SPECIALIST ASSESSMENT REPORT

ENVIRONMENTAL VISUAL IMPACT ASSESSMENT REPORT FOR THE PROPOSED TENBOSCH MINING PROJECT TO BE SITUATED OUTSIDE OF KOMATIPOORT, MPUMALANGA PROVINCE, SOUTH AFRICA.

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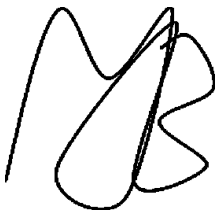
Signature			
Date	28-08-2023	28-08-2023	29-08-2023

DISCLAIMER

DECLARATION OF INDEPENDENCE

I, **Andre Buys**, in my capacity as a specialist consultant, hereby declare that I:

- Act as an independent consultant;
- Do not have any financial interest in the undertaking of this project, other than remuneration for the work performed in terms of the National Environmental Management Act 107 of 1998;
- Have and will not have vested interest in the proposed and/or existing activity nor will I engage myself in any conflicting interest associated with this project;
- I undertake to disclose and provide to the competent authority any material or information at my disposal regarding this project as required in terms of National Environmental Management Act 107 of 1998;
- Based on the information provided to me by the client and in addition to information obtained during the course of this study, I have presented the results and conclusion with regard to this project to the best of my professional ability;
- I reserve the right to modify aspects pertaining to this study should additional information become available through ongoing research and further work on this field;
- I undertake to have my work peer reviewed on a regular basis by a competent specialist in the field of study; and
- I am duly qualified and experienced to undertake the work at hand.



Andre Buys (Environmental Consultant)

Environmental Consultant	Relevant expertise
Andre Buys	Has completed a B.Ss. in Geography and Geology, followed by a B.Sc. (Hons). Environmental Science. He has comprehensive experience and knowledge on compliance monitoring, project management and specialist reporting. As an environmental consultant, Andre has provided several environmental monitoring assessments, audits and specialist input services.

EXECUTIVE SUMMARY

This report has been prepared by Environmental Assurance (Pty) Ltd. (hereafter referred to as "ENVASS") as an independent environmental consultancy firm as appointed by Kimopax Group (Pty) Ltd., (hereafter referred to as "the client") to undertake a visual impact assessment for the proposed Mining Right Application at Tenboch to be situated at outside of Portion 21, 55, 56, 64,65, 66, 69, & 213 of Tenbosch 162 JU; Portion 2, 5 & 6 of Turfbelt 593 JU and Remaining Extent of Tecklenburg`s Ranch 548 JU, situated in the Magisterial District of Barberton in the Komatipoort town.

The assessment is required as part of an Environmental Impact Assessment (EIA) in terms of the National Environmental Management Act (Act 107 of 1998), for the approval of the proposed mining project. The scope of the assessment focussed on the current visual baseline conditions of the study area and the possibility of the proposed activities having a visual impact.

RESULTS AND IMPACT STATEMENT

From the results obtained in this study, it is expected that the commencement of the proposed Tenbosch mining project will contribute to localised visual impacts, however, the visual impacts are expected to be **moderate to low** if proactively managed. Mitigation measures are recommended under Section 9 in order to reduce possible visual impacts. It is also deemed that only Portion 548 will have a visual impact due to it being the only portion where proposed infrastructure is to be constructed.

The assessment found that the proposed Tenbosch mining project itself will have the greatest potential visual impact among those activities assessed. Secondary visual impacts are expected to include dust generation and night-time illumination. Several visual mitigation measures have been identified to address the anticipated impacts.

SPECIALIST'S RECOMMENDATION

Considering the project as a whole, it is the specialist's reasoned opinion that the proposed Tenbosch mining project activity be allowed, provided that the findings within this report are considered along with the recommendations made towards the management of the proposed mining project. All mitigation measures recommended herein should be added to the Environmental Management Programme (EMPr) relevant to the proposed project.

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ACRONYMS

DFFE	Department of Forestry, Fisheries and Environment
DMRE	Department of Mineral Resources and Energy
EA	Environmental Authorisation
EIA	Environmental Impact Assessment
ENVASS	Environmental Assurance (Pty) Ltd.
EMPr	Environmental Management Programme
ESA	Ecological Support Area
GIS	Geographic Information System
GPS	Global Positioning System
IDW	Inverse Distance Weighting
km	Kilometres
MDARD	Mpumalanga Department of Agriculture and Rural Development
LiDAR	Light Detection and Ranging
MRA	Mining Right Area
NEMA	National Environmental Management Act
RoM	Run of Mine
SLR	Single Lens Reflex
VAC	Visual Absorption Capacity
VIA	Visual Impact Assessment
VP	Viewpoint
VT	Vegetation Type

GLOSSARY

Critical viewpoints	**Important points from where viewers will be able to view the proposed or actual development and from where the development impact may be significant.**
Field of view	The field of view is the angular extent of the observable world that is seen at any given moment. Humans have an almost 180º forward-facing field of view. Note that human stereoscopic (binocular) vision only covers 140º of the field of view in humans; the remaining peripheral 40º have no binocular vision due to the lack of overlap of the images of the eyes. The lower the focal length of a lens (see below), the wider the field of view.
Focal length	The focal length of a lens is a measure of how strongly the lens converges (focuses) or diverges (defocuses) light. Focal length refers to the "strength" of a lens, in other words how many times the lens magnifies an image (brings it closer) or widens an image (makes it look further away). The standard lens on most Single-Lens Reflex (SLR) cameras have a focal length of 50 mm. Using a 50 mm lens as a start, a 200 mm lens will magnify an image four times (i.e. 4 x magnification). The focal length of an average human eye is 22 mm.
Mitigation	Any action taken or not taken in order to avoid, minimise, rectify, reduce, eliminate, or compensate for actual or potential adverse visual impacts.
Scenic value	Degree of visual quality resulting from the level of variety, harmony and contrast among the basic visual elements.
Sense of place	The character of a place, whether natural, rural or urban. It is allocated to a place or area through cognitive experience by the user.
Viewshed	The theoretical area within which an observer is likely to see a specific structure or area in the landscape. It is generated from a digital terrain model (DTM) made up of 3D contour lines of the landform. Intervening objects, structures or vegetation will modify the view shed at ground level.
Visual absorption capacity (VAC)	The ability of elements of the landscape to "absorb" or mitigate the visibility of an element in the landscape. Visual absorption capacity is based on factors such as vegetation height (the greater the height of vegetation, the higher the absorption capacity), structures (the larger and higher the intervening structures, the higher the absorption capacity) and topographical variation (rolling topography presents opportunities to hide an element in the landscape and therefore increases the absorption capacity).
Visual character	The overall impression of a landscape created by the order of the patterns composing it; the visual elements of these patterns are the form, line, colour and texture of the landscape's components. Their interrelationships are described in terms of dominance, scale, diversity and continuity. This characteristic is also associated with land use.
Visual exposure	Visual exposure is based on distance from the project to selected viewpoints. Visual exposure or visual impact tends to diminish exponentially with distance.
Visual quality	Subjective evaluation of the visible components of the environment by viewers.
Visually sensitive	Areas in the landscape from where the visual impact is readily or excessively encountered.

