrow area.
- Transferring of material
    - Material required for the upgrade of the R573, will be loaded onto haul vehicles (i.e., tipper trucks) by a front-end loader, where the material will then be transported to the necessary construction sites.

Rehabilitation and Closure

The following activities will occur subsequent to the mining phase:

- All infrastructure (fences, site offices), mining equipment (crushers, screens, haul vehicles) will be removed from site.
- All waste/rubble will be removed from site.
- Overburden stockpiles from the mining phase will be used for the filling of the Quarry.
- Site Stabilisation
    - The Quarry area will be graded, revegetated, and grassed in order to blend with the surrounding environment.
- **Closure**
    - Closure of the Quarry will be undertaken in line with the Environmental Impact Assessment Regulations. The site will be rehabilitated and left in an environmentally acceptable state. A closure plan will also be required for the proposed Quarry. The closure plan will ensure that the borrow area is rehabilitated, and that after closure of the area, vegetation establishes effectively.

Access Roads

The R573 Moloto road forms the northern boundary of the entrance and exit of the site. The existing R573 will be used for the haulage of Material. No new access roads will be constructed for the haulage of material to the respective sites as access to site already exists. The potential impacts resulting from the haulage of material to the respective sites has also been addressed in this Basic Assessment. The existing access roads within the South African Police Service, Moloto training facility will be used. Certain existing access tracks will be required to be widened in order to accommodate the haulage vehicles. The widening of the existing tracks will not exceed 4m. A portion of the haulage road traverses a seepage wetland that has been identified on side. It is anticipated that the existing road will be bypassed for approximately 1.2 km. According to the design engineers, it is not anticipated that the bypass road will be greater than 4m and will be constructed whereby only one-way traffic will be applicable to these sections.

Stormwater Management

Although some water may collect in depressions, during excavation no water will be required to be pumped out. Other than evaporation, the water that collects in the excavations will be collected by the excavator with the material and transferred to the crusher, which will also aid in dust suppression. A Stormwater Management Plan shall be compiled by the Contractor prior to the commencement of construction activities.

Waste Management

All waste generated during the construction and operational phase of the quarry will be temporarily stored at suitable locations (e.g.in receptables/skips) and will be removed at regular intervals and disposed of appropriately at a licensed municipal waste site or acceptable disposal facility. The anticipated waste volumes or quantities that will be stored on site do not trigger the need to apply for a Waste Licence.

Site Demarcation

The study area will be temporarily fenced off for the entire duration of the project until the site has been completely rehabilitated.

Water and Sanitation

Sanitation services will be required for onsite personnel during the construction and operational phase of the project. Chemical toilets will be used and serviced regularly by a registered Waste Contractor. Water may be required for dust suppression especially during crushing operations. The appointed Contractor responsible for the operation of the Quarry 4, will be responsible for ensuring that the relevant permits/authorisations are in place based on their assessment of suitable water sources.

e) Policy and Legislative Context

Table 3:Policy and Legislative Context

APPLICABLE LEGISLATION AND GUIDELINES USED TO COMPILE THE REPORT (a description of the policy and legislative context within which the development is proposed including an identification of all legislation, policies, plans, guidelines, spatial tools, municipal development planning frameworks and instruments that are applicable to this activity and are to be considered in the assessment process);	**REFERENCE WHERE APPLIED**	**HOW DOES THIS DEVELOPMENT COMPLY WITH AND RESPOND TO THE LEGISLATION AND POLICY CONTEXT** (e.g. In terms of the National Water Act a Water Use Licence has / has not been applied for)
Constitution of the Republic of South Africa, 1996 (Act No. 108 of 1996**)**	The environmental right is mentioned in Section 24 of the Constitution of the Republic of South Africa, 1996 (Act No. 108 of 1996). This states the following: "*...everyone has the right to have the environment protected, for the benefit of present and future generations, through reasonable legislative and other measures that prevent pollution and ecological degradation, promote conservation, and secure ecologically sustainable development and use of natural resources while promoting justifiable economic and social development*". The State must therefore respect, protect, promote, and fulfil the social, economic, and environmental rights of everyone and strive to meet the basic needs of previously disadvantaged communities. The Constitution therefore recognises that the environment is a functional area of concurrent national and provincial legislative competence, and all spheres of government and all organs of state must cooperate with, consult, and support one another if the State is to fulfil its constitutional mandate.	The issuing of an environmental authorisation or other permits or licence for any aspect of the proposed Quarry 4 will ensure that the environmental right enshrined in the Constitution contributes to the protection of the biophysical and socio- economic environment
National Environmental Management Act, 1998 (Act No. 107 of 1998)	In order to bring section 24 of the Constitution of the Republic of South Africa, 1996 (Act No. 108 of 1996) into realisation, the National Environmental Management Act, 1998 (NEMA) (Act No. 107 of 1998) was promulgated to serve to *'provide for co-operative environmental governance by establishing principles for decision-making on matters*	The proposed project will trigger listing activities from Listing Notice 1 and Listing Notice 3 as provided in **Table 2**.

	affecting the environment, institutions that will promote cooperative governance and procedures for co-ordinating environmental functions exercised by organs of state; to provide for certain aspects of the administration and enforcement of other environmental management laws; and to provide for matters connected therewith'. Chapter 5 of NEMA outlines the general objectives and implementation of Integrated Environmental Management (IEM), which provides a framework for the integration of environmental issues into the planning, design, decision-making and implementation of plans and development proposals. Section 24 provides a framework for granting of Environmental Authorisations. In order to give effect to the general objectives of IEM, the potential impacts on the environment of listed activities must be considered, investigated, assessed, and reported on to the competent authority. Environmental Impact Assessment (EIA) Regulations were promulgated in December 2014 (as amended) in terms of Section 24(5) and Section 44 of the National Environmental Management Act (NEMA), Act 107 of 1998. . In terms of the 2014, EIA Regulations the triggered listed activities fall under Listing Notices 1, 2 and 3 which are further discussed as follows: • *Listing Notice 1 (Regulation 983) define activities which will trigger the need for a **Basic Assessment process.*** • *Listing Notice 2 (Regulation 984) define activities which trigger a **Scoping and Environmental Impact Assessment (EIA) process**.* • *Listing Notice 3 (Regulations 985) refers to certain listed activities located in specifically defined geographical areas for which a **Basic Assessment process** would be required.*	
National Environmental Management Act, 1998 (Act No. 107 of 1998). Procedures for the Assessment and Minimum Criteria for Reporting on Identified Environmental Themes in terms of Sections 24(5)(A) and (H) and 44 of the National Environmental Management Act (NEMA; Act No 107 of 1998) when Applying for Environmental	Specialist reports are required to be undertaken in line with Procedures for the Assessment and Minimum Criteria for Reporting on Identified Environmental Themes in terms of Sections 24(5)(A) and (H) and 44 of the National Environmental Management Act (NEMA; Act No 107 of 1998) when Applying for Environmental Authorisation, dated 2020 March 2020 and comes into effect 50 days after publication, i.e., 9 May 2020.	The site visit was undertaken on the 24th of March 2020, and the report was compiled in May 2020 prior to the promulgation of the regulations. The report was however undertaken in line with the Appendix 6 of the National Environmental Management Act (NEMA; Act No 107 of 1998) Amendments to the Environmental Impact Regulations, 2014 (as amended).

Authorisation, dated 2020 March 2020 and comes into effect 50 days after publication, i.e., 9 May 2020.		
Department of Forestry, Fisheries and Environment Screening Tool	On 5 July 2019, The Department of Forestry, Fisheries and Environment (DFFE) gave Notice of the Requirement to submit a Report generated by the National Web-based Environmental Screening Tool in terms of section 24(5)(h) of the NEMA, 1998 (Act No 107 of 1998) and regulation 16(1)(b)(v) of the EIA regulations, 2014, as amended. The submission of this report is compulsory when submitting an application for environmental authorisation in terms of regulation 19 and regulation 21 of the Environmental Impact Assessment Regulations, 2014 effective from 4 October 2019.	A copy of the DFFE Screening report is provided in **Appendix H** of this report.
National Environmental Management: Waste Act 59 of 2008 (Act No. 59 of 2008)	This Act aims to regulate waste management to protect human health and the environment by putting measures in place to prevent pollution and ecological degradation; promote conservation; and secure ecologically sustainable development and use of natural resources. The Applicant shall ensure compliance with this Act by implementing practical measures to avoid or reduce unnecessary generation of waste and where the waste is generated measures such as re-using, recycling and recovery of waste shall be encouraged.	A waste licence is not required for the proposed Quarry 4. The general principles of responsible waste management will be incorporated in the EMPr to manage waste related activities during construction and operational phase of the project.
National Environmental Management: Biodiversity Act, 2004 (Act No. 10 of 2004)	The purpose of this Act is to provide 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 bio-prospecting involving indigenous biological resources; • The establishment and functions of a South African National Biodiversity Institute Chapter 7 of the NEMBA regulations govern the 'PERMIT SYSTEM FOR LISTED THREATENED OR PROTECTED SPECIES'. In order to remove or relocate any Threatened species or Protected species identified on the site, the relevant permits must be applied for.	A Terrestrial Biodiversity Assessment was undertaken by Field and Form Landscape Science. The study confirmed that Quarry 4 is not situated within any listed Threatened Ecosystems, and no floral TOPS were recorded within the project area. In terms of the faunal TOPS, an Aardvark (*Orycteropus afer*) burrow was noted in the woodland habitat unit. The proposed project will however include the removal of indigenous vegetation. The recommendations and mitigation measures as provided by the specialist has been included in the EMPr.
National Forests Act, 1998 (Act No 84 of 1998)	The purpose of the Act is to promote the sustainable management and development of forests and to provide protection for certain forests and trees in terms of:	According to the Terrestrial Biodiversity Assessment, no protected tree species in

	• Section 15 (1) of the National Forest Act (Act 84 of 1998), any person wishing to cut, disturb, damage or destroy any protected tree or possess, collect, remove, transport, export, purchase, sell, donate or in any other manner acquire or dispose of any protected tree or any forest product derived from a protected tree must apply for a license from the Minister or any delegated institution or authority. • Government Notice 38215, Notice of the List of Protected Tree Species under the National Forests Act, 1998 (Act No 84 of 1998) was gazetted in November 2014.	terms of the National Forests Act (Act No. 84 of 1998) were recorded within the project area.
National Water Act, 1998 (Act No. 36 of 1998)	The National Water Act, 1998 (Act No. 36 of 1998) aims to provide for management of the national water resources in order to achieve sustainable use of water for the benefit of all water users. This act requires that the quality of water resources is protected as well as the integrated management of water resources with the delegation of powers to institutions at the regional or catchment level. The purpose of the Act is to ensure that the nation's water resources are protected, used, developed, conserved, and managed in ways which take into account: • Meeting basic human needs of present and future generations; • Promoting equitable access to water; • Redressing the results of past racial discrimination; • Promoting the efficient, sustainable and beneficial use of water in the public interest; facilitation social and economic development; • Providing for the growing demand for water use; • Protecting aquatic and associated ecosystems and their biological diversity; • Reducing and preventing pollution and degradation of water resources; • Meeting international obligations; • Promoting dam safety; and • Managing floods and drought. In pursuit of these objectives, Chapter 4 of the act regulates water use, while Section 21 lists eleven water use types that are regulated [Section 21 (a) – (k)]. Watercourses and wetlands are protected in terms of this section, as both are regarded as water resources. The list of the regulated areas inclusive of the 500m distance, but specific to the delineated boundary are as follows:	A Wetland/Riparian delineation and Functional Assessment was undertaken for the proposed Quarry 4 site. An unchanneled valley bottom wetland was recorded within the study area, along the existing access road used by the SAPS. A General Authorisation has been issued by the Department of Water and Sanitation. The General Authorisation has been included under **Appendix I**.

	• *The outer edge of the 1:100 year flood line and /or delineated riparian habitat whichever is the greatest measured from the middle of a river, spring, natural channel, lake or dam;* • *In the absence of a determined 1:100 year flood line or riparian area, the area within 100m from the edge of a watercourse where the edge of the watercourse is the first identifiable annual bank fill flood bench (subject to compliance to section 144 of the Act);* • *500m radius from the delineated boundary of any wetland or pan.*	
National Environmental Management Air Quality Act (Act 39 of 2004)	The purpose of the act is to reform the law regulating air quality in order to protect the environment by providing reasonable measures for the prevention of pollution and ecological degradation and for securing ecologically sustainable development while promoting justifiable economic and social development; to provide for national norms and standards regulating air quality monitoring, management and control by all spheres of government; for specific air quality measures; and for matters incidental thereto. Section 32 of the Act relates to the control of dust and Section 34 of the Act relates to the control of Noise. National Environmental Management Air Quality Act (Act 39 of 2004- *Category 2: Subcategory 2.4: Storage and handling of Petroleum Products* *National Dust Control Regulations (2013)*	The principles provided in Section 32 and 34 of the Act has been included into the EMPr, in order to manage and minimise dust and noise related activities generated during the construction and operational phase of the project. It is further acknowledged that depending on the volumes of diesel that may be required during the construction phase of the project, diesel tanks may require that an Air Emission Licence be obtained before installations. According to the Air Quality Act ''All permanent immobile tanks liquid storage facilities at a single site with a combined storage capacity of greater than 1000m^3'' require an Air Emission Licence. It is unlikely that the development will install tanks above the listed activity thresholds 1000m^3 thus no Basic Assessment or Scoping/EIA will be triggered. Should this be required an AEL will be lodged with the relevant Competent Authority. Based on the information provided, An Air Emission Licence is not required as the anticipated dust that will be released will be managed through the National Dust Control Regulations (2013).

National Heritage Resources Act, 1999 (Act No. 25 of 1999)	The objective of the National Heritage Resources Act, 1999 (Act No. 25 of 1999) is to introduce an integrated system for the management of national heritage resources. The identification, evaluation and assessment of any cultural heritage site, artefact or find in South Africa is required by this Act. Section 38 of this Act pertains to Heritage resources management and Section 38(1) states the following *Subject to the provisions of subsections (7), (8) and (9), any person who intends to undertake a development categorised as—* *(a) the construction of a road, wall, powerline, pipeline, canal or other similar form of linear development or barrier exceeding 300m in length;* *(b) the construction of a bridge or similar structure exceeding 50 m in length;* *(c) any development or other activity which will change the character of a site—* *(i) exceeding 5 000 m^2 in extent; or* *(ii) involving three or more existing erven or subdivisions thereof; or* *(iii) involving three or more erven or divisions thereof which have been consolidated within the past five years; or* *(iv) the costs of which will exceed a sum set in terms of regulations by SAHRA or a provincial heritage resources authority;* *(d) the re-zoning of a site exceeding 10 000 m2 in extent; or* *(e) any other category of development provided for in regulations by SAHRA or a provincial heritage resources authority,* *must at the very earliest stages of initiating such a development, notify the responsible heritage resources authority and furnish it with details regarding the location, nature, and extent of the proposed development.*	Based on the triggered activities in Section 38 of the Act, a Heritage Impact Assessment has been undertaken for the proposed development. No sites, features or objects of cultural significance were identified.
Mineral and Petroleum Resource Development Act 28 of 2002	The purpose of the Act is to regulate the prospecting for and the optimal exploitation, processing and utilization of minerals; to regulate the orderly utilization and the rehabilitation of the surface of land during and after prospecting and mining operations; and to provide for matters connected therewith. In terms of Section 22 of the Act, a Mining Right must be obtained prior to the commencement of any mining activities.	It is noted that in terms of Section 106 of the MPRDA, SANRAL is exempted from applying for a Mining permit to develop a quarry for the purposes of sourcing road building material. However, SANRAL is still required to obtain Environmental Authorisation in terms of NEMA.
Spatial Planning and Land Use Management Act (Act No. 16 of 2013) (SPLUMA)	SPLUMA is a framework act for all spatial planning and land use management legislation in South Africa. It seeks to promote consistency and uniformity in procedures and decision-making in this field. SPLUMA will also assist municipalities to address historical spatial imbalances and	The site earmarked for development is currently zoned as Agricultural. According to the CoT Regional Spatial Development Framework, 2012, the density map indicates

	the integration of the principles of sustainable development into land use and planning regulatory tools and legislative instruments.	that the proposed site is identified as a Critical Biodiversity Area 1. However, the Quarry 4 is temporary in nature, but with the intention of SANRAL to follow a land acquisition process. Landowner consent is required for a SPLUMA process and such will be handled through the SANRAL appointed property service provider.
Gauteng Environmental Management Framework	The Gauteng Department of Agriculture and Rural Development have developed an Environmental Management Framework Tool to streamline the requirements for an Environmental Impact Assessment (EIA) and reduce the need for the undertaking of EIA requirements, a reduction in timeframes for approvals and as a contribution towards reducing the cost of doing business in Gauteng. In this tool, a number of the National Environmental Management Act, 1998 (Act No. 107 of 1998) (NEMA) listed activities are excluded from the requirement to obtain an Environmental Authorisation (EA). Government Notice 164 in Government Gazette No. 41473 of 2 March 2018 presents a list of activities that are excluded from the need to obtain an Environmental Authorisation as they occur within Zones 1 and 5 of the Gauteng Provincial Environmental Management Framework (GPEMF).	Majority of the proposed Quarry 4 site and sections of the access road falls within Zone 3: High Control Zone, while portions of the remainder of the access road falls within Zone 4: Normal Control Zone, hence the proposed development is not excluded from the undertaking of an Environmental Authorisation process. The GPEMF indicates that the proposed site is situated within a Special Control Zone a) Dinokeng.
Gauteng Conservation Plan (C-Plan)	The Gauteng C-Plan focuses on the mapping of biodiversity priority areas within the Gauteng Province and is compiled by the Gauteng Department of Agriculture and Rural Development (GDARD). The C-Plan was consulted in order to determine the location of areas of increased ecological or conservation importance and sensitivity within the vicinity of the study area. This was undertaken by an investigation of biodiversity priority areas which include Critical Biodiversity Areas (CBAs) and Ecological Support Areas (ESAs).	The majority of Quarry 4, with the exception of two areas of limited extent, that mainly comprise the access road in the north and centre of the project area, is located within a CBA Important Area.
Gauteng Development Guidelines for Ridges (2019)	The Gauteng C-Plan Version 3.3 database (2011) identifies a number of key areas which represent a high diversity of environmental parameters in relatively small areas as CBAs or Ecological Support Areas (ESAs). Designated CBA and ESA areas include the ridges and higher-altitude areas occurring in the Gauteng province, because of the relatively large topographic and geological diversity within these areas, which are critical for ensuring the long-term persistence of both species and ecosystems. These areas include the ecological gradients required to allow species and habitats to adjust to climate change impacts and are also likely to include important refuge areas (City of Tshwane, 2016). The	According to the GDARD: Gauteng Ridges Version 7 dataset, a Class 1 ridge is located southwest of the Quarry 4 project area.

	aforementioned is further supported by the GDARD Requirements for Biodiversity Assessments (2014) which states that all ridges must be designated as sensitive. Where the interface between the lower slopes and adjacent land is deemed important for certain species, a buffer zone of 200m must be mapped and designated as sensitive. GDARD (2014) further indicates that a 200m buffer zone for Class 1 ridges must be designated as sensitive. In line with the updated Ridges Guidelines (2019), a 200m buffer is only required around a Class 1 ridge.	
Mining and Biodiversity Guidelines (2012)	The intention of the guideline is to find a balance between economic growth and environmental sustainability (i.e., in the name of sustainable development). The Guideline is envisioned as a tool to "foster a strong relationship between biodiversity and mining which will eventually translate into best practice within the mining sector." In identifying biodiversity priority areas which have different levels of risk against mining, the Guideline categorises biodiversity priority areas into 4 classes with the following levels of risk for mining attached to them: 1. Legally protected areas, where mining is prohibited 2. Ares of highest biodiversity importance, which are at the highest risk for mining 3. Areas of high biodiversity importance, which are at a high risk for mining Areas of moderate biodiversity importance, which are at a moderate risk for mining	The Mining and Biodiversity Guidelines (2012) indicates that the majority of Quarry 4, with the exception of two areas of limited extent that mainly comprise the access road in the north and centre of the project area, is indicted to be located within an area of Highest Biodiversity Importance.
City of Tshwane Spatial Development Framework (2021)	The vision of the City of Tshwane is to become a prosperous capital city through fairness, freedom and opportunity. The purpose of a spatial framework for Tshwane is to provide a spatial representation of the City's vision and to be a tool to integrate all aspects of spatial (physical) planning, such as – • land use planning; • planning of pedestrian, vehicular and other movement patterns; • planning regarding buildings and built-up areas; • planning of open space systems; and • planning of roads and other service infrastructure as well as to guide all decision-making processes regarding spatial (physical) development. According to the municipal SDF (2021), the Moloto rail corridor is an imperative project for Tshwane to elevate rail as the backbone of public transport. Addressing the current road infrastructure and improving road safety is one of the objectives of the Moloto rail corridor project.	The proposed Quarry 4 is for the sourcing of Material for the R573 Moloto Road upgrade. The proposed Quarry 4 will therefore support the strategic objectives and will contribute to improved mobility within the region. However, the Quarry 4 is temporary in nature, but with the intention of SANRAL to undertake a land acquisition process for the permanent acquisition of the portion of property required. Landowner consent is required for a SPLUMA process and such will be handled through the SANRAL appointed property service provider.

	The SDF (2021) makes reference to the K139 (Moloto Road upgrade) being the missing link that is a supposed to carry north-south transport between the Waltloo industrial area and the Rosslyn Automotive Hub, as well as to link Waltloo and Mamelodi with the Moloto Road. An implementation mechanism for the municipal SDF was developed by the City. One on the mechanisms being the compilation of Regional Spatial Development Frameworks for each of the City's seven regions. The proposed project falls within Region 5 of the city. One of the key opportunities as identified in the regional SDF is transport. The Moloto Road corridor project has been identified as a strategic road link of the region. The site earmarked for development is currently zoned as Agricultural. According to the Regional Spatial Development Framework, 2018, the density map indicates that the proposed site is identified as a Critical Biodiversity Area 1.	
Occupational Health and Safety Act (85 of 1993), Major Hazard Installation Regulations (GNR 629, 30 July 2001).	Any use or ancillary activity that involves the storage or keeping of hazardous substances that may result in an installation being declared a major hazardous installation in terms of occupational health and safety law is not permitted, unless a risk management and prevention plan has been submitted by the owner, and the City has given approval thereto.	It cannot be confirmed within the Environmental scope work if diesel storage will be undertaken on site and if such constitutes a Major Hazardous Installation. It is strongly recommended that SANRAL sought input from Health and Safety specialist with regard to this aspect and the City of Tshwane Fire Brigade Service bylaws are adhered to.
Directions regarding the measures to address, prevent and combat the spread of the COVID-19 relating to the National Environmental Management Permits and Licences issued by the Minister of Environment, Forestry and Fisheries on 05 June 2020 issued in terms of regulation 4(10) of the Regulations issued by the Minister of Cooperative Governance and Traditional Affairs in terms of section 27(2) of the Disaster Management Act, 2002 (Act No. 57 of 2002) and published on 29 April 2020 in Government Notice No. R. 480 of	The purpose of these Directions is to curtail the threat posed by the COVID -19 pandemic and to alleviate, contain and minimise the effects of the national state of disaster, and in particular to provide directions to ensure fair licensing processes and public participation processes as required by the laws contemplated in the Permitting Directions.	Thus far, the Public Participation Process has been undertaken in line with the directions regarding the measures to address, prevent and combat the spread of the COVID-19 relating to the National Environmental Management Permits and Licenses. All protocols have been observed to ensure these regulations are upheld whilst the public is afforded an opportunity to comment and participate in the Basic Assessment Process.

Government Gazette No. 43258,		

In addition to the above-mentioned legislative requirements, the upgrading of the R573 Moloto Road is a Strategic Infrastructure Project (SIP). SIP's are coordinated by the Presidential Infrastructure Coordinating Commission (PICC). The PICC has identified 18 SIPs to regenerate the South African economy. The upgrading of the Moloto Road projects falls under SIP 1: Unlocking the northern mineral belt with Waterberg as the catalyst, which includes the development of a logistics corridor to connect Gauteng with Mpumalanga. The SIP application has been included with this EIA Application under **Appendix I**.

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).

The proposed Quarry 4 will supply construction material for the proposed upgrading of National Road R573-1 (K139) from Stormvoël Road in Tshwane (km 0,00) to the Gauteng / Mpumalanga Provincial Border (± 48.00 km). The rational for the proposed upgrade is provided below:

- The R573 Moloto Road is one of South Africa's busiest and most important economic routes connecting Gauteng, Mpumalanga, and Limpopo provinces with an extremely high number of buses and light motor vehicles. The road links small towns and rural settlements within Pretoria and carries inter-district traffic between these locations, hence the road is an important regional mobility function but has an equally significant accessibility function (KBK Engineers, 2020).
- The road has been dubbed the "road of death" due to the high number of accidents that has happened on it over the years. According to the media release issued on the 31st July 2018 by Pretoria News, the Moloto road has not been upgraded for many years and has been exposed to increasing traffic over the years. Statistics taken from a period of 29 months, January 2012 to May 2014, show that there were 489 crashes on Moloto Road, resulting in 158 fatalities and 594 serious injuries (iol, 2018).
- In order to address safety, mobility functions and ensure that reasonable access is provided to adjacent properties and areas to enable the future land use development, SANRAL is proposing the upgrade of the R573 Moloto Road.

Large volumes of construction material would be required for the proposed project, hence the development of a local source of material would be highly beneficial. Obtaining the required quality and quantity of material from commercial sources would not be financially viable. Substantial cost savings would result by eliminating the cost of procurement and transportation of large volumes of material from existing commercial sources. Material investigations have also revealed that the proposed study area holds material reserves to meet the project requirements in conjunction with various other sites as provided in **Part A, Section d** of the report. The proposed site falls within close proximity of the proposed road upgrades, such will avoid potential risks associated with road safety on the surrounding road networks and carbon emissions as the distance travelled by the haul vehicles will be reduced.

g) Motivate for the overall preferred site, activities and technology alternative

Quarry 4 is considered to be adequately sized to allow for stockpiling of material, establishment of the Contractors camp, and crushing equipment. The site is relatively undeveloped, owned by the South African government, with the SAPS training academy towards the north. The material testing undertaken by the geotechnical specialists revealed that the site will provide a viable source of material for the upgrade of the R573, hence Quarry 4 is vital for the proposed Moloto Road upgrade project. The site was earmarked to supply G1 and G7 material and it is the only source of all the sites investigated that can supply this material product for the northern section of the project cycle.

h) Full description of the process followed to reach the proposed preferred site.

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

(i) Details of the development footprint alternatives considered.

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

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

According to the design engineers (KBK Engineers), six (6) potential Quarry sites and eight (8) Borrow Pits sites were identified following a geotechnical desktop study (**Figure 9**). As the majority of the R573 Moloto Road is bordered by residences or small holdings areas for safe reliable quarrying were severely limited. Many of the sites presented in **Figure 9** were eliminated following a screening process which also involved discussions with the landowners. Due to the difficulty in procuring the land, various other sites were identified and investigated by geotechnical drilling (**Figure 10**). The results of the site investigations are presented in **Table 4** below. From the eight sites that were investigated only four were feasible. It is important to note that separate environmental Authorisation processes are currently underway for each of the preferred sites, highlighted in grey in **Table 4**.

Table 4:Results from the Material Investigations

Site	Material Source	Coordinates	Suitability
Borrow Pit 4	N/A	25º 28’ 43.2”S 28º 36’ 16.3”E	Material is not suitable for proposed use and was not investigated any further.
Borrow Pit 6	G7 & G9	25º 38’ 29.6”S 28º 17’ 09.6”E.	The site holds significant potential to supply gravel material. However additional provision must be made for excavation aids and material crushing in order to achieve sufficient borrow pit depths to produce the estimated material volumes.
Borrow Pit 6 additional area	G9		
Borrow Pit 7	G7	25º 36’ 46.4”S 28º 17’ 34.7”E.	The site holds potential to supply gravel material. However additional provision must be made for excavation aids and material crushing in order to achieve sufficient borrow pit depths to produce the estimated material volumes.
Borrow Pit 8	N/A	25º 30’ 36.3”S 28º 31’ 46.0”E.	Material and environmental (i.e., possible wetland) restrictions make this site unsuitable.
Quarry 4	G1 & G7	25º 28’ 43.2”S 28º 36’ 16.3”E.	Pivotal source of G1 and G7 material produced from crushed rock to service the northern half of the project.
Quarry 5	G5, G6, G7	25º 32' 05.5"S 28º 30' 59.4"E.	This quarry is the only material source proven to hold large volumes of G5 crushed rock material which will be vital. The source should be dedicated to producing crushed G5 material (and G6 by-products).
Quarry 6.4/6B	G1, G5 & G6	25º 36’ 31.9”S 28º 15’ 31.3”E.	Quarry 6.4/6B is the largest source of G1 material for this project and benefits from G5 and G6 by-products.
Quarry 6.5/6A	G1 and G6	25º 36’46.4”S 28º 17’ 34.7”E.	Quarry 6.5/6A is a viable source of G1 material, with proven supplementary G6 by-products to be produced from crushing overburden materials.

Quarry 4 is considered to be adequately sized to allow for stockpiling of material, establishment of the Contractors camp, and crushing equipment. The site is relatively undeveloped, and the material testing undertaken by the geotechnical specialists revealed that the site will provide a viable source of material for the upgrade of the R573.

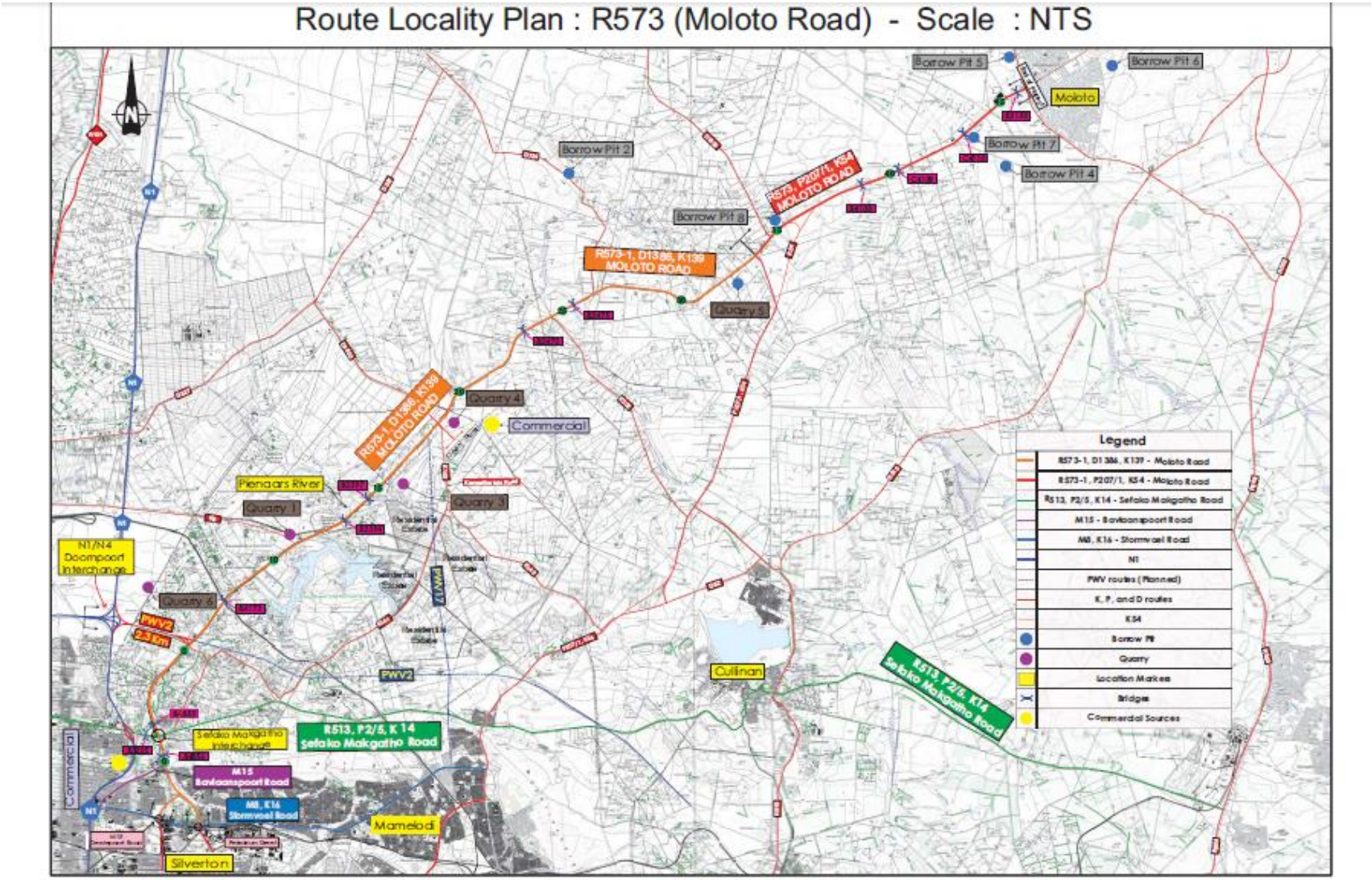

Figure 9: Quarries and Borrow Pit Sites Identified

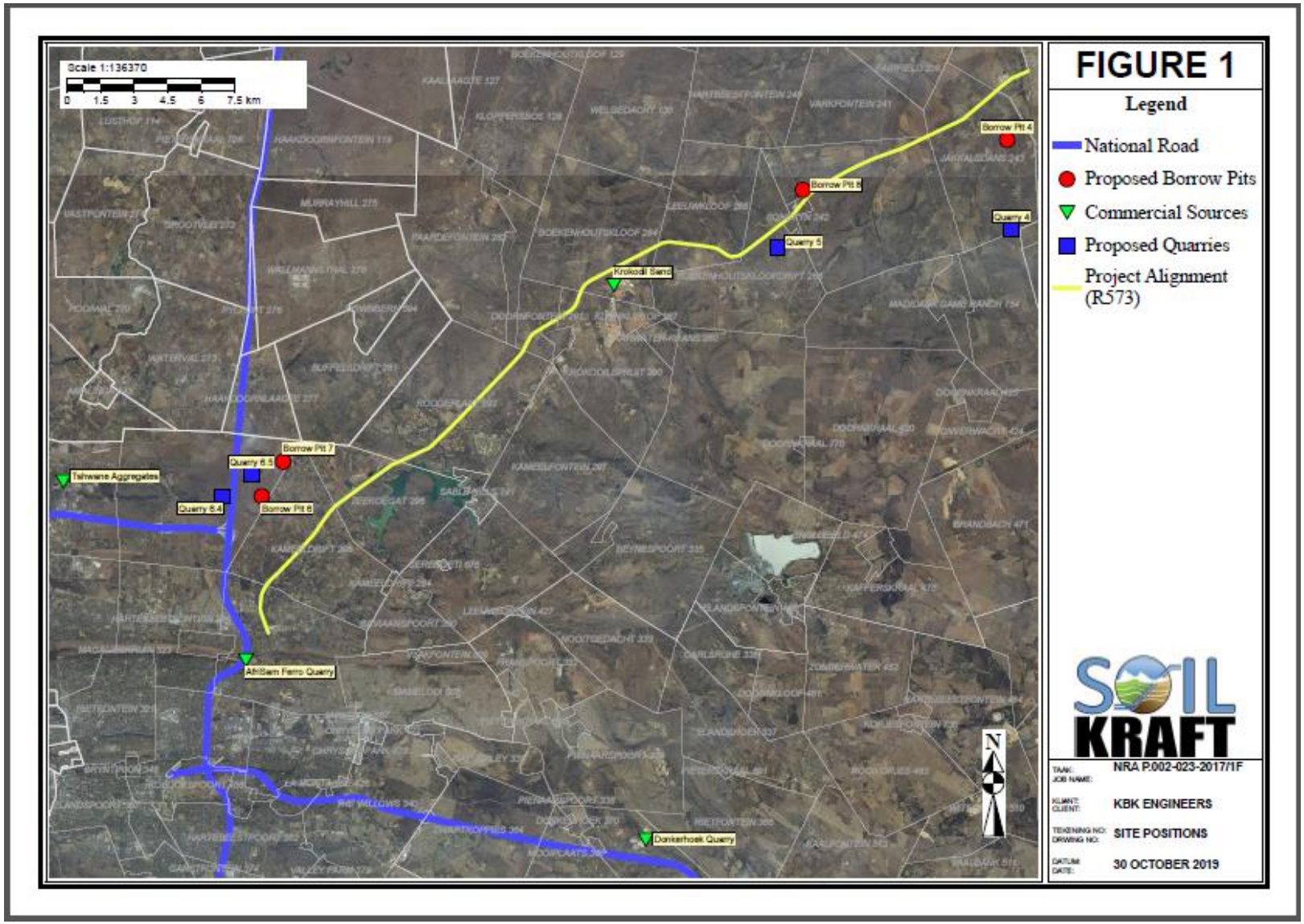

Figure 10: Quarries and Borrow Pit Sites where Material Investigations were undertaken

(b) the type of activity to be undertaken;

The application for Environmental Authorisation is based on the need for material sources. The need for material sources defines the activity to be undertaken which is mining, therefore no activity alternatives were assessed during the Basic Assessment Process.