1. INTRODUCTION AND BACKGROUND

1.1 INTRODUCTION

Environmental Assurance (Pty) Ltd (ENVASS), as an independent environmental consultancy, was appointed by Kimopax Group (Pty) Ltd., (hereafter referred to as "the client") to undertake a visual impact assessment for the proposed Mining Right Application at Tenboch to be situated at outside of Portion 21, 55, 56, 64,65, 66, 69, & 213 of Tenbosch 162 JU; Portion 2, 5 & 6 of Turfbelt 593 JU and Remaining Extent of Tecklenburg`s Ranch 548 JU, situated in the Magisterial District of Barberton in the Komatipoort town.

1.2 LOCALITY

The Tenbosch Project is in the Nkomazi Municipality, Barberton District Municipality, Mpumalanga Province, South Africa. It lies about 28km East of Malelane, approximately, 15km South of Marloth Park, 12km west of Komatipoort, and 85km South-Esat of hazyview. The Mining Right area is located on Portion 21, 55, 56, 64,65, 66, 69, & 213 of Tenbosch 162 JU; Portion 2, 5 & 6 of Turfbelt 593 JU and Remaining Extent of Tecklenburg`s Ranch 548 JU. The footprint of the proposed project is approximately 6 521 hectares. The surrounding area can be characterized by agricultural activities, as well as urban development which includes formal and informal housing in the Komatipoort Town. The site is surrounded by various areas of interest which include, Marloth Park, Komatipoort, the Lebombo border post, Kruger National Park's Crocodile Bridge Gate, Various Lodges and Private Farms.

1.3 ACTIVITY DESCRIPTION

The activity of the proposed operation is summarized below as sourced from the Background information report KIM-MIN-2022-270 provision by Kimopax.

The mine will be developed as follows:

a) The Tenbosch Mining project will consist of an underground mining operation. The approximate extent of the underground mining area is 6 251 ha, and the proposed coal mining will be by decline method (Figure 1). There is an alternative to use a single or twin decline shafts which will comprise of two parallel shafts, one dedicated to personnel and material movement and one dedicated to coal conveying;
b) These will be the up and down cast ventilation tunnels for the mine, but up-cast raise bore ventilation shafts will be developed once required and the these two declines will both be downcast. Raise bore ventilation holes will be developed as part of on-going capital as mining progresses;
c) Bord-and-pillar mining method is proposed for dipping coal seams. This entails the mining of rooms (bords) leaving pillars intact as a primary support to support the immediate roof;
d) Secondary support will be used in the form of roof bolts and any other support means as and when required into the immediate roof of the bords mined;

The project triggers activities listed in terms of Listing Notice 2 (Activities 15, 17 and 21) and Listing Notice 3 (Activities 4, 10, and 12) of the NEMA (as amended) and will require an EA from the Department of Mineral Resources and Energy (DMRE), Mpumalanga Province. The proposed stockpile and dump areas or hard and soft material will trigger activities listed in GNR 921 (Category B: Activities 7, 8, 10, and 11) of the NEM: WA and therefore requires a WML. A full Environmental Impact Assessment (EIA) including Scoping and Impact Assessment will be followed as stipulated in GNR 982 of the NEMA. and GNR 921 of the NEM: WA.

The proposed processing plant, stockpile and dump areas of hard and soft material will trigger activities listed in GNR 921 (Category B: Activities 7, 8, and 10) of the NEM: WA and therefore requires a WML from the DMRE. A full Environmental Impact Assessment (EIA) including Scoping and Impact Assessment will be followed as stipulated in GNR 982 of the NEMA and GNR921 of the NEM: WA.

1.4 MINING METHOD

The Tenbosch Mine is planned as a conventional underground mining operation. The proposed infrastructure development includes (Kimopax Background Information, 2022):

- The shaft bank area (for the main and ventilation shafts and the immediate infrastructure associated therewith including the winder houses, the ventilation fans, materials handling equipment etc.);
- The ROM ore storage areas and underground development waste rock areas;
- Crushing and screening plant;
- Sales product storage areas and load out areas;
- Tailings storage facility;
- Surface substations and the like;
- Main access road from the N4 to the mine site,
- Stormwater management infrastructure;
- A pollution control dam;
- Buildings including workshops, change house-lamp room, offices, stores;
- Contractors' laydown area and parking;
- Power Supply infrastructure including a switching yard and electrical powerlines;
- Sewerage treatment package plant;
- Water Treatment Plant;
- Fuel storage; and
- Water Infrastructures including portable water tanker etc.

The proposed mining operations is anticipated to have a life span of approximately 35 years. The potential environmental impacts associated with the mining activities will be identified through the Scoping Report of the EIA Study, assessed and

significance of impacts determined through the Environmental Impact Report (EIR) and managed through a detailed Environmental Management Programme (EMPr).

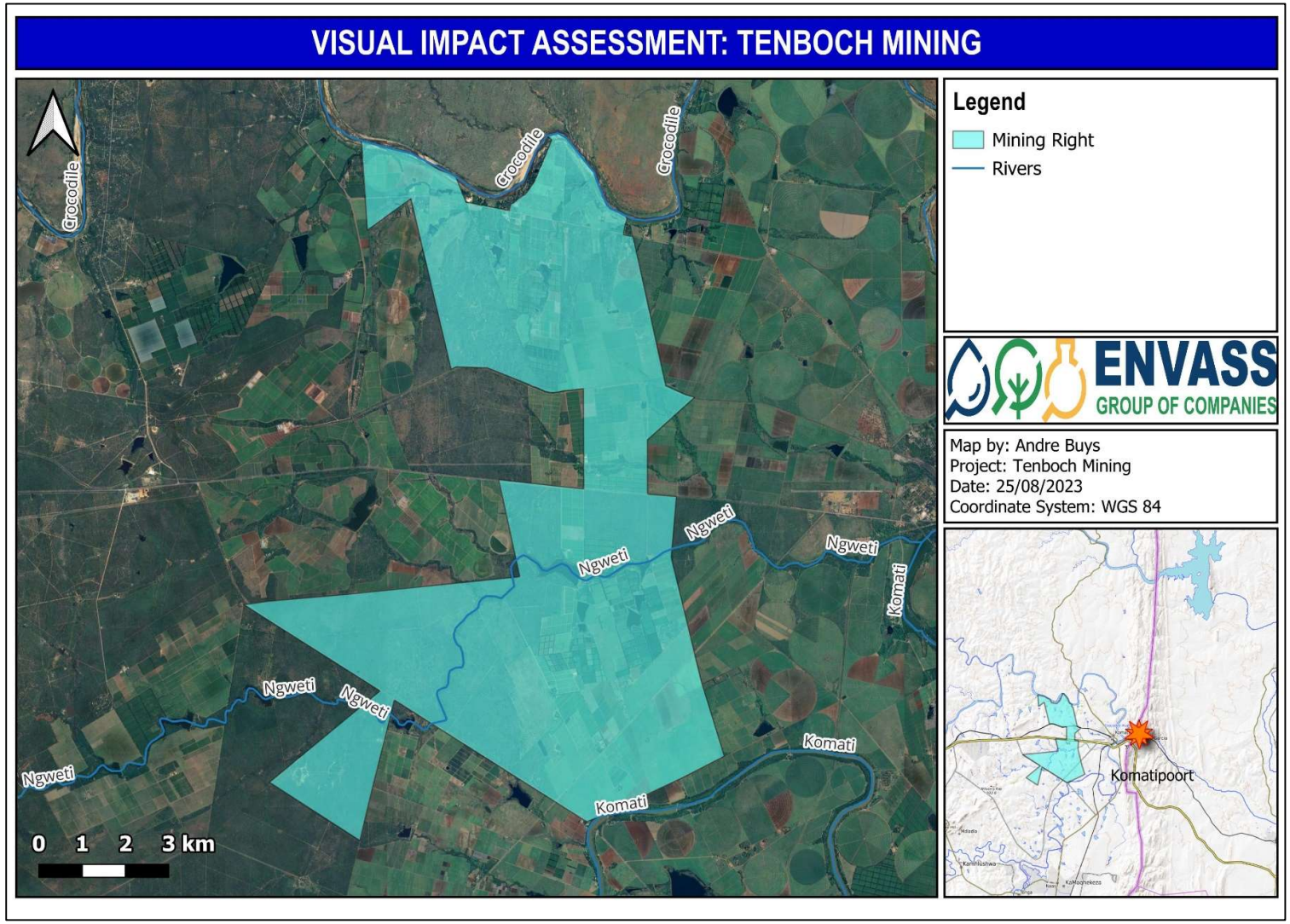

Figure 1: Tenboch Mining Project Area

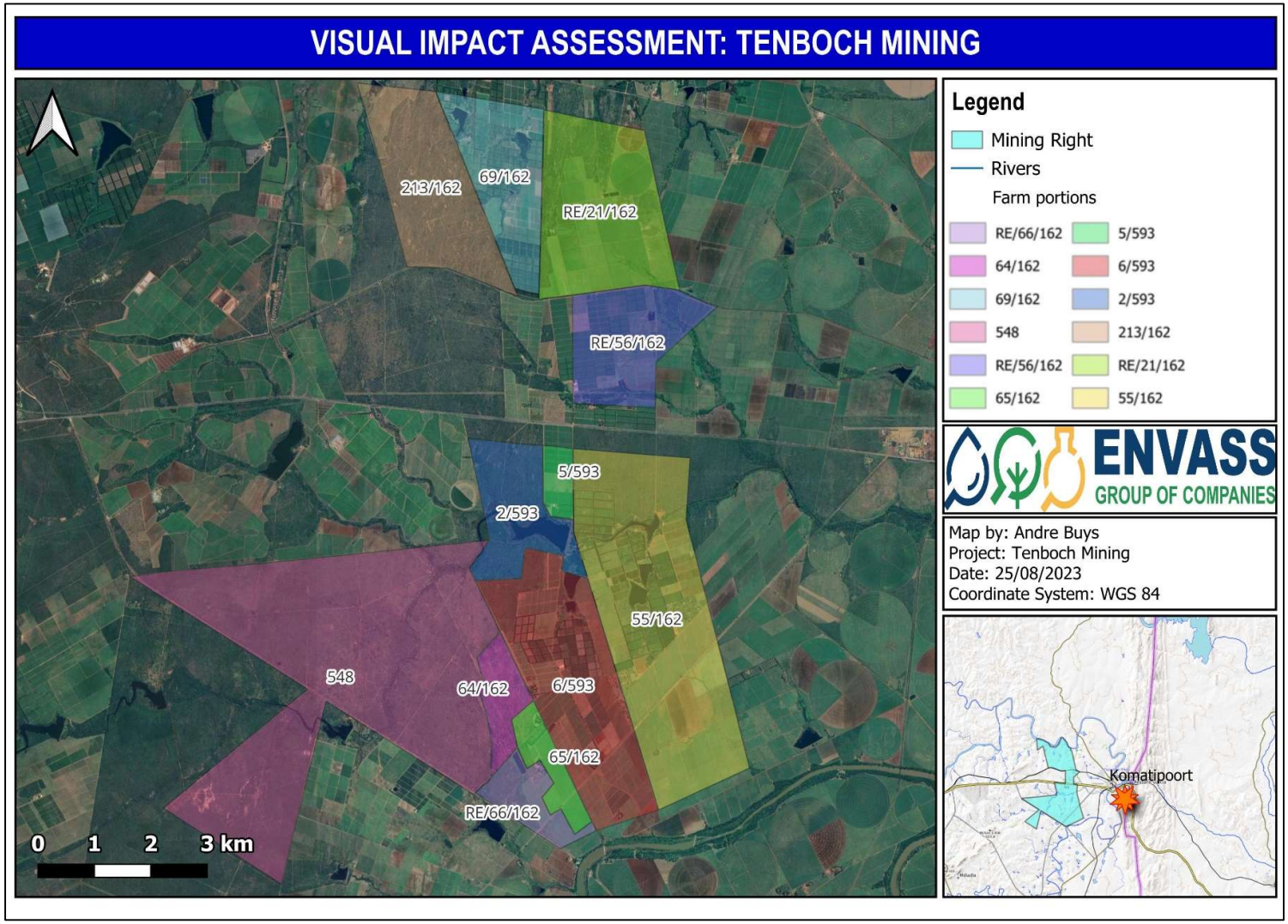

Figure 2: Tenboch Mining Infrastructure Map

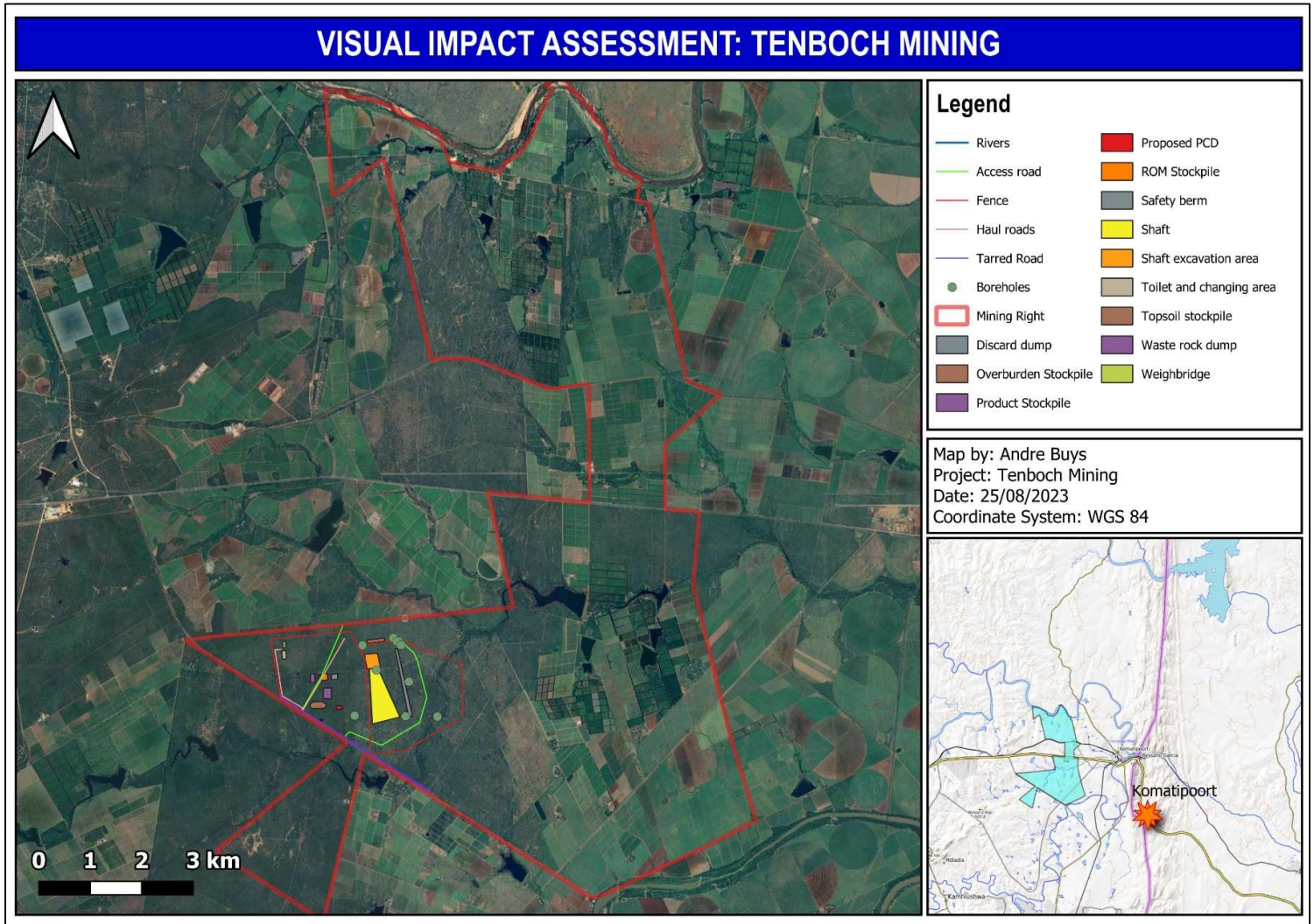

Figure 3: Infrastructure Map

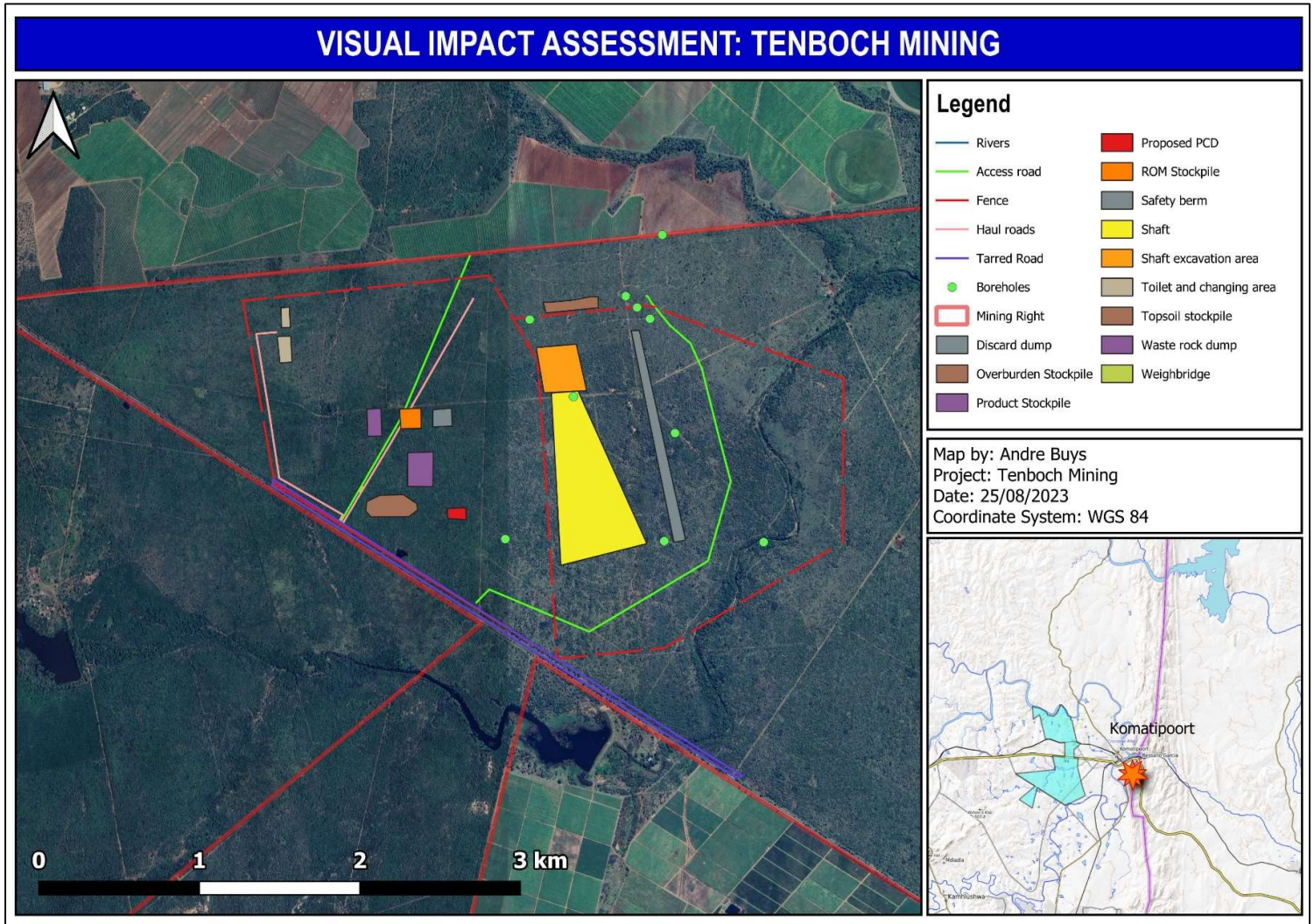

Figure 4: Focussed Infrastructure Map

1.5 DELINEATION OF THE VISUAL STUDY AREA

The study area for the VIA comprises of the spatial extent of the project footprint and related activities, as well as an associated buffer area. For the purposes of this VIA, due to the activities being underground, the study area was focussed on the Farm portion 548, where surface infrastructure and activities will take place, with an added buffer defined as a five (5) km radius around the physical footprint of all surface components of the project. The distance of five (5) km was selected based on the location of sensitive receptors, topography, and the elevation of the proposed