(c) the design or layout of the activity;

Three Layout alternatives were considered by the design engineers Layout **Alternative A** (**Figure 11**), **Layout Alternative B (Preferred)** (**Figure 12**) and **Alternative C** (**Figure 13**). **Alternative B** is the Preferred Option.

The advantages and disadvantages of each layout is provided in **Table 5**.

Table 5: Advantages and Disadvantages of the Layouts Considered

Layout Alternative A	Layout Alternative B (Preferred)	Layout Alternative C
Advantages • The access road to be used for the haulage of vehicles is situated away from the SAPS Moloto training facility, which results in less disruptions to the operational activities currently at the facility. • The project footprint is greater than that of Alternative B resulting in a larger footprint for the mining area, operational activities and the movement of haulage vehicles. Disadvantages • The project footprint area is greater in extent, which is larger than the preferred project area boundary (Alternative B) and would lead to a larger area of natural habitat potentially being impacted. • Alternative A results in placement of infrastructure within the Class 1 ridge and associated 200m buffer zone which could lead to the direct, permanent loss of high ecological condition ridge habitat. • The use of an existing access road which falls within the 200m Class 1 buffer zone.	Advantages • The access road to be used for the haulage of vehicles is situated away from the SAPS Moloto training facility, which results in less disruptions to the operational activities currently at the facility. • The project footprint area is less than that of Alternative A. The smaller footprint will result in a smaller area of the natural habitat being impacted on. • The bypass access road will reduce impact on the wetland, as haulage vehicles will travel parallel to the wetland. Alternative B will limit habitat loss to the northern wetland system which is considered to be of increased ecological sensitivity by bypassing the majority of the wetland system and by making use of existing wetland crossings. • Avoids placement of new infrastructure within the Class 1 ridge and associated 200m buffer zone thus reducing potential impacts on the high ecologically sensitive Class 1 ridge habitat and surrounds. Disadvantages • The project footprint is less than that of Alternative A resulting in a smaller footprint for the mining area, operational activities, and the movement of haulage vehicles. • The use of an existing access road which falls within the 200m Class 1 buffer zone.	Advantages • This alternative will avoid the northern wetland system which is considered to be of increased ecological sensitivity. • Alternative C avoids placement of infrastructure within the Class 1 ridge and associated 200m buffer zone thus reducing potential impacts on the ecologically sensitive ridge habitat and surrounds. Disadvantages • The access road to be used for the haulage of vehicles is situated on the same route used for the SAPS Moloto training facility, which results in disruptions to the operational activities currently at the facility. During the public participation process and site visit with the SAPS, the SAPS Colonel advised that such alternative is not preferred. • Alternative C existing access road will cross two wetlands while Alternative B will cross one wetland system.

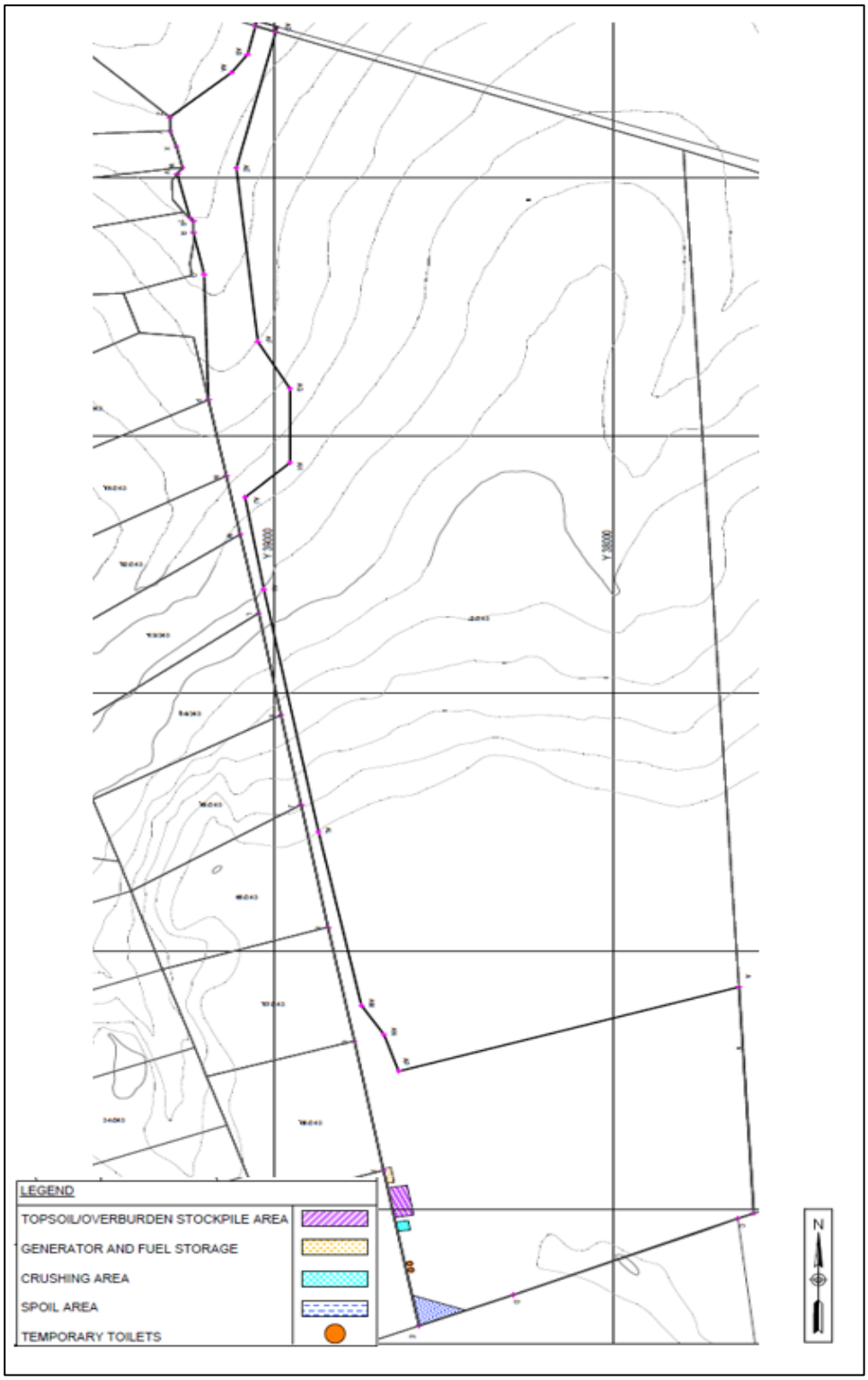

Figure 11:Layout Alternative A

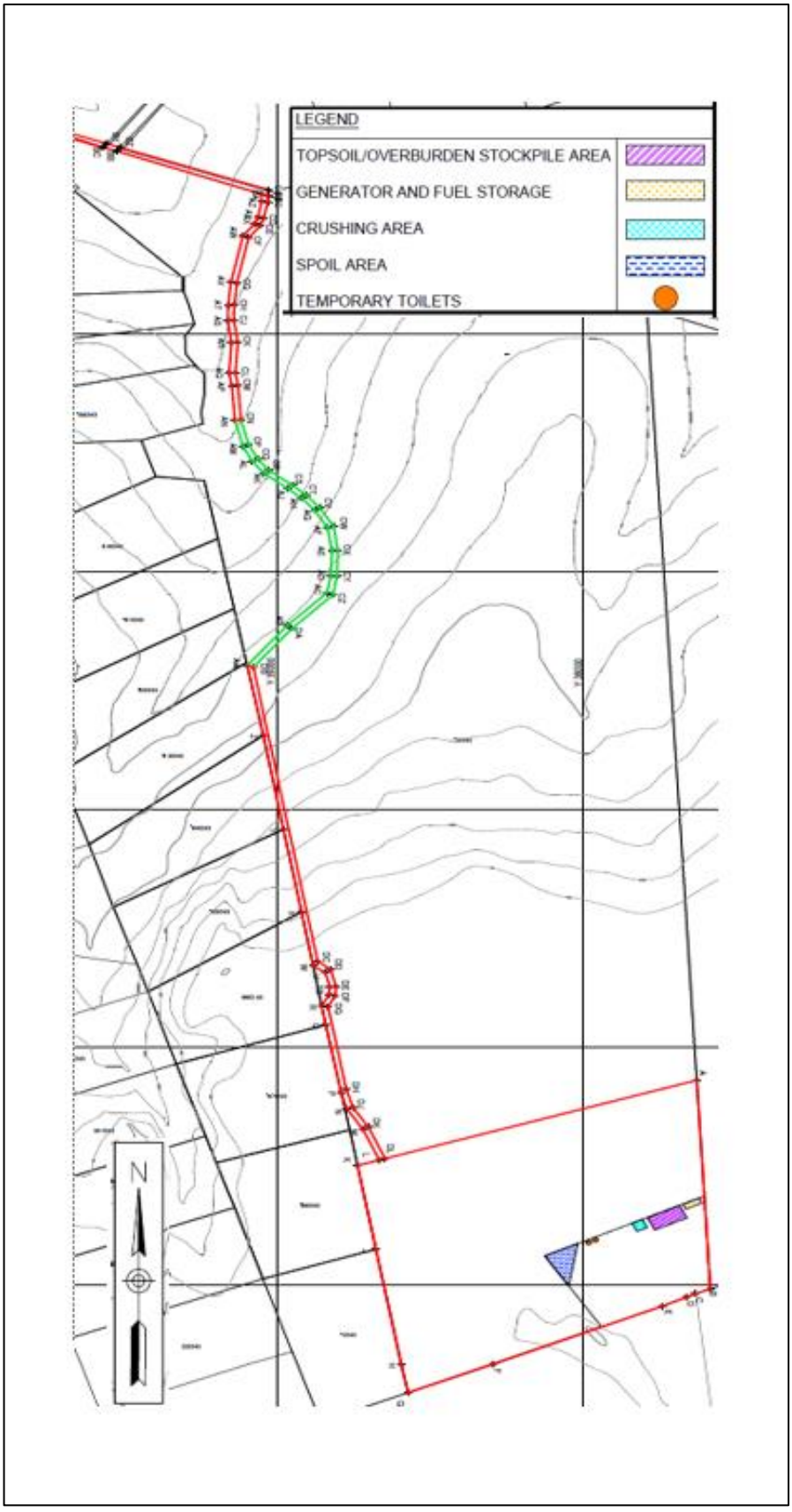

Figure 12: Layout Alternative B (Preferred)

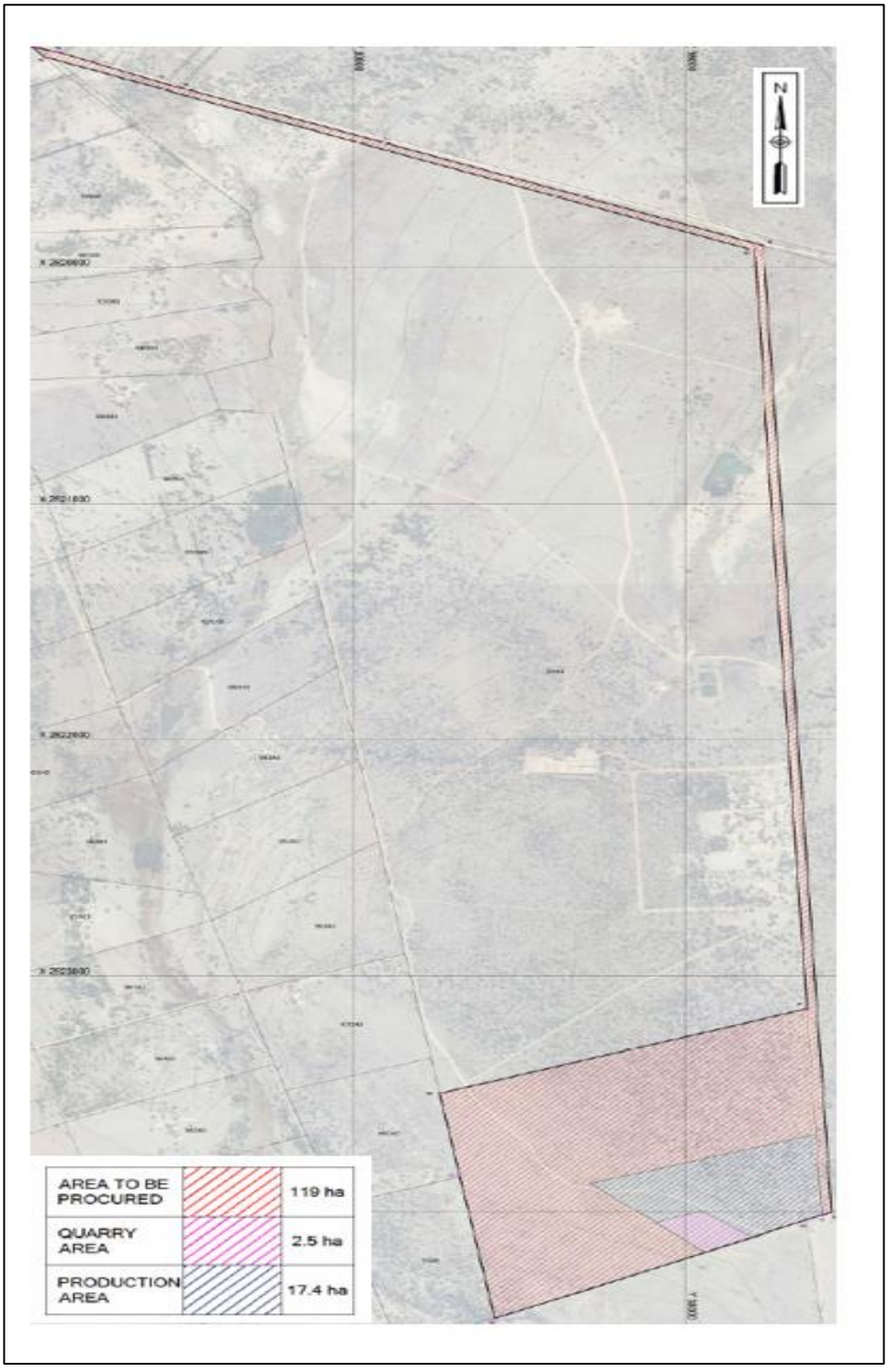

Figure 13: Layout Alternative C

(d) the technology to be used in the activity;

No technology alternatives have been assessed.

(e) the operational aspects of the activity; and

Two options were considered for the operational aspects of the Quarry. These are as follows:

- Option 1: Opencast mining using excavators and crushing and screening area on site.
- Option 2: Opencast mining using excavators, transporting material for crushing and screening to an area offsite.

The advantage of Option 1 is that less time will be required for the processing of material and the operations of having all facilities on site is cost effective. The operations could potentially have a smaller carbon footprint due to reduced haulage of material resulting in less diesel use. The disadvantage is that there would be a potential increase in noise levels and an increase in dust disturbance.

The advantage of Option 2 is that less noise and dust will be generated on site. The disadvantage is that there are greater financial implications to have crushing and screening offsite as materials will have to be transported off site to be processed.

Based on the assessment of the two options, Option 2 was not the preferred option due to the substantial increased financial obligations for the transport of material to an offsite crusher.

(f) the option of not implementing the activity.

The option of not implementing the activity is referred to as the No-Go alternative. The Potential Impacts as discussed in **Section vii** would not materialise. The implications of implementing the no-go alternatives are as follows:

- The condition of the R573 will remain, safety and traffic concerns will prevail. The condition of the R573 will continue to deteriorate. The R573 links small towns and rural settlements with Pretoria and carries inter-district traffic between these locations, hence the road is an important regional mobility function but has an equally significant accessibility function. As such the poor condition of the road will have an effect on the economy.
- The direct economic benefits associated with the Quarry 4 operation for sourcing of material for the upgrade of the R573 Moloto Road would be lost. Furthermore, any possible indirect economic benefits of the quarry operation (related to the procurement of goods and services and the spending power of employees) would not materialise.
- Construction materials would have to be obtained from commercial sources, there would be other potential negative impacts associated with the movement of haul vehicles over large distances on the surrounding provincial and national road network (e.g., damage to roads from heavy loads, road safety and air pollution). Obtaining the required quality and quantity of material from commercial sources would not be financially viable. Substantial cost savings would result by eliminating the cost of transportation of large volumes of material from existing commercial sources; and
- The No-Go alternative assumes that the project as proposed does not go ahead. This alternative would result in no environmental impacts on the natural environment or surrounding communities.

(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.

The NEMA (1998) EIA Regulations, 2014, as amended, prescribe that the Basic Assessment process must include the undertaking of public participation in accordance with the Chapter 6 of the Regulations.

The purpose of the Public Participation Process is to provide all potential and / or registered Interested and Affected Parties (I&APs hereafter), including the competent authority and any other stakeholder or organ of state, an opportunity to become involved in the Basic Assessment process and provide comments during the various phases of the project. Involvement by I&APs is critical, as it contributes to a better understanding of the proposed project among I&APs, raises important issues that need to be assessed and provides local insight that will enhance the Basic Assessment process. This Section of the report provides details on the Public Participation Process followed during the Basic Assessment for the proposed project.

In addition to Chapter 6 of the NEMA EIA Regulations, 2014 as amended, on the 5th of June 2020, the Minister of Environment, Forestry and Fisheries issued directions regarding the measures to address, prevent and combat the spread of the COVID-19 relating to the National Environmental Management Permits and Licences. A Public Participation Plan was submitted to the DMRE on the 22nd of June 2020. Public Participation for the proposed project commenced on the 3rd of July 2020.

i. Identification of Interested and Affected Parties

Interested and Affected Parties (I&APs) were identified through various means from the inception phase of the project. These means included the placement of an advertisement in a local newspaper the placement of Site Notices and the distribution of Notification Letters. Each of these are discussed below.

ii. Notification Letters

Regulation 41(2)(b) of the NEMA (1998) EIA Regulations, 2014, as amended requires that written notification be given to various parties who include the following:

> *(i) the occupiers of the site and, if the proponent or applicant is not the owner or person in control of the site on which the activity is to be undertaken, the owner or person in control of the site where the activity is or is to be undertaken and to any alternative site where the activity is to be undertaken;*
> *(ii) owners, persons in control of, and occupiers of land adjacent to the site where the activity is or is to be undertaken and to any alternative site where the activity is to be undertaken;*
> *(iii) the municipal councillor of the ward in which the site and alternative site is situated and any organisation of ratepayers that represent the community in the area;*
> *(iv) the municipality which has jurisdiction in the area;*
> *(v) any organ of state having jurisdiction in respect of any aspect of the activity; and*
> *(vi) any other party as required by the competent authority*;

An example of the notification letter that was compiled for the proposed development is attached as **Appendix D1.** The document provided a background on the project, the proposed activities as well as information on how one can register as an Interested and Affected Party (I&AP) on the project in order to be able to be kept abreast of all developments. Notification letters were compiled and distributed to all adjacent landowners on the 3rd of July 2020. Knock and Drop Registers were completed for all I&APs that received a notification letter on the aforementioned dates. The knock and drop register has been attached to **Appendix E8**. Electronic versions of the notification letters have also been sent to I&APs and is currently ongoing.

iii. Newspaper Advertisement

Regulation 41(2)(c) and (d) of the NEMA (1998) EIA Regulations, 2014, as amended requires that PPP includes the placement of a Newspaper Advertisement to notify all potential I&AP's about the proposed project and to invite them to register as I&APs and provide comments on the project. An advertisement was placed on page 2 of the Pretoria News on the 9th of July 2020 and on Page 4 of the Pretoria North Rekord on the 10th of July 2020. The proof of the placement of the Newspaper Advertisement is attached as **Appendix D2.**

iv. Notice Boards/Site Notices

In accordance with the NEMA (1998) EIA Regulations, 2014, as amended, a notice board detailing the proposed activity as well as the contact details of the EAP was placed on site. Site notices presenting the project were erected on site and at visible and accessible locations close to the site on the 3rd of July 2020. The locations of the placement of the A2 notice boards as well as the A3 notice boards are as follows and provided in **Appendix D3.**

- Main entrance of the SAPS training facility (25°28'43.20"S; 28°36'16.03"E)
- Access control point at the SAPS training facility offices (25°30'19.99"S; 28°37'30.19"E)
- Total Jakkalsdans (25°28'39.40"S; 28°36'3.75"E)
- Milk shop at the R573 Moloto Road (25°29'30.74"S; 28°34'7.56"E)
- De Wagendrift Supermarket (25°30'50.30"S 28°31'39.80"E);

v. Availability of Draft Basic Assessment Report (DBAR) for review

The DBAR will be issued out for public review for a legislated period of at least 30 days. This DBAR will be made available for public review and registered I&APs have been notified via email. The provision of the DBAR for review will allow I&APs adequate time to review the details of the project and provide, in writing, comments and concerns relating to the proposed development. All registered I&APs will be informed of the availability of the report through various means and proof of the notification will be kept. The following commenting authorities will be provided with a copy of the report in both electronic as well as hardcopy format:

- Gauteng Department of Agriculture and Rural Development.
- City of Tshwane Metropolitan Municipality-Economic Development and Spatial Planning Department.
- City of Tshwane: Stormwater.
- City of Tshwane: Water Conservation and Water Demand Management & Water and Sanitation Planning.
- City of Tshwane: Roads and Transport Department.
- Department of Rural Development and Land Reform.
- City of Tshwane: Environmental Planning and Open Space.
- Provincial Heritage Resource Agency-Gauteng.
- Gauteng Department of Roads and Transport.
- South African Heritage Resources Agency; and
- Department of Forestry, Fisheries and Environment (DFFE) (Biodiversity Management.

SMS, e-mail notifications and telephone calls will be utilised to notify all registered I&AP's about the availability of the report.

vi. I&APs Register and Comments & response report

From the onset of the project, a database of persons, organizations and organs of state identified as I&APs or registered as I&APs was opened and is updated as and when required. The I&APs register is included in **Appendix D4**. Comments received from various I&APs have been captured in the Comments and Response Report. The Comments and Response report is attached to **Appendix D5**.

vii. Focus Group Meetings/Public Open Day

No public open days have been held to date with I&APs. Depending on the comments received during the public review period for the Draft Basic Assessment Report, a public open day/focus group meeting will be arranged accordingly in terms of the directions regarding the measures to address, prevent and combat the spread of the COVID-19 relating to the National Environmental Management Permits and Licences. A Focus group meeting was held with Councillor Welmans on the 30th of June 2020. Councillor Welmans is no longer serving as the Ward Councillor for Ward 99. As a result, another meeting was held with Councillor Phuti Kwenaite on the 18th of August 2021 to present the project. The meeting notes have been included under **Appendix D6**. A meeting was also held with the South African

Police Services on the 3rd of July 2020. The notes of the meeting has been included under Appendix D6.

GA Environment also met with the traditional leader Chief Mapuru on the 24th of July 2020 to inform him of the proposed project. The attendance register is attached to **Appendix D6**.

(iii) Summary of issues raised by I&APs

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

The table below provides a summary of the stakeholders consulted to date. A high-level summary of the issues raised has been included on the table. All comments provided to date regarding the proposed project has been detailed in the comments and response report which is provided in **Appendix D5** Public Participation is ongoing and the table will be updated as the Basic Assessment Process unfolds.

Table 6: Issues Raised by I&APs

Interested and Affected Parties List the names of persons consulted in this column, and Mark with an X where those who must be consulted were in fact consulted.		**Date Comments Received**	**Issues raised**	**EAPs response to issues the applicant**
AFFECTED PARTIES				Responses are proposed in the Comments and Response report attached to **Appendix D5**.
Landowner/s				
National Department of Public Works and Infrastructure	X	16th July 2021	Provided consent to undertake the Environmental Authorisation process.	
Lawful occupier/s of the land				
South African Police Services Tactical Academy Moloto	X	3rd July 2020	• The identified site where drilling took place for possible Quarry 4 and the proposed site indicated on map for project is not corresponding • The main road leading up to the Quarry will be used by learners, trainers and personnel during the day • Handling of security, vehicles and use of main gate of the academy, current structure and gate is too small / narrow for vehicle flow • Blasting that will take place during this project will probably damage the current borehole in use at the academy • Shooting Range Complex 2 is in line with proposed project site	
Landowners or lawful occupiers on adjacent properties				
Ms Titia van Deventer	X	3rd July 2021	Concerns regarding dust, noise and traffic control	
Foxtrot Primary Farm School	X	3rd July 2021	Scholar safety is very important	
Municipal councillor				
Councillor Phuti Kwenaite	X	18th August 2021	• How will the proposed project add value to the community and employment opportunities. • Information to be provided on the timeframes of the project • When will the advertisements for the contrcator be placed out? Public meetings to be held before and after the adverts are placed • The community, more importantly the schools shall be involved in the process. Environmental awareness and school sponsorship (Scouts)	

			shall be undertaken by SANRAL in terms of the Social Development Plan for the Quarry	
Municipality				
City of Tshwane: Environmental Planning and open space	X		No comments received to date	
City of Tshwane: Roads and Transport Department Transportation Planning Division	X		No comments received to date	
Organs of state (Responsible for infrastructure that may be affected Roads Department, Eskom, Telkom, DWA e				
Department of Water and Sanitation	X	15th February 2021	Issued a General Authorisation for the project	
City of Tshwane: Transport Department Infrastructure Design, Construction and Maintenance Division	X		No comments received to date	
Communities				
N/A				
Dept. Land Affairs				
Department of Rural Development and Land Reform	X	25th August 2020	Confirmed that there are land claims against the property proposed for Quarry 4.	
Traditional Leaders				
Chief Mapuru	X		No comments received to date	
Dept. Environmental Affairs				
Gauteng Department of Agriculture and rural development	X		No comments received to date	
Other Competent Authorities affected				
South African Heritage Resources Agency	X		No comments received to date	
Provincial Heritage Resource Agency-Gauteng	X		No comments received to date	
Gauteng Department of Roads and Transport	X		No comments received to date	
OTHER AFFECTED PARTIES				
Wildlife and Environment Society of South Africa			No comments received to date	
INTERESTED PARTIES				

(iv) The Environmental attributes associated with the alternatives. (The environmental attributed described must include socio-economic, social, heritage, cultural, geographical, physical and biological aspects)

1. Baseline Environment

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

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

This Section serves to describe the environmental setting of the area identified and will also provide a description of the overall character and other sensitivities that were identified in the surrounding environment.

Climate

Pretoria has a humid subtropical climate with long hot rainy summers and short mild winters (Wikipedia, 2020). An average high temperature of 29°C and an average low temperature of 18°C with January being the warmest month (**Figure 14**). June is the coldest month of the year with an average high temperature of 19°C and an average low temperature of 5°C.

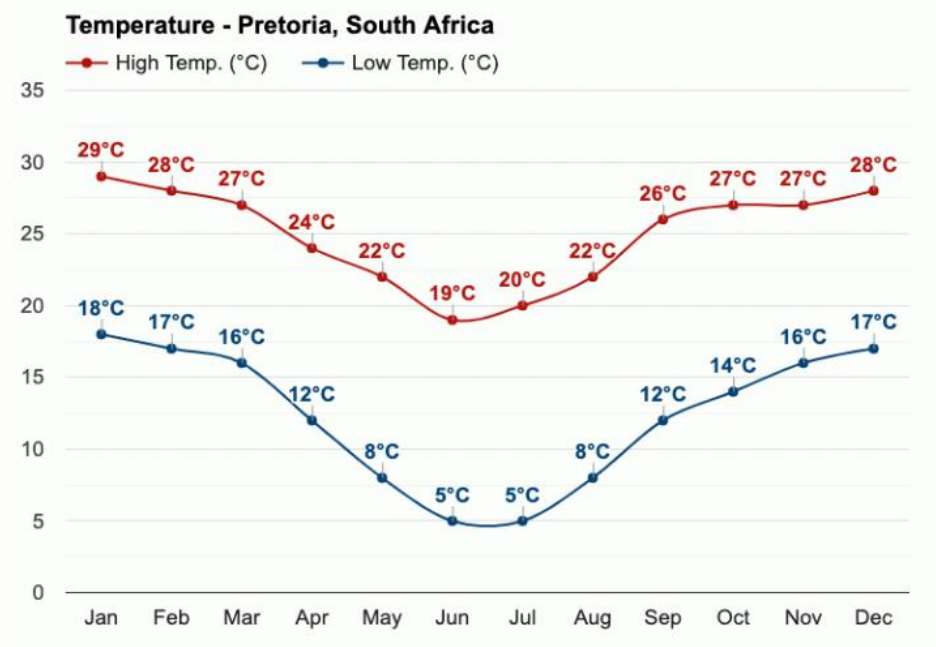

Figure 14:Average temperature for Pretoria (weather-atlas)

Pretoria experiences rainfall throughout the year, as there are approximately 88 rainfall days and 732mm is accumulated. The month with the most rainfall is January with an average of 155mm, and July has been recorded as the month with the least rainfall where 3mm has been recorded (**Figure 15**).

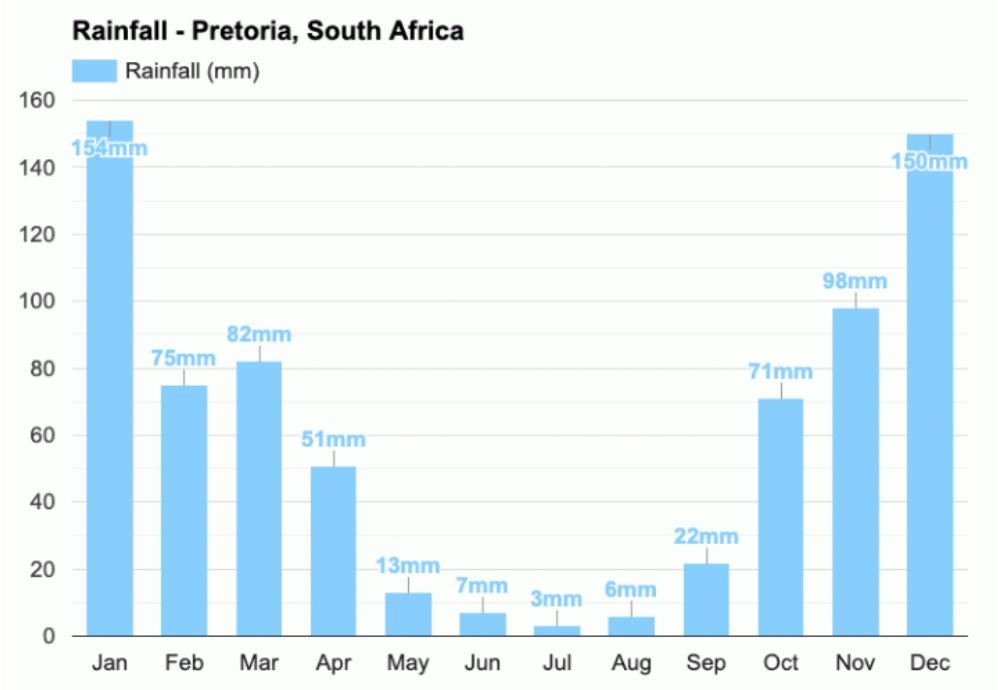

Figure 15: Average Rainfall for Pretoria (weather-atlas)

Topography

The project area slopes to the south and ranges in elevation from 1 241 meters above mean sea level (mamsl) at the access road in the north to 1 368 meters mamsl at the highest elevation in the south, where a ridge is located (**Figure 16**).

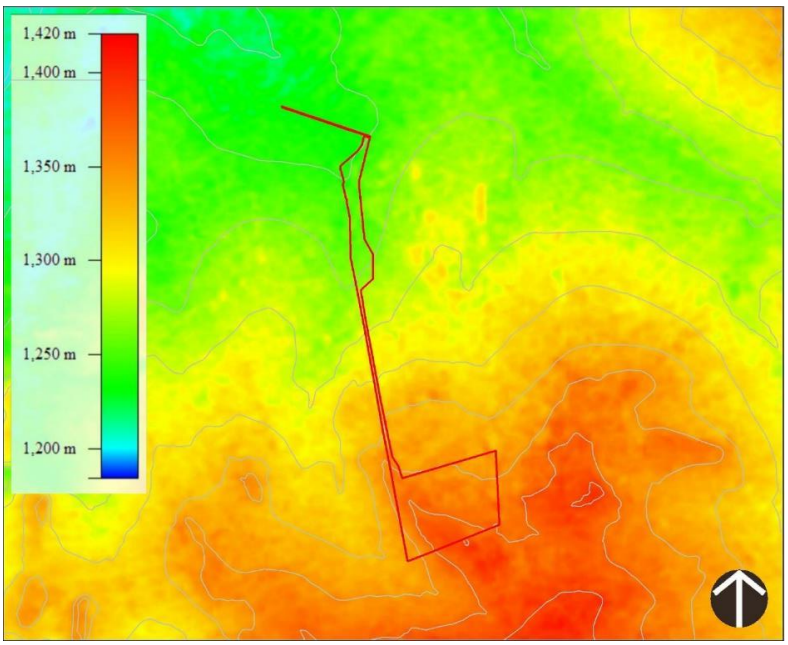

Figure 16: Digital elevation map of the project area, indicating elevated topography towards the south (Field and Form, 2020)

Geology

A Materials investigation was commissioned by KBK engineers as part of the engineering contract. According to the Geotechnical Investigation undertaken by Soilkraft CC (2019), the regional geology surrounding Quarry 4 is fairly complex and spans numerous geological eras and materials (**Figure 17**). However, in the immediate vicinity of the site, the following geology is indicated:

- *Ecca Formation (Pe):* Scattered outliers of the Ecca Formation (Karoo Supergroup) are found throughout the region. One such outlier is indicated near the entrance to the training facility. Bedrock materials of the Ecca Formation typically include shale, sandstone, grit and conglomerate.

- *Nebo Granite (Mn):* The Nebo Granite is part of the Lebowa Granite Suite (Bushveld Igneous Complex). As suggested by the name, bedrock materials typically consist of medium or coarse-grained granite.

- *Rashoop Granophyre Suite (Mr):* The Rashoop Granophyre Suite also forms part of the Bushveld Igneous Complex but consists of granophyre or granophyre derivative materials.

- *Rayton Formation (Vr):* The Rayton Formation occurs on the south western parts of the farm and forms an inferred geological contact. The Rayton Formation is part of the Pretoria Group, Transvaal Supergroup and typically consists of bedrock materials such as quartzite, shale and greywacke.

The Geotechnical Investigation has revealed that the site is a viable source of G1 and G7 material. The materials investigation report is attached to **Appendix F.**.

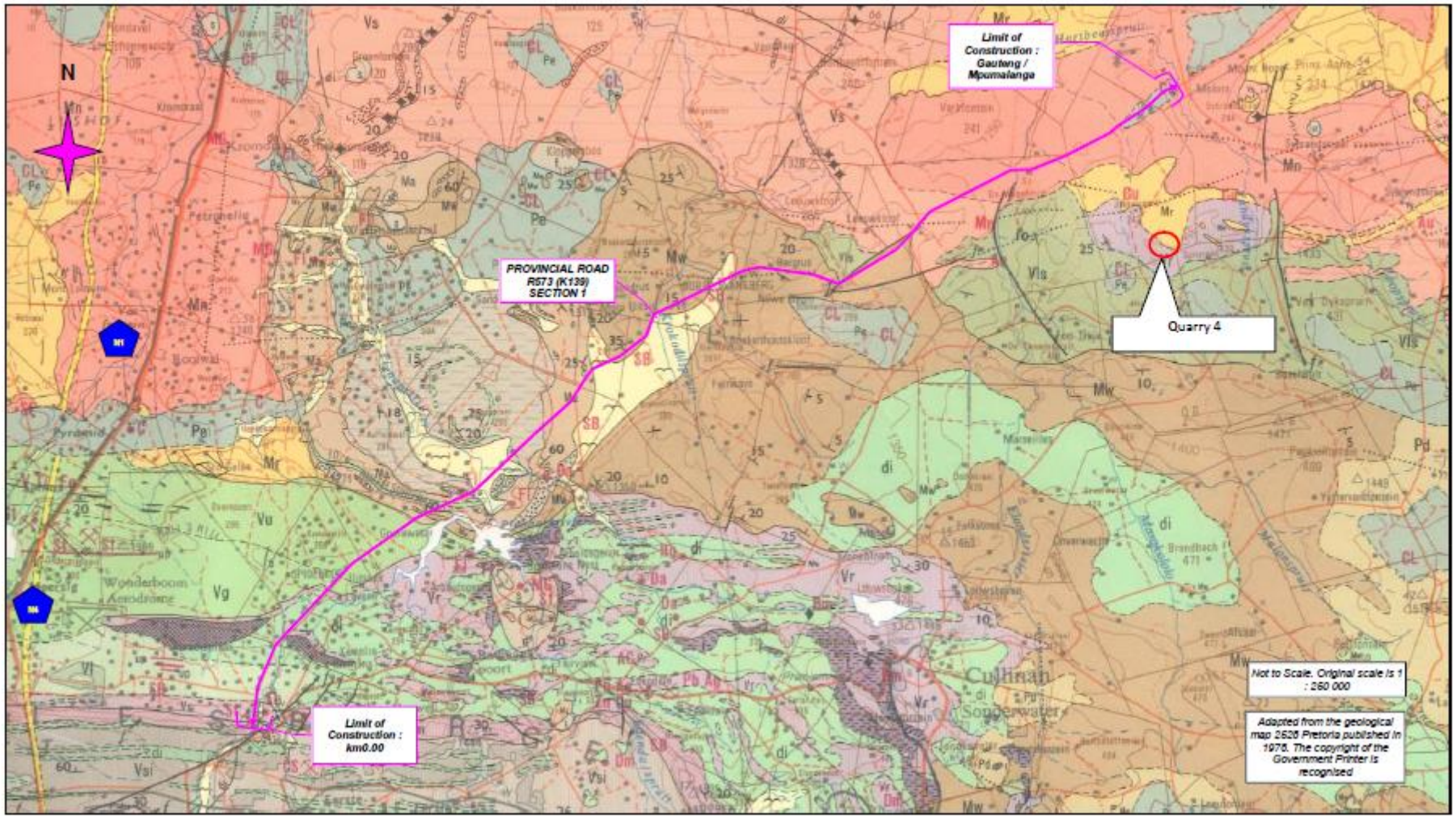

Figure 17: Geology in Relation to the Proposed Study Area

Vegetation Types and Habitat Units

The Gauteng C-Plan focuses on the mapping of biodiversity priority areas within the Gauteng Province and is compiled by the Gauteng Department of Agriculture and Rural Development (GDARD). The C-Plan was consulted in order to determine the location of areas of increased ecological or conservation importance and sensitivity within the vicinity of the study area. This was undertaken by an investigation of biodiversity priority areas which include Critical Biodiversity Areas (CBAs) and Ecological Support Areas (ESAs). The majority of Quarry 4, with the exception of two areas of limited extent, that mainly comprise the access road in the north and centre of the project area, is located within a CBA Important Area. (**Figure 18**).