area. For the purposes of this VIA, the term 'site' refers to the area that will be physically affected by the proposed activities. Similarly, the term 'study area' refers to the area that will potentially be visually affected by the project and represents the five (5) km radius buffer around the visible components of the proposed infrastructure.

2. LEGISLATIVE CONTEXT AND REFERENCES

Section 28 of the National Environmental Management Act (NEMA, Act 107 of 1998) places a duty of care on any person causing, has caused or may cause significant pollution or degradation of the environment to take reasonable measures to prevent such pollution or degradation from occurring, continuing, or, insofar as such harm to the environment is authorised by law or cannot be reasonably avoided or stopped and rectify such pollution of the environment. The measures required in terms of subsection (1) may include measures to:

- Investigate, assess, and evaluate the impact on the environment.
- Inform and educate employees on the environmental risk of their work and the manner in which tasks must be performed in order to avoid causing significant pollution or degradation of the environment.
- Cease, modify or control any activity or processes causing pollution or degradation.
- Contain or prevent the movement of pollutants or the cause of degradation.
- Eliminate any source of the pollution or degradation; or
- Remedy the effects of pollution or degradation.

In addition to this, the Protected Areas Act (57 of 2003) Section 17 is intended to protect natural landscapes and the National Heritage Resources Act (25 of 1999) provides legislated protection for listed proclaimed sites such as urban conservation areas, natural reserves and proclaimed scenic routes. This legislation is applicable to the study and will be used in the determination of the possible visual impact of the proposed development.