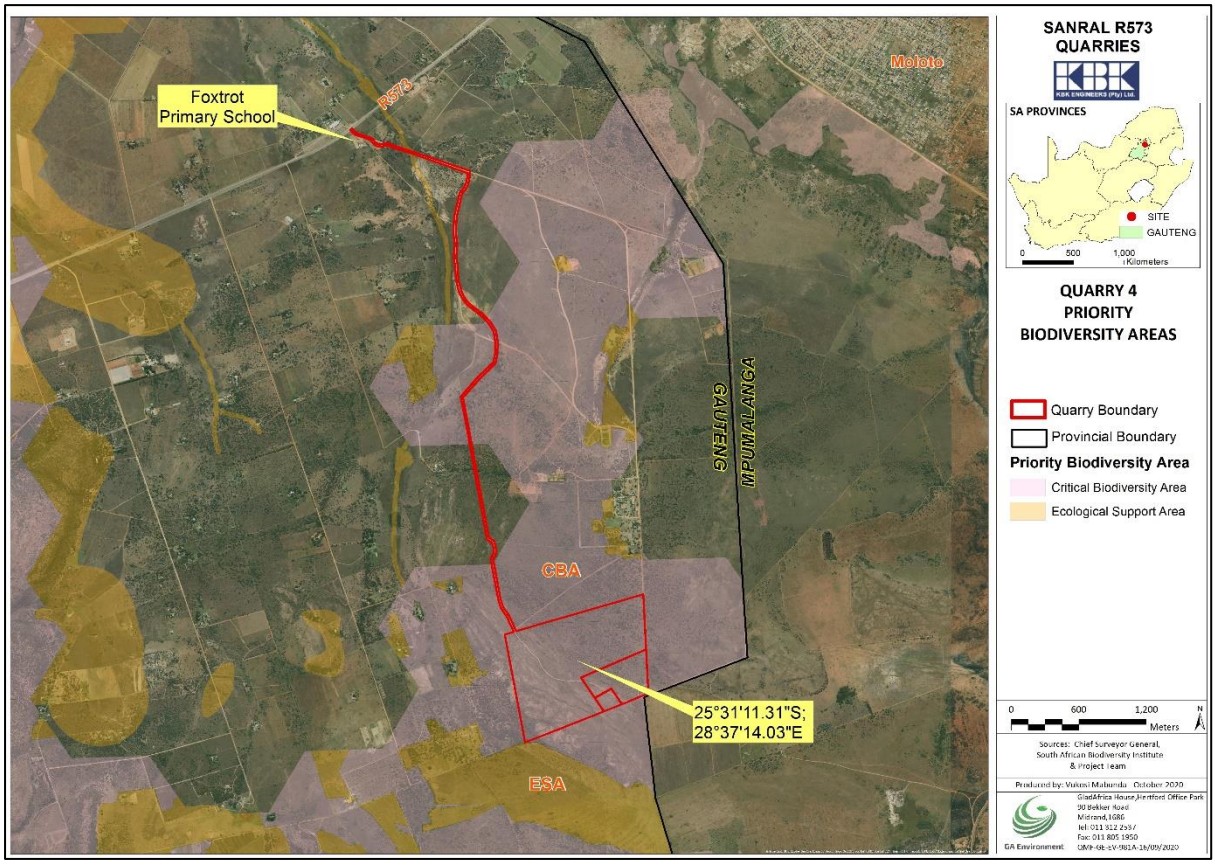

Figure 18: Gauteng C-Plan of the Study Area

A Terrestrial Biodiversity Assessment was undertaken by Field and Form Landscape Science. The report is attached to **Appendix F**. The project area is situated within the Savanna Biome within the Central Bushveld Bioregion and the Central Sandy Bushveld vegetation type which has a conservation status of vulnerable (**Figure 19**). The project area is not affected or located in close proximity to protected areas. According to the most recently published South African Protected Areas Database (SAPAD) (2019) and South African Conservation Areas Database (SACAD) (2019), the project area is not affected or located in close proximity to protected areas or formal conservation areas, with the Leeuwfontein Nature Reserve and Hardenberg Private Nature Reserve located 8km and 12km to the north and northwest, respectively. According to the National Protected Areas Expansion Strategy (NPAES) database (2010), the project area is not located within an NPAES focus area, with the closest NPAES focus area being the NW/ Gauteng Bushveld NPAES focus area located 4km to the north (**Figure 20**).

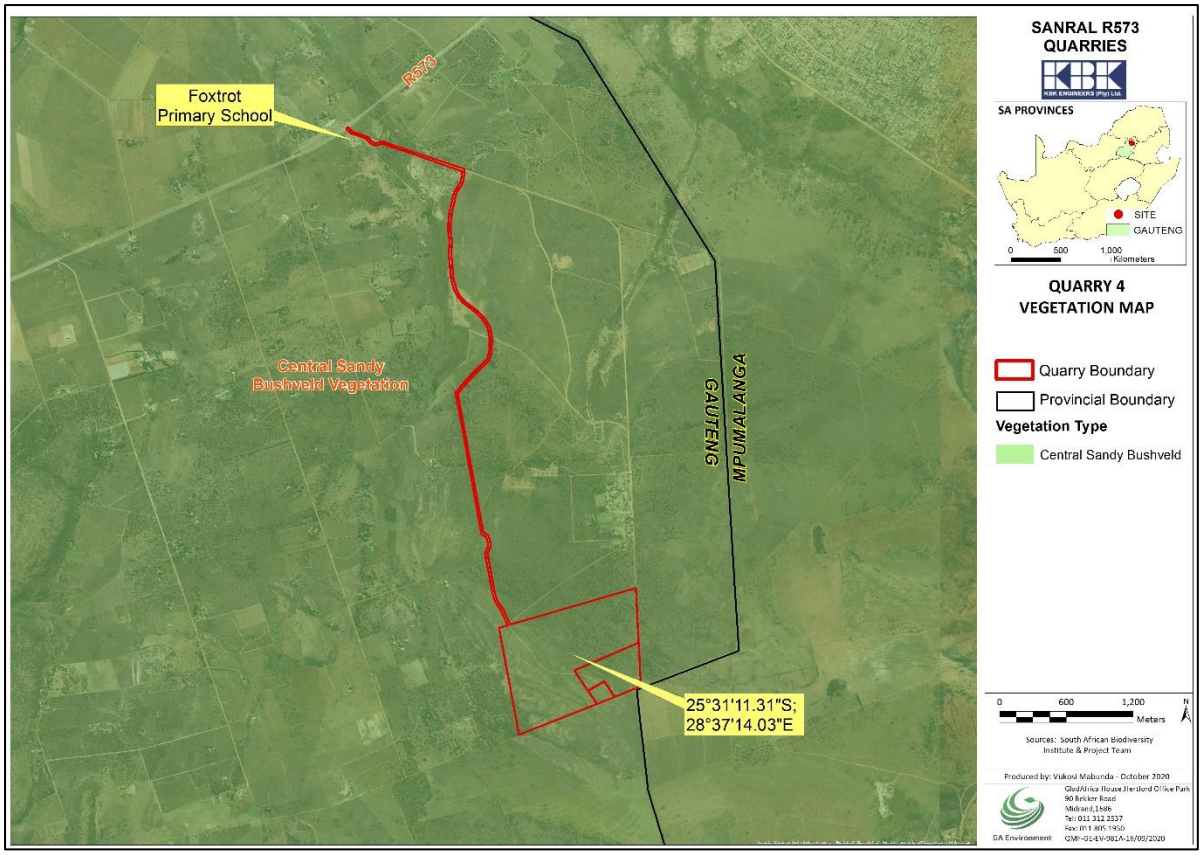

Figure 19: Vegetation in relation to the Study Area

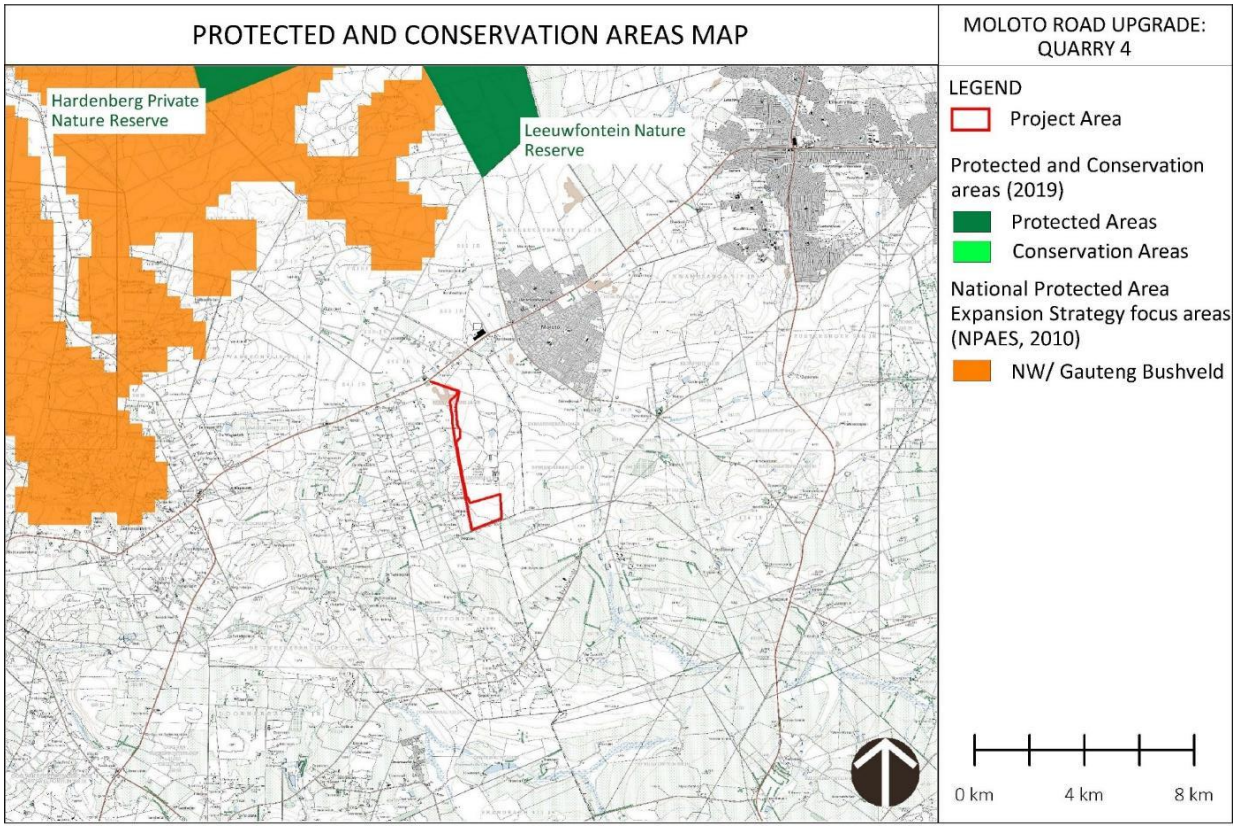

Figure 20: The location of the project area in relation to Protected and Conservation Areas (Field and Form Landscape Science, 2020)

Four broad habitat units (**Figure 21**) were identified within the project area, based primarily on floral species composition and vegetation structure, faunal species habitat provision, the topographical position of the habitat unit in the landscape, as well as the degree of anthropogenic impact and disturbance within the unit. These habitat units are:

- Ridge habitat.
- Rocky slope habitat.
- Degraded *Burkea africana* Woodland; and
- Wetland Habitat.

In addition, three further habitat units that are not well represented within the project area itself, were identified within 200m of Quarry 4. These include the following:

- Mixed Woodland, occurring adjacent to the access road and within adjacent properties.
- Modified Grassland, also occurring along the proposed access road and within adjacent properties; and
- Modified and disturbed habitat, including agricultural fields and existing modified areas such as access roads and built infrastructure.

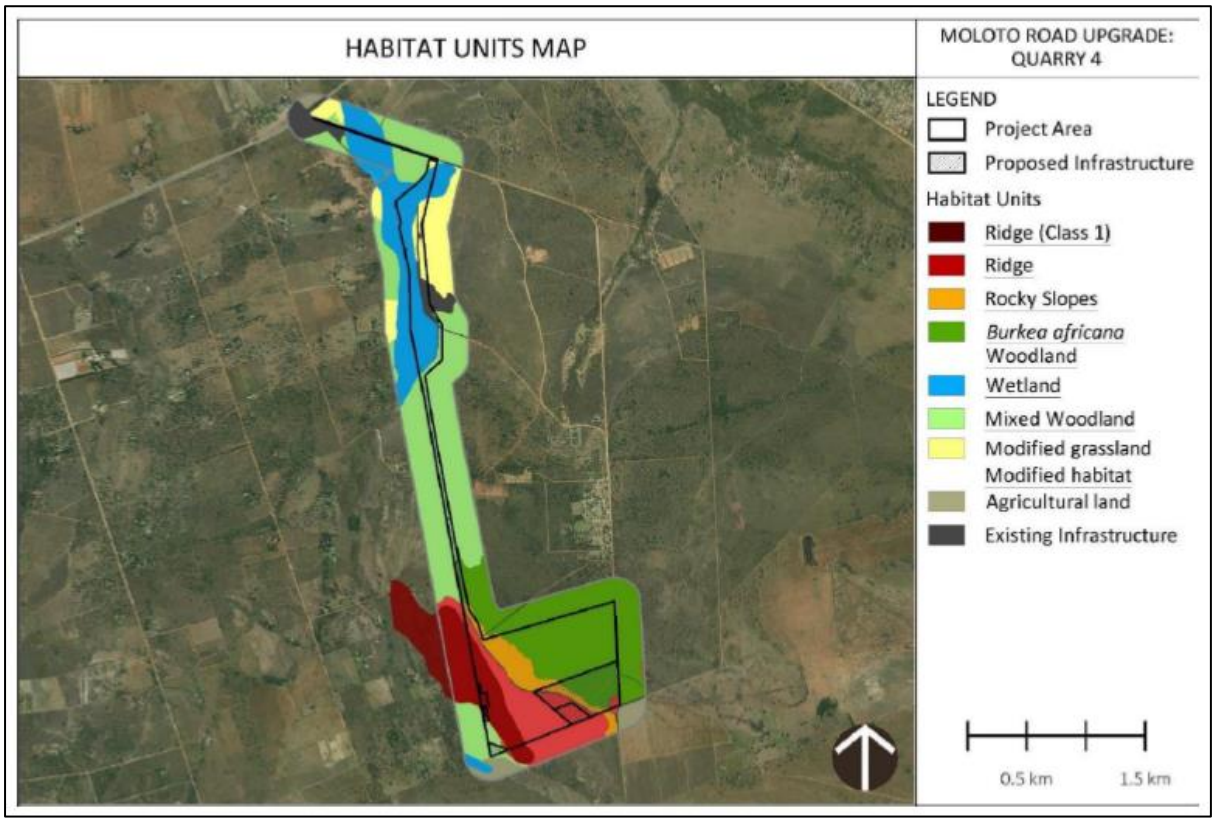

Figure 21: Habitat Units within the Study Area (Field and Form Landscape Science, 2020)

Ridge Habitat Unit

The Ridge habitat unit (**Figure 22** & **Figure 23**) occurs within the southern portions of the project area, where it is associated with a rocky outcrop of limited extent in the southeast and a larger ridge system extending across the southwest of the project area, respectively.

Figure 22: Representative photographs of the Ridge habitat unit indicating the rocky outcrop in the southeast (Field and Form Landscape Science,2021)

Figure 23: Representative photographs of the Ridge habitat unit indicating the ridge in the southwest, with the top photographs showing the ridge as identified and delineated during the field assessment and the bottom photographs showing the habitat associated with the Class 1 ridge (Field and Form Landscape Science, 2020)

A portion of the ridge in the southwest is indicated by GDARD as a Class 1 ridge (**Figure 24**). According to the most recent Ridges Guidelines (GDARD, 2019), Class 1 ridges are defined as ridges with 5% or less transformed by human activity, and only low impact activities with an ecological footprint of 5% or less in the 200m buffer zone of the ridge will be supported, and no development will be supported on the ridge itself. According to the 2001 Gauteng Development Guideline for Ridges (GDACE 2001), ridges in Gauteng were defined based on the slope of the site, whereby any topographic feature in the landscape that is characterised by slopes of 5° or more (i.e. > 8.8%, > 1 in 11 gradient), as determined by means of a GIS digital elevation model, is defined as a ridge .According to the Terrestrial Biodiversity Assessment, the areas adjacent to the Class 1 ridge as delineated form part of contiguous, untransformed ridge habitat, although at a slope of less than 5°, that extends beyond the project area

to provide important niche and refuge habitat for both floral and faunal species and plays a critical role in regional ecosystem processes. The existing access road broadly follows the north-eastern boundary of the ridge habitat.

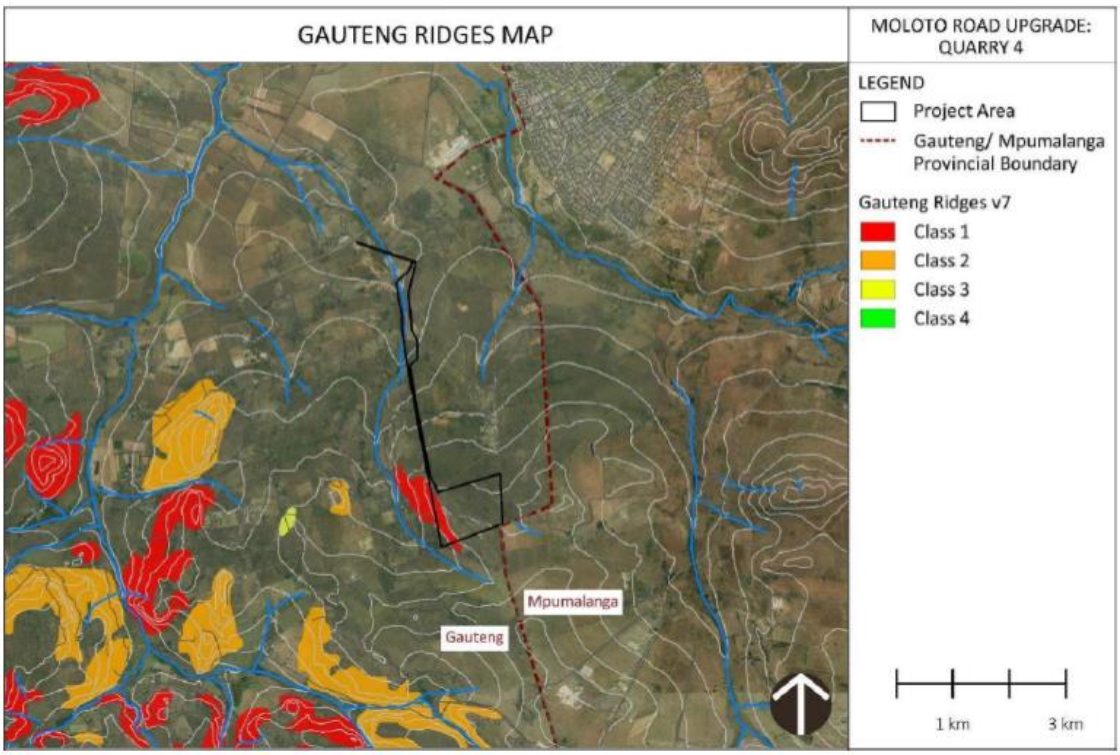

Figure 24: Location of the project area in relation to ridges as indicated by the GDARD: Gauteng Ridges v7 dataset (Field and Form Landscape Science, 2020)

Rocky Slopes Habitat

The Rocky Slopes habitat unit (**Figure 25**) forms the interface between the ridge habitat in the southwest and the surrounding *Burkea africana* Woodland. The existing access road broadly delineated the southwestern boundary of this habitat unit. This habitat unit is characterised by rocky substrate and is floristically dominated by *Xerophyta retinervis* and other species characteristics of rocky habitat such as *Searsia magalismontana*, *Pellaea calomelanos, Cheilanthes viridis* var. *viridis* and *Bulbostylis* spp. The vegetation structure and composition of this habitat unit is largely intact, and no significant disturbances were noted.

Figure 25: Representative photographs of the Rocky Slopes habitat unit (Field and Form Landscape Science, 2020)

***Bureka afrikana* Woodland**

The *Burkea africana* woodland habitat unit (**Figure 26**) covers the majority of the southern portion of the project area. The woody layer is dominated by *Burkea africana* trees, and is well-developed, with some bush encroachment by this species also noted, possibly due to an absence of an adequate fire management regime within the site. Other tree and shrub species present in low abundance include, amongst others, *Searsia pyroides*, *S. zeyheri*, *Terminalia sericea* and *Dombeya rotundifolia.*

*Figure 26: Representative photographs of the **Burkea africana** Woodland habitat unit (Field and Form Landscape Science, 2020)*

Wetland

The Wetland habitat unit (**Figure 27**) occurs mainly within the northern portion of the project area along the proposed access road, which follows an existing unpaved route. The wetland vegetation is dominated by grass species such as *Imperata cylindrica, Sporobolus africanus, Paspalum urvillei* and *Andropogon eucomus,* with the emergent palustrine wetland species *Typha capensis* and *Phragmites australis* dominant towards the centre of the wetland where the wetland has been dammed.

Figure 27: Representative photographs of the Wetland habitat unit (Field and Form Landscape Science , 2020)

Mixed Woodland

The Mixed Woodland habitat unit (**Figure 28**) is located adjacent to the proposed access road, which follows an existing unpaved route. Provided that the project development footprint remains small and limited to a reasonable width required for a road upgrade, it is unlikely that this habitat unit will be significantly impacted. The Mixed Woodland habitat unit has a relatively intact vegetation structure, with a species composition typical of the mixed bushveld of the region.

Figure 28: Representative photographs of the Mixed Woodland habitat unit (Field and Form Landscape Science , 2020)

Modified Grassland

The Modified Grassland habitat unit (**Figure 29**) is also located adjacent to the proposed access road, and provided that the project development footprint remains limited to a reasonable width required for a road upgrade, it is unlikely that this habitat unit will be significantly impacted.

Figure 29: Representative photographs of the Modified Grassland habitat unit (Field and Form Landscape Science , 2020)

Modified and Degraded Areas

The Modified and Degraded habitat unit (**Figure 30**) includes those areas where the habitat has been altered due to current and historic anthropogenic impacts. Such areas include access roads, agricultural field and existing infrastructure. These areas are characterised by pioneer grass species such as *Cynodon dactylon* or are devoid of vegetation and has an overall low conservation value.

Figure 30: Representative photographs of the Modified and Degraded areas (Field and Form Landscape Science , 2020)

The Terrestrial Ecological Sensitivity Map is provided in **Figure 31.**

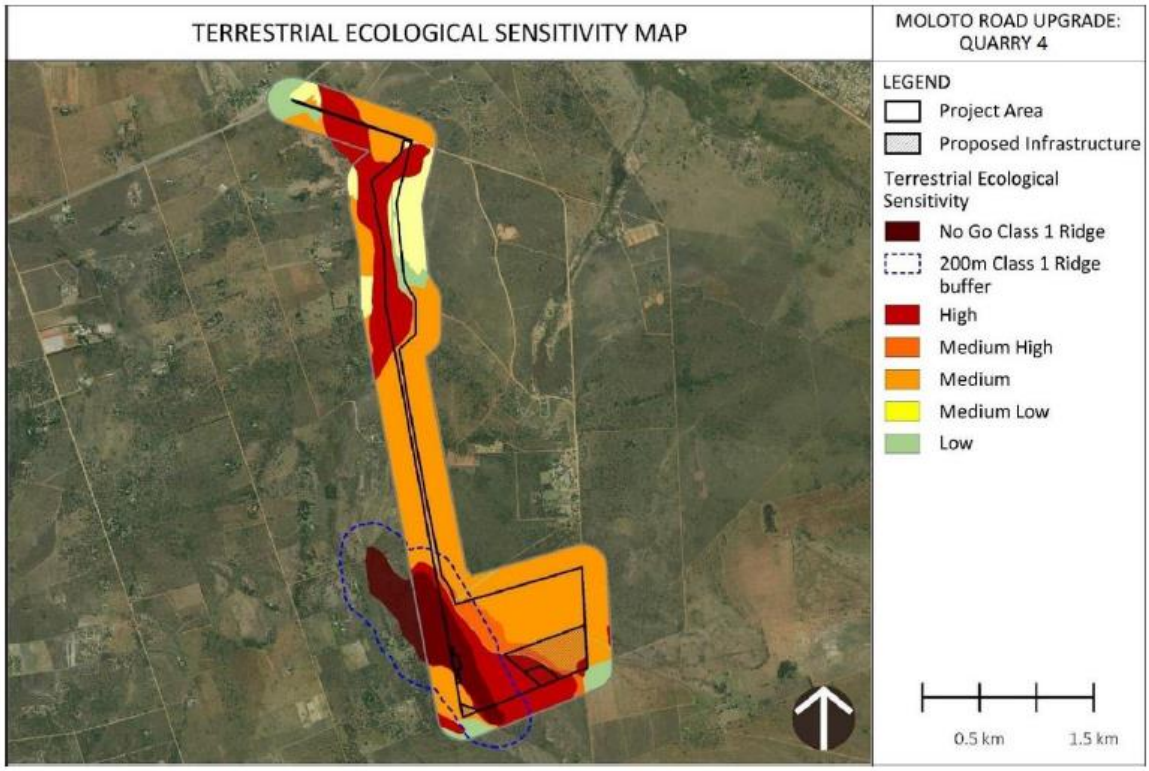

Figure 31: Terrestrial ecological sensitivity map for Quarry 4 (Field and Form Landscape Science , 2020)

Faunal Habitat and Species

Ridges and associated rocky aspects form important faunal dispersal corridors and promote important ecological processes. Ridges are associated with elevated spatial heterogeneity due to the range of slopes, soil, light and hydrological conditions. The wetland extends beyond the project area and acts as an important corridor, facilitating dispersal patterns. These habitats provide specific benefits to faunal communities within the area. There is a high degree of connectivity to surrounding micro-habitats characterised by ecological features such as unique floral assemblages and landscape features i.e., ridge and more open woodland habitats. Eleven mammals, one amphibian, five reptiles, and 60 avian species were identified within the project area based on direct observations and indirect signs. An Aardvark (*Orycteropus afer*) burrow was noted within the woodland habitat (25°31'3.14"S; 28°37'13.77"E). *O. afer* was the only SCC reported within the project area and protected under the

NEMBA TOPS Regulations and the TNCO (No. 12 of 1983), however there is an increased probability of several faunal SCC to occur.

Mining Biodiversity Guidelines.

The Mining and Biodiversity Guidelines (2012) indicates that the majority of Quarry 4, with the exception of two areas of limited extent that mainly comprise of the access road in the north and centre of the project area, is indicted to be located within an area of Highest Biodiversity Importance (**Figure 32**).

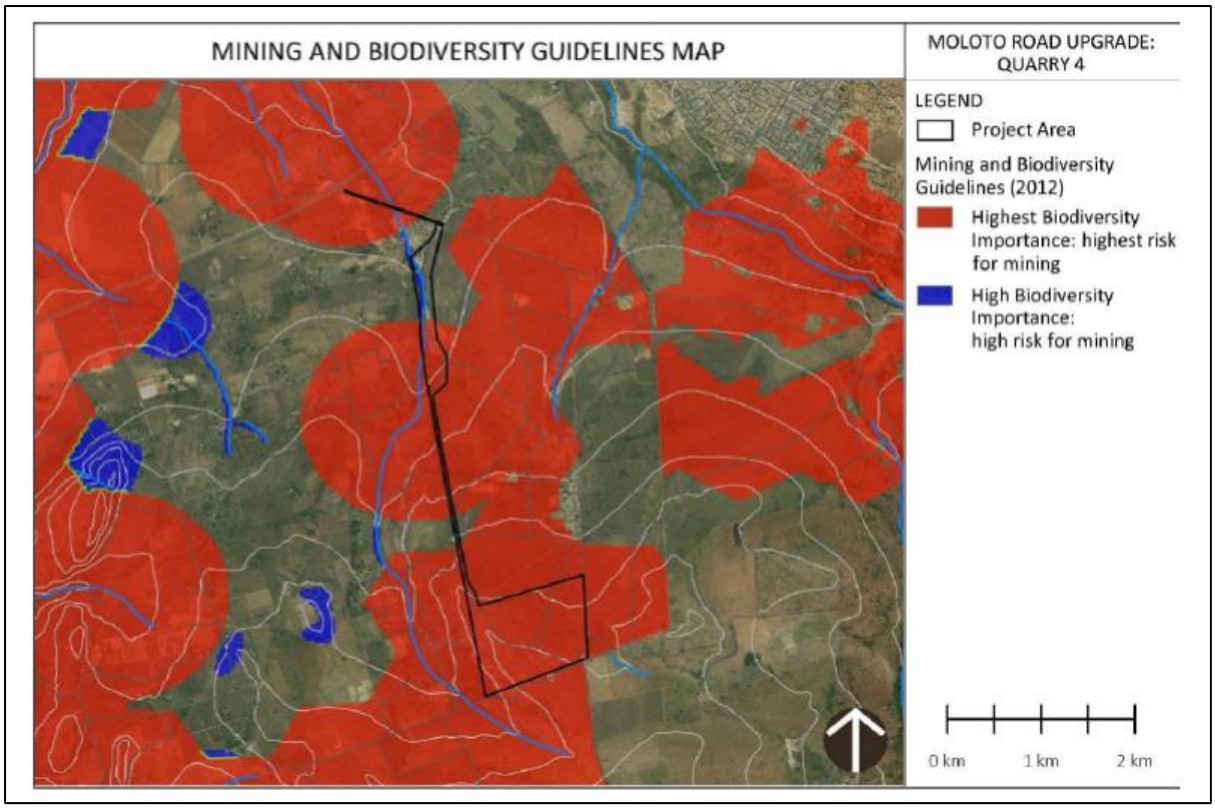

Figure 32: The location of the project area in relation to areas of increased biodiversity importance in terms of the Mining and Biodiversity Guidelines (2012) (Field and Form Landscape Science, 2020)

Hydrological

A Wetland/ delineation and Functional Assessment was undertaken by Limosella Consulting for the proposed Quarry 4 site. A copy of the report is attached to **Appendix F**. The site is situated in the Quaternary Catchments B31B. One un-channelled valley bottom wetland was recorded within the study area (**Figure 33**Error! Reference source not found.**).** The wetland flows from south through the study site to the north reaching the Elands River.

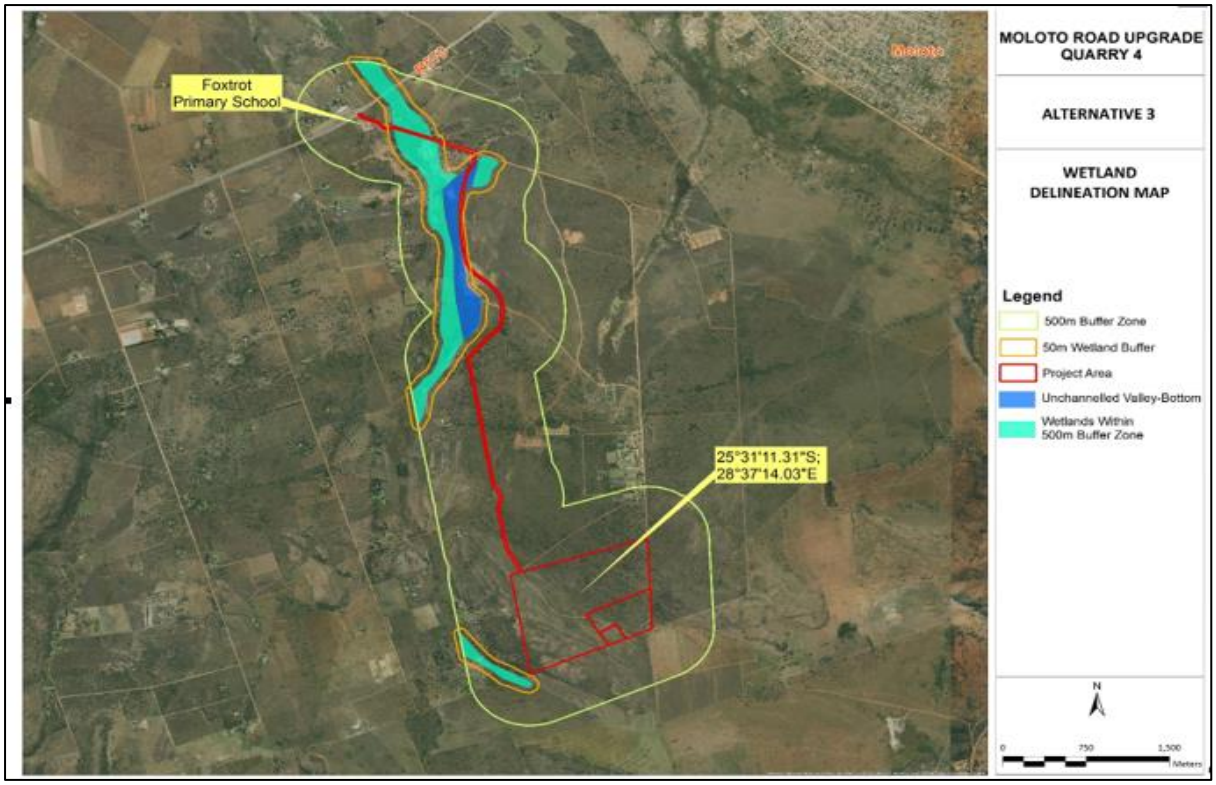

Figure 33: The location and extent of wetland areas in relation to the proposed quarry 4

As provided in Error! Reference source not found.**,** the haulage route is proposed to be re-routed out of the buffer zone reducing the risk of sedimentation and other activities that may directly impact on the wetland.

Gauteng Environmental Management Framework

The Gauteng Department of Agriculture and Rural Development have developed an Environmental Management Framework Tool to streamline the requirements for an Environmental Impact Assessment (EIA). In addition, to reduce the need for the undertaking of EIA requirements and a reduction in timeframes for approvals and as a contribution towards reducing the cost of doing business in Gauteng. In this tool, a number of the National Environmental Management Act, 1998 (Act No. 107 of 1998) (NEMA) listed activities are excluded from the requirement to obtain an Environmental Authorisation (EA). Government Notice 164 in Government Gazette No. 41473 of 2 March 2018 presents a list of activities that are excluded from the need to obtain an Environmental Authorisation as they occur within Zones 1 and 5 of the Gauteng Provincial Environmental Management Framework (GPEMF). **Table 7** indicates the various zones of the GPEMF including *Zones 1 and 5.*

Table 7: Gauteng Provincial Environmental Management Framework Zones

ZONE	INTENTION
Zone 1: Urban development zone	The intention with this zone is to streamline urban development activities in it and to promote development infill, densification and concentration of urban development, in order to establish a more effective and efficient city region that will minimise urban sprawl into rural areas.
Zone 2: High control zone (within the urban development zone)	This zone is sensitive to development activities. Only conservation should be allowed in this zone. Related tourism

ZONE	INTENTION
	and recreation activities must be accommodated in areas surrounding this zone
Zone 3: High control zone (outside the urban development zone)	This zone is sensitive to development activities and in several cases also have specific values that need to be protected. Conservation and related tourism and recreation activities should dominate development in this zone.
Zone 4: Normal control zone	**Intention** This zone is dominated by agricultural uses outside the urban development zone. Agricultural and rural development that support agriculture should be promoted
Zone 5: Industrial and large commercial focus zone Intention	The intention with Zone 5 is to streamline non-polluting industrial and large-scale commercial (warehouses etc.) activities in areas that are already used for such purposes and areas that are severely degraded but in proximity to required infrastructure.