Requirements of Appendix 6 of the NEMA: EIA Regulations (2014, as amended). The following is an extract of the requirements:

Specialist reports

1. (1) A specialist report prepared in terms of these Regulations must contain—

(a) details of—

(i) the specialist who prepared the report; and

(ii) the expertise of that specialist to compile a specialist report including a curriculum vitae;

(b) a declaration that the specialist is independent in a form as may be specified by the competent authority;

(c) an indication of the scope of, and the purpose for which, the report was prepared;

(cA) an indication of the quality and age of base data used for the specialist report;

(cB) a description of existing impacts on the site, cumulative impacts of the proposed development and levels of acceptable change;

(d) the duration, date and season of the site investigation and the relevance of the season to the outcome of the assessment;

(e) a description of the methodology adopted in preparing the report or carrying out the specialised process inclusive of equipment and modelling used;

(f) details of an assessment of the specific identified sensitivity of the site related to the proposed activity or activities and its associated structures and infrastructure, inclusive of a site plan identifying site alternatives;

(g) an identification of any areas to be avoided, including buffers;

(h) a map superimposing the activity including the associated structures and infrastructure on the environmental sensitivities of the site including areas to be avoided, including buffers;

(i) a description of any assumptions made and any uncertainties or gaps in knowledge;

(j) a description of the findings and potential implications of such findings on the impact of the proposed activity or activities;

(k) any mitigation measures for inclusion in the EMPr;

(l) any conditions for inclusion in the environmental authorisation;

(m) any monitoring requirements for inclusion in the EMPr or environmental authorisation;

(n) a reasoned opinion—

(i) whether the proposed activity, activities or portions thereof should be authorised;

(iA) regarding the acceptability of the proposed activity or activities; and

(ii) if the opinion is that the proposed activity, activities or portions thereof should be authorised, any avoidance, management and mitigation measures that should be included in the EMPr, or EA and where applicable, the closure plan;

(o) a description of any consultation process that was undertaken during the course of preparing the specialist report;

(p) a summary and copies of any comments received during any consultation process and where applicable all responses thereto; and

(q) any other information requested by the competent authority.

(2) Where a government notice *gazetted* by the Minister provides for any protocol or minimum information requirement to be applied to a specialist report, the requirements as indicated in such notice will apply.

3. PURPOSE AND SCOPE

3.1 PURPOSE

The purpose of this assessment is to determine the visual impact of the proposed activity. The visual impact assessment will describe the existing visual characteristics of the proposed site and surrounding environment to establish the baseline characteristics of the receiving environment. If it is found that the possibility exists for visual impacts to pose a problem, recommendations will be made as to prevent and/or mitigate the possible impacts. This will be done to prevent disturbances to the receiving environment. This report also aims to give effect to the requirements and legislation as promulgated in South Africa. Please refer to Section 2 for detailed legislative requirements for the study. Key aspects for the purpose of this document are to:

- Description of the existing visual characteristics of the proposed site and its surroundings.
- Determining areas from which the proposed development will be visible.
- Visual Impact Assessment (VIA) in order to assess the significance of the visual impacts determined to be caused by the proposed development; and
- Recommendation of possible mitigation measures.

3.2 SCOPE

The scope includes the visual impact assessment of the proposed Tenboch mining project (refer to Figure 1). This document reports on the visual impact assessment conducted and outlines findings made and recommendations to the authorisation of the proposed mining project. The site is located approximately six (6) km west of Komatipoort, Mpumalanga Province, South Africa.

4. METHODOLOGY AND UNDERTAKING

4.1 SITE ESTABLISHMENT

An initial desktop site assessment was conducted to determine suitable locations regarding the visual impact assessment. The result of the desktop study was the identification of areas or activities which could possibly contribute to the deterioration of the visual characteristics of the area.

Site baseline characterisation (and subsequent fieldwork) occurred on the 25th and 26th of July 2023 for the visual assessment. The site baseline characterisation was conducted to undertake the visual assessment of the current characteristics of the receiving environment. The field survey included photographic evidence at the various viewpoints which were used as a basis for determining the potential visual ability and visual impacts of the proposed development. Various viewpoints were identified based on the sensitivity and visual impact of the area.

The VIA was conducted following the methodology:

- Site visit and orientation.
- Describing the landscape character or visual baseline based on:
- Photographs of the project site and larger study area were taken during a field visit conducted on the 25th and 26th of July 2023.
- A review of available aerial photography and topographical maps, in relation to:
    - Natural elements; and
    - Human-made elements.
- Determining the area/s where the project will be visible from.
- Determining the visual resource value of the landscape in terms of:
    - The topographical character of the site and its surroundings and potential occurrence of landform features of interest;
    - The presence of water bodies within the study area;
    - The general nature and level of disturbance of existing vegetation cover within the study area; and
    - The nature and level of human disturbance and transformation evident.
- Determine the visual absorption capacity of the receiving visual landscape.
- Determining the receptor sensitivity to the proposed project.
- Determine the magnitude of the impact, by considering the proposed project in terms of aspects of VIA, namely:
    - Visibility.
    - Visual intrusion; and
    - Visual exposure.
- Assessing the impact significance by relating the magnitude of the visual impact to its:
    - Duration.
    - Severity; and

- Geographical extent.

- To recommend mitigation measures to reduce the potential visual impacts of the project.

4.2 ASSUMPTIONS AND LIMITATIONS

The following is relevant to the field of VIA and the findings of this study:

- Determining the value, quality and significance of a visual resource or the significance of the visual impact that any activity may have on it, in absolute terms, is not achievable. Visual perception is by nature a subjective experience, as it is influenced largely by personal opinions and world views. For instance, what one viewer may experience as an intrusion in the landscape, another may regard as positive. Such differences in perception are greatly influenced by culture, education and socio-economic background. A degree of subjectivity is therefore bound to influence the rating of visual impacts. It is therefore impossible to conduct a visual assessment without relying to some extent on the opinion of a qualified consultant, which is inherently subjective. The subjective opinion of the visual consultant is however unlikely to materially influence the findings and recommendations of this study, as a wide body of scientific knowledge exists in the industry of VIA, on which findings are based.
- A once-off field survey was sufficient to characterise the baseline visual characteristics of the site.
- The main focus was on the Farm Portion where surface activity will be evident. Evidence on the total mining right was also obtained to serve as baseline status.
- The primary objective of this study was to assess the visual environment.
- The fieldwork relevant to this study was a once-off assessment that was conducted.
- A preliminary mine layout was available. Detailed dimensions, such as the vertical offset of proposed surface infrastructure above ground level, were however not available and were assigned based on experience from similar infrastructure in previous projects.
- All viewsheds were based on terrain level. As such these viewsheds do not incorporate distractive views in the form of vegetation or land use (infrastructure, buildings, etc.).
- This study did not include an illumination assessment.
- The assessment of impacts and recommendation of mitigation measures was informed by the site-specific aspects identified and based on the assessor's working knowledge and experience with similar activities.