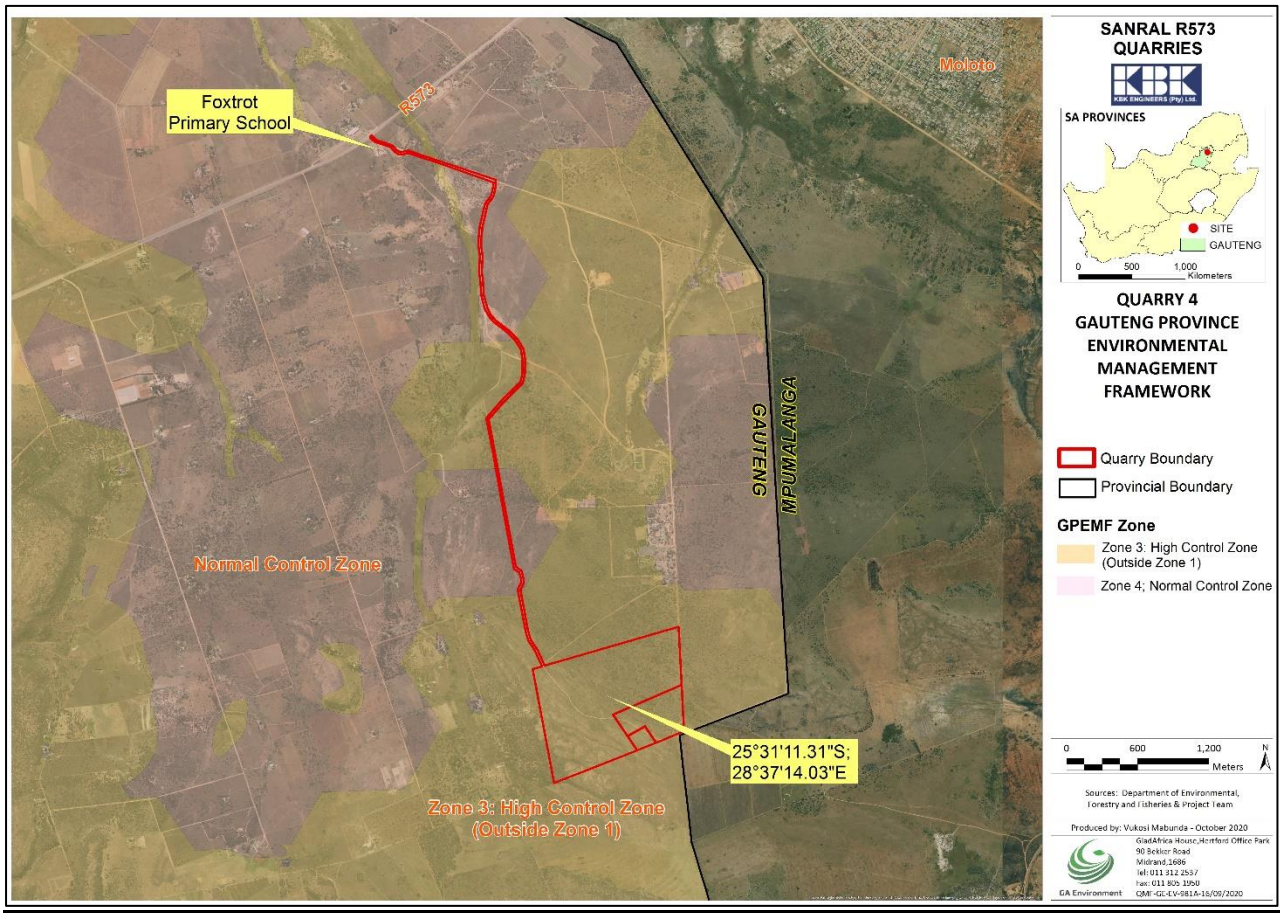

Figure 34:Quarry 4 EMF Map

According to **Figure 34**, majority of the proposed Quarry 4 site falls with Zone 3: High Control Zone, while a portion of the site towards the centre and north falls within Zone 4: Normal Control Zone, hence the proposed development is not excluded from the undertaking of an Environmental Authorisation process. The GPEMF indicates that the proposed site is situated within a Special Control Zone a) Dinokeng. According to the GPEMF, Special Control Zones "*are areas that have specific additional objectives that should be taken into account in decision making process".*

In terms of the GPEMF, the Dinokeng area has a very high potential for nature tourism activities within an area with a strong nature conservation character. Its location in respect to the urban areas of Gauteng and especially the O.R. Tambo International Airport, makes it an ideal area for wildlife tourism.

Other activities that should be promoted in this zone include:

- *Recreation (especially in the Roodeplaat Dam area);*
- *Hospitality (especially lodges);*
- *Rural development that caters for the specific needs of the area; and*
- *Maintenance of current agricultural activities.*

Activities that should be avoided as far as possible in this zone include:

- *Battery farming and feedlots;*
- *Mining and sand winning;*
- *Industrial activities; and*
- *Large commercial and retail developments.*

Although the proposed activity (Quarry) has been listed as one of the activities that should be avoided in this zone, the GPEMF does allow for the lodging of an Environmental Application process with the Competent Authority. This Basic Assessment has identified no fatal flaws, and some of the potential impacts identified can be mitigated to lower impacts with robust mitigation where impacts of medium to high significance were identified.

<u>Agricultural Potential</u>

Agricultural Potential Areas are based on four main pillars which are Agricultural Hubs, Important Agricultural Sites, Existing Agriculture and Remaining high Potential Agricultural Land. According to the Gauteng Agricultural Potential Atlas IV (GAPA IV) and as presented in **Figure 35**, the proposed site falls within areas of high agricultural potential land.

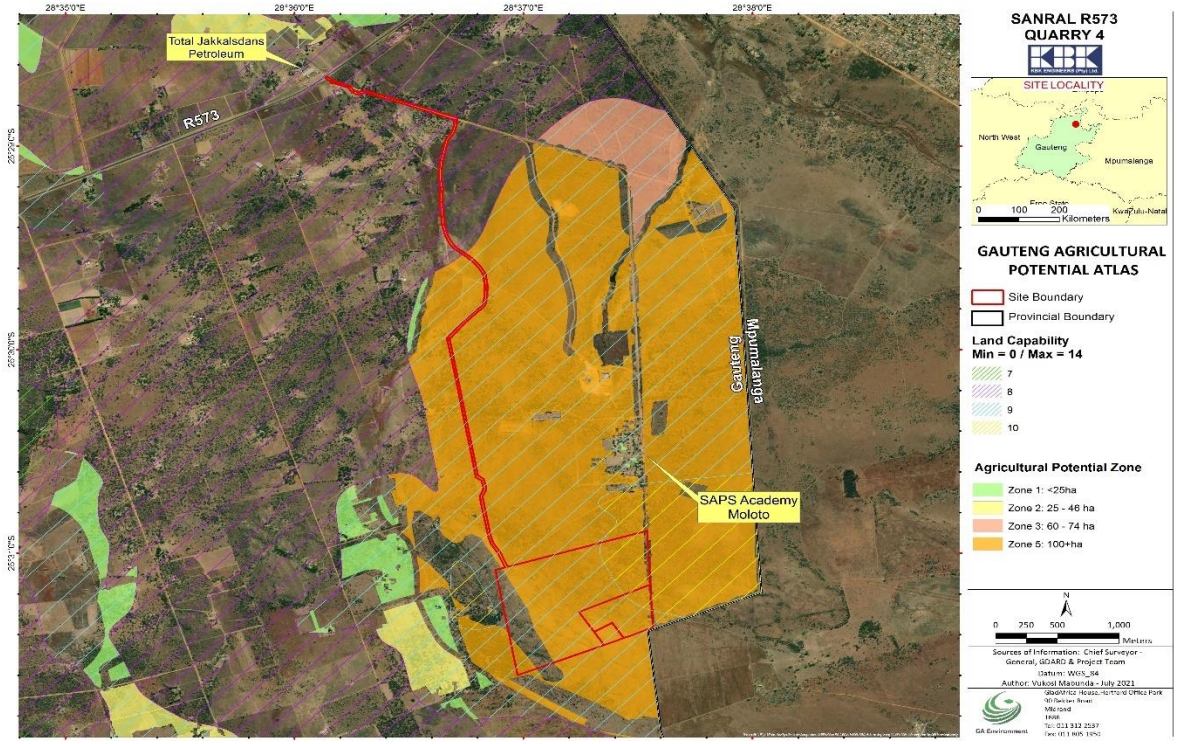

Figure 35: Quarry 4 Agricultural Potential Map

Based on the desktop and site assessment undertaken by the EAP it has been noted that the northern section of the site was historically used for agricultural purposes. The site is characterised by a CBA,

ridge habitat and a rocky slope habitat with free roaming wildlife. Currently the SAPS utilises the same farm portion as a training academy, whereby a portion of the property has been impacted on.

Heritage and Palaeontological Features

A Heritage Impact Assessment was undertaken by Dr Johnny van Schalkwyk. The study revealed that no sites, features, or objects of cultural significance were identified.

A desktop Palaeontological Assessment was undertaken by Dr Heidi Fourie. The study concluded that the potential impact of the mining on fossil heritage is **MODERATE** for the Rayton Formation and **VERY LOW** for the Rashoop Granophyre Suite and therefore a field survey is not necessary for this development (according to SAHRA protocol).

Socio-Economic

The proposed study area is situated within the City of Tshwane Metropolitan Municipality. The Metropolitan covers an area of 6360km^2 with a population of 3 275 152. The study area is situated within ward 99 of the Municipality. Ward 99 covers an area of 1095.9 square kilometres.

According to the 2011 census, the population of Ward 99 was 27227. Of these 1% were coloured, 77% black and 21% white, 0% Indian/Asian as depicted in **Figure 36**. Of the total population 69% were between the ages of 18 and 64 with 55% of the population consisting of males (Census, 2011).

Figure 36: Ward 99 Demographics (https://wazimap.co.za/profiles/ward-99)

a) Employment

In 2011, 50.5% of the community members within Ward 99 were employed with 51% of these employed in the formal sector. The average annual income is R 30 000 which is approximately half of the average annual income of Gauteng which is R 57 500 as presented in **Figure 37** below.

Figure 37: Ward 99 Employment and Income Statistics (https://wazimap.co.za/profiles/ward-99)

b) Service Delivery

Approximately seventy-point seven percent (70.7%) of households obtain water from a regional or local service provider, 22% from a borehole, and the remainder from other sources (**Figure 38**).

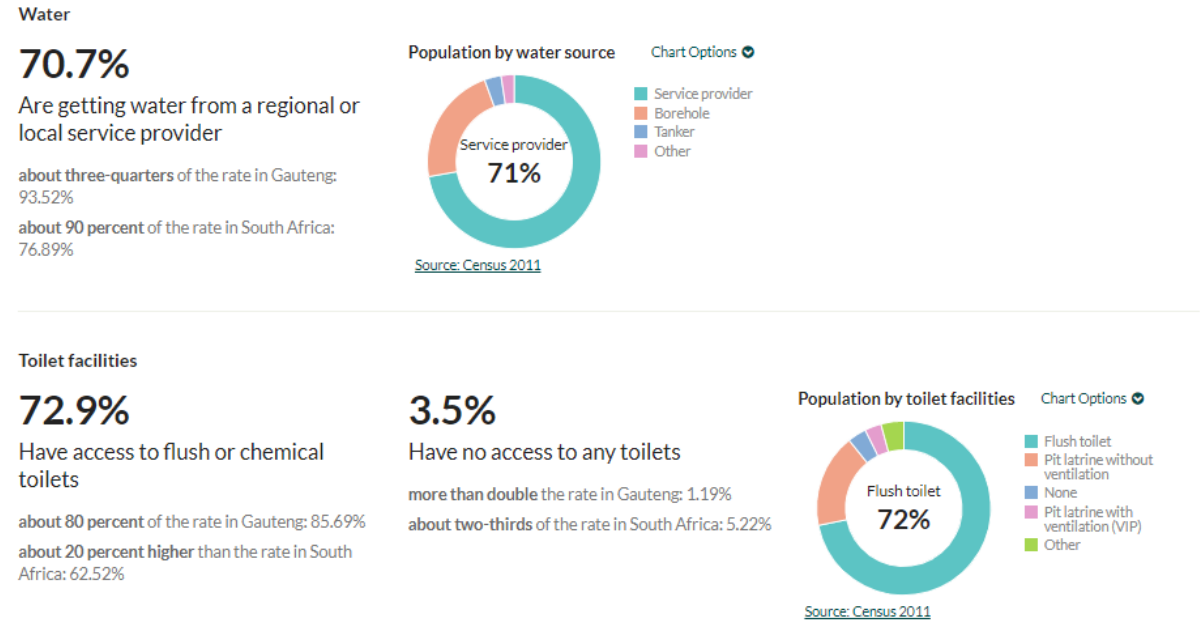

Figure 38: Ward 99 Housing and Service Delivery (https://wazimap.co.za/profiles/ward-99)

Approximately 72.9% have access to flush or chemical toilets whilst 3.5% of the population have no access to toilets.

(b) Description of the current land uses.

The study area, which is 19.4 hectares (ha) in extent which compromises of open vacant land presumably used for grazing of wildlife. The project area is located in a region characterised by mostly undeveloped land and small holdings, interspersed with gravel roads and occasional agricultural fields, within a rural setting. The R573 roadway borders the project entry and exit point in the north.

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

Refer to the sensitivity map (**Figure 39**) which shows sensitive environmental features within the study area.

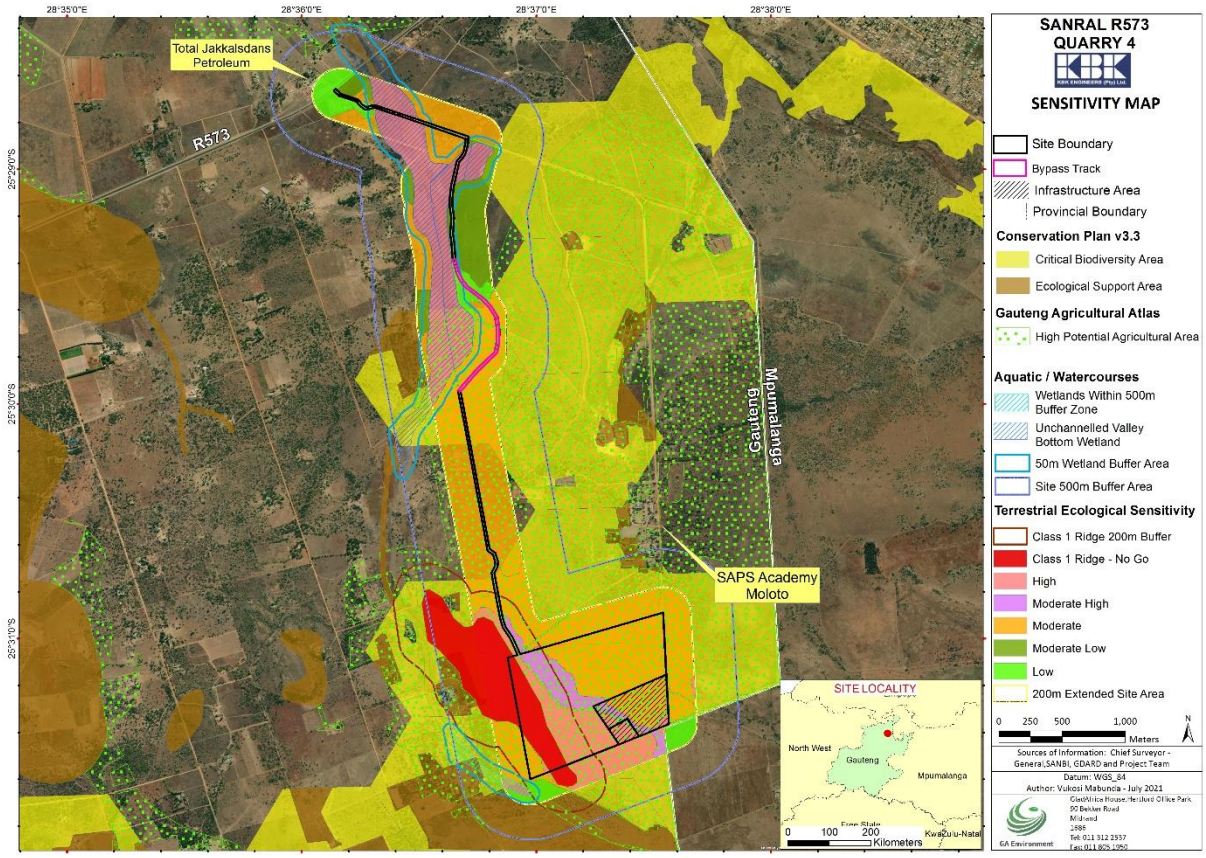

Figure 39: Environmental Sensitivity Map of the Site

The environmental features have already been discussed under **Section h (iv 1a).**

The study area consists of open, vacant land with grazing game/wildlife. In terms of Infrastructure, no services or utilities occur in close proximity to the proposed quarry area or adjacent areas where a possible production camp will likely be erected. However, the site forms part of a larger police training facility which does include infrastructure, and boreholes. Scatted dirt roads are present within the study area.

(d) Environmental and current land use map.

(Show all environmental, and current land use features)

Figure 40 provides a land cover map for the proposed Quarry 4 Study area.

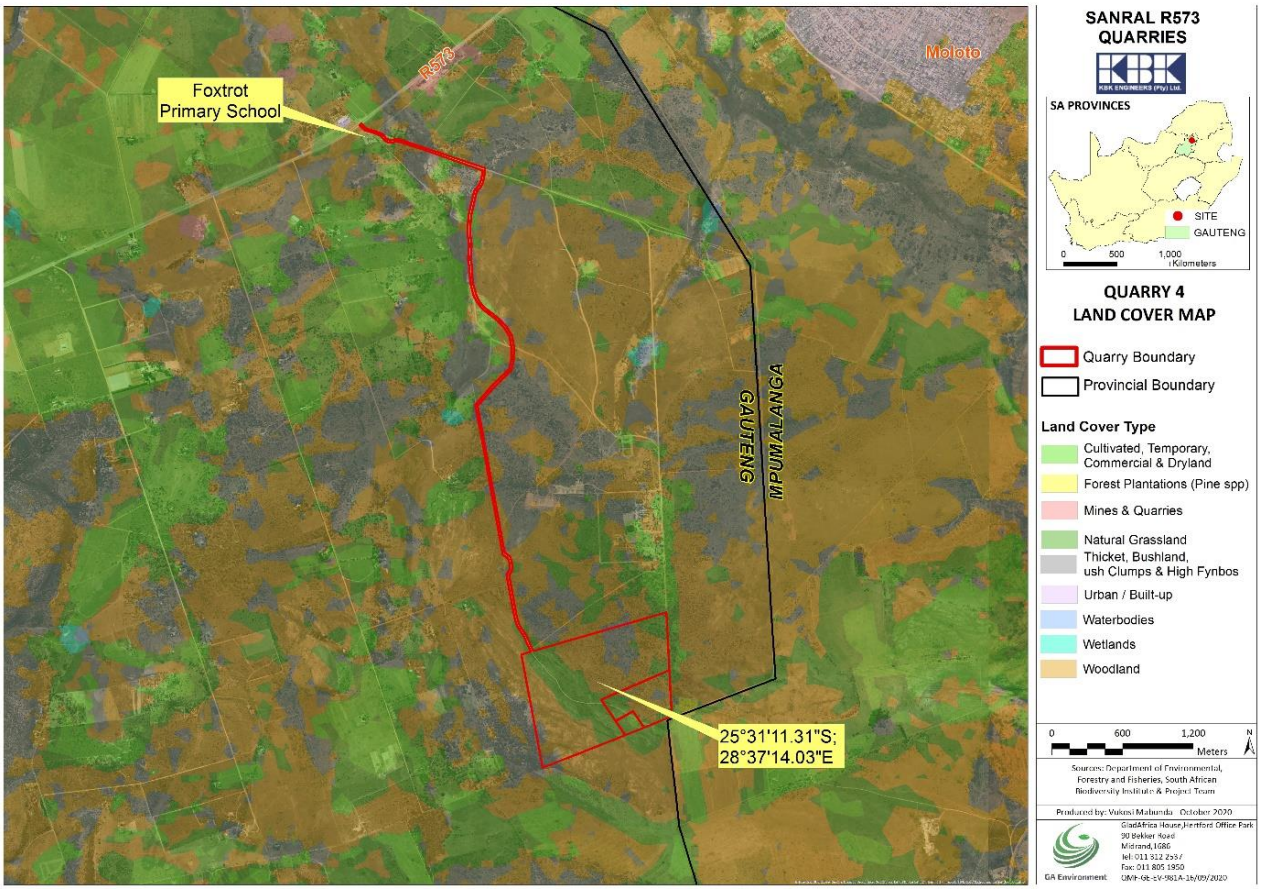

Figure 40: Land Cover Map

The map shows that the proposed study area and surroundings does not fall within an urban/built up area. The dominant land cover types within the Quarry 4 project area are woodland, natural grassland and waterbodies, due to the wetland identified on site.

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

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

1. Impact 1: Change in Topography

Description of the Impact

There will be minimal impact on topography during the construction phase. During the operational phase, there will be a localised change in topography due to the excavation of rock material. It is anticipated that the proposed mining activities and production area will cover an area of approximately 19.4 hectares. The approximate depth of the Quarry will be between 2m and 8m. **Table 8** presents the impact ratings for change in topography.

Table 8: Impact rating for change in topography

Project phase	Nature of impact	Extent	Duration	Intensity	Consequence (E+ D+I)	Probability	Reversibility	Loss of resources	Significance (C X P)	Significance
									Without Mitigation	With Mitigation
Construction	Negative	1 Site	1 Short term	1 Low	3 Negligible	2 Probable	Y	Low	4-6 Low	4-6 Low
Operational	Negative	1 Site	2 Medium	2 Medium	4-5 Low	4 Definite	Y	Low	8-10 Medium	4-6 Low

Cumulative Impact

The proposed mining activities will alter the topography of the study area and contribute to the cumulative impact as mining activities are present locally. The establishment of additional projects in the area could impact on current topography.

Mitigation measures

- The footprint of the proposed mining activities shall be demarcated in order to restrict the excavation footprint.
- Local depressions within the Quarry pit area shall be backfilled with available material as part of the wider shaping operations.
- Once localised backfilling is complete, the side slopes shall be shaped, and the area shall be fenced off.

2. Impact 2: Removal of Geological Material

Description of the Impact

During the operational phase of the Quarry, geological material will be removed for use as road construction material. This will alter the current underlying geology. **Table 9** provides the impact ratings for the geological impact.

Table 9:Impact rating for the removal of Geological material

Project phase	Nature of impact	Extent	Duration	Intensity	Consequence (E+ D+I)	Probability	Reversibility	Loss of resources	Significance (C X P)	Significance
									Without Mitigation	With Mitigation
Construction	Negative	1 Site	1 Short term	2 Medium	4-5 Low	2 Probable	Y	Low	4-6 Low	4-6 Low
Operational	Negative	1 Site	3 Long term	3 High	6-8 Moderate	4 Definite	Y	Low	12-16 High	8-10 Medium

Cumulative Impact

The proposed mining activities will alter the geology of the study area and contribute to the cumulative impact as mining activities are present locally.

Mitigation Measures

- The footprint of the proposed mining activities shall be demarcated in order to restrict the excavation footprint.
- Local depressions within the Quarry pit area shall be backfilled with available material as part of the wider shaping operations.
- Once localised backfilling is complete, the side slopes shall be shaped, and the area shall be fenced off.

3. Impact 3: Loss of floral and faunal habitat

Description of Impact

Loss of floral and faunal habitat will take place during the pre-construction/ pre-mining and construction phases of the project, and continue during the operational phase, mainly as result of direct clearing of vegetation within the *Burkea africana* Woodland, Ridge and Rocky Slopes habitat units prior to excavation of source material. An access road is also proposed, which will mostly follow an existing dirt access road. Indirect loss of floral and faunal habitat is likely to occur as a result of edge effects such as alien vegetation introduction, proliferation and encroachment which may outcompete indigenous species in adjacent areas, potential erosion and a decline in faunal refugia and food resources. Effective rehabilitation of the project area, particularly with regards to the ridge and rocky slopes will be unlikely given their unique characters. Gauteng ridges represent important wildlife habitat (providing food resources and refugia) and act as biological corridors, providing for movement between habitat patches. Furthermore, rehabilitation of disturbed areas of the *Burkea africana* Woodland will also be very difficult due to it being extremely difficult to cultivate the slow-growing *Burkea africana*, the most prominent tree species within the southern portion of the project area, as a result of symbiotic relationships only available in its natural environment.

Potential activities that could contribute to the loss of floral and faunal habitat are as follows:

Construction Phase

- Initial clearing of vegetation during site establishment and preparing surface areas for excavation activities and stockpiling.
- Development of infrastructure and temporary infrastructure such as access roads, contractors' laydown areas and ancillary infrastructure such as generator and fuel storage areas, temporary toilets, stockpile, spoil and crushing areas within areas of increased ecological sensitivity, such as the Ridge habitat unit.
- Vehicular access across the high sensitivity ridge habitat.
- Erosion due to loss of vegetation cover.
- Disturbance of soils leading to increased erosion, particularly on slopes and sandy, erosion-prone soils.
- Compaction of exposed soils due to vehicle movement.
- Littering and dumping of waste material outside of designated areas.

Operational Phase

- Ongoing excavation of source material from the quarry areas and increasing development footprint areas leading to ongoing loss of vegetation and niche habitat.
- Access and hauling of material across the high ecological sensitivity ridge to access stockpiles, crushing and spoil area
- Disturbance within the project area due to increased human activity and operational vehicles.
- Movement of construction vehicles leading to soil compaction and excessive dust generation due to quarrying and excavation activities.
- Ongoing proliferation of alien and invasive floral species that may outcompete indigenous floral species and degrade faunal habitat, and failure to implement an invasive species management programme.

- Altered community composition of areas within the project footprint as well as adjacent habitats due to altered ecosystem processes.
- Altered runoff patterns leading to erosion and sedimentation.
- Ineffective rehabilitation of exposed and impacted areas and failure to implement progressive backfilling, rehabilitation and revegetation in line an approved rehabilitation plan.

Table 10 provides the risk rating for loss of floral and faunal habitat.

Table 10: Impact Ratings for the loss of floral and faunal habitat

Project phase	Nature of impact	Extent	Duration	Intensity	Consequence (E+ D+I)	Probability	Reversibility	Loss of resources	Significance (C X P)	Significance
									Without Mitigation	With Mitigation
Construction	Negative	1 Site	3 Long term	3 High	6-8 Moderate	4 Definite	Y	High	12-16 High	8-10 Medium
Operational	Negative	1 Site	3 Long term	3 High	6-8 Moderate	4 Definite	Y	High	12-16 High	12-16 High

Cumulative Impact

The project area is located within an area where some degree of land transformation is noticeable of available aerial imagery. Furthermore, the effects of poor land management and resulting direct loss of resources is likely to diminish local biodiversity, and available habitat, associated with the region over time. The proposed quarry project, when considered together with surrounding activities may contribute to the overall loss of unique floral and faunal communities associated with the region, contribute and lead to further loss of a CBA: Important area, create a precedent for future mining of the ridge and lead to the cumulative loss of the remaining extent of the Central Sandy Bushveld vegetation type. The fragmentation of habitats into small, isolated patches will likely result in a decline in biodiversity over time.

Mitigation Measures

- No areas should be cleared of natural vegetation if not required for construction and operational purposes, and the loss of indigenous vegetation should be limited where possible.
- No excavation or other development activities may take place beyond the approved project development footprint areas and development footprint areas should be kept as small and compact as possible.
- No natural areas on adjacent properties may be disturbed in any way.
- The location and extent of areas of increased ecological importance and sensitivity should be considered during the pre-construction and planning phases of the project and positioning of project infrastructure should avoid areas of increased ecological sensitivity, such as the rocky outcrop and ridge habitat, and the wetland habitat in the north, as far as possible. Where areas of increased ecological sensitivity can be avoided, these areas should be indicated on site and be off limits to construction vehicles and personnel.
- No new infrastructure may be located within the Class 1 ridge or within its designated 200m buffer areas and this area should be a strict No-Go zone for construction and operational activities, including mining vehicles and personnel, with the exception of use of the existing access road. The location of the wetland and any applicable wetland buffers as per the wetland assessment should also be considered.

- The existing access road bordering the ridge habitat will be utilised, which may lead to disturbance to the terrestrial ecology of the adjacent ridge. It is important that the following mitigation measures be implemented in considering this portion of the access road:
    - Road widening along this portion of the access road should be avoided.
    - Spills should be prevented by ensuring all vehicles utilising the road are well-maintained at all times.
    - A speed limit of 30km/h must be maintained.
    - Regular watering down should take place during dry/ windy conditions to manage dust.
    - Vehicles are to remain strictly on the existing access road and no turning of vehicles may take place along this portion of the road.
    - Edge effects along this portion of the access road must be effectively managed in terms of invasive species control and erosion.
- It is recommended that a fence or other barrier be erected and in place for the duration of the project as indicated in **Figure 41** to prevent access from the production area into the adjacent ridge and prevent encroachment of excavation into this area. The fence/ barrier should be permeable to allow for the movement of small, naturally occurring species while mining activities progress. Should Layout Alternative B be implemented, this fence should follow the corresponding western boundary of the production area.
- Ecological connectivity between areas of increased ecological sensitivity should be considered and maintained. Gauteng ridges represent critical wildlife habitat (providing food resources and refugia) and act as biological corridors, providing for movement between habitat patches.
- No new access roads through natural areas beyond the approved development footprint area may be constructed and vehicle access beyond the designated project footprint areas should be prohibited.
- Construction camps, contractors' laydown areas and other temporary infrastructure are to be placed within areas that have already been modified or areas of lower ecological sensitivity where possible.
- No littering or dumping of waste and construction material within natural areas beyond the project footprint areas may be allowed.
- Edge effects from construction and operational activities, such as erosion and alien floral species proliferation and the spread of these within disturbed areas, should be managed throughout all the development phases through the implementation of erosion control measures where required and the implementation of an alien and invasive species control plan. Specific attention must be paid in this regard to the ecological boundary between the production area and the ridge habitat.
- Dust suppression measures must be implemented.
- A rehabilitation plan for the extent of the project area and all areas impacted by the quarrying activities and associated infrastructure must be developed and approved by the relevant authorities for implementation prior to closure.
    - Prior to commencement of site clearance, all available topsoil and upper soil layers containing the seed bank and must be removed and stockpiled separately for use in rehabilitation in such a way to prevent degradation (Van den Berg et al., 2011).
    - As far as possible, site restoration/ rehabilitation should take place concurrently/ progressively and as areas become available for rehabilitation.
    - When backfilling open voids, the surrounding topography needs to be considered. Although the specialist recommended that no surface depressions should remain post-closure it is the EAP's recommendation that where no surface depressions cannot be avoided, shaping of the side slopes to reduce the gradient, and fencing shall be undertaken.
    - It was the specialist recommendation that the rehabilitated surface should be sloped and shaped in such a way to be free draining, to prevent erosion and to a degree which will support vegetation establishment. It is the EAP recommendation that the side slopes are re-vegetated by commercial grass seeds to allow for eventual return to natural vegetation.
    - Topsoil or suitable growing medium should be applied to the surface prior to revegetation to support vegetation growth, and the necessary soil amelioration should be undertaken. Soil analysis may be required to determine the necessary requirements.
    - Revegetation should, as a minimum, comprise direct seeding of an indigenous grass seed mixture comprising grass species recorded in the study area or species representative of the Central Sandy Bushveld vegetation type. The grass species mixture must comprise both pioneer and climax species, be applied at a density of at least 24kg/ ha and include at least eight grass species.

- It is strongly recommended that woody tree and shrub species also be planted within the rehabilitation area once topographical reinstatement has taken place and a growing medium has been applied. These species could be cultivated on site from seed collected from site within a shade house or temporary site nursery (if time frames will allow for this) or bought from local indigenous tree cultivators
- The post-rehabilitation landscape should be capable of supporting a self-sustaining ecosystem.

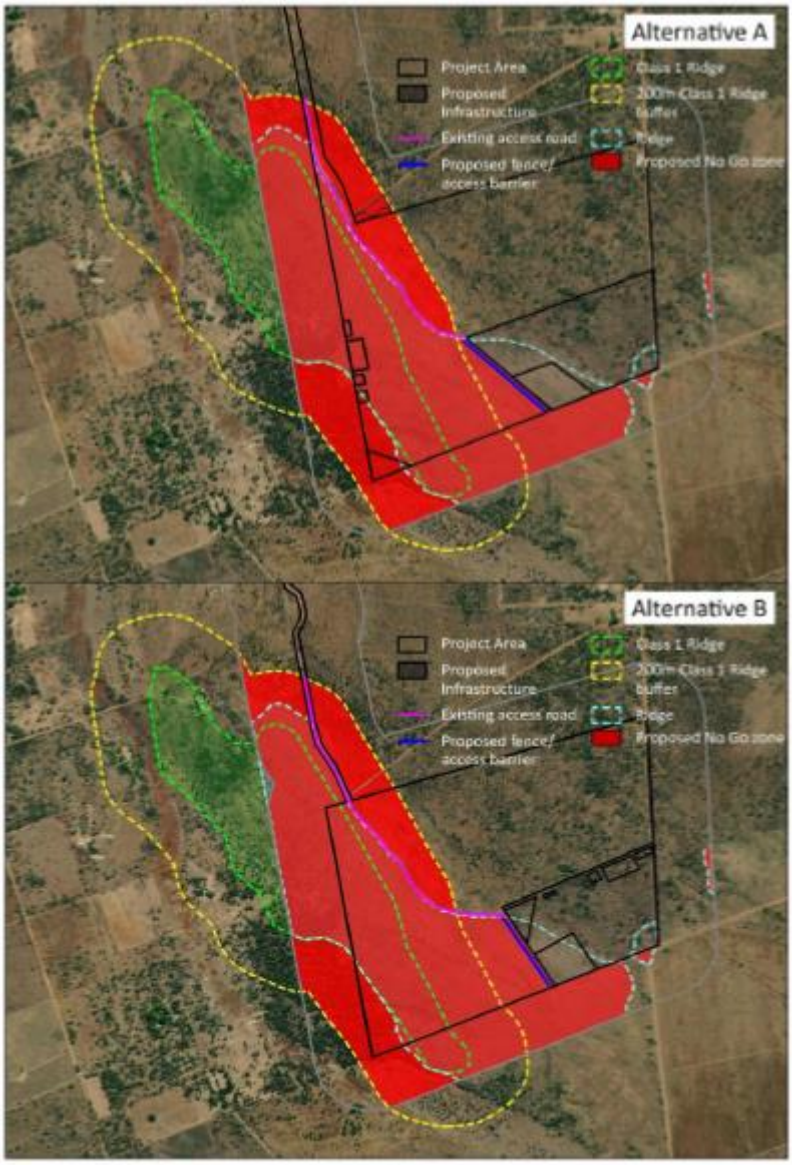

Figure 41: Proposed location of fence/ barrier (blue line) and extent of designated No-Go zone (red) for Layout Alternatives A (top) and B (bottom)

4. Impact 4: Loss of floral Species diversity and floral SCC

Description of Impacts

Loss of floral species diversity may take place during the construction and operational phases of the project as a result of clearing of vegetation for site establishment. During the construction & Operational phase of the project, the loss of floral species diversity and faunal SCC can result from the following activities:

Construction Phase

- Initial clearing of vegetation during site establishment and preparing surface areas for excavation activities and stockpiling.
- Clearing of vegetation within the ridge habitat unit and movement of vehicles through the ridge habitat to access ancillary infrastructure along the western site boundary.
- Movement of construction vehicles through areas with an increased floral diversity and areas beyond the development footprint.
- Accidental fires due to increased human activity.
- Failure to implement alien and invasive floral species control throughout all development phases.
- Clearing of vegetation for construction and excavation purposes within areas of increased ecological sensitivity such as ridges, that are known to provide habitat for floral SCC, and particularly threatened floral species with limited distribution ranges such as *Frithia humilis* (EN) which has a high probability of occurrence within the Class 1 ridge and surrounding rocky habitat.
- Construction of infrastructure and temporary infrastructure such as access roads and contractors' laydown areas through or within areas of high ecological sensitivity, known to provide habitat for floral SCC.
- Illegal harvesting of floral SCC and floral species with a limited representation within the project area and surrounds.
- Loss of floral species providing ecosystem goods and services (such as medicinal species) due to disturbance within and beyond the project footprint area.

Operational Phase

- Ongoing excavation of source material from the proposed quarry and increasing development footprint areas leading to ongoing loss of habitat and a decrease in floral species diversity.
- Ongoing disturbance within the project area and surrounds due to increased human activity and movement of operational vehicles.
- Disturbance beyond the project footprint areas, leading to loss of habitat with increased floral diversity and species with limited representation in the region.
- Illegal harvesting of floral species with a limited representation within the project area or region. Accidental fires due to increased human activity.
- Dust generation from unpaved roads impacting on floral species diversity.
- Ongoing proliferation of alien and invasive floral species may outcompete certain floral species.
- Illegal harvesting of floral SCC and floral species with a limited representation within the project area.
- Movement of operational vehicles through areas of increased ecological sensitivity known to provide habitat for floral SCC beyond the project footprint area.

The impact ratings for the loss of floral species diversity and floral SCC are provided in **Table 11.**

Table 11: Impact ratings for the loss of floral species diversity and floral SCC

Project phase	Nature of impact	Extent	Duration	Intensity	Consequence (E+ D+I)	Probability	Reversibility	Loss of resources	Significance (C X P) Without Mitigation	Significance With Mitigation
Construction	Negative	2 Local	4 Permanent	3 High	9-10 High	3 Highly probable	Y	High	12-16 High	8-10 Medium
Operational	Negative	2 Local	4 Permanent	3 High	9-10 High	3 Highly probable	Y	High	12-16 High	8-10 Medium

Cumulative Impacts

Development within the project area will lead to the loss of ecological resources and is likely to diminish local and regional biodiversity and available habitat, associated with the region over time.

Mitigation Measures

- Mitigation measures prescribed under impact 4 should be strictly implemented. Key mitigation measures include limiting the development and site clearance footprint as much as possible, implementing an alien species management plan throughout the duration of the project, limiting impacts on the ridge habitat by implementing Layout Alternative B, cordoning or fencing off of ridge habitat bordering the production area and implementing rehabilitation to such a degree that indigenous floral species may re-establish within the rehabilitated areas. Mitigation measures as proposed should be implemented to reduce the impact of utilising the existing road traversing the ridge habitat for access to the production area.
- The establishment of a temporary site nursery for the purposes of cultivating tree and shrub species for use in revegetation should be considered, if time frames allow for this.
- All construction and operational personnel must be educated in environmental awareness and be trained to identify floral SCC known to occur in the project area, as well as floral SCC with a high probability of occurring in the project area.
- The loss of floral SCC must be actively avoided and floral SCC and habitat for these species should ideally be conserved *in situ.*
- It is recommended that the appointed independent Environmental Control Officer (ECO) undertake a walkthrough of the development footprint areas prior to site clearance and commencement of construction. Emphasis should be placed on ridge and rocky slope habitat falling within this area, to confirm that no SCC, not recorded during the current assessment but with an increased likelihood of occurrence are located within the development footprint. Should any such species be recorded, GDARD must be contacted to determine a way forward. Depending on the species' ecological status, GDARD may approve rescue and relocation of such species under the supervision of a suitably qualified specialist and approval of a rescue and relocation procedure.
- According to the specialist communication with GDARD, the relocation of floral species listed as protected in terms of the TNCO (No. 12 of 1983) but not of national or provincial conservation concern in Gauteng, is not required. Should any protected tree species in terms of the National Forests Act (Act No. 84 of 1998) be encountered within the project development footprint area during any of the proposed project's development phases, a permit for the removal or destruction of these species has to be obtained from the Department of Forestry and Fisheries and Environment (DFFE)
- Should nationally threatened species or species listed as a NEMBA TOPS species be encountered, a permit for removal/ relocation of such species also has to be obtained from DFFE.
- No harvesting of firewood or collection of floral species from natural areas surrounding the project footprint should be allowed by construction workers.

5. Impact 5: Loss of faunal species diversity, SCC and disturbance to Faunal Communities

Description of Impacts

Loss of faunal species will likely take place during the construction and operational phases of the project. Disturbance to faunal communities will occur during both the construction and operational phases of the project. The expected area of influence pertaining to the noise disturbance will extend outside of the project area. Elevated levels of disturbance will likely result in local faunal species moving away from the area and a subsequent localised decline in biodiversity (as certain species are more sensitive to disturbances). The loss of faunal habitat is also considered a direct disturbance as the loss and degradation of habitat will likely influence current faunal assemblages and dynamics as these areas will become suboptimal and unsuitable. Fauna occurring in adjacent habitats, outside of the direct development impact zone, may also be negatively affected by impacts leading to the alteration or impediment of movement corridors. It must be noted that some degree of disturbance, including noise disturbances, already occurs within the project area with the Moloto Training Facility located in proximity to the site.

The following project activities may lead to disturbance and loss of faunal communities:

Construction Phase

- Initial clearing/harvesting of vegetation during site establishment and preparing surface areas for excavation activities and stockpiling, particularly within intact faunal habitats.

- Construction of infrastructure and temporary infrastructure such as access roads and contractors' laydown areas through or within areas of increased ecological sensitivity.
- Movement of construction vehicles through sensitive faunal habitats.
- Placement of infrastructure within the Class 1 ridge and surrounding rocky habitat which will lead to disturbance of faunal habitat and impede migratory connectivity.
- Accidental fires due to increased human activity.
- Excavations and construction activities resulting in the inadvertent burial or mortalities of *fossorial/ rupicolous species.*
- Increased human presence resulting in negative faunal interactions with humans (poaching, trapping and potential collection of SCC).

Operational Phase

- Ongoing excavation of source material from the quarry site and increasing development footprint areas leading to ongoing loss of habitat and faunal species diversity.
- Ongoing disturbance within the project area and surrounds due to increased human activity and movement of operational vehicles.
- Ongoing clearance of vegetation and ongoing disturbance within the project area and surrounds due to increased human activity and movement of operational vehicles, powered machinery, noise-pollution from quarrying activities, vibrations, excessive dust, and artificial lighting associated with operational activities.
- Uncontrolled fires.
- Potential collection/ poaching of fauna.
- Disturbance beyond the project footprint areas, leading to loss of habitat quality.
- Use of heavy machinery and construction activities such as blasting resulting in faunal species moving away from the mining area.
- Movement of operational vehicles through areas of increased ecological sensitivity known to provide habitat for faunal SCC.
- Likely alteration of faunal communities to those with a higher tolerance of anthropogenically modified landscapes. This will likely result in the decline in the likelihood of SCC being present.

Table 12 provides the impact ratings for loss of faunal species diversity, SCC and disturbance to faunal Communities

Table 12: Impact Ratings for the loss of faunal species diversity, SCC and disturbance to faunal Communities

Project phase	Nature of impact	Extent	Duration	Intensity	Consequence (E+ D+I)	Probability	Reversibility	Loss of resources	Significance (C X P)	Significance
									Without Mitigation	With Mitigation
Construction	Negative	2 Local	4 Permanent	3 High	9-10 High	3 Highly probable	Y	High	12-16 High	8-10 Medium
Operational	Negative	2 Local	4 Permanent	3 High	9-10 High	3 Highly probable	Y	High	12-16 High	8-10 Medium

Cumulative Impacts

Development within the project area will lead to the loss of ecological resources and is likely to diminish local and regional biodiversity and available habitat, associated with the region over time.

Mitigation Measures

- Site clearance of the approved footprint must utilise a phased approach to allow faunal species to disperse from the area. With regards to Quarry 4, site clearance should proceed from the centre of

the site moving outwards, to allow fauna to move into adjacent habitats that will not be affected by the proposed project.
- All vehicles (construction or light motor vehicles) accessing the project must adhere to a 30km/hr speed limit and vigilant driving techniques.
- No wild animals may be handled or be interfered with by construction workers or any personnel.
- Hunting/ killing/ collection of fauna is prohibited.
- Any snares or traps found on or adjacent to the project area must be removed and disposed of.
- Should any faunal SCC be noted within the project area, quarrying activities must stop, and the relevant authorities must be notified. Input into the possible relocation of such species or implementation of buffers must be provided by a suitably qualified ecologist.
- Biodiversity education and awareness programmes must be implemented. This programme should form part of the staff induction in which topics such as vigilant driving techniques and the necessary procedures for working in close proximity to sensitive habitats.
- Disturbance to sensitive habitats including identified buffers and the designated No-Go zone, must be avoided and the project footprint area must be clearly demarcated. Avoiding sensitive habitats will reduce the likelihood of impacts faunal SCC.
- No wild animals may be handled or be interfered with by construction workers or any personnel.
- In order to reduce noise pollution, proper maintenance of equipment is required, and the implementation of low noise techniques is recommended.
- Blasting design must be optimise to minimise the area of disturbance.
- Any faunal species located on the site during the construction phase, which cannot relocate themselves (e.g. fossorial species), must be moved to a more suitable location. This should be undertaken by a suitable qualified ecologist/faunal specialist.
- Light pollution must be kept to a minimum so as not to interfere with insect life cycles and the attraction of nocturnal vertebrates into the site. Any lighting require must be directed away from sensitive habitats and the use of sodium vapour lights are recommended.
- No dumping of waste may take place outside of the project area and any accidental spills of hazardous waste must be immediately cleaned through an appropriate and approved plan.

6. Impact 6: Soil compaction and contamination

Description of Impacts

During the construction and operational phases, heavy equipment traffic could potentially result in soil compaction. The mining activities on site will also result in the loss of the original spatial distribution of the natural soil forms and horizon sequences as the removal of topsoil and subsoil within the project footprint will be undertaken for the establishment of the Quarry. The loss of topsoil could potentially result in a decrease in the rehabilitation and future land use potential of land that has been disturbed. Pollution of soils as a result of *ad-hoc* spills. Contamination sources are generally unpredictable and often occur as incidental spills or leaks from operational activities **Table 13** presents the impact ratings for soil compaction and contamination.

Table 13: Potential Impacts of soil compaction and contamination

Project phase	Nature of impact	Extent	Duration	Intensity	Consequence (E+ D+I)	Probability	Reversibility	Loss of resources	Significance (C X P) Without Mitigation	Significance With Mitigation
Construction	Negative	1 Site	3 Long term	2 Medium	6-8 Moderate	3 Highly probable	Y	Low	8-10 Medium	4-6 Low
Operational	Negative	1 Site	3 Long term	2 Medium	6-8 Moderate	3 Highly probable	Y	Low	8-10 Medium	4-6 Low

Cumulative Impacts

Other activities that may contribute to the cumulative impact on the soils include overgrazing and associated poor land-management practices. With the expected soil degradation occurring, a decline in the overall soil quality and health, may hinder the soil suitability for the end land use after project closure.

Mitigation measures

- A stormwater management plan must be compiled and implemented by the Contractor to take the increased surface water run-off rates and volumes and their erosion potential into consideration.
- Topsoils should be excavated and stockpiled separately from the subsoils to be used during the rehabilitation.
- Drip trays shall be provided in construction areas for stationary plant and for "parked" plant; Drip trays, sumps and bunds must be emptied regularly, especially before a known rain event and after a rain event, and the contents disposed of at a licensed disposal facility.
- All vehicles and equipment shall be kept in good working order and serviced regularly; Leaking equipment shall be repaired immediately or removed from the Site.
- Ensuring that the development is kept within the Construction footprint.

7. Impact 7: Impact of Land Capability and Spatial Planning

Description of Impacts

Currently the proposed study area is vacant, with wildlife present. The greater farm portion is being used by the SAPS Moloto Training academy. The establishment of a Quarry will result in social urban impact due to the transformation of land from agricultural to mining as well as the loss of land for wildlife habitat. During the operational and construction phase of the project, topsoil will be removed. As topsoil has a high concentration of organic matter and microorganisms and provides the environment for where most of the earth's biological soil activity occurs, the removal of topsoil will alter the land capability status. According to the CoT Regional Spatial Development Framework, 2018, the density map indicates that the proposed site is identified as a Critical Biodiversity Area 1.

Table 14 presents the impact ratings associated with land capability and spatial planning

Table 14: Impact ratings for land capability and spatial planning

Project phase	Nature of impact	Extent	Duration	Intensity	Consequence (E+ D+I)	Probability	Reversibility	Loss of resources	Significance (C X P)	Significance
									Without Mitigation	With Mitigation
Construction	Negative	1 Site	3 Long term	2 Medium	6-8 Moderate	3 Highly probable	Y	Low	8-10 Medium	4-6 Low
Operational	Negative	1 Site	3 Long term	2 Medium	6-8 Moderate	3 Highly probable	Y	Low	8-10 Medium	4-6 Low

Cumulative Impacts

Other activities that may contribute to the cumulative impact on the soils include overgrazing and associated poor land-management practices. With the expected soil degradation occurring, a decline in the overall soil quality and health, may hinder the soil suitability for the end land use after project closure. The establishment of additional projects in the area could impact on existing land uses.

Mitigation Measures

- Reinstatement and rehabilitation of disturbed land.
- Take necessary steps to prevent negative impact on surrounding land by ensuring that the development is kept within the Construction footprint.
- The property earmarked for the Quarry shall be acquired by SANRAL through the SANRAL land acquisition/land negotiation process prior to the SPLUMA process.
- Closure planning to incorporate measures to achieve future land use plans.

8. Impact 8: Impact on surface water resources

Description of Impacts

During the construction and operational phase of the Quarry, changing the quantity and fluctuation properties of the watercourse by for example obstructing water flow could potentially occur through the compaction of soil, clearing of vegetation and changing runoff patterns through the grading of the existing access road, maintenance of the road, and construction of the bypass road as well as the haulage of vehicles. Construction and maintenance activities will result in earthworks and soil disturbance as well as the disturbance of natural vegetation. This could result in the loss of topsoil, sedimentation of the watercourse and increase the turbidity, change in flow patterns of the watercourse. Hydrocarbon spillages from vehicles and mining machinery could also result in hydrocarbon concentrations in surface runoff. The identified seepage wetland will not be impacted by the excavations to be undertaken, but potential impacts could result from the haulage of material. It is anticipated that the haulage vehicles will make use of the existing access track which traverses the wetland as well as a proposed new bypass track. The access track has been planned to be constructed out of the 50m buffer of the active section of the wetland, where wetland vegetation, habitat and foraging is evident.

Table 15 provides the impact ratings for surface water resources.

Table 15: Impact Ratings for surface water resources

Project phase	Nature of impact	Extent	Duration	Intensity	Consequence (E+ D+I)	Probability	Reversibility	Loss of resources	Significance (C X P)	Significance
									Without Mitigation	With Mitigation
Construction	Negative	1 Site	3 Long term	2 Medium	6-8 Moderate	3 Highly probable	Y	Low	8-10 Medium	4-6 Low
Operational	Negative	1 Site	3 Long term	2 Medium	6-8 Moderate	3 Highly probable	Y	Low	8-10 Medium	4-6 Low

Cumulative Impacts

Construction activities may result in Low cumulative impact to the water courses within the local catchments and beyond by contributing to loss of wetland zonation through changed water flow patterns. Sedimentation of the watercourse will further change hydrological zonation and result in the loss of specialised habitats. Reversing this process is unlikely and should be prevented in the first place.

Mitigation measures

- The bypass access track shall be discussed with the ECO prior to the clearance of vegetation;
- Changes in water flow regime
    - The footprint of activities should be as small as possible and must remain outside the delineated wetland boundaries and buffer zones.
    - Effective stormwater management should be a priority during the construction phase. This should be monitored as part of the EMPr. High energy stormwater input into the

watercourses should be prevented at all cost. Changes to natural flow of water (surface water as well as water flowing within the soil profile) should be taken into account.
    - Ensure that the activity does not result in downstream erosion or sedimentation.
- Changes in sediment entering and existing the system
    - Sediment traps should be installed downstream of the stormwater outlets.
    - Cover transport material with tarpaulin to reduce material spillage.
    - Restrict the height of transport material to reduce material spillage.
    - Construction in and around watercourses must be restricted to the dryer winter months where possible.
    - Retain vegetation and soil in position for as long as possible, removing it immediately ahead of construction / earthworks in that area.
    - Where sedimentation has been observed, effective rehabilitation with a focus on the long term control of alien invasive plants should be done.
    - Remove only the vegetation where essential for construction and do not allow any disturbance to the adjoining natural vegetation cover.
    - Where rehabilitation is required the accompanying rehabilitation plan should be followed.
    - Cordon off areas that are under rehabilitation as no-go areas using danger tape and steel droppers. If necessary, these areas should be fenced off to prevent vehicular, pedestrian and livestock access.
    - Protect all areas susceptible to erosion and ensure that there is no undue soil erosion resultant from activities within and adjacent to the construction camp and work areas.
    - Runoff from the construction area and access road must be managed to avoid erosion and pollution problems.
    - Monitoring should be done to ensure that sediment pollution is timeously addressed
- Introduction and spread of alien vegetation
    - Implement an Alien Plant Control Plan as part of the contractor's method statement
    - Retain vegetation and soil in position for as long as possible, removing it immediately ahead of construction / earthworks in that area and returning it where possible afterwards.
    - Monitor the establishment of alien invasive species within the areas affected by the construction and maintenance and take immediate corrective action where invasive species are observed to establish.
    - Where sedimentation has been observed, effective rehabilitation with a focus on the long term control of alien invasive plants should be done.
    - Rehabilitate or revegetate disturbed areas
- Loss and disturbance of watercourse habitat and fringe vegetation
    - No construction should occur in the wetland or its buffer.
    - Demarcate the watercourse areas and buffer zones to limit disturbance, clearly mark these areas as no-go areas
    - Where sedimentation has been observed, effective rehabilitation with a focus on the long term control of alien invasive plants should be done.
    - Monitor the establishment of alien invasive species within the areas affected by the construction and take immediate corrective action where invasive species are observed to establish
- Changes in water quality due to foreign materials and increased nutrients
    - Provision of adequate sanitation facilities located outside of the watercourse or its associated buffer zone.
    - Implementation of appropriate stormwater management around the excavation to prevent the ingress of run-off into the excavation and to prevent contaminated runoff into the watercourse.
    - The development footprint must be fenced off from the watercourses and no related impacts may be allowed into the watercourse e.g. water runoff from cleaning of equipment, vehicle access etc.
    - After construction, the land must be cleared of rubbish, surplus materials, and equipment, and all parts of the land shall be left in a condition as close as possible to that prior to use.
    - Maintenance of construction vehicles / equipment should not take place within the watercourse or watercourse buffer.
    - Control of waste discharges and do not allow dirty water from operational activities to enter the watercourse
    - Treatment of pollution identified should be prioritized accordingly.

9. Impact 9: Impact on ground water resources

Description of Impacts

During the construction and operational phases, potential contamination of groundwater due to spillages and leaks of hazardous substances, improper stormwater management, and fuel/oil leaks from vehicles during the operation of the Quarry. In addition, the impact on the geology during the mining operations could potentially disturb the flow patterns of the groundwater. It is anticipated that the proposed excavations will between 2m and 8m. According to the materials investigation study undertaken by Soilkraft CC, the groundwater within the region depths between 10m and 20m. The report further indicated that water levels were monitored for two months after drilling and were found to fluctuate between depths of 5.30m and 6.90m from surface during this time.

Table 16 provides the impact ratings for groundwater resources.

Table 16: Impact ratings for groundwater resources

Project phase	Nature of impact	Extent	Duration	Intensity	Consequence (E+ D+I)	Probability	Reversibility	Loss of resources	Significance (C X P)	Significance
									Without Mitigation	With Mitigation
Construction	Negative	1 Site	3 Long term	2 Medium	6-8 Moderate	3 Highly probable	Y	Low	8-10 Medium	4-6 Low
Operational	Negative	1 Site	3 Long term	2 Medium	6-8 Moderate	3 Highly probable	Y	Low	8-10 Medium	4-6 Low

Cumulative Impacts

Poor land-management practices may contribute to the cumulative impact on ground water resources.

Mitigation measures

- Water level readings in the core locations where standpipes were established shall be taken prior to the commencement of constructions activities.
- Excavations shall not be deeper than the groundwater depth as advised by the geotechnical investigations.
- Should groundwater be encountered on site, the DWS shall be informed, and the required authorisation process shall be followed.
- Emergency machinery and equipment maintenance shall be conducted over a drip tray, or a PVC lining to prevent soil and water contamination.
- Effective stormwater management should be a priority during the construction and operational phase.
- Material Safety Data Sheets for the item(s) spilled will be consulted for information concerning clean up requirements to ensure correct clean up procedure.

10. Impact 10: Impacts on Air Quality

Description of Impacts

During the construction phase of the project, the activities that will most likely generate emissions are excavations, earthworks, removal of topsoil and vegetation clearance, and vehicle movement on haulage routes and public roads. In terms of the construction phase, the main sources of particulate emissions would be the haulage of material and vehicular entrainment on unsurfaced dust roads, and the public roads, blasting, crushing, and handling of material. These emissions will have an impact on air quality on site as well as the surrounding areas. **Table 17** provides the impact ratings for Air Quality.

Table 17: Impact ratings for air quality

Project phase	Nature of impact	Extent	Duration	Intensity	Consequence (E+ D+I)	Probability	Reversibility	Loss of resources	Significance (C X P) Without Mitigation	Significance With Mitigation
Construction	Negative	1 Site	3 Long term	2 Medium	6-8 Moderate	3 Highly probable	Y	Low	8-10 Medium	4-6 Low
Operational	Negative	1 Site	3 Long term	2 Medium	6-8 Moderate	3 Highly probable	Y	Low	8-10 Medium	4-6 Low

Cumulative Impacts

Additional emissions from other vehicles could contribute to impacts on the ambient air quality of the region.

Mitigation Measures

- Implement dust suppression measures in all areas that will be affected by construction activities and where dust will be generated. Dust suppression must also be undertaken during windy and dry weather conditions.
- Air quality to be monitored (baseline and during construction/operation) for dust fallout and particulate matter. Sampling locations to consider major sources of dust and sensitive receptors.
- Dust monitoring should be implemented around aggregate crushing plants, in particular where these are located in proximity to sensitive receptors in order to monitor if dust levels are exceeding standards and to identify additional dust suppression measures. If it becomes evident that dust emissions from aggregate crushing and screening and extraction of borrow or quarry material are resulting in an impact to sensitive receptors within the Project Area then additional dust suppression measures (and wind breaks if feasible) will need to be considered around these crushing, screening, and extraction activities.
- Consideration should be given to scheduling aggregate crushing and hauling activities outside of dry and windy conditions where sensitive receptors may be affected, if feasible.
- The Contractor shall produce method statements for activities with the potential to generate dust emissions.
- The Contractor shall document any air quality / dust complaints raised by communities and record them on a grievance register sheet. Any dust related grievances raised shall be investigated.
- Dust suppression must be considered as part of the design and location of quarries and aggregate crushing plants, and other measures will be implemented to restrict dust-related impacts.
- If the use of watering techniques on exposed open earthworks is not feasible and if it becomes evident that dust emissions from these exposed areas are resulting in an impact to local residents then the use of surface binding agents shall be considered.
- Restrict the project footprint to only what is required.
- Stockpiles shall be protected from wind erosion.
- Heavy vehicles and machinery should be serviced regularly to minimise exhaust fume pollution.
- Diesel generators shall be subject to routine maintenance to keep the engines in optimum working order.
- An Environmental monitoring committee shall be established. Such committee shall include the adjacent landowners. The dust monitoring results shall be discussed in this committee.

11. Impact 11: Noise and Blasting Hazard

Description of Impacts

Activities undertaken during the construction/establishment of the Quarry will generate noise and could potentially affected the adjacent community/SAPS Academy. These include site establishment and

fencing, and vehicle movement. During the operational phase, noise and vibration will be generated from the blasting and crushing activities undertaken. Blasting activities have the potential to impact on people, animals (wildlife of the property) and structures located in the vicinity of the proposed quarry. Blast hazards include ground vibration, air blast, fly rock, blast fumes and dust. Ground vibrations travel directly through the ground and have the potential to cause damage to surrounding structures. During the operational phase noise could also be potentially generated as a result as a result of haulage vehicles, mechanical noise from plant and machinery. Sensitive receptors such as adjacent properties, SAPS Training Facility (approximately 1.3km), Foxtrot Primary Farm School (approximately 5.2km) and adjacent landowners (approximately 780m) could be impacted on by the blasting activities(noise and vibration). The study area does include wildlife which are also regarding as sensitive receptors. **Table 18** provides the impact ratings for noise and blasting hazards.

Table 18: Impact ratings for noise and blasting hazards

Project phase	Nature of impact	Extent	Duration	Intensity	Consequence (E+ D+I)	Probability	Reversibility	Loss of resources	Significance (C X P) Without Mitigation	Significance With Mitigation
Construction	Negative	1 Site	3 Long term	2 Medium	6-8 Moderate	3 Highly probable	Y	Low	8-10 Medium	4-6 Low
Operational	Negative	1 Site	3 Long term	2 Medium	9-10 High	3 Highly probable	Y	Low	12-16 High	8-10 Medium

It should also be noted that noise pollution (disturbance and nuisance) will have different impacts on the different receptors because some are very sensitive to noise while others are not. For example, workers would not expect a noise free working environment and so they will be less sensitive to environmental noise pollution at work. However , neighbouring residents may be sensitive to additional noise and so any change to ambient noise levels because of operation-related noise may have a negative impact on them and their anticipated residential experience. The South African National Standard (SANS) guidelines for noise (SANS 10103, 2008) provides a guideline for estimating community response to an increase in general ambient noise level caused by an intruding noise. In general, an increase of 3 dBA or less will not cause a response from a community; an increase of 3 to 5 dBA may elicit background noise levels to increase. No quantification of the current ambient noise levels for the site were undertaken, however given the rural nature of the site, it is assumed that the SANS limits for rural areas (45 dBA during the day and 35 dBA during the night) would be applicable. The current ambient noise levels surrounding the project area include a combination of sources such as dirt roads, Training facility, and agricultural holdings.

Cumulative impacts

The generation of additional noise could contribute to impacts on the ambient noise level experienced in proximity to the site.

Mitigation Measures

- Prior to the commencement of construction activities, baseline monitoring shall be undertaken at sensitive receptors (within 1km from the site) and at the site. Daily noise monitoring shall be undertaken at sensitive receptors when construction activities occur within 1 km of the receptor, and at mining and crushing area (depending on any complaints received).
- Noise levels shall be monitored to comply with SANS 10103:2008 and Occupational Health and Safety Act requirements.
- Undertake excavations and crushing only after 07:00 in the morning and before 18:00 in the evening in consultation with adjacent landowners.Sensitive receptors shall be notified of the timing and duration of the construction related activities and the potential noise nuisance it may cause.
- The Contractor shall compile a method statement that describe all measures that will be implemented to control and minimise noise and impacts on biodiversity, people, and livestock.

- The Contractor will be required to develop a grievance protocol to manage and address any noise complaints received. Respond to all noise related grievances received and implement mitigation measures.
- A conservative vehicle maintenance schedule will be developed that seeks to reduce any increase in noise / vibration outputs due to 'wear and tear'.
- The informal use of truck honking systems will be prohibited (especially when in or passing residential areas or schools) and will only be used to prevent vehicle / pedestrian collision.
- The excessive idling of stationary trucks will be prevented.
- The Contractor shall implement a blast management plan as per the blast design prior to the implementation of blasting on site.
- A monitoring programme for the recording of blasting operations shall be implemented. The elements of the programme shall include the following:
    - Weather conditions at time of the blast.
    - Video recording of the blast.
    - Fly rock observations.
    - Ground vibration and air blast results.
- The Contractor shall employ industry standard methods to control the impact of blasting and limit the risk of damage to buildings and structures by reducing blast vibrations induced in the rock mass, eliminating fly rock, and limiting air-blast and noise to acceptable levels.
- The blast design shall take into consideration the adjacent landowners, structures and wildlife.
- The size of explosive charges used for blasting (if required) should be optimised so as to balance breaking capacity against minimising any vibration impact and fly-rock.
- Survey potentially affected structures prior to and after blasting. Pre-mining photographic crack survey shall be undertaken.
- Adjacent landowners and businesses must be notified well in advance about blasting activities and appropriate precautionary measures must be taken.
- Noisy activities (e.g., blasting) are not to be scheduled around critical times (e.g., school exams, religious services/ celebrations). Local leaders, school principals, healthcare workers and religious leaders are to be consulted regarding times that may be negatively affected by noise.
- All blast related complaints shall be recorded and closed out by the Contrcator.
- An Environmental monitoring committee shall be established. Such committee shall include the adjacent landowners. The dust/noise monitoring results shall be discussed in this committee.

12. Impact 12: Traffic Impacts

Description of Impacts

The R573 Moloto road currently experiences significant traffic volumes. During the construction phase of the project, an increase in the traffic volumes is expected due to the movement of heavy construction vehicles and trucks. During the operational phase on the project, haul trucks would undertake regular trips to and from site to transport the material that has been sourced from the mining activities. The Foxtrot Primary Farm school is situated adjacent to the haulage route. It is of the utmost importance that road safety initiatives also focus on the scholars and that measures be implemented to make travel to and from schools safer. Inadequate traffic signage on or around the site, scholar patrol, and flagmen, could result in traffic accidents which could cause injury or death.

Table 19 provides the impact ratings for traffic impacts.

Table 19: Impact ratings for traffic impacts

Project phase	Nature of impact	Extent	Duration	Intensity	Consequence (E+ D+I)	Probability	Reversibility	Loss of resources	Significance (C X P)	Significance
									Without Mitigation	With Mitigation
Construction	Negati ve	1 Site	3 Long term	2 Medi um	6-8 Moderate	3 Highly	Y	Low	8-10 Medium	4-6 Low

						probable				
Operational	Negative	2 Local	3 Long term	3 High	6-8 Moderate	3 Highly probable	Y	Low	8-10 Medium	4-6 Low

Cumulative Impacts

Future development within the region could result in a cumulative impact on road traffic.

Mitigation Measure

- Movement of haulage vehicles shall be restricted to off peak traffic times.
- Entry/Exit points onto public roads should take cognizance of traffic safety.
- The Contractor & applicant shall discuss the entry and exit points with the SAPS in order to prevent disturbance on the existing access points of the SAPS Training facility.
- The movement of heavy vehicles (excavators, bulldozers, & trucks) should be clearly sign posted in both directions along the access track.
- The use of flagmen at the school and entry and exit onto the R573 shall be implemented;
- A pedestrian walkway shall be established for the moved of scholar traffic.
- Scholar patrol shall be available during the school opening and closing hours to direct scholars onto the safe pedestrian walkway.
- Implementation of a traffic complaints procedure.
- A traffic management plan shall be compiled and implemented by the Contractor.
- The number of haulage vehicles shall be controlled per day.
- Drivers must be licensed by law and should be carefully briefed on the appropriate driving practices and the site sensitivities (adjacent school, National R573 Moloto Road Traffic) by the Environmental Site Officer.

13. Impact 13: Visual and Aesthetic Impacts

Description of Impacts

In terms of the aesthetics, the mining activities will impact on the localised sense of place. During the construction phase of the project, it is anticipated that construction vehicles in the area as well as excavations will have a potentially negative impact on the surrounding land use. The site is not clearly visible from the adjacent agricultural holdings or the R573, however the haulage of material will have a potential impact on the sense of place in relation to the SAPS training academy and the Foxtrot Farm school. The visual intrusion is expected to be low after mitigation.

Table 20 provides the impact ratings for visual and aesthetic impacts.

Table 20: Impact ratings for Visual and Aesthetic Impacts

Project phase	Nature of impact	Extent	Duration	Intensity	Consequence (E+ D+I)	Probability	Reversibility	Loss of resources	Significance (C X P) Without Mitigation	Significance With Mitigation
Construction	Negative	2 Local	3 Long term	2 Medium	6-8 Moderate	3 Highly probable	Y	Low	8-10 Medium	4-6 Low
Operational	Negative	2 Local	3 Long term	2 Medium	6-8 Moderate	3 Highly probable	Y	Low	8-10 Medium	4-6 Low

Cumulative Impacts

Potential cumulative impacts will depend on the number of projects within the region at the same time.

Mitigation Measures

- Develop material stockpiles only in areas designated on the site plan.
- Ongoing clearing of alien invasive vegetation in the disturbed areas associated with the works.
- Control visual intrusion by screening of the site where possible, e.g., screen fencing and earth bunds shall be used where topographically feasible.
- Reinstatement and rehabilitation of disturbed areas with vegetation as per the rehabilitation plan or as soon as practical.

14. Impact 14: Cultural and Heritage Impacts

Description of Impacts

The proposed establishment of the Quarry will require removal of topsoil and vegetation during the construction phase and excavations during the operational phase. During the course of such operations, it is possible that undiscovered cultural heritage material, including fossils could be unearthed.**Table 21** provides the impact ratings for cultural and heritage impacts.

Table 21: Impact Ratings for Cultural and Heritage Impacts

Project phase	Nature of impact	Extent	Duration	Intensity	Consequence (E+ D+I)	Probability	Reversibility	Loss of resources	Significance (C X P)	Significance
									Without Mitigation	With Mitigation
Construction	Negative	1 Site	3 Long term	2 Medium	6-8 Moderate	2 Probable	Y	Low	8-10 Medium	4-6 Low
Operational	Negative	1 Site	3 Long term	2 Medium	6-8 Moderate	2 Probable	Y	Low	8-10 Medium	4-6 Low

Cumulative Impacts

While the broader area surrounding the site is largely undeveloped, future development within the region could result in a cumulative loss of heritage resources over time.

Mitigation Measures

- 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.
- 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).

15. Impact 15: Palaeontological Impacts

The Nature of the impact is the destruction of Fossil Heritage. Loss of fossil heritage will have a negative impact. Threats to palaeontological resources are earth moving equipment/machinery (for example haul trucks, front end loaders, excavators, graders, dozers) during construction and operation, the sealing-in or destruction of the fossils by the development, vehicle traffic, and human disturbance. According to the Palaeontological Impact Assessment undertaken by Dr Heidi Fourie the potential impact of the development on fossil heritage is Moderate for the Rayton Formation and Very Low for the Bushveld Complex . **Table 22** provides the impact ratings for Palaeontological impacts.

Table 22: Impact ratings for Palaeontological Impact

Project phase	Nature of impact	Extent	Duration	Intensity	Consequence (E+ D+I)	Probability	Reversibility	Loss of resources	Significance (C X P) Without Mitigation	Significance With Mitigation
Construction	Negative	1 Site	3 Long term	2 Medium	6-8 Moderate	2 Probable	Y	Low	8-10 Medium	4-6 Low
Operational	Negative	1 Site	3 Long term	2 Medium	6-8 Moderate	2 Probable	Y	Low	8-10 Medium	4-6 Low

Cumulative Impacts

While the broader area surrounding the site is largely undeveloped, future development within the region could result in a cumulative loss of fossil resources over time.

Mitigation Measures

- Special care must be taken during the digging, drilling, blasting, and excavating of foundations, trenches, channels and footings and removal of overburden as a site visit may have missed a fossiliferous outcrop.
- The development may go ahead, but the ECO must survey for fossils before and or after clearing, blasting, drilling, or excavating.
- If any palaeontological material is exposed during digging, excavating, drilling, or blasting SAHRA must be notified. All construction activities must be stopped, and a palaeontologist should be called in to determine proper mitigation measures,
- Should Fossils be unearthed the Contractor shall notify the Provincial Heritage Resource Agency Gauteng and specialists to further investigate. The area must be fenced-off with a 30 m barrier and the construction workers must be informed that this is a no-go area.

16. Impact 16: Socio Economic Impacts

Description of the Impacts

The construction phase of the Quarry 4 will have the following negative impacts:

- Temporary loss of existing land use through clearance of mining areas.
- Temporary use of local road network by delivery and haul vehicles.
- Damage to existing infrastructure e.g., fences, heritage features etc.
- Population influx due to job seekers to the area which could pose a number of risks to the local community.

The operational phase of the Quarry 4 will have the following impacts:

- The mining of the Quarry will result in road material for the upgrading of the R573 and upgrades of local link roads resulting in road safety, improved access, and promotion of future land use development in the area.
- Proposed development would create a number of local employment and business opportunities during operation.
- Opportunity for skills development and onsite training.

Table 23 provides the impact ratings for Socio-Economic Impacts

Table 23: Impact Ratings for Socio-Economic Impacts

Project phase	Nature of impact	Extent	Duration	Intensity	Consequence (E+ D+I)	Probability	Reversibility	Loss of resources	Significance (C X P) Without Mitigation	Significance With Mitigation
Construction	Negative	2 Local	2 Medium	2 Medium	6-8 Moderate	3 Highly probable	Y	Low	8-10 Medium	4-6 Low
Operational	Positive	2 Local	2 Medium	2 Medium	6-8 Moderate	3 Highly probable	Y	Low	8-10 Medium Positive	1-3 No Significance

Cumulative Impacts

Construction Phase: Depending on the number of other projects in the area, and the number of labourers may exacerbate the risks.

Operational Phase: Potential cumulative impacts linked to employment and business opportunities would depend on other construction projects being implemented in the same timeframe.

Mitigation Measures

- Employment and procurement opportunities provided to identified communities.
- The Contractor must ensure that the recruitment process is conducted through the community structures established for the contract.
- A Project Liaison Committee (PLC) shall be established to assist with the recruitment of local labour.
- The SANRAL 14-point plan that stipulates the principles concerning project liaison, sub-contracting and labour sourcing shall be implemented.

17. Impact 17: Increase in Waste

Description of Impacts

During the construction phase, waste will be generated through the clearance of vegetation, fencing of the site and site establishment. During the operational phase of the Quarry building and domestic waste will be generated. Littering and improper waste storage may attract vermin resulting in a negative visual appeal of the area. The potential of incidental spillages that may occur on site will result in contaminated soil which is treated as hazardous waste e.g., chemicals, oils, soil contaminated by spillages, diesel rags. **Table 24** provides the impact ratings for waste.