4.3 BASELINE VISUAL ENVIRONMENT

The visual baseline assessment was informed by a field visit, assessment of on-site photographs and Google Earth imagery. To determine the visual resource value of the study area, specific attention was given to the following aspects:

- The nature of existing vegetation cover, in terms of its overall appearance, density and height, and level of disturbance.
- The general topographical character of the study area, including prominent or appealing landforms, and their spatial orientation in terms of the project sites.
- The nature and level of human transformation or disturbance of the study area.

- The location, physical extent and appearance of water bodies within the study area, if present; and
- The perceived level of compatibility of existing land uses in terms of the study area and each other.

4.4 DESCRIPTION OF AFFECTED AREA AND ENVIRONMENT

This section provides a brief overview of the visual baseline environment and context in which the proposed project will take place.

The Tenbosch Project is in the Nkomazi Municipality, Barberton District Municipality, Mpumalanga Province, South Africa. It lies about 28km East of Malelane, approximately, 15km South of Marloth Park, 12km west of Komatipoort, and 85km South-Esat of hazyview. The Mining Right area is located on Portion 21, 55, 56, 64,65, 66, 69, & 213 of Tenbosch 162 JU; Portion 2, 5 & 6 of Turfbelt 593 JU and Remaining Extent of Tecklenburg`s Ranch 548 JU. The footprint of the proposed project is approximately 6 521 hectares. The proposed site is located approximately 6 km east of Komatipoort, Mpumalanga Province, South Africa. The site is surrounded by various areas of interest which include, Marloth Park, Komatipoort, the Lebombo border post, Kruger National Park's Crocodile Bridge Gate, Various Lodges and Private Farms.

The proposed site occurs on the northern and southern site of the N4 national highway. The northern part will not consist of any surface features and activities, whilst the southern section is characterised by all mining infrastructure as discussed in Section 1.3. Therefore, the main focus will be on describing the environment present on portion 548 as per Figure 5 below.

The proposed project area is in close proximity to major roads such as the N4, R571, Tenboch Drive, Olifant Drive as well as surrounding gravel roads. The surrounding area can be characterized by agricultural activities.

The Portion 548 (referred to as the Infrastructure Layout area) ranges from approximately 254 to 183 metres above mean sea level (mamsl) from west to east (Figure 6 and 7), predominantly flat, with a general decrease in slope towards the east. The elevation gain/loss: 75,1 meters, - 121 meters. The maximum slope is 13,4 %, - 15,1 % with an average slope of 2,8 %; - 2,5 %.
From the north to south (Figure 8 and 9), the elevation ranges from approximately 213 to 198 metres above mean sea level (mamsl) from North to south, predominantly flat, with a general decrease in slope towards centre of the site. The elevation gain/loss: 43,1 meters, - 51 meters. The maximum slope is 11.9 %, - 12,6 % with an average slope of 2,8 %; - 3,0 %.

The vegetation in the infrastructure layout area consists mainly of dense forests & woodlands, open woodlands, fallow lands & old fields, with areas characterized by artificial dams, herbaceous wetlands and continuous low forests & thicket. The study area (mining right) is characterized by mostly private owned land where intense agricultural farming activities takes place with dominant commercial citrus, banana and sugarcane cultivation farming.

Overall, the landscape and terrain in and around study area typical of the Lowveld region of South Africa, consisting of Tshokwane-Hlane Basaltt Lowveld as well as the Delagoa Lowveld vegetation. It falls within the Savanna Biome, and Lowveld Bio- and Ecoregions.

The Project area does not have any threatened Ecosystems or Protected area within close proximity. This may be due to the fact that the surrounding areas has been highly modified.

Various natural and artificial wetlands occur throughout the mining right, with a NFEPA river evident towards the centre of the infrastructure layout area Farm Portion. Additionally, no Ecological Support Areas (ESA) areas are located within the proposed mining right. In addition, no Critical Biodiversity Area (CBA) Important Areas are also located within the proposed mining right.