Table 24: Impact Ratings for the Waste

Project phase	Nature of impact	Extent	Duration	Intensity	Consequence (E+ D+I)	Probability	Reversibility	Loss of resources	Significance (C X P)	Significance
									Without Mitigation	With Mitigation
Construction	Negative	1 Site	3 Long term	2 Medium	6-8 Moderate	3 Highly probable	Y	Low	8-10 Medium	4-6 Low
Operational	Negative	1 Site	3 Long term	2 Medium	6-8 Moderate	3 Highly probable	Y	Low	8-10 Medium	4-6 Low

Cumulative Impacts

Potential cumulative impacts will depend on the number of projects within the region at the same time**.**

Mitigation Measures

- A waste management plan shall be compiled and implemented by the Contractor. Waste hierarchy principals-reduce, reuse, recycle shall be implemented. Recyclable waste must be kept separate from general waste and taken to a waste recovery / recycling facility.
- Adequate storage facilities for general and hazardous waste shall be provided.
- Waste receptables with lids (i.e. weather and vermin proof) for management of waste on site must be provided.
- Hazardous waste shall be stored in a bund wall. Disposal of all hazardous waste at a hazardous waste landfill.
- General waste shall be disposed at a landfill at least weekly, or more frequently if required.

18. Impact 18: Safety

Description of Impacts

Criminal activity within the proposed site is rife. The proposed mining activities could serve as an attraction for criminal activity. In addition, the construction and operational activities that will be required for Quarry 4 may have health and safety implications for the personnel that will be working on the project. **Table 25** provides the impact ratings for Safety.

Table 25: Impact Ratings for Safety

Project phase	Nature of impact	Extent	Duration	Intensity	Consequence (E+ D+I)	Probability	Reversibility	Loss of resources	Significance (C X P)	Significance
									Without Mitigation	With Mitigation
Construction	Negative	1 Site	3 Long term	2 Medium	6-8 Moderate	3 Highly probable	Y	Low	8-10 Medium	4-6 Low
Operational	Negative	1 Site	3 Long term	2 Medium	6-8 Moderate	3 Highly probable	Y	Low	8-10 Medium	4-6 Low

Cumulative Impacts

Potential safety impacts related to criminal activity will depend on construction projects with the same timeframe.

Mitigation Measures

- Access control to the Quarry must be strictly controlled at the entrance, providing access only to approved persons.
- The site shall be fenced off for both personnel and livestock safety.
- The security fence shall be monitored regularly for vandalism.
- Suitable Personal Protective Equipment (PPE) must be worn at all times by all employees on site during the construction and maintenance phases of the project.
- With the exception of the project team members, no persons should be allowed to enter the construction site area.
- The site and crew are to be managed in strict accordance with the OHS Act.
- The Contractor must ensure that all emergency procedures are in place prior to commencing work. Emergency procedures must include (but not be limited to) fire, spills, contamination of soil, accidents to employees and limiting casual access to the construction site for workers, use of hazardous substances and materials, etc.
- The Contractor must ensure that lists of all emergency telephone numbers / contact persons are kept up to date and that all numbers and names are posted at relevant locations throughout the construction site.
- The nearest emergency service provider must be identified during all phases of the project as well as its capacity and the magnitude of accidents it will be able to handle. The contact details of this emergency centre, including police and ambulance services must be available at prominent locations around the construction site.
- A Health and Safety Officer as well as an independent firm must be appointed to audit the site's compliance with the OHS Act during construction.
- The proposed quarry site shall be fully fenced off. Mining activities will be undertaken approximately 1.5 km from the shooting complex. The safety protocols as implemented by the SAPS during training shall be factored into the contractor's method statement for the management of the site and emergency protocols.
- The appointed Contractor shall establish a separate entrance that will bypass the current SAPS access control point. Consultation with the SAPS shall be undertaken prior to the establishment of the access point. Access control shall also be managed at the access point by the security personnel appointed by the Contrcator. The management of the access point shall be undertaken in line with the Security protocol of the SAPS.

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

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

In accordance with the NEMA EIA regulations (Government Notice R.982, promulgated in terms of Section 24 of the National Environmental Management Act, 1998 (Act 107 of 1998)), as amended the Environmental Assessment Practitioner (EAP) is required to assess the significance of potential impacts in terms of the following criteria as outlined in Appendix 1:

- cumulative impacts;
- nature, significance and consequences of the impact and risk;
- extent and duration of the impact and risk;
- probability of the impact and risk occurring;
- the degree to which the impact and risk can be reversed;
- the degree to which the impact and risk may cause irreplaceable loss of resources; and
- the degree to which the impact and risk can be avoided, managed, or mitigated.

Activities within the framework of the proposed development and their respective construction and operational phases, give rise to certain impacts. For the purpose of assessing these impacts, the project has been divided into three phases from which impacting activities can be identified, namely:

Construction phase:
This phase refers to all the pre-construction and construction related activities on site, until the Contractor leaves the site.

Operational phase:
This includes all post construction activities, including the operation and maintenance of the proposed development.

The assessment of the impacts will be conducted according to a synthesis of criteria required by the integrated environmental management procedure. The methodology that will be used comprises of the following four steps:

- Step 1: Identification of positive and negative impacts of the project;
- Step 2: Identification of the significance rating of the impact before mitigation;
- Step 3: Identification of the mitigation measure and the mitigation efficiency; and
- Step 4; Identification of the significance rating of the impact after mitigation;

Activities that will be undertaken to give effect to the proposed development gives rise to certain impacts. For the purpose of assessing these impacts, the project has been divided into the following phases discussed in **Table 26.**

Table 26: Project phases in a development

PHASES OF A PROJECT IN WHICH IMPACTS WILL OCCUR
Status Quo
The study area as it currently exists.
Construction Phase
All activities on site up to the start of construction, not including the transport of materials, but including the initial site preparations. This also includes the impacts that would be associated with planning.
Operational Phase
This phase will include, excavations, stockpiling of material, haulage of material.

The activities arising from each of the relevant phases have been included in the impacts assessment tables. The assessment endeavours to identify activities that would require environmental management actions to mitigate the impacts arising from them. The criteria against which the activities were assessed are given in the next section.

Assessment Criteria

The assessment of the impacts has been conducted according to a synthesis of criteria required by the guideline documents to the EIA regulations (2006) and integrated environmental management series published by the Department of Environmental Affairs and Tourism (DEAT) currently Department of Environment, Forestry and Fisheries (DEFF). In addition to this, it is a requirement of the National Environmental Management Act (NEMA) 2014 Regulations as amended, Appendices 1 and 2 that an Impact and Risk Assessment process be undertaken for the Basic Assessments and Environmental Impact Reporting. Acronyms have been used in some of the tables to abbreviate some aspects of the assessment criteria. The Assessment Criteria is based on the following:

- Nature of impact;
- Extent **(E);**
- Duration **(D)**;
- Intensity **(I);**
- Consequence **(C);** *this will be a combination of Extent **(E)**+Duration **(D)** + Intensity **(I)***
- Probability **(P)**;
- Determination of significance (with or without mitigation); *and is a combination of consequence **(C)**x Probability **(P);***
- Reversibility of impact; and
- Irreplaceable loss of resources will be defined as loss of resource for the purposes of the Impact Assessment Tables

Each of these is explained in **Table 27.**

Table 27: Assessment Criteria

ASSESSMENT CRITERIA	SCORING
a) Nature of Impact	
This is an appraisal of the type of effect the proposed activity would have on the affected environmental component. The description should include what is being affected, how and whether the impact is positive or negative	Scoring does not apply, impact will either be positive or negative
b) Extent (E)	
The physical and spatial size of the impact. This is classified as: **i) Site** The impact could affect the whole, or a measurable portion of the site. **ii) Local** The impacted area extends only as far as the activity, e.g. a footprint of the specific activity **iii) Regional** The impact could affect areas such as neighbouring farms, transport corridors and the adjoining towns. **iv) National** The impact could have an effect on South Africa.	 **1** **2** **3** **4**
c) Duration (D)	

The lifetime of the impact; this is measured in the context of the lifetime of the proposed project. **i) Short term** The impact will either disappear with mitigation or will be mitigated through natural processes (less than 1 year). **ii) Medium term** The impact will last up to the end of the phases, thereafter it will be entirely negated (1 to 10 years). **iii) Long term** The impact 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. **iv) Permanent** Mitigation either by man or natural processes will not occur in such a way or in such a time span that the impact can be considered transient, thus beyond decommissioning.	**1** **2** **3** **4**
d) Intensity (I)	
Is the impact destructive or benign? Does it destroy the impacted environment, alter its functioning, or slightly alter it? These are rated as: **i) Low** The impact alters the affected environment in such a way that the natural processes or functions are not affected. **ii) Medium (Moderate)** The affected environment is altered, but function and process continue, albeit in a modified way. **iii) High** Function or process of the affected environment is disturbed to the extent where it temporarily or permanently ceases. This will be a relative evaluation within the context of all the activities and the other impacts within the framework of the project.	**1** **2** **3**
e) Consequence of Impact (C)	
The anticipated consequence of the impact is determined using the following formula: **Consequence = Duration + Extent + Intensity** Consequence is rated as: **i) Negligible** An acceptable impact on natural systems, patterns or processes. **ii) Low** A small impact on natural systems, patterns or processes, where the environment continues to function but in a modified manner and for which mitigation is desirable but not essential **iii) Moderate**	3 4-5

A substantial alteration of natural systems, patterns or processes, where environmental functions and processes are altered such that they temporarily or permanently cease. Mitigation will be required.	6-8
iv) High A serious alteration of natural systems, patterns or processes. Impacts may result in the irreversible damage to irreplaceable aspects if mitigation measures are not implemented.	9-10
v) Very High Very high impact on natural systems, patterns or processes, where environmental functions and processes are altered such that could permanently cease, even with mitigation.	11-12
f) Probability (P)	
This describes the likelihood of the impacts actually occurring. The impact may occur for any length of time during the life cycle of the activity, and not at any given time. The classes are rated as follows: ***i) Improbable*** The possibility of the impact occurring is very low, due either to the circumstances, design or experience.	1
ii) Probable There is a possibility that the impact will occur to the extent that provisions must be made.	2
iii) Highly probable It is most likely that the impacts will occur at some or other stage of the development. Plans must be drawn up before the undertaking of the activity.	3
iv) Definite The impact will take place regardless of any prevention plans, and mitigation actions or contingency plans are relied on to contain the effect.	4
h) Significance of impact with or without mitigation	

Score		Significance = Consequence x Probability					
Probability	4	Definite	4	8	12	16	20
	3	Highly probable	3	6	9	12	15
	2	Probable	2	4	6	8	10
	1	Improbable	1	2	3	4	5
			Negligible	Low	Moderate	High	Very High
			1	2	3	4	5
		Consequence					

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. To determine significance of the potential impact/risk, the consequence is multiplied by probability. The classes are rated as follows: **i) No significance** The impact is not substantial and does not require any mitigation. Score 1-5 **ii) Low** The impact is of little importance but may require limited mitigation. Score 4-6 **iii) Medium (Moderate)** The impact is of importance and therefore considered to have a negative impact. Mitigation is required to reduce the negative impacts to acceptable levels. Score 8-10 **iv) High** The impact is of great importance. Failure to mitigate, with the objective of reducing the impact to acceptable levels, could render the entire development option or entire project proposal unacceptable. Score 12-16 **v) Fatal Flaw** The impact presents a fatal flaw and the entire development option or entire project proposal is unacceptable. Score 20	1-3 4-6 8-10 12-16 20
g) Reversibility of impact (R)	
The extent to which the impacts are reversible **(i) Yes** The impact is reversible within two years after construction. **(ii) No** The impact is reversible within 2 to 10 years after construction.	
g) The degree to which the impact can cause irreplaceable loss of resources	
(i) Low The impact results in the loss of resources but the natural, cultural and social processes/functions are not affected. **(ii) Medium** The loss of resources occurs but natural cultural and social processes continue, albeit in a modified manner. **(iii) High** The impact results in irreplaceable loss of resource.	

The assessment criteria used in the tables will be applied to all of the impacts and a brief descriptive review of the impacts and their significance provided in the text of the report. The overall significance

of impacts will be determined by considering consequence and probability.

(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)

The proposed Quarry 4 will have a high-moderate to moderate-low impact (after mitigation) on the receiving environment. The negative impacts associated with the proposed development are provided below:

- Loss of floral habitat and species diversity.
- Loss of faunal habitat and species diversity.
- Potential loss of land capability and soil contamination.
- Potential ground and surface water contamination.
- Potential increase in noise levels.
- Potential increase in dust levels.
- Visual intrusion and loss of aesthetic value.
- Increase of traffic on local roads.
- Loss and cultural and heritage resources.
- Increase in waste.

The above-mentioned impacts are expected during the operational phase of the project. However, with the application of mitigations measures as provided in the EMPr, the potential impacts can be minimised or avoided. Apart from the negative impacts, the proposed project will have positive impacts. These positive impacts are as follows:

- The mining of the Quarry will result in road material for the upgrading of the R573 and upgrades of local link roads resulting in road safety, improved access, and promotion of future land use development in the area.
- Proposed development would create a number of local employment and business opportunities during operation.
- Opportunity for skills development and on-site training.

(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).

Mitigation measure for the proposed Quarry 4 have been provided in **Table 31** of the EMPr report.

(ix) Motivation where no alternative sites were considered.

Not applicable as alternatives were considered and provided in **Section h** of the report.

(x) Statement motivating the alternative development location within the overall site.

(Provide a statement motivation the final site layout that is proposed)

Quarry 4 is considered to be adequately sized to allow for stockpiling of material, establishment of the Contractors camp, and crushing equipment. The material testing undertaken by the geotechnical specialists revealed that the site will provide a viable source of material for the upgrade of the R573. The site earmarked for the development is owned by the South African Government.

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.** (including (i) a description of all environmental issues and risks that were identified during the environmental impact assessment process and (ii) an assessment of the significance of each issue and risk and an indication of the extent to which the issue and risk could be avoided or addressed by the adoption of mitigation measures).

Please refer to **Section vi** regarding the Methodology used in determining the significance of environmental impacts.

j) Assessment of each identified potentially significant impact and risk

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

Table 28: Assessment of each identified potentially significant impact and risk

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.)	**POTENTIAL IMPACT** (Including the potential impacts for cumulative impacts) (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)	**SIGNIFICANCE** if not mitigated	**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	**SIGNIFICANCE** if mitigated
Excavation and Stockpiling, Reshaping of the Quarry pit, resurfacing	• Change in topography of landscape and drainage pattern due to the excavation of rock material. The impact on topography is permanent.	Topography	Construction	Low	• Control through the limiting of the footprint of the proposed mining activities • Mining activities shall be demarcated in order to restrict the excavation footprint. • Control through the appropriate rehabilitation measures	Low
			Operational Decommissioning and Closure	Medium		Low
Excavations, Reshaping of the Quarry pit, resurfacing	• Geological material will be removed from the Quarry. Such impact is unavoidable and permanent.	Geology	Construction	Low	• Control through the limiting of the footprint of the proposed mining activities • Mining activities shall be demarcated in order to restrict the excavation footprint. • Control through the appropriate rehabilitation measures	Low
			Operational Decommissioning and Closure	High		Medium
Vegetation Clearing, removal of topsoil and stockpiling, construction of infrastructure	• Loss of floral and faunal habitat will take place during the pre-construction/ pre-mining and construction phases of the project, and continue during the operational phase, mainly as result of direct clearing of vegetation within the *Burkea africana Woodland*, Ridge and Rocky Slopes habitat units prior to excavation of source material. An access road is also proposed, which will mostly follow an existing dirt access road. Indirect loss of floral and faunal habitat is likely to occur as a result of edge effects such as alien vegetation introduction, proliferation and encroachment which may outcompete indigenous species in adjacent areas, potential erosion and a decline in faunal refugia and food resources. Effective rehabilitation of the project area, particularly with regards to the ridge and rocky slopes will be unlikely given their unique characters. Gauteng ridges represent important wildlife habitat (providing food resources and refugia) and act and biological corridors, providing for movement between habitat patches. Furthermore, rehabilitation of disturbed areas of the *Burkea africana* Woodland will also be very difficult due to it being extremely difficult to cultivate the slow-growing *Burkea africana*, the most prominent tree species within the southern portion of the project area, as a result of symbiotic relationships only available in its natural environment.	Fauna and Flora habitat	Construction	High	• Restrict project footprint as per the layout plan. • Prevention of the disturbance of the ecosystem • Apply mitigation measures provided by the Ecological Specialists • Control through the rehabilitation of disturbed areas	Medium
			Operational	High		High
Vegetation Clearing, removal of topsoil and stockpiling, construction of infrastructure	• During the operational phase, Loss of floral species diversity may take place during the construction and operational phases of the project as a result of clearing of vegetation for site establishment. During the construction phase of the project the loss of species	Flora Species Diversity and SCC	Construction	High		Medium

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.)	**POTENTIAL IMPACT** (Including the potential impacts for cumulative impacts) (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)	**SIGNIFICANCE** if not mitigated	**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	**SIGNIFICANCE** if mitigated
	diversity and floral SCC can result from ongoing excavation of source material from quarries and increasing development footprint areas leading to ongoing loss of habitat and a decrease in floral species diversity		Operational	High		Medium
Vegetation Clearing, removal of topsoil and stockpiling, construction of infrastructure	• Loss of faunal species will likely take place during the construction and operational phases of the project. Disturbance to faunal communities will occur during both the construction and operational phases of the project. The expected area of influence pertaining to the noise disturbance will extend outside of the project area. Elevated levels of disturbance will likely result in local faunal species moving away from the area and a subsequent localised decline in biodiversity (as certain species are more sensitive to disturbances). The loss of faunal habitat is also considered a direct disturbance as the loss and degradation of habitat will likely influence current faunal assemblages and dynamics as these areas will become suboptimal and unsuitable. Fauna occurring in adjacent habitats, outside of the direct development impact zone, may also be negatively affected by impacts leading to the alteration or impediment of movement corridors. It must be noted that some degree of disturbance, including noise disturbances, already occurs within the project area with the Moloto Training Facility located in proximity to the site.	Fauna Species Diversity & SCC, and habitat disturbance	Construction	High		Medium
			Operational	High		Medium
Vegetation clearing, Topsoil removal and stockpiling, Vehicle movement and construction of Infrastructure	• Loss of the original spatial distribution of the natural soil forms and horizon sequences. • Potential disturbance on soil includes compaction owing to vehicle traffic and increased surface runoff from the compacted areas; • Soil pollution may emanate from petroleum hydrocarbon contamination owing to vehicle and machinery break-down;	Soils	Construction	Medium	• Control through the appropriate stripping and stockpiling measures • Control of the mining footprint • Control through the implementation of a Stormwater Management Plan	Low
			Operational Decommissioning and Closure	Medium		Low
Vegetation clearing, Topsoil removal and stockpiling, Vehicle movement and construction of Infrastructure, Excavations, Reshaping of the Quarry pit, resurfacing	• Currently the proposed study area is vacant, with wildlife present. The greater farm portion is being used by the SAPS Moloto Training academy. The establishment of a Quarry will result in social urban impact due to the transformation of land from agricultural to mining as well as the loss of land for wildlife habitat. During the operational and construction phase of the project, topsoil will be removed. As topsoil has a high concentration of organic matter and microorganisms and provides the environment for where most of the earth's biological soil activity occurs, the removal of topsoil will alter the land capability status. According to the CoT Regional Spatial Development Framework, 2018, the density map indicates that the proposed site is identified as a Critical Biodiversity Area 1.	Land Capability	Construction	Medium	• Implementation and management through a rehabilitation and closure plan	Low
			Operational Decommissioning and Closure	Medium		Low

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.)	**POTENTIAL IMPACT** (Including the potential impacts for cumulative impacts) (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)	**SIGNIFICANCE** if not mitigated	**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	**SIGNIFICANCE** if mitigated
Vegetation clearing, Topsoil removal and stockpiling, Vehicle movement and construction of Infrastructure, Excavations, Reshaping of the Quarry pit, resurfacing	• During the construction and operational phase of the Quarry, changing the quantity and fluctuation properties of the watercourse by for example obstructing water flow could potentially occur through the compaction of soil, clearing of vegetation and changing runoff patterns through the grading of the existing access road, maintenance of the road, and construction of the bypass road as well as the haulage of vehicles. Construction and maintenance activities will result in earthworks and soil disturbance as well as the disturbance of natural vegetation. This could result in the loss of topsoil, sedimentation of the watercourse and increase the turbidity, change in flow patterns of the watercourse. Hydrocarbon spillages from vehicles and mining machinery could also result in hydrocarbon concentrations in surface runoff. The identified seepage wetland will not be impacted by the excavations to be undertaken, but potential impacts could result from the haulage of material. It is anticipated that the haulage vehicles will make use of the existing access track which traverses the wetland as well as a proposed new bypass track. The access track has been planned to be constructed out of the 50m buffer of the active section of the wetland, where wetland vegetation, habitat and foraging is evident.	Surface water resources	Construction	Low	• Control through the implementation of a stormwater management plan • Implementation and management through a rehabilitation and closure plan	Insignificant
			Operational Decommissioning and Closure	Low		Insignificant
Clearance of vegetation, construction of infrastructure, excavations, Reshaping of the Quarry pit & resurfacing, removal of infrastructure	• During the construction and operational phases, potential contamination of groundwater due to spillages and leaks of hazardous substances, improper stormwater management, and fuel/oil leaks from vehicles during the operation of the Quarry. In addition, the impact on the geology during the mining operations could potentially disturb the flow patterns of the groundwater. It is anticipated that the proposed excavations will between 2m and 8m. According to the materials investigation study undertaken by Soilkraft CC, the groundwater within the region depths between 10m and 20m. The report further indicated that water levels were monitored for two months after drilling and were found to fluctuate between depths of 5.30m and 6.90m from surface during this time.	Groundwater Resources	Construction	Medium	• Control through the implementation of a stormwater management plan • Manage all hazardous substances • Groundwater levels to be considered, in the design of the Quarry	Low
			Operational Decommissioning and Closure	Medium		Low
Vegetation clearance and stockpiling, Blasting, crushing and operation of machinery; demolition and/or removal of temporary infrastructure	• During the construction phase of the project, the activities that will most likely generate emissions are excavations, earthworks, removal of topsoil and vegetation clearance, and vehicle movement on haulage routes and public roads. In terms of the construction phase, the main sources of particulate emissions would be the haulage of material and vehicular entrainment on unsurfaced dust roads, and the public roads, blasting, crushing, and handling of material. These emissions will have an impact on air quality on site as well as the surrounding areas.	Air Quality	Construction	Medium	• Control through frequent dust suppression • Control through dust monitoring and recording • Speed control measures on traffic	Low
			Operational Decommissioning and Closure	Medium		Low

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.)	**POTENTIAL IMPACT** (Including the potential impacts for cumulative impacts) (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)	**SIGNIFICANCE** if not mitigated	**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	**SIGNIFICANCE** if mitigated
Blasting, crushing and operation of machinery; demolition and/or removal of temporary infrastructure	• Activities undertaken during the construction/establishment of the Quarry will generate noise and could potentially affected the adjacent community, as well as fauna, as the site is used as a migration corridor. • Noise and vibration will be generated from the blasting and crushing activities undertaken. • Blasting activities have the potential to impact on people, animals and structures located in the vicinity of the proposed quarry. Blast hazards include ground vibration, air blast, fly rock, blast fumes and dust. • Ground vibrations travel directly through the ground and have the potential to cause damage to surrounding structures. • Noise generation as a result of haulage vehicles • Removal of existing infrastructure during rehabilitation and closure could result in noisy activities • Close proximity of blasting to sensitive receptors (adjacent agricultural holdings, school, police academy)	Noise and blasting hazard	Construction	Medium	• Noise Control through the maintenance of vehicles and equipment • Control through the implementation of a blast management plan	Low
			Operational Decommissioning and Closure	High		Medium
Haulage of Material and transportation	• The R573 Moloto road currently experiences significant traffic volumes. During the construction phase of the project, an increase in the traffic volumes is expected due to the movement of heavy construction vehicles and trucks. During the operational phase on the project, haul trucks would undertake regular trips to and from site to transport the material that has been sourced from the mining activities. The Foxtrot Primary Farm school is situated adjacent to the haulage route. It is of the utmost importance that road safety initiatives also focus on the scholars and that measures be implemented to make travel to and from schools safer. Inadequate traffic signage on or around the site, scholar patrol, and flagmen, could result in traffic accidents which could cause injury or death.	Traffic	Construction	Medium	• Control through the implementation of a traffic management plan • Implementation of a traffic complaints procedure	Low
			Operational Decommissioning and Closure	Medium		Low
Material Stockpiles, excavations, Rehabilitation and restoration of disturbed areas, demolition and/or removal of temporary infrastructure	• In terms of the aesthetics, the mining activities will impact on the localised sense of place. During the construction phase of the project, it is anticipated that construction vehicles in the area as well as excavations will have a potentially negative impact on the surrounding land use. The site is not clearly visible from the adjacent agricultural holdings or the R573 however the haulage vehicles will have a potential impact on the sense of place in relation to the SAPS training academy and the Foxtrot Farm school.	Visual and aesthetic	Construction	Medium	• Control visual intrusion by screening where possible • Implementation and management through a rehabilitation and closure plan	Low
			Operational Decommissioning and Closure	Medium		Low
Vegetation Clearing, Excavations, Construction of infrastructure	• The proposed establishment of the Quarry will require removal of topsoil and vegetation during the construction phase and excavations during the operational phase. During the course of such operations, it is possible that undiscovered cultural heritage material, including fossils could be unearthed	Cultural and Heritage	Construction	Medium	• Prevent through the reporting and evaluation of any archaeological heritage resource found on site	Low
			Operational Decommissioning and Closure	Medium		Low
Vegetation Clearing, Excavations, Construction of infrastructure	• The Nature of the impact is the destruction of Fossil Heritage. Loss of fossil heritage will have a negative impact. Threats to palaeontological resources are earth moving equipment/machinery (for example haul trucks, front end loaders, excavators, graders, dozers) during	Fossil Heritage	Construction	Medium	Prevent through the reporting and evaluation of any archaeological heritage resource found on site	Low
			Operational Decommissioning and Closure	Medium		Low

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.)	**POTENTIAL IMPACT** (Including the potential impacts for cumulative impacts) (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)	**SIGNIFICANCE** if not mitigated	**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	**SIGNIFICANCE** if mitigated
	construction and operation, the sealing-in or destruction of the fossils by the development, vehicle traffic, and human disturbance. According to the Palaeontological Impact Assessment undertaken by Dr Heidi Fourie the potential impact of the development on fossil heritage is Moderate for the Rayton Formation and Very Low for the Bushveld Complex					
Clearance of vegetation, construction of infrastructure, Mining activities.	**Construction Phase** • Temporary loss of existing land use through clearance of mining areas. • Temporary use of local road network by delivery and haul vehicles. • Damage to existing infrastructure e.g., fences, water hole etc • Population influx due to job seekers to the area which could pose a number of risks to the local community **Operational Phase** • The mining of the Quarry will result in road material for the upgrading of the R573 and upgrades of local link roads resulting in road safety, improved access, and promotion of future land use development in the area. • Proposed development would create a number of local employment and business opportunities during operation. • Opportunity for skills development and onsite training	Socio-Economic	Construction Operational Decommissioning and Closure	Medium Positive	• Control access to site from fencing and access gate. • Control through the implementation of a traffic management plan • Implementation of a traffic complaints procedure • Control through the recruitment process is conducted through the community structures established for the contract. • Establish platform for community engagement and complaints management procedure	Low Insignificant
Vegetation clearing, Excavations, demolition and/or removal of temporary infrastructure	• During the construction phase, waste will be generated through the clearance of vegetation, fencing of the site and site establishment. During the operational phase of the Quarry building and domestic waste will be generated. Littering and improper waste storage may attract vermin resulting in a negative visual appeal of the area. The potential of incidental spillages that may occur on site will result in contaminated soil which is treated as hazardous waste e.g., chemicals, oils, soil contaminated by spillages, diesel rags	Waste	Construction Operational Decommissioning and Closure	Medium Medium	• Control through implementation of a waste management plan	Low Low
Operation of the Quarry, Rehabilitation and restoration of disturbed areas	• Criminal activity within the proposed site is rife. The proposed mining activities could serve as an attraction for criminal activity. In addition, the construction and operational activities that will be required for Quarry 4 may have health and safety implications for the personnel that will be working on the project.	Safety	Construction Operational Decommissioning and Closure	Medium Medium	• Control access to site from fencing and access gate. • remedy through awareness training and signage • Appointment of Health and Safety officer to independently monitor safety compliance on site	Low Low

k) Summary of Specialist Reports

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

Table 29: Summary of Specialist Reports

LIST OF STUDIES UNDERTAKEN	RECOMMENDATIONS OF SPECIALIST REPORTS	SPECIALIST RECOMMENDATIONS THAT HAVE BEEN INCLUDED IN THE EIA REPORT (Mark with an X where applicable)	REFERENCE TO APPLICABLE SECTION OF REPORT WHERE SPECIALIST RECOMMENDATIONS HAVE BEEN INCLUDED.
Terrestrial Biodiversity Assessment undertaken by Field and Form Landscape Science	• No areas should be cleared of natural vegetation if not required for construction and operational purposes, and the loss of indigenous vegetation should be limited where possible. • No excavation or other development activities may take place beyond the approved project development footprint areas and development footprint areas should be kept as small and compact as possible. • No natural areas on adjacent properties may be disturbed in any way. • The location and extent of areas of increased ecological importance and sensitivity should be considered during the pre-construction and planning phases of the project and positioning of project infrastructure should avoid areas of increased ecological sensitivity, such as the rocky outcrop and ridge habitat within the production area, and the wetland habitat in the north, as far as possible. Where areas of increased ecological sensitivity can be avoided, these areas should be indicated on site and be off limits to construction vehicles and personnel. • No new infrastructure may be located within the Class 1 ridge or within its designated 200m buffer areas and this area should be a strict No-Go zone for construction and operational activities, including mining vehicles and personnel, with the exception of use of the existing access road. The location of the wetland and any applicable wetland buffers as per the wetland assessment should also be considered. • The existing access road bordering the ridge habitat will be utilised, which may lead to disturbance to the terrestrial ecology of the adjacent ridge. It is important that the following mitigation measures be implemented in considering this portion of the access road: o Road widening along this portion of the access road should be avoided. o Spills should be prevented by ensuring all vehicles utilising the road are well-maintained at all times. o A speed limit of 30km/h must be maintained. o Regular watering down should take place during dry/ windy conditions to manage dust. o Vehicles are to remain strictly on the existing access road and no turning of vehicles may take place along this portion of the road. o Edge effects along this portion of the access road must be effectively managed in terms of invasive species control and erosion. • It is recommended that a fence or other barrier be erected and in place for the duration of the project as indicated in **Figure 41** to prevent access from the production area into the adjacent ridge and prevent encroachment of excavation into this area. The fence/ barrier should be permeable to allow for the movement of small, naturally occurring species while mining activities progress. Should Layout Alternative B be implemented, this fence should follow the corresponding western boundary of the production area. • Ecological connectivity between areas of increased ecological sensitivity should be considered and maintained. Gauteng ridges represent critical wildlife habitat (providing food resources and refugia) and act as biological corridors, providing for movement between habitat patches. • No new access roads through natural areas beyond the approved development footprint area may be constructed and vehicle access beyond the designated project footprint areas should be prohibited. • Construction camps, contractors' laydown areas and other temporary infrastructure are to be placed within areas that have already been modified or areas of lower ecological sensitivity where possible. • No littering or dumping of waste and construction material within natural areas beyond the project footprint areas may be allowed. • Edge effects from construction and operational activities, such as erosion and alien floral species proliferation and the spread of these within disturbed areas, should be managed throughout all the development phases through the implementation of erosion control measures where required and the implementation of an alien and invasive species control plan. Specific attention must be paid in this regard to the ecological the boundary between the production area and the ridge habitat. • Dust suppression measures must be implemented. • Prior to commencement of construction/ development, a rehabilitation plan for the extent of the project area and all areas impacted by the quarrying activities and associated infrastructure must be developed and approved by the relevant authorities for implementation. This rehabilitation plan should be based on the following principles:	x	Table 31

	○ Prior to commencement of site clearance, all available topsoil and upper soil layers containing the seed bank and must be removed and stockpiled separately for use in rehabilitation in such a way to prevent degradation (Van den Berg et al., 2011). ○ As far as possible, site restoration/ rehabilitation should take place concurrently/ progressively and as areas become available for rehabilitation. ○ When backfilling open voids, the surrounding topography needs to be considered and no surface depressions should remain post-closure. ○ Topographic reinstatement should be undertaken where ridge habitat has been impacted to ensure landscape and visual connectivity. ○ The rehabilitation surface should be sloped and shaped in such a way to be free draining and to prevent erosion. ○ Topsoil or suitable growing medium should be applied to the surface prior to revegetation to support vegetation growth, and the necessary soil amelioration should be undertaken. Soil analysis may be required to determine the necessary requirements. ○ Revegetation should, as a minimum, comprise direct seeding of an indigenous grass seed mixture comprising grass species recorded in the study area or species representative of the Central Sandy Bushveld vegetation type. The grass species mixture must comprise both pioneer and climax species, be applied at a density of at least 24kg/ ha and include at least eight grass species. ○ It is strongly recommended that woody tree and shrub species also be planted within the rehabilitation area once topographical reinstatement has taken place and a growing medium has been applied. These species could be cultivated on site from seed collected from site within a shade house or temporary site nursery (if time frames will allow for this) or bought from local indigenous tree cultivators ○ The post-rehabilitation landscape should be capable of supporting a self-sustaining ecosystem. • Mitigation measures prescribed under impact 4 should be strictly implemented. Key mitigation measures include limiting the development and site clearance footprint as much as possible, implementing an alien species management plan throughout the duration of the project, limiting impacts on the ridge habitat by implementing Layout Alternative B, cordoning or fencing off of ridge habitat bordering the production area and implementing rehabilitation to such a degree that indigenous floral species may re-establish within the rehabilitated areas. Mitigation measures as proposed should be implemented to reduce the impact of utilising the existing road traversing the ridge habitat for access to the production area. • The establishment of a temporary site nursery for the purposes of cultivating tree and shrub species for use in revegetation should be considered, if time frames allow for this. • All construction and operational personnel must be educated in environmental awareness and be trained to identify floral SCC known to occur in the project area, as well as floral SCC with a high probability of occurring in the project area. • The loss of floral SCC must be actively avoided and floral SCC and habitat for these species should ideally be conserved *in situ* • It is recommended that the appointed independent Environmental Control Officer (ECO) undertake a walkthrough of the development footprint areas prior to site clearance and commencement of construction. Emphasis should be placed on ridge and rocky slope habitat falling within this area, to confirm that no SCC, not recorded during the current assessment but with an increased likelihood of occurrence are located within the development footprint. Should any such species be recorded, GDARD must be contacted to determine a way forward. Depending on the species' ecological status, GDARD may approve rescue and relocation of such species under the supervision of a suitably qualified specialist and approval of a rescue and relocation procedure. • According to the specialist communication with GDARD, the relocation of floral species listed as protected in terms of the TNCO (No. 12 of 1983) but not of national or provincial conservation concern in Gauteng, is not required. Should any protected tree species in terms of the National Forests Act (Act No. 84 of 1998) be encountered within the project development footprint area during any of the proposed project's development phases, a permit for the removal or destruction of these species has to be obtained from the Department of Forestry and Fisheries and Environment (DFFE) • Should nationally threatened species or species listed as a NEMBA TOPS species be encountered, a permit for removal/ relocation of such species also has to be obtained from DFFE. • No harvesting of firewood or collection of floral species from natural areas surrounding the project footprint should be allowed by construction workers. • Site clearance of the approved footprint must utilise a phased approach to allow faunal species to disperse from the area. With regards to Quarry 4, site clearance should proceed from the centre of the site moving outwards, to allow fauna to move into adjacent habitats that will not be affected by the proposed project. • All vehicles (construction or light motor vehicles) accessing the project must adhere to a 30km/hr speed limit and vigilant driving techniques. • No wild animals may be handled or be interfered with by construction workers or any personnel. • Hunting/ killing/ collection of fauna is prohibited. • Any snares or traps found on or adjacent to the project area must be removed and disposed of. • Should any faunal SCC be noted within the project area, quarrying activities must stop, and the relevant authorities must be notified. Input into the possible relocation of such species or implementation of buffers must be provided by a suitably qualified ecologist. • Biodiversity education and awareness programmes must be implemented. This programme should form part of the staff induction in which topics such as vigilant driving techniques and the necessary procedures for working in close proximity to sensitive habitats. • Disturbance to sensitive habitats including identified buffers and the designated No-Go zone, must be avoided and the project footprint area must be clearly demarcated. Avoiding sensitive habitats will reduce the likelihood of impacts faunal SCC. • No wild animals may be handled or be interfered with by construction workers or any personnel. • In order to reduce noise pollution, proper maintenance of equipment is required, and the implementation of low noise techniques is recommended.		

	• Blasting design must be optimise to minimise the area of disturbance. • Any faunal species located on the site during the construction phase, which cannot relocate themselves (e.g. fossorial species), must be moved to a more suitable location. This should be undertaken by a suitable qualified ecologist/faunal specialist. • Light pollution must be kept to a minimum so as not to interfere with insect life cycles and the attraction of nocturnal vertebrates into the site. Any lighting require must be directed away from sensitive habitats and the use of sodium vapour lights are recommended. • No dumping of waste may take place outside of the project area and any accidental spills of hazardous waste must be immediately cleaned through an appropriate and approved plan.		
Heritage Impact Assessment Undertaken by Dr Johnny van Schalkwyk	• No sites, features or objects of cultural significance were identified, no mitigation measures are proposed. • 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.	X	Table 31
Wetland/Riparian delineation and Functional Assessment was undertaken by Limosella	• Changes in water flow regime o The footprint of activities should be as small as possible and must remain outside the delineated wetland boundaries and buffer zones o Effective stormwater management should be a priority during the construction phase. This should be monitored as part of the EMP. High energy stormwater input into the watercourses should be prevented at all cost. Changes to natural flow of water (surface water as well as water flowing within the soil profile) should be taken into account. o Ensure that the activity does not result in downstream erosion or sedimentation • Changes in sediment entering and existing the system o Sediment traps should be installed downstream of the stormwater outlets. o Cover transport material with tarpaulin to reduce material spillage. o Restrict the height of transport material to reduce material spillage. o Construction in and around watercourses must be restricted to the dryer winter months where possible. o Retain vegetation and soil in position for as long as possible, removing it immediately ahead of construction / earthworks in that area. o Where sedimentation has been observed, effective rehabilitation with a focus on the long term control of alien invasive plants should be done. o Remove only the vegetation where essential for construction and do not allow any disturbance to the adjoining natural vegetation cover. o Where rehabilitation is required the accompanying rehabilitation plan should be followed. o Cordon off areas that are under rehabilitation as no-go areas using danger tape and steel droppers. If necessary, these areas should be fenced off to prevent vehicular, pedestrian and livestock access. o Protect all areas susceptible to erosion and ensure that there is no undue soil erosion resultant from activities within and adjacent to the construction camp and work areas. o Runoff from the construction area and access road must be managed to avoid erosion and pollution problems. o Monitoring should be done to ensure that sediment pollution is timeously addressed • Introduction and spread of alien vegetation o Implement an Alien Plant Control Plan as part of the contractor's method statement o Retain vegetation and soil in position for as long as possible, removing it immediately ahead of construction / earthworks in that area and returning it where possible afterwards. o Monitor the establishment of alien invasive species within the areas affected by the construction and maintenance and take immediate corrective action where invasive species are observed to establish. o Where sedimentation has been observed, effective rehabilitation with a focus on the long term control of alien invasive plants should be done. o Rehabilitate or revegetate disturbed areas • Loss and disturbance of watercourse habitat and fringe vegetation o No construction should occur in the wetland or its buffer. o Demarcate the watercourse areas and buffer zones to limit disturbance, clearly mark these areas as no-go areas o Where sedimentation has been observed, effective rehabilitation with a focus on the long term control of alien invasive plants should be done. o Monitor the establishment of alien invasive species within the areas affected by the construction and take immediate corrective action where invasive species are observed to establish • Changes in water quality due to foreign materials and increased nutrients o Provision of adequate sanitation facilities located outside of the watercourse or its associated buffer zone. o Implementation of appropriate stormwater management around the excavation to prevent the ingress of run-off into the excavation and to prevent contaminated runoff into the watercourse. o The development footprint must be fenced off from the watercourses and no related impacts may be allowed into the watercourse e.g. water runoff from cleaning of equipment, vehicle access etc. o After construction, the land must be cleared of rubbish, surplus materials, and equipment, and all parts of the land shall be left in a condition as close as possible to that prior to use. o Maintenance of construction vehicles / equipment should not take place within the watercourse or watercourse buffer. o Control of waste discharges and do not allow dirty water from operational activities to enter the watercourse o Treatment of pollution identified should be prioritized accordingly.	X	Table 31
Desktop Palaeontological Impact Assessment	• Special care must be taken during the digging, drilling, blasting and excavating of foundations, trenches, channels and footings and removal of overburden as a site visit may have missed a fossiliferous outcrop. • The development may go ahead, but the ECO must survey for fossils before and or after clearing, blasting, drilling or excavating.	X	Table 31

	• If any palaeontological material is exposed during digging, excavating, drilling or blasting SAHRA must be notified. All construction activities must be stopped, and a palaeontologist should be called in to determine proper mitigation measures.		

Specialist Reports are attached to **Appendix F**.

In addition to the Specialist Studies undertaken, according to Regulation 16(1)(v) of the NEMA EIA Regulations 2014, as amended, an Application for Environmental Authorisation must be accompanied by 'the report generated by the national web based environmental screening tool. The custodian of this report is the Department of Forestry, Fisheries and Environment. The results of the tool are indicated in the Report attached as **Appendix H.**

Page 8 of 15 of the DFFE Screening Report indicates that certain Specialist Assessments must be undertaken for the proposed development Quarry 4. There is however an allowance of the EAP to motivate for the reasons for not including certain assessments in the assessment report. **Table 30** presents these Specialist Assessments/ Studies as well as the motivations behind the EAP's decision of the recommendations behind the undertaking or non-undertaking of certain Specialist Assessments/ Studies.

Table 30:DFFE Screening Tool, Summary of discussions regarding the undertaking of Specialist Assessments

No	Specialist Assessment	EAP Motivation
1	Agricultural Impact Assessment	Based on the desktop and site assessment undertaken by the EAP it has been noted that the northern section of the site was historically used for agricultural purposes. The site is characterised by a CBA, ridge habitat and a rocky slope habitat with free roaming wildlife. Currently the SAPS utilises the same farm portion as a training academy, whereby a portion of the property has been impacted on. According to the DFFE screening tool the site has a medium sensitivity with a pocket of high sensitivity. The site proposed for the Quarry is currently vacant, and the landowner (South African Government) has been consulted in terms of this EIA process and SANRAL will commence with a land acquisition process only once all the relevant authorisations have been received. Based on the above, the EAP suggests that an Agricultural Impact Assessment is not required.
2	Archaeological and Cultural Heritage Impact Assessment	The Archaeological and Cultural Heritage theme has a medium sensitivity due to the presence of a ridge. However, in terms of Section 38 (1) of the National Heritage Resources Act, 1999 (Act No. 25 of 1999) a Heritage Impact Assessment is required for Quarry 4. A Phase 1 Heritage Impact Assessment has been undertaken. The report is attached to **Appendix F**.
3	Palaeontology Impact Assessment	The Palaeontological Impact Assessment has been undertaken for the proposed Quarry 4. The specialist report is attached to Appendix F.
4	Terrestrial Biodiversity Impact Assessment	According to the DFFE screening tool, the Terrestrial Biodiversity has a very high sensitivity. A Terrestrial Biodiversity Assessment has been undertaken. The report is attached to **Appendix F**.

5	Aquatic Biodiversity Impact Assessment	According to the DFFE screening tool, the aquatic biodiversity theme is low, however an aquatic assessment was undertaken for the entire R573-1 project which includes Quarry 4. A Wetland Assessment has also been undertaken. The report is attached to **Appendix F**.
6	Hydrology Assessment	The proposed project will not impact on any perennial water courses; hence a hydrological assessment is not required.
7	Noise Impact Assessment	The Quarry will be located in area where the noise levels are Medium to low as the site is directly adjacent to the Moloto Training Academy and a shooting range as part of the academy. The proposed quarry will generate noise through the construction and operational activities. However, the noise generated on site will be managed through the EMPr. Hence a noise impact assessment will not be required.
8	Traffic Impact Assessment	A Traffic Impact Assessment has been commissioned by KBK Engineers for the upgrade of the R573 Moloto Road. In terms of Quarry 4, a Traffic Impact Assessment will not be required as traffic issues will be managed through a Traffic Management Plan which shall be compiled by the appointed Contrcator.
9	Geotechnical Assessment	A Geotechnical Investigation has been commissioned by KBK Engineers in order to determine and assess the material quality on site. The report is attached to **Appendix F**.
10	Climate Impact Assessment	The proposed Quarry 4 will generate emissions through its direct operations and through its value chain. The direct emission will be through the emission of combustion of diesel in equipment and haulage vehicles. Indirect operations will be haulage purchased goods and services e.g., diesel, and capital goods e.g., equipment fleet. The Contractor will use generators on site, hence imported electricity would not be required which is a major contributor to Green House Gas Emissions. Bearing in mind that the proposed operations will be temporary, and the site will be rehabilitated by SANRAL once the construction is completed. A closure certified will be obtained from the DMRE, a Climate Change assessment will not be required.
11	Health Impact Assessment	The proposed mining operations will generate fugitive dust emissions from mining operations and vehicle tailpipe emissions, vehicle entrained dust from paved and unpaved roads. In terms of dust, non-toxic and environmentally friendly dust suppression measures will be undertaken on site and on haulage roads to prevent vegetative dust. Regular dust monitoring will be undertaken on site during the construction and operational phases. Ongoing community forum meetings will be held by the Contractor and the adjacent communities to

		present the findings of the monitoring. Considering the long-term viability of the Quarry, the surfacing of the haulage routes will be undertaken as a control measure for dust. The mitigation measures for dust will be included in the EMPr. A health impact assessment will therefore not be required.
12	Socio-Economic Assessment	In terms of land use change, it is not anticipated that the Quarry will lead to a drastic land use change as the proposed activities is temporary and rehabilitation will be undertaken once the mining activities have been concluded. The main objective for the mining of Quarry 4 is for material sources for the upgrade of the R573 Moloto Road. The proposed road will also relieve the traffic pressure on surrounding link roads. There is a likelihood of temporary employment during the construction & Operational phase of the project. In addition, the proposed Quarry 4 is situated on land that is owned by the South African Government. It is the opinion of the EAP that a Socio-Economic Assessment is not deemed necessary.
13	Ambient Air Quality Impact Assessment	Dust generation during the construction and operational phase of the project will be manged according to the dust suppression measures provided in the approved EMPr. Dust outfall monitoring will also be undertaken. The EAP therefore suggests that an Ambient Air Quality Assessment is not necessary.
14	Air Quality Assessment	Dust generation during the construction and operational phase of the project will manged according to the dust suppression measures provided in the approved EMPr. Dust outfall monitoring will also be undertaken. The EAP therefore suggests that an Air Quality Assessment is not necessary.
15	Plant Species Assessment	According to the DFFE screening tool, the plant species theme has a medium sensitivity. A Terrestrial Biodiversity Assessment has been commissioned. The report is provided in **Appendix F**.
16	Animal Species Assessment	According to the DFFE screening tool, the animal species theme has a medium sensitivity. A Terrestrial Biodiversity Assessment (Fauna and Flora) has been undertaken. The report is provided in **Appendix F**.

l) Environmental impact statement

(i) Summary of the key findings of the environmental impact assessment;

Table 28 of the report provides the significance of impacts pre and post mitigation. The project area is located in a region characterised by mostly undeveloped land and small holdings, interspersed with gravel roads and occasional agricultural fields, within a rural setting. As part of the Terrestrial Biodiversity Assessment, project area is not located within a listed threatened ecosystem but is located within an area earmarked as being of very high conservation importance in terms of the Gauteng C-Plan (2011) and the 2012 Mining and Biodiversity Guidelines. The project area is indicated to comprise remnant vegetation in terms of the 2018 NBA and is located within the Central Sandy Bushveld vegetation type which has a Vulnerable (VU) conservation status according to Mucina & Rutherford (2006) and Least Concern in line with the National Biodiversity Assessment, 2018 (NBA). Based on the Terrestrial Biodiversity Assessment, it is evident that the ridge and rocky slopes habitat within the southern portion of the project area provide intact, mostly undisturbed habitat for a high diversity of floral and faunal species. These habitat units are considered to be of high and medium high ecological sensitivity, respectively. Although no International Union for Conservation of Nature (IUCN) or SANBI floral SCC were recorded, these habitat units do provide suitable habitat for such species. The ridge habitat unit also includes an area indicated by GDARD as being a Class 1 ridge. According to the 2019 Gauteng Ridges Guidelines, no development within a Class 1 ridge will be supported, and a 200m buffer zone must be maintained around the ridge. The proposed mining activities will not be situated within the class 1 ridge, however the existing access road is situated with the 200m buffer zone. The access road will be used for the haulage of material. In terms of the GPEMF, the proposed site is situated in Zone 3: High control zone (outside the urban development zone) & Zone 4: Normal control zone as well as Special Control Zone (Dinokeng).

In terms of the Wetland Assessment undertaken, a seepage wetland was delineated north of the study area. The identified seepage wetland will not be impacted on by the excavations to be undertaken, but potential impacts could result from the haulage of material. It is anticipated that the haulage vehicles will make use of the existing access track which traverses the wetland as well as a proposed new bypass track. The bypass access track has been planned to be constructed out of the 50m buffer of the active section of the wetland, where wetland vegetation, habitat and foraging is evident.

In terms of heritage resources, no sites, features or objects of cultural significance were identified within the study area.

Due to the proposed Quarry site being largely intact, the impact assessment revealed that certain proposed activities without mitigation are expected to have impacts with high significance ratings in relation to Fauna and Flora habitat. The overall impacts of the proposed Quarry 4 will have high to moderate impacts on the bio-physical environment and some of the impacts can be reduced to a medium to low significance provided all recommended mitigation are adhered to.

Although the proposed development has been assessed to pose significant negative environmental or social impacts that cannot be mitigated to acceptable levels, there are significant positive socio-economic impacts that will emanate from the proposed project, and the development will contribute towards economic growth in line with the countries ‘Strategic Infrastructure Projects already planned along the Moloto corridor.

It must be noted that there are certain sensitivities on site that are unavoidable. In order to protect biodiversity and conserve sensitive environments during development, steps that should be followed are to firstly avoid, then minimize, then repair or restore, and finally compensate for, or offset (if possible) the negative effects of any development on biodiversity. Thus, where the impact is unavoidable, the impacts must be minimized and the unavoidable and unforeseen impacts restored or rehabilitated.

(ii) Final Site Map

Figure 42 provides a Site layout plan of the preferred alternative.

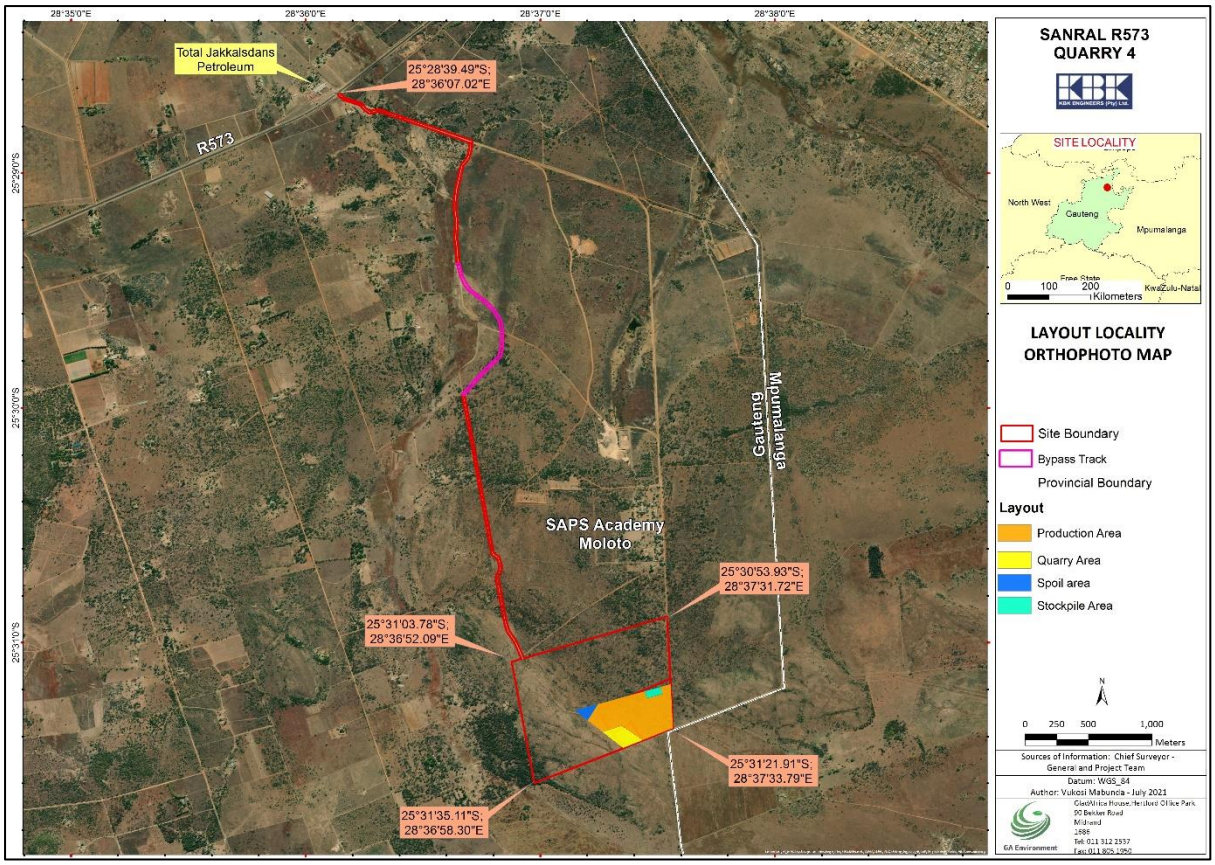

Figure 42: Final Site Layout Map

(iii) Summary of the positive and negative impacts and risks of the proposed activity and identified alternatives;

A summary of the positive and negative have been provided in **Section h (vii).**

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**.**

The purpose of the EMPr is to provide relevant management measures to conduct activities with due care and diligence, as well as avoid/ limit any adverse impacts of Quarry 4. The EMPr is compiled to help control impacts that may occur to meet acceptable standards, both as a legal and social responsibility to the environment within which the activities take place.

The objectives of the EMPr are as follows:

- To ensure compliance with applicable legislation and/or guidelines;
- To ensure that the roles and responsibilities of the various parties involved in the implementation of the EMPr are clearly outlined;
- To reduce adverse environmental impacts as a result of the project activities; and
- To ensure continuous improvement in terms of the environmental performance of the project.

The following environmental management objectives are recommended for the proposed Quarry 4 development and associated infrastructure:

- Alien plant monitoring should take place after construction, throughout the lifecycle of the Quarry, as well as post closure of the Quarry;
- Monitor soils so as to avoid unnecessary erosion, and implement erosion control measures to preserve the quality of the soil for rehabilitation;
- Development planning must restrict the area of impact to minimum and designated areas only;
- Monitor and prevent contamination and undertake appropriate remedial actions;
- Limit the visual and noise impact on receptors;
- Avoid impact on possible heritage finds;
- Promote health and safety of workers; and
- Limit dust and other emissions to within allowable limits.

n) Aspects for inclusion as conditions of Authorisation.

Any aspects which must be made conditions of the Environmental Authorisation

The following aspects have been noted by the EAP for inclusion as conditions of the Environmental Authorisation for Quarry 4:

- An Environmental Management Programme (EMP) for the construction and operational phases must be implemented for the duration of the proposed project. The EMPr is attached to Appendix G.
- Implementation of the EMPr for the entire life-cycle (i.e. construction, operation, rehabilitation and closure) of the project is considered to be vital in achieving the appropriate environmental management standards as detailed for this project.
- SANRAL is not negated from complying with any other statutory requirements that is applicable to the undertaking of the activity. All necessary permits, licences and approvals must be obtained prior to the commencement of construction.
- The proponent must appoint a suitably experienced Environmental Control Officer (ECO) for the construction phase of the development that will have the responsibility to ensure that the mitigation / rehabilitation measures and recommendations are implemented and to ensure compliance with the provisions of the EMPr.
- The conditions in terms of the General Authorisation issued by the Department of Sanitation shall be adhered to.
- The Department of Rural Development and Land Reform shall be notified of the commencement of mining activities,30 days prior to site establishment.
- A site walkdown shall be undertaken prior to the construction phase of the project. The Floral SCC and projected tree species shall be clearly marked and recorded.
- Should the presence of any floral or faunal SCC not recorded during the current study be confirmed within the project area, rescue and relocation of these species must take place under the supervision of a suitable qualified botanist or faunal specialist and with the required permits in place if necessary, and the existing management strategy must be adapted to protect such species. According to the Terrestrial Biodiversity Assessment, an Aardvark (*Orycteropus afer*) burrow was noted within the woodland habitat. Such burrow shall be confirmed during the site walkdown and if still active shall be avoided.
- The bypass access track shall be discussed with the ECO prior to the clearance of vegetation;
- The width of any new access tracks shall be below 4m.
- No new infrastructure may be located within the Class 1 ridge or within its designated 200m buffer areas and this area should be a strict No-Go zone for construction and operational activities, including mining vehicles and personnel, with the exception of use of the existing access road. The location of the wetland and any applicable wetland buffers as per the wetland assessment should also be considered.

- The existing access road bordering the ridge habitat will be utilised, which may lead to disturbance to the terrestrial ecology of the adjacent ridge. It is important that road widening along this portion of the access road should be avoided.
- It is recommended that a fence or other barrier be erected and in place for the duration of the project to prevent access from the production area into the adjacent ridge and prevent encroachment of excavation into this area. The fence/ barrier should be permeable to allow for the movement of small, naturally occurring species while mining activities progress.
- Should any faunal SCC be noted within the project area, quarrying activities must stop, and the relevant authorities must be notified. Input into the possible relocation of such species or implementation of buffers must be provided by a suitably qualified ecologist.
- Prior to site clearance, a description of the rescue and relocation process and procedures must be submitted to GDARD for approval. This description must also include a map of the current location of floral SCC to be relocated, a map indicating where the plants will be relocated to and details of how the long-term survival of the plants once relocated will be ensured. If approved by GDARD, the rescue and relocation procedure must be implemented.
- The mining area should be demarcated and fenced off, to prevent unauthorised entry.
- All development activities must be monitored to ensure that the footprint areas do not exceed approved areas.
- All declared alien plants must be identified and managed in accordance with the Conservation of Agricultural Resources Act, 1983 (Act No 43 of 1994), and the implementation of a monitoring programme in this regard is recommended.
- Ecological connectivity within the project area and between the project area and adjacent properties should be considered and maintained where and if possible, to ensure faunal movement patterns are not completely restricted.
- SANRAL shall ensure that land owner negotiations are undertaken prior to the commencement of activities on site.
- Accurate blasting management plans and blasting charge calculations should be developed and/or calculated to ensure that good blasts are achieved without overcharging of the blast holes which will result in the generation of excessive noise and elevated levels of blasting emissions.
- Air quality to be monitored (baseline and during construction and operation) for dust fallout and particulate matter. Sampling locations to consider major sources of dust and sensitive receptors.
- Prior to the commencement of construction activities, baseline noise monitoring shall be undertaken at sensitive receptors (within 1km from the site) and at the site.
- Stormwater Management Plan shall be compiled to describe the design measures that ensure contaminated water is kept separate from clean water run-off through a system of berms, trenches, and erosion protection measures.
- Should archaeological sites or graves be exposed during construction work, it must immediately be reported to a heritage practitioner and the Provincial Heritage Resource Agency-Gauteng so that an investigation and evaluation of the finds can be made.
- An Environmental monitoring committee shall be established. Such committee shall include the adjacent landowners. The dust monitoring results shall be discussed in this committee.
- All adjacent residents shall be informed of the Quarry 30 days prior to site establishment.
- A public complaints register must be available on site to record any issues of concern from the public regarding the project.
- Implementation of the environmental awareness education to the contractor's during and prior to construction
- The Contractor must ensure that the recruitment process is conducted through the community structures established for the contract.
- A Project Liaison Committee (PLC) shall be established to assist with the recruitment of local labour.
- Develop a comprehensive Rehabilitation and Closure Plan prior to the decommissioning and closure of the proposed quarry operation.

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

(Which relate to the assessment and mitigation measures proposed)

The following assumption and limitations have been identified for the proposed Quarry 4 development:

Assumptions

- The report has been compiled based on the assumption that KBK Engineers has provided all required information to undertake a complete and accurate assessment.
- The EAP and specialists have identified all possible impacts based on the information provided and these have been assessed and rated; accordingly, and
- Due to the complexity of natural ecosystems and seasonality of species, it is possible that some aspects pertaining to terrestrial biodiversity, including certain floral species, may have been overlooked during the field assessment, however all effort was made by the consultants to gather and convey accurate information, although the possibility exists that additional information with regard to the project area may come to light at a later stage. It is also important to note that the majority of floral SCC are also known to be extremely seasonal and only flower during specific periods of the year. Prior information on potential threatened flora that may occur in the project area was however known and special emphasis was placed in searching for such species during the field assessment.

Uncertainties

- The EMPr that forms part of this Basic Assessment Report provides an assessment of impacts and mitigation measures based on the specialist assessment, site visits, and public participation process. As the impact assessment is a predictive tool, the applicant shall ensure that the require monitoring of the project is undertaken to determine the validity and accuracy of the predictions made. The EMPr shall be improved and refined regularly to ensure that management measures are effective to avoid, minimize and mitigate impacts; and that corrective action is being undertaken to address shortcomings.

Gaps in knowledge

- Thus far, the Public Participation Process has been undertaken in line with the directions regarding the measures to address, prevent and combat the spread of the COVID-19 relating to the National Environmental Management Permits and Licenses. All protocols have been observed to ensure these regulations are upheld whilst the public is afforded an opportunity to comment and participate in the Basic Assessment Process.
- In accordance with the Protection of Personal Information Act (Act 4 of 2013), personal information (emails, contact numbers, address) have been blanked out and excluded from Public Participation section and will only be provided to DMRE officials.
- Personal information of I&APs made available to the competent authority shall only be used by the authorities to confirm or obtain information regarding this specific project.

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

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

It is the reasoned opinion of the EAP that the project shall be authorised due to the following reasons:

- Should the mitigation measures and monitoring programmes proposed in this document be implemented on site, no fatal flaws could be identified that were deemed so severe as to prevent the activity from continuing.
- The R573 Moloto Road is a National Road which would like together Gauteng, Mpumalanga and Limpopo provinces, economic hubs which will play a role in economic development and

upliftment. The R573 Moloto Road upgrade will also facilitate the safe and efficient movement of people and goods and services as well as an important catalyst for the development of the Moloto Corridor. The R573 Moloto Road upgrade will serve as an impetus to improve feeder road networks while facilitating sustainable economic growth along the entire corridor. In order to address safety, mobility functions and ensure that reasonable access is provided to adjacent properties and areas to enable the future land use development, SANRAL is proposing the upgrade of the R573 Moloto Road. The material required for the proposed project is for the upgrade of the R573 Moloto Road for the use of the local communities, and other commuters.

- Should the proposed Quarry 4 not be authorised, then material from commercial sources will need to be sourced which would not be financially viable due to the required quality and quantity of material.
- The expected long-haul distances from commercial sources could potentially result in a larger carbon footprint and further deterioration to the R573.

Although the proposed development has been assessed to pose significant negative environmental or social impacts that cannot be mitigated to acceptable levels, there are significant positive socio-economic impacts that will emanate from the proposed project, and the development will contribute towards economic growth in line with the countries 'Strategic Infrastructure Projects. It must be noted that there are certain sensitivities on site that are unavoidable. In order to protect biodiversity and conserve sensitive environments during development, steps that should be followed are to firstly avoid, then minimize, then repair or restore, and finally compensate for, or offset (if possible) the negative effects of any development on biodiversity. Thus, where the impact is unavoidable, the impacts must be minimized and the unavoidable and unforeseen impacts restored or rehabilitated.

(ii) Conditions that must be included in the authorisation

Conditions to be included in the authorisation have been included in Section N above.

q) Period for which the Environmental Authorisation is required.

Environmental Authorisation is required for 10 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 is provided at the end of the EMPr and is applicable to the BAR and the EMPr.

s) Financial Provision

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

SANRAL is exempted from having financial provision to be held by DMRE in the form of a bank guarantee. However, budget will be set aside by SANRAL to ensure that this area is rehabilitated and left in a manner that is environmentally safe. This has been confirmed by the DMRE in a meeting held on the 15th of October 2020. The minutes of the meeting are attached to **Appendix E**.

(i) Explain how the aforesaid amount was derived.

Refer to the comment provided in Section S, under financial provision.

(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).

Refer to the comment provided in Section S, under financial provision.

t) Specific Information required by the competent Authority

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

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

The proposed Quarry 4 will be utilised for the upgrades of the R573 Moloto Road and associated link roads. The R573 Moloto Road is one of South Africa's busiest and most important economic routes connecting Gauteng, Mpumalanga, and Limpopo provinces with an extremely high number of buses and light motor vehicles. The road links small towns and rural settlements with Pretoria and carries inter-district traffic between these locations, hence the road is an important regional mobility function but has an equally significant accessibility function (KBK Engineers, 2020). Should the R573 Moloto Road not be maintained, there will be negative impact on the people, their safety and their livelihoods, furthermore vehicular wear and tear and maintenance results in higher living costs. The approval/commissioning of the proposed Quarry will allow for the proposed Moloto Road Upgrade that will benefit not only local communities and residents but also all road users. The proposed Quarry 4 site forms part of a larger police area and is currently vacant with grazing wildlife. Subsequent to the mining activities, the Quarry 4 area will be rehabilitated back to its pre-mining state once mining activities are completed. The proposed site is owned by the South African Government.

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

A Heritage Impact Assessment was undertaken by Dr Johnny van Schalkwyk, no sites, features or objects of cultural significance were identified for the proposed Quarry 4.

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).

Not applicable as alternatives have been assessed.

PART B: ENVIRONMENTAL MANAGEMENT PROGRAMME REPORT

The Environmental Management Programme report shall be read together with the Environmental Management Programme compiled in terms of the 2014 EIA, Regulations, as amended, (Appendix 4). The Environmental Management Programme is attached to Appendix G of this Basic Assessment Report.

1) Draft environmental management programme.

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

The details and expertise of the EAP are included in Part A, section 3(a).

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

The aspects of the activity that are covered by the draft EMPr are included in Part A (Section d).

c) Composite Map

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

The composite map is attached as Appendix B and provided in **Figure 43** below.

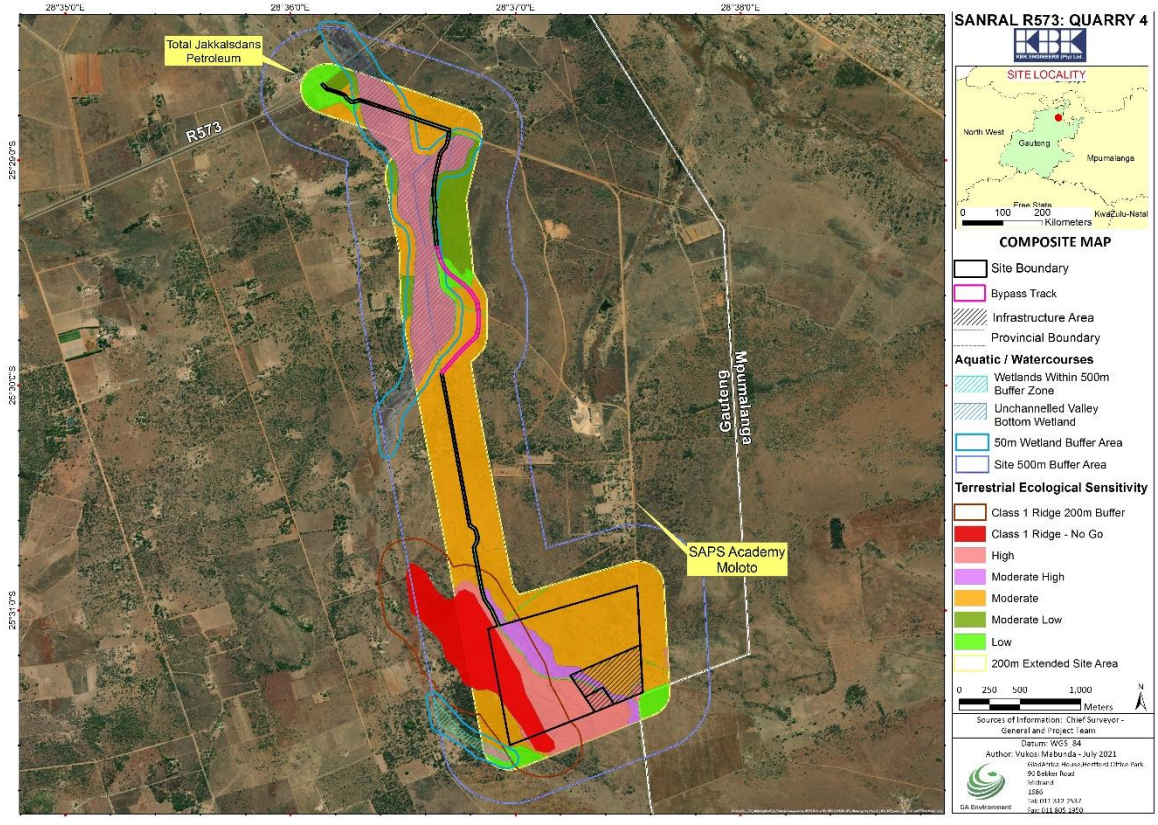

Figure 43: Composite Map of the proposed Quarry 4

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)

The following closure objectives for the proposed Quarry 4 are to:

- Ensure the long-term stability and environmental quality of the site to minimise potential environmental and health risks by the implementation of progressive rehabilitation, as far as possible, throughout the life of the quarry to reduce the rehabilitation efforts required at the time of closure;
- Once the mining activity has ceased, the mining area shall be levelled with topsoil, overburden rocks and revegetated;
- The project area and immediate surrounds must be monitored for erosion and where encountered; immediate rectification must take place;
- The project area and immediate surrounds must be monitored for invasive floral species, and where encountered, these should be eradicated immediately;
- Reduce the visual impact of the Quarry components through rehabilitation of all disturbed land
- All temporary structures (ablution facilities, refuse bin, contractors office) shall be dismantled and removed; and
- The Quarry must be shaped to ensure that no stockpiled heaps remain, and the area blends in with the existing landscape.

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

Water may be required for dust suppression especially during crushing operations and for use during construction. It is anticipated that a minimal volume of water will be required for the proposed Quarry. The appointed Contractor responsible for the operation of the Quarry 4, will be responsible for ensuring that the relevant permits/authorisations are in place based on their assessment of suitable water sources.

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

As the proposed haulage access track falls with the Department of Water and Sanitation's regulated area, a Water Use Authorisation application in terms of Section 21 (c) and (i) of the National Water Act (Act 36 of 1998) was lodged with the department. The DWS issued a General Authorisation on the 15th of February 2021. The General Authorisation is attached to **Appendix I**.

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iv). Impacts to be mitigated in their respective phases

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

Table 31: Impacts to be mitigated in their Respective Phases

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).	**ASPECTS AFFECTED**	**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 alluvial diamond prospecting as the case may be.
Excavation and Stockpiling, Reshaping of the Quarry pit, resurfacing	Operational, Decommissioning and Closure	Topography	Approximately 19.4 ha	• The footprint of the proposed mining activities shall be demarcated in order to restrict the excavation footprint. • Local depressions within the Quarry pit area shall be backfilled with available material as part of the wider shaping operations. • Once localised backfilling is complete, the side slopes shall be shaped, and the area shall be fenced off.	Compliance with the Mitigation measures provided in the BAR	
Excavations, Reshaping of the Quarry pit, resurfacing	Operational, Decommissioning and Closure	Geology	Approximately 19.4 ha	• The footprint of the proposed mining activities shall be demarcated in order to restrict the excavation footprint. • Local depressions within the Quarry pit area shall be backfilled with available material as part of the wider shaping operations. • Once localised backfilling is complete, the side slopes shall be shaped, and the area shall be fenced off.	Compliance with the Mitigation measures provided in the BAR	
Vegetation Clearing, removal of topsoil and stockpiling, construction of infrastructure Reshaping of the Quarry pit & resurfacing, removal of infrastructure	Operational, Construction; Decommissioning and Closure	Loss of Faunal and Floral habitat	Approximately 19.4ha	• No areas should be cleared of natural vegetation if not required for construction and operational purposes, and the loss of indigenous vegetation should be limited where possible. • No excavation or other development activities may take place beyond the approved project development footprint areas and development footprint areas should be kept as small and compact as possible. • No natural areas on adjacent properties may be disturbed in any way. • The location and extent of areas of increased ecological importance and sensitivity should be considered during the pre-construction and planning phases of the project and positioning of project infrastructure should avoid areas of increased ecological sensitivity, such as the rocky outcrop and ridge habitat, and the wetland habitat in the north, as far as possible. Where areas of increased ecological sensitivity can be avoided, these areas should be indicated on site and be off limits to construction vehicles and personnel. • No new infrastructure may be located within the Class 1 ridge or within its designated 200m buffer areas and this area should be a strict No-Go zone for construction and operational activities, including mining vehicles and personnel, with the exception of use of the existing access road. The location of the wetland and any applicable wetland buffers as per the wetland assessment should also be considered. • The existing access road bordering the ridge habitat will be utilised, which may lead to disturbance to the terrestrial ecology of the adjacent ridge. It is important that the following mitigation measures be implemented in considering this portion of the access road: o Road widening along this portion of the access road should be avoided. o Spills should be prevented by ensuring all vehicles utilising the road are well-maintained at all times.	Compliance with the Mitigation measures provided in the BAR Compliance with the mitigations provided by the specialist	Throughout construction, operational and decommissioning and closure phases

				○ A speed limit of 30km/h must be maintained. ○ Regular watering down should take place during dry/ windy conditions to manage dust. ○ Vehicles are to remain strictly on the existing access road and no turning of vehicles may take place along this portion of the road. ○ Edge effects along this portion of the access road must be effectively managed in terms of invasive species control and erosion. • It is recommended that a fence or other barrier be erected and in place for the duration of the project as indicated in **Figure 41** to prevent access from the production area into the adjacent ridge and prevent encroachment of excavation into this area. The fence/ barrier should be permeable to allow for the movement of small, naturally occurring species while mining activities progress. Should Layout Alternative B be implemented, this fence should follow the corresponding western boundary of the production area. • Ecological connectivity between areas of increased ecological sensitivity should be considered and maintained. Gauteng ridges represent critical wildlife habitat (providing food resources and refugia) and act as biological corridors, providing for movement between habitat patches. • No new access roads through natural areas beyond the approved development footprint area may be constructed and vehicle access beyond the designated project footprint areas should be prohibited. • Construction camps, contractors' laydown areas and other temporary infrastructure are to be placed within areas that have already been modified or areas of lower ecological sensitivity where possible. • No littering or dumping of waste and construction material within natural areas beyond the project footprint areas may be allowed. • Edge effects from construction and operational activities, such as erosion and alien floral species proliferation and the spread of these within disturbed areas, should be managed throughout all the development phases through the implementation of erosion control measures where required and the implementation of an alien and invasive species control plan. Specific attention must be paid in this regard to the ecological the boundary between the production area and the ridge habitat. • Dust suppression measures must be implemented. • A rehabilitation plan for the extent of the project area and all areas impacted by the quarrying activities and associated infrastructure must be developed and approved by the relevant authorities for implementation prior to closure. ○ Prior to commencement of site clearance, all available topsoil and upper soil layers containing the seed bank and must be removed and stockpiled separately for use in rehabilitation in such a way to prevent degradation (Van den Berg et al., 2011). ○ As far as possible, site restoration/ rehabilitation should take place concurrently/ progressively and as areas become available for rehabilitation. ○ When backfilling open voids, the surrounding topography needs to be considered. Although the specialist recommended that no surface depressions should remain post-closure it is the EAP's recommendation that where no surface depressions cannot be avoided, shaping of the side slopes to reduce the gradient, and fencing shall be undertaken. ○ It was the specialist recommendation that the rehabilitated surface should be sloped and shaped in such a way to be free draining, to prevent erosion and to a degree which will support vegetation establishment. It is the EAP recommendation that the side slopes are re-vegetated by commercial grass seeds to allow for eventual return to natural vegetation. ○ Topsoil or suitable growing medium should be applied to the surface prior to revegetation to support vegetation growth, and the necessary soil amelioration should be undertaken. Soil analysis may be required to determine the necessary requirements. ○ Revegetation should, as a minimum, comprise direct seeding of an indigenous grass seed mixture comprising grass species recorded in the study area or species representative of the Central Sandy Bushveld vegetation type. The grass species mixture must comprise both pioneer and climax species, be applied at a density of at least 24kg/ ha and include at least eight grass species. ○ It is strongly recommended that woody tree and shrub species also be planted within the rehabilitation area once topographical reinstatement has taken place and a growing medium has been applied. These species could be cultivated on site from seed collected from site within a shade house or temporary site		

				nursery (if time frames will allow for this) or bought from local indigenous tree cultivators o The post-rehabilitation landscape should be capable of supporting a self-sustaining ecosystem.		
Vegetation Clearing, removal of topsoil and stockpiling, Reshaping of the Quarry pit & resurfacing, removal of infrastructure	Construction, Operational; Decommissioning and Closure	Loss of floral Species diversity and Floral SCC	Approximately 19.4ha	• Mitigation measures prescribed under impact 4 should be strictly implemented. Key mitigation measures include limiting the development and site clearance footprint as much as possible, implementing an alien species management plan throughout the duration of the project, limiting impacts on the ridge habitat by implementing Layout Alternative B, cordoning or fencing off of ridge habitat bordering the production area and implementing rehabilitation to such a degree that indigenous floral species may re-establish within the rehabilitated areas. Mitigation measures as proposed should be implemented to reduce the impact of utilising the existing road traversing the ridge habitat for access to the production area. • The establishment of a temporary site nursery for the purposes of cultivating tree and shrub species for use in revegetation should be considered, if time frames allow for this. • All construction and operational personnel must be educated in environmental awareness and be trained to identify floral SCC known to occur in the project area, as well as floral SCC with a high probability of occurring in the project area. • The loss of floral SCC must be actively avoided and floral SCC and habitat for these species should ideally be conserved *in situ* • It is recommended that the appointed independent Environmental Control Officer (ECO) undertake a walkthrough of the development footprint areas prior to site clearance and commencement of construction. Emphasis should be placed on ridge and rocky slope habitat falling within this area, to confirm that no SCC, not recorded during the current assessment but with an increased likelihood of occurrence are located within the development footprint. Should any such species be recorded, GDARD must be contacted to determine a way forward. Depending on the species' ecological status, GDARD may approve rescue and relocation of such species under the supervision of a suitably qualified specialist and approval of a rescue and relocation procedure. • According to the specialist communication with GDARD, the relocation of floral species listed as protected in terms of the TNCO (No. 12 of 1983) but not of national or provincial conservation concern in Gauteng, is not required. Should any protected tree species in terms of the National Forests Act (Act No. 84 of 1998) be encountered within the project development footprint area during any of the proposed project's development phases, a permit for the removal or destruction of these species has to be obtained from the Department of Forestry and Fisheries and Environment (DFFE) • Should nationally threatened species or species listed as a NEMBA TOPS species be encountered, a permit for removal/ relocation of such species also has to be obtained from DFFE. • No harvesting of firewood or collection of floral species from natural areas surrounding the project footprint should be allowed by construction workers.	Compliance with the Mitigation measures provided in the BAR Compliance with the mitigations provided by the specialist	
Vegetation Clearing, removal of topsoil and stockpiling, construction of infrastructure	Construction, Operational,	Loss of faunal species diversity, SCC and disturbance to Faunal Communities	Approximately 19.4ha	• Site clearance of the approved footprint must utilise a phased approach to allow faunal species to disperse from the area. With regards to Quarry 4, site clearance should proceed from the centre of the site moving outwards, to allow fauna to move into adjacent habitats that will not be affected by the proposed project. • All vehicles (construction or light motor vehicles) accessing the project must adhere to a 30km/hr speed limit and vigilant driving techniques. • No wild animals may be handled or be interfered with by construction workers or any personnel. • Hunting/ killing/ collection of fauna is prohibited. • Any snares or traps found on or adjacent to the project area must be removed and disposed of. • Should any faunal SCC be noted within the project area, quarrying activities must stop, and the relevant authorities must be notified. Input into the possible relocation of such species or implementation of buffers must be provided by a suitably qualified ecologist. • Biodiversity education and awareness programmes must be implemented. This programme should form part of the staff induction in which topics such as vigilant driving techniques and the necessary procedures for working in close proximity to sensitive habitats.	Compliance with the Mitigation measures provided in the BAR Compliance with the mitigations provided by the specialist	

				• Disturbance to sensitive habitats including identified buffers and the designated No-Go zone, must be avoided and the project footprint area must be clearly demarcated. Avoiding sensitive habitats will reduce the likelihood of impacts faunal SCC. • No wild animals may be handled or be interfered with by construction workers or any personnel. • In order to reduce noise pollution, proper maintenance of equipment is required, and the implementation of low noise techniques is recommended. • Blasting design must be optimise to minimise the area of disturbance. • Any faunal species located on the site during the construction phase, which cannot relocate themselves (e.g. fossorial species), must be moved to a more suitable location. This should be undertaken by a suitable qualified ecologist/faunal specialist. • Light pollution must be kept to a minimum so as not to interfere with insect life cycles and the attraction of nocturnal vertebrates into the site. Any lighting require must be directed away from sensitive habitats and the use of sodium vapour lights are recommended. • No dumping of waste may take place outside of the project area and any accidental spills of hazardous waste must be immediately cleaned through an appropriate and approved plan.		
Vegetation clearing, Topsoil removal and stockpiling, Vehicle movement and construction of Infrastructure	Construction, Operational, Decommissioning and Closure	Soils	Approximately 19.4ha	• A stormwater management plan must be compiled and implemented by the Contractor to take the increased surface water run-off rates and volumes and their erosion potential into consideration. • Topsoils should be excavated and stockpiled separately from the subsoils to be used during the rehabilitation. • Drip trays shall be provided in construction areas for stationary plant and for "parked" plant; Drip trays, sumps and bunds must be emptied regularly, especially before a known rain event and after a rain event, and the contents disposed of at a licensed disposal facility. • All vehicles and equipment shall be kept in good working order and serviced regularly; Leaking equipment shall be repaired immediately or removed from the Site. • Ensuring that the development is kept within the Construction footprint.	Compliance with the Mitigation measures provided in the BAR	
Vegetation clearing, Topsoil removal and stockpiling, Vehicle movement and construction of Infrastructure, Excavations, Reshaping of the Quarry pit, resurfacing	Construction, Operational, Decommissioning and Closure	Land Capability	Approximately 19.4ha	• Reinstatement and rehabilitation of disturbed land. • Take necessary steps to prevent negative impact on surrounding land by ensuring that the development is kept within the Construction footprint. • The property earmarked for the Quarry shall be acquired by SANRAL through the SANRAL land acquisition/land negotiation process prior to the SPLUMA process. • Closure planning to incorporate measures to achieve future land use plans.	Compliance with the Mitigation measures provided in the BAR	

Vegetation clearing, Topsoil removal and stockpiling, Vehicle movement and construction of Infrastructure, Excavations, Reshaping of the Quarry pit, resurfacing	Construction, Operational, Decommissioning and Closure	Surface Water Resources	Approximately 19.4ha	• The bypass access track shall be discussed with the ECO prior to the clearance of vegetation;
				• Changes in water flow regime
				  ○ The footprint of activities should be as small as possible and must remain outside the delineated wetland boundaries and buffer zones
				  ○ Effective stormwater management should be a priority during the construction phase. This should be monitored as part of the EMP. High energy stormwater input into the watercourses should be prevented at all cost. Changes to natural flow of water (surface water as well as water flowing within the soil profile) should be taken into account.
				  ○ Ensure that the activity does not result in downstream erosion or sedimentation
				• Changes in sediment entering and existing the system
				  ○ Sediment traps should be installed downstream of the stormwater outlets.
				  ○ Cover transport material with tarpaulin to reduce material spillage.
				  ○ Restrict the height of transport material to reduce material spillage.
				  ○ Construction in and around watercourses must be restricted to the dryer winter months where possible.
				  ○ Retain vegetation and soil in position for as long as possible, removing it immediately ahead of construction / earthworks in that area.
				  ○ Where sedimentation has been observed, effective rehabilitation with a focus on the long term control of alien invasive plants should be done.
				  ○ Remove only the vegetation where essential for construction and do not allow any disturbance to the adjoining natural vegetation cover.
					Compliance with the Mitigation measures provided in the BAR	

				○ Where rehabilitation is required the accompanying rehabilitation plan should be followed. ○ Cordon off areas that are under rehabilitation as no-go areas using danger tape and steel droppers. If necessary, these areas should be fenced off to prevent vehicular, pedestrian and livestock access. ○ Protect all areas susceptible to erosion and ensure that there is no undue soil erosion resultant from activities within and adjacent to the construction camp and work areas. ○ Runoff from the construction area and access road must be managed to avoid erosion and pollution problems. ○ Monitoring should be done to ensure that sediment pollution is timeously addressed • Introduction and spread of alien vegetation ○ Implement an Alien Plant Control Plan as part of the contractor's method statement ○ Retain vegetation and soil in position for as long as possible, removing it immediately ahead of construction / earthworks in that area and returning it where possible afterwards. ○ Monitor the establishment of alien invasive species within the areas affected by the construction and maintenance and take immediate corrective action where invasive species are observed to establish. ○ Where sedimentation has been observed, effective rehabilitation with a focus on the long term control of alien invasive plants should be done. ○ Rehabilitate or revegetate disturbed areas • Loss and disturbance of watercourse habitat and fringe vegetation ○ No construction should occur in the wetland or its buffer. ○ Demarcate the watercourse areas and buffer zones to limit disturbance, clearly mark these areas as no-go areas ○ Where sedimentation has been observed, effective rehabilitation with a focus on the long term control of alien invasive plants should be done. ○ Monitor the establishment of alien invasive species within the areas affected by the construction and take immediate corrective action where invasive species are observed to establish • Changes in water quality due to foreign materials and increased nutrients ○ Provision of adequate sanitation facilities located outside of the watercourse or its associated buffer zone. ○ Implementation of appropriate stormwater management around the excavation to prevent the ingress of run-off into the excavation and to prevent contaminated runoff into the watercourse. ○ The development footprint must be fenced off from the watercourses and no related impacts may be allowed into the watercourse e.g. water runoff from cleaning of equipment, vehicle access etc. ○ After construction, the land must be cleared of rubbish, surplus materials, and equipment, and all parts of the land shall be left in a condition as close as possible to that prior to use. ○ Maintenance of construction vehicles / equipment should not take place within the watercourse or watercourse buffer. ○ Control of waste discharges and do not allow dirty water from operational activities to enter the watercourse ○ Treatment of pollution identified should be prioritized accordingly.		
Clearance of vegetation, construction of infrastructure, excavations, Reshaping of the Quarry pit & resurfacing, removal of infrastructure	Construction, Operational, Decommissioning and Closure	Ground Water Resources	Approximately 19.4ha	• Water level readings in the core locations where standpipes were established shall be taken prior to the commencement of constructions activities • Excavations shall not be deeper than the groundwater depth as advised by the geotechnical investigations. • Should groundwater be encountered on site, the DWS shall be informed and the required authorisation process shall be followed. • Emergency machinery and equipment maintenance shall be conducted over a drip tray, or a PVC lining to prevent soil and water contamination. • Effective stormwater management should be a priority during the construction and operational phase. • Material Safety Data Sheets for the item(s) spilled will be consulted for information concerning clean up requirements to ensure correct clean up procedure.	Compliance with the Mitigation measures provided in the BAR	

Vegetation clearance and stockpiling, Blasting, crushing and operation of machinery; demolition and/or removal of temporary infrastructure	Construction, Operational, Decommissioning and Closure	Air Quality	Approximately 19.4ha	• Implement dust suppression measures in all areas that will be affected by construction activities and where dust will be generated. Dust suppression must also be undertaken during windy and dry weather conditions. • Air quality to be monitored (baseline and during construction/operation) for dust fallout and particulate matter. Sampling locations to consider major sources of dust and sensitive receptors. • Dust monitoring should be implemented around aggregate crushing plants, in particular where these are located in proximity to sensitive receptors in order to monitor if dust levels are exceeding standards and to identify additional dust suppression measures. If it becomes evident that dust emissions from aggregate crushing and screening and extraction of borrow or quarry material are resulting in an impact to sensitive receptors within the Project Area then additional dust suppression measures (and wind breaks if feasible) will need to be considered around these crushing, screening, and extraction activities. • Consideration should be given to scheduling aggregate crushing and hauling activities outside of dry and windy conditions where sensitive receptors may be affected, if feasible. • The Contractor shall produce method statements for activities with the potential to generate dust emissions. • The Contractor shall document any air quality / dust complaints raised by communities and record them on a grievance register sheet. Any dust related grievances raised shall be investigated. • Dust suppression must be considered as part of the design and location of quarries and aggregate crushing plants, and other measures will be implemented to restrict dust-related impacts. • If the use of watering techniques on exposed open earthworks is not feasible and if it becomes evident that dust emissions from these exposed areas are resulting in an impact to local residents then the use of surface binding agents shall be considered. • Restrict the project footprint to only what is required. • Stockpiles shall be protected from wind erosion. • Heavy vehicles and machinery should be serviced regularly to minimise exhaust fume pollution. • Diesel generators shall be subject to routine maintenance to keep the engines in optimum working order. • An Environmental monitoring committee shall be established. Such committee shall include the adjacent landowners. The dust monitoring results shall be discussed in this committee.	• Dust suppression controls National Dust Control Regulations (GNR 827 of November 2013) • Compliance with the Mitigation measures provided in the EIR.	
Blasting, crushing and operation of machinery; demolition and/or removal of temporary infrastructure	Construction, Operational, Decommissioning and Closure	Noise receptors	Approximately 19.4ha	• Prior to the commencement of construction activities, baseline monitoring shall be undertaken at sensitive receptors (within 1km from the site) and at the site. Daily noise monitoring shall be undertaken at sensitive receptors when construction activities occur within 1 km of the receptor, and at mining and crushing area (depending on any complaints received). • Noise levels shall be monitored to comply with SANS 10103:2008 and Occupational Health and Safety Act requirements. • Undertake excavations and crushing only after 07:00 in the morning and before 18:00 in the evening in consultation with adjacent landowners.Sensitive receptors shall be notified of the timing and duration of the construction related activities and the potential noise nuisance it may cause. • The Contractor shall compile a method statement that describe all measures that will be implemented to control and minimise noise and impacts on biodiversity, people, and livestock. • The Contractor will be required to develop a grievance protocol to manage and address any noise complaints received. Respond to all noise related grievances received and implement mitigation measures. • A conservative vehicle maintenance schedule will be developed that seeks to reduce any increase in noise / vibration outputs due to 'wear and tear'. • The informal use of truck honking systems will be prohibited (especially when in or passing residential areas or schools) and will only be used to prevent vehicle / pedestrian collision. • The excessive idling of stationary trucks will be prevented. • The Contractor shall implement a blast management plan as per the blast design prior to the implementation of blasting on site.	• Noise standard requirements of the Occupational Health and Safety Act (No. 85 of 1993) SANS 10103 • Compliance with the Mitigation measures provided in the EIR.	

				• A monitoring programme for the recording of blasting operations shall be implemented. The elements of the programme shall include the following:
				  ○ Weather conditions at time of the blast.
				  ○ Video recording of the blast.
				  ○ Fly rock observations.
				  ○ Ground vibration and air blast results.
				• The Contractor shall employ industry standard methods to control the impact of blasting and limit the risk of damage to buildings and structures by reducing blast vibrations induced in the rock mass, eliminating fly rock, and limiting air-blast and noise to acceptable levels.
				• The blast design shall take into consideration the adjacent landowners, structures and wildlife.
				• The size of explosive charges used for blasting (if required) should be optimised so as to balance breaking capacity against minimising any vibration impact and fly-rock.
				• Survey potentially affected structures prior to and after blasting. Pre-mining photographic crack survey shall be undertaken.
				• Adjacent landowners and businesses must be notified well in advance about blasting activities and appropriate precautionary measures must be taken.
				• Noisy activities (e.g., blasting) are not to be scheduled around critical times (e.g., school exams, religious services/ celebrations). Local leaders, school principals, healthcare workers and religious leaders are to be consulted regarding times that may be negatively affected by noise.
				• All blast related complaints shall be recorded and closed out by the Contractor.
				• An Envionmntal monitoring committee shall be established. Such committee shall include the adjacent landowners. The dust/noise monitoring results shall be discussed in this committee		

Haulage of Material and transportation	Construction, Operational, Decommissioning and Closure	Traffic	Approximately 19.4ha	• Movement of haulage vehicles shall be restricted to off peak traffic times. • Entry/Exit points onto public roads should take cognizance of traffic safety. • The Contractor & applicant shall discuss the entry and exit points with the SAPS in order to prevent disturbance on the existing access points of the SAPS Training facility. • The movement of heavy vehicles (excavators, bulldozers, & trucks) should be clearly sign posted in both directions along the access track. • The use of flagmen at the school and entry and exit onto the R573 shall be implemented; • A pedestrian walkway shall be established for the moved of scholar traffic. • Scholar patrol shall be available during the school opening and closing hours to direct scholars onto the safe pedestrian walkway. • Implementation of a traffic complaints procedure. • A traffic management plan shall be compiled and implemented by the Contractor. • The number of haulage vehicles shall be controlled per day. • Drivers must be licensed by law and should be carefully briefed on the appropriate driving practices and the site sensitivities (adjacent school, National R573 Moloto Road Traffic) by the Environmental Site Officer.	• Compliance with the Mitigation measures provided in the BAR • Traffic Management Plan	
Material Stockpiles, excavations Rehabilitation and restoration of disturbed areas, demolition and/or removal of temporary infrastructure	Construction, Operational, Decommissioning and Closure	Visual and aesthetic	Approximately 19.4ha	• Develop material stockpiles only in areas designated on the site plan. • Ongoing clearing of alien invasive vegetation in the disturbed areas associated with the works. • Control visual intrusion by screening of the site where possible, e.g., screen fencing and earth bunds shall be used where topographically feasible. • Reinstatement and rehabilitation of disturbed areas with vegetation as per the rehabilitation plan or as soon as practical.	• Compliance with the Mitigation measures provided in the BAR • Contractor method statement to control and management visual intrusion	
Vegetation Clearing, Excavations, Construction of infrastructure	Operational, Construction, Decommissioning and Closure	Heritage and cultural resources	Approximately 19.4ha	• 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.	• Compliance with the Mitigation measures provided in the BAR. • Compliance with the mitigations provided by Heritage specialist	

				• Under no circumstances shall any artefacts be removed, destroyed, or interfered with by anyone on the site. • 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).		
Vegetation Clearing, Excavations, Construction of infrastructure	Operational, Construction,	Palaeontological Impacts	Approximately 19.4ha	• Special care must be taken during the digging, drilling, blasting, and excavating of foundations, trenches, channels and footings and removal of overburden as a site visit may have missed a fossiliferous outcrop. • The development may go ahead, but the ECO must survey for fossils before and or after clearing, blasting, drilling, or excavating. • If any palaeontological material is exposed during digging, excavating, drilling, or blasting SAHRA must be notified. All construction activities must be stopped, and a palaeontologist should be called in to determine proper mitigation measures, • Should Fossils be unearthed the Contractor shall notify the Provincial Heritage Resource Agency Gauteng and specialists to further investigate; • The area must be fenced-off with a 30 m barrier and the construction workers must be informed that this is a no-go area.	• Compliance with the Mitigation measures provided in the BAR. • Compliance with the mitigations provided by Heritage specialist	
Clearance of vegetation, construction of infrastructure Excavations and stockpiling	Construction; Operational, Decommissioning and Closure	Socio-Economic	Approximately 19.4ha	• Employment and procurement opportunities provided to identified communities. • The Contractor must ensure that the recruitment process is conducted through the community structures established for the contract. • A Project Liaison Committee (PLC) shall be established to assist with the recruitment of local labour. • The SANRAL 14-point plan that stipulates the principles concerning project liaison, sub-contracting and labour sourcing shall be implemented	• Compliance with the Mitigation measures provided in the BAR.	
Vegetation clearing, Excavations, demolition and/or removal of temporary infrastructure	Construction, Operational, Decommissioning and Closure	Waste Generation	Approximately 19.4ha	• A waste management plan shall be compiled and implemented by the Contractor. Waste hierarchy principals-reduce, reuse, recycle shall be implemented. Recyclable waste must be kept separate from general waste and taken to a waste recovery / recycling facility. • Adequate storage facilities for general and hazardous waste. • Waste receptables with lids (i.e. weather and vermin proof) for management of waste on site. • Hazardous waste shall be stored in a bund wall. Disposal of all hazardous waste at a hazardous waste landfill. • General waste shall be disposed at a landfill at least weekly, or more frequently if required.	• Compliance with the Mitigation measures provided in the BAR.	
Operation of the Quarry, Rehabilitation and restoration of disturbed areas	Construction, Operational, Decommissioning and Closure	Safety	Approximately 19.4ha	• Access control to the Quarry must be strictly controlled at the entrance, providing access only to approved persons. • The site shall be fenced off for both personnel and livestock safety. • The security fence shall be monitored regularly for vandalism. • Suitable Personal Protective Equipment (PPE) must be worn at all times by all employees on site during the construction and maintenance phases of the project. • With the exception of the project team members, no persons should be allowed to enter the construction site area. • The site and crew are to be managed in strict accordance with the OHS Act. • The Contractor must ensure that all emergency procedures are in place prior to commencing work. Emergency procedures must include (but not be limited to) fire, spills, contamination of soil, accidents to employees and limiting casual access to the construction site for workers, use of hazardous substances and materials, etc. • The Contractor must ensure that lists of all emergency telephone numbers / contact persons are kept up to date and that all numbers and names are posted at relevant locations throughout the construction site. • The nearest emergency service provider must be identified during all phases of the project as well as its capacity and the magnitude of accidents it will be able to handle. The contact details of this emergency centre, including police and ambulance services must be available at prominent locations around the construction site. • A Health and Safety Officer as well as an independent firm must be appointed to audit the site's compliance with the OHS Act during construction. • The proposed quarry site shall be fully fenced off. Mining activities will be undertaken approximately 1.5 km from the shooting complex. The safety protocols as	• Compliance with the Mitigation measures provided in the BAR.	

				implemented by the SAPS during training shall be factored into the contractor's method statement for the management of the site and emergency protocols. • The appointed Contractor shall establish a separate entrance that will bypass the current SAPS access control point. Consultation with the SAPS shall be undertaken prior to the establishment of the access point. Access control shall also be managed at the access point by the security personnel appointed by the Contrcator. The management of the access point shall be undertaken in line with the Security protocol of the SAPS.		

e) Impact Management Outcomes

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

Table 32: Impact Management Outcomes

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.**	**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 alluvial diamond prospecting as the case may be.
Excavation and Stockpiling, Reshaping of the Quarry pit, resurfacing	Change in topography	Topography	Operational,	• Control through the limiting of the footprint of the proposed mining activities. • Mining activities shall be demarcated in order to restrict the excavation footprint. • Control through the appropriate rehabilitation measures.	• Compliance with the Mitigation measures provided in the BAR.	Throughout construction, operational and decommissioning and closure phases
Excavations, Reshaping of the Quarry pit, resurfacing	Removal of geological material	Geology	Decommissioning and Closure	• Control through the limiting of the footprint of the proposed mining activities. • Mining activities shall be demarcated in order to restrict the excavation footprint. • Control through the appropriate rehabilitation measures.	• Compliance with the Mitigation measures provided in the BAR.	
Vegetation Clearing, removal of topsoil and stockpiling, construction of infrastructure	Loss of floral and faunal habitat	Fauna and Flora	Operational, Construction	• Restrict project footprint. • Prevention of the disturbance of the ecosystem. • Control through the rehabilitation of disturbed areas.	• Compliance with the Mitigation measures provided in the BAR. • Compliance with the mitigations provided by the specialist	
Vegetation Clearing, removal of topsoil and stockpiling, construction of infrastructure	Loss of floral Species diversity and Floral SCC	Flora	Operational, Construction	• Restrict project footprint. • Prevention of the disturbance of the ecosystem. • Control through the rehabilitation of disturbed areas.	• Compliance with the Mitigation measures provided in the BAR. • Compliance with the mitigations provided by the specialist	
Vegetation Clearing, removal of topsoil and stockpiling, construction of infrastructure	Loss of faunal species and disturbance to faunal communities	Fauna	Operational, Construction	• Restrict project footprint. • Prevention of the disturbance of the ecosystem. • Control through the rehabilitation of disturbed areas.	• Compliance with the Mitigation measures provided in the BAR.	

					• Compliance with the mitigations provided by the specialist	
Vegetation clearing, Topsoil removal and stockpiling,	Soil compaction and contamination	Soils	Construction, Operational, Decommissioning and Closure	• Control through the appropriate stripping and stockpiling measures. • Control of the mining footprint. • Control through the implementation of a Stormwater Management Plan.	• Compliance with the Mitigation measures provided in the BAR.	
Vegetation clearing, Topsoil removal and stockpiling,excavations	Loss of land use and land capability	Land capability and transformation of land	Operational, Construction	• Implementation and management through a rehabilitation and closure plan.	• Compliance with the Mitigation measures provided in the BAR	
Reshaping of the Quarry pit & resurfacing, removal of infrastructure	Pollution of surface water resources	Surface water resources	Construction, Operational; Decommissioning and Closure	• Control through the implementation of a stormwater management plan. • Implementation and management through a rehabilitation and closure plan.	Rehabilitation standards/end use objectives	
Vegetation Clearing, removal of topsoil and stockpiling,	Pollution of groundwater resources	Groundwater resources	Operational, Construction,	• Control through the implementation of a stormwater management plan. • Implementation and management through a rehabilitation and closure plan.	Rehabilitation standards/end use objectives	
Vegetation Clearing, Excavations, Construction of infrastructure	Increase in nuisance dust	Air Quality	Construction, Operational, Decommissioning and Closure	• Control through frequent dust suppression. • Control through dust monitoring and recording.	Dust suppression controls National Dust Control Regulations (GNR 827 of November 2013)	
Reshaping of the Quarry pit & resurfacing, removal of infrastructure	Increase in ambient noise levels	Noise receptors	Decommissioning and Closure	• Noise Control through the maintenance of vehicles and equipment. • Control through the implementation of a blast management plan. • Control through the implementation of a blast monitoring plan.	Noise standard requirements of the Occupational Health and Safety Act (No. 85 of 1993) SANS 10103	
Clearance of vegetation, construction of infrastructure, excavations, Reshaping of the Quarry pit & resurfacing, removal of infrastructure	Increase in traffic on the local road networks to due haulage;	Traffic	Construction, Operational, Decommissioning and Closure	• Control through the implementation of a traffic management plan. • Implementation of a traffic complaints procedure.	Traffic Management Plan	
Material Stockpiles, excavations Rehabilitation and restoration of disturbed areas, demolition and/or removal of temporary infrastructure	Visual Intrusion	Visual and aesthetic	Construction, Operational, Decommissioning and Closure	• Control visual intrusion by screening where possible. • Implementation and management through a rehabilitation and closure plan.	Contractor method statement to control and management visual intrusion	
Vegetation Clearing, removal of topsoil and stockpiling, construction of infrastructure	Unearthing of underground heritage and archaeological artefacts	Heritage and cultural resources	Operational, Construction; Decommissioning and Closure	• Prevent through the reporting and evaluation of any archaeological heritage resource found on site.	Rehabilitation standards/end use objectives	
Vegetation Clearing, removal of topsoil and stockpiling, construction of infrastructure	Unearthing of underground heritage and archaeological artefacts	Palaeontological Impacts	Operational, Construction; Decommissioning and Closure	• Prevent through the reporting and evaluation of any palaeontological resource found on site.	Rehabilitation standards/end use objectives	
Clearance of vegetation, construction of infrastructure Excavations and stockpiling	Population influx due to job seekers to the area which could pose a number of risks to the local community. Proposed development would create a number of local employment and business opportunities during operation;	Socio-Economic	Construction, Operational, Decommissioning and Closure	• Control access to site from fencing and access gate. • Control through the implementation of a traffic management plan. • Implementation of a traffic complaints procedure. • Control through the recruitment process is conducted through the	Rehabilitation standards/end use objectives	

				community structures established for the contract.		
Vegetation clearing, Excavations, demolition and/or removal of temporary infrastructure	Increase in waste	Waste Generation	Construction; Operational, Decommissioning and Closure	• Control through implementation of a waste management plan.	Waste Management Plan	
Operation of the Quarry, Rehabilitation and restoration of disturbed areas	The Quarry pit posed a safety risk, and site personnel, community members and livestock could fall into the pit	Safety	Construction, Operational, Decommissioning and Closure	• Control access to site from fencing and access gate. • remedy through awareness training and signage.	Health and Safety Plan	

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 alluvial diamond 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)
All of the above requirements are addressed in **Section e.**				

i) Financial Provision

(1) Determination of the amount of Financial Provision.

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

The objectives for closure have been discussed in Section d (i). However, the most critical objective is to ensure that the Quarry 4 footprint would be shaped and rehabilitated in order to allow for the establishment of natural vegetation, and to facilitate the end land use identified for the mining footprint during detailed closure planning.

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

Public participation for the proposed Quarry 4 is ongoing. All comments received to date have been provided in Appendix D5. This BAR does include the closure objectives which would be made available to the public for review and comment. A land acquisition process is currently underway between SANRAL and the landowner whereby closure objectives will be further discussed.

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

The entire area utilised for the borrow activities is limited to 19.4 ha. The following activities will take place during the decommissioning phase:

- The removal of temporary structures and facilities;
- Removal and appropriate disposal of waste materials;
- Removal of bunded areas;
- Removal of the temporary fence and signage.
- Reshaping of the Quarry Pit;
- Re-grading and resurfacing of the site;
- Re-planting; and
- Post rehabilitation monitoring.

In terms of the aerial extent of the rehabilitation**, Appendix B,** shows the site layout and aerial extent of the Proposed Quarry 4 and associated mining activities, depicting the anticipated mining permit area at the time of closure.

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

The decommissioning phase will entail the rehabilitation of the mining site. Upon cessation of the mining activities, the area will be fully rehabilitated. The rehabilitation of the mining area will comply with the minimum closure objectives as prescribed by DMRE and the activities as provided in **Part B Section d (i),** hence the rehabilitation plan is considered to be compatible with the closure objectives identified for the site.

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

SANRAL is exempted from having financial provision to be held by DMRE in the form of a bank guarantee. However, budget will be set aside by SANRAL to ensure that this area is rehabilitated and

left in a manner that is environmentally safe. This has been confirmed by the DMRE in a meeting held on the 15th of October 2020. The minutes of the meeting is attached to **Appendix E**.

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

Refer to **Section i 1e above.**

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

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

Table 33: Mechanisms 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
Excavations and stockpiling Reshaping of the Quarry pit, resurfacing Vegetation clearing, Topsoil removal and stockpiling; Vehicle movement and construction of Infrastructure Construction of infrastructure Blasting and Crushing	Alien Invasive Plants	An Alien Invasive Species Control programme must be developed and implemented for all phases of the project	ECO, Contractor	Monthly during the rehabilitation phase. Once rehabilitation work has been completed, invasive species monitoring, and eradication must continue biannually (every six months) for a period of two years.
	Soil Erosion	Management and monitoring of soil stockpiles. Soils must be stored properly and revegetated to prevent erosion and to enable re-use during rehabilitation.	ECO, Contractor	Monthly during the rehabilitation phase, and where encountered, immediate rectification must take place. Once such monitoring must continue biannually (every six months) for a period of two years.
	Groundwater	Monitoring of groundwater levels and potential contamination	ECO, Contractor	Biannual monitoring of boreholes
	Dust	Set up PM^{10} Monitoring sites in the area to monitor dust fall. Regular dust suppression measures.	ECO, Contractor	Daily and Monthly monitoring
	Noise	Compliance with local by-laws and regulations regarding the generation of noise and hours of operation. Noise levels shall be monitored to comply with SANS 10103:2008 and Occupational Health and Safety Act requirements	ECO, Contractor	Daily monitoring
	Blasting	Monitor compliance with blast management plan. Investigation of blast related complaints	ECO, Contractor	As and when required
	Traffic	Implementation of a Traffic Management Plan	ECO, Contractor	Daily Monitoring
	Waste	Implementation of a Waste Management Plan	ECO, Contractor	Daily Monitoring

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

The Environmental Control Officer will undertake audits in compliance with the EMPr every month and will compile monthly audit reports which will be submitted to the Applicant and the DMR, unless otherwise stated by the DMR in the Environmental Authorisation.

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.

The Environmental Control Officer (ECO) and the Environmental Site Representative (ESR) will be responsible for ensuring that all site employees are given an environmental awareness induction prior to the commencement of site activities. The initial training will be undertaken by the ECO.

The environmental awareness training will aim to:

- Promote general environmental awareness as well as awareness specific to the project;
- Inform personnel about the availability and importance of adherence to the EMPr, Environmental Authorization as well as any other permits or licenses issued for the project;

The environmental awareness training programme will include:

- Induction of all personnel in a language and method most suitable;
- Signing of an attendance register and declaration of ensuring environmental protection

Topics that will be included in the induction include:

- What is the environment and why must it be protected?
- What are the environmental sensitivities of the area in which activities are being undertaken?
- How construction activities can adversely impact of the environment;
- What are the mitigation measures for adverse impacts?
- What is the social responsibility of all site employees during construction?
- How should environmental incidents be recorded?

All new employees will be inducted by the ESR prior to commencing with work on site. Proof of the induction will be kept. Refresher environmental awareness training will be conducted by the ESR as and when the need arises. An example of this is when there is repeated non-compliances. The ESR will ensure daily toolbox talks include alerting the workforce to particular environmental concerns associated with the tasks for that day or the area / habitat in which they are working, etc. Awareness posters and pamphlets must be provided to create environmental awareness throughout the site.

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

All potential risks will be managed and potential environmental impacts prevented or minimised through the implementation of mitigation measures and the EMP. The mitigation measures are provided in **Table 31 and Table 32** and the EMP in Appendix G. The appropriate implementation of the EMP would be monitored through regular environmental monitoring by the appointed Environmental Control Officer.

n) Specific information required by the Competent Authority

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

A pre-application meeting was held on the 24th of January 2020 with the DMR, no specific information has been requested by the Competent Authority.

2) UNDERTAKING

The EAP herewith confirms

a) the correctness of the information provided in the reports [X]

b) the inclusion of comments and inputs from stakeholders and I&APs [X]

c) the inclusion of inputs and recommendations from the specialist reports where relevant; [X] and

d) that the information provided by the EAP to interested and affected parties and any responses by the EAP to comments or inputs made by interested and affected parties are correctly reflected herein. [X]

Signature of the environmental assessment practitioner:

GA Environment (Pty) Ltd

Name of company:

Date: 29 September 2021

-END-

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