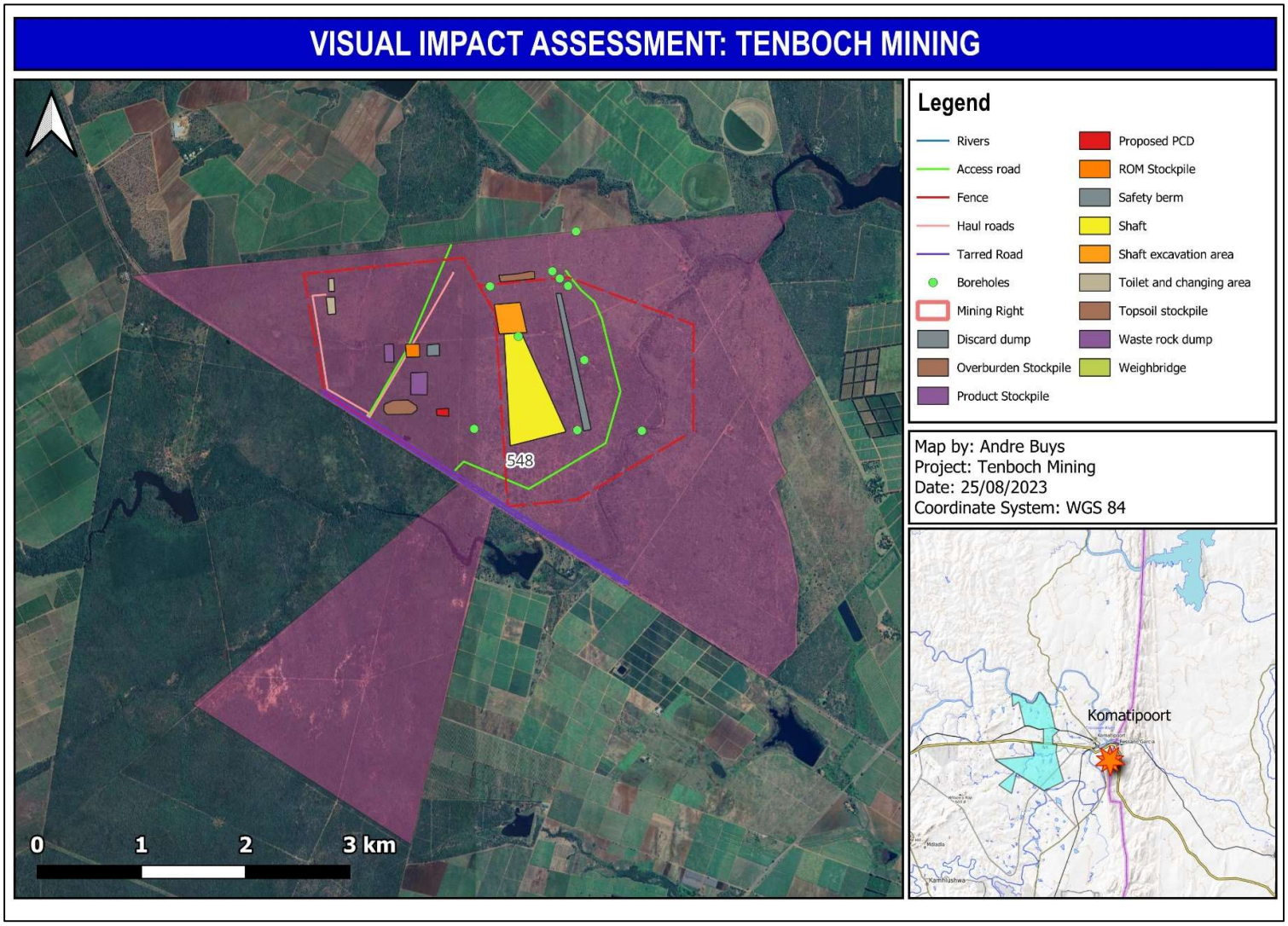

Figure 5: Focussed Farm Portion Infrastructure Map

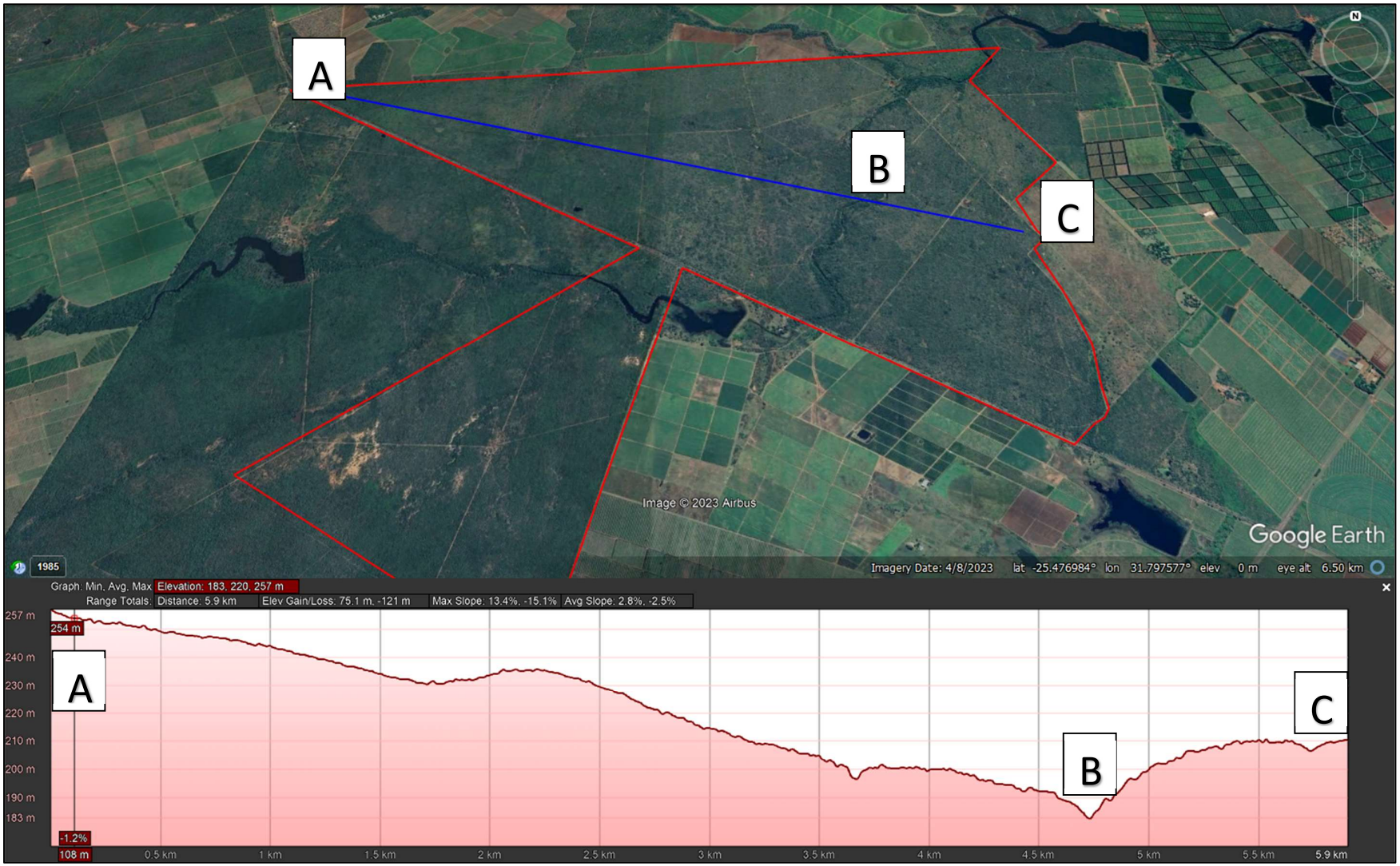

Figure 6: Elevation Profile (maximum elevation at point A and minimum at point B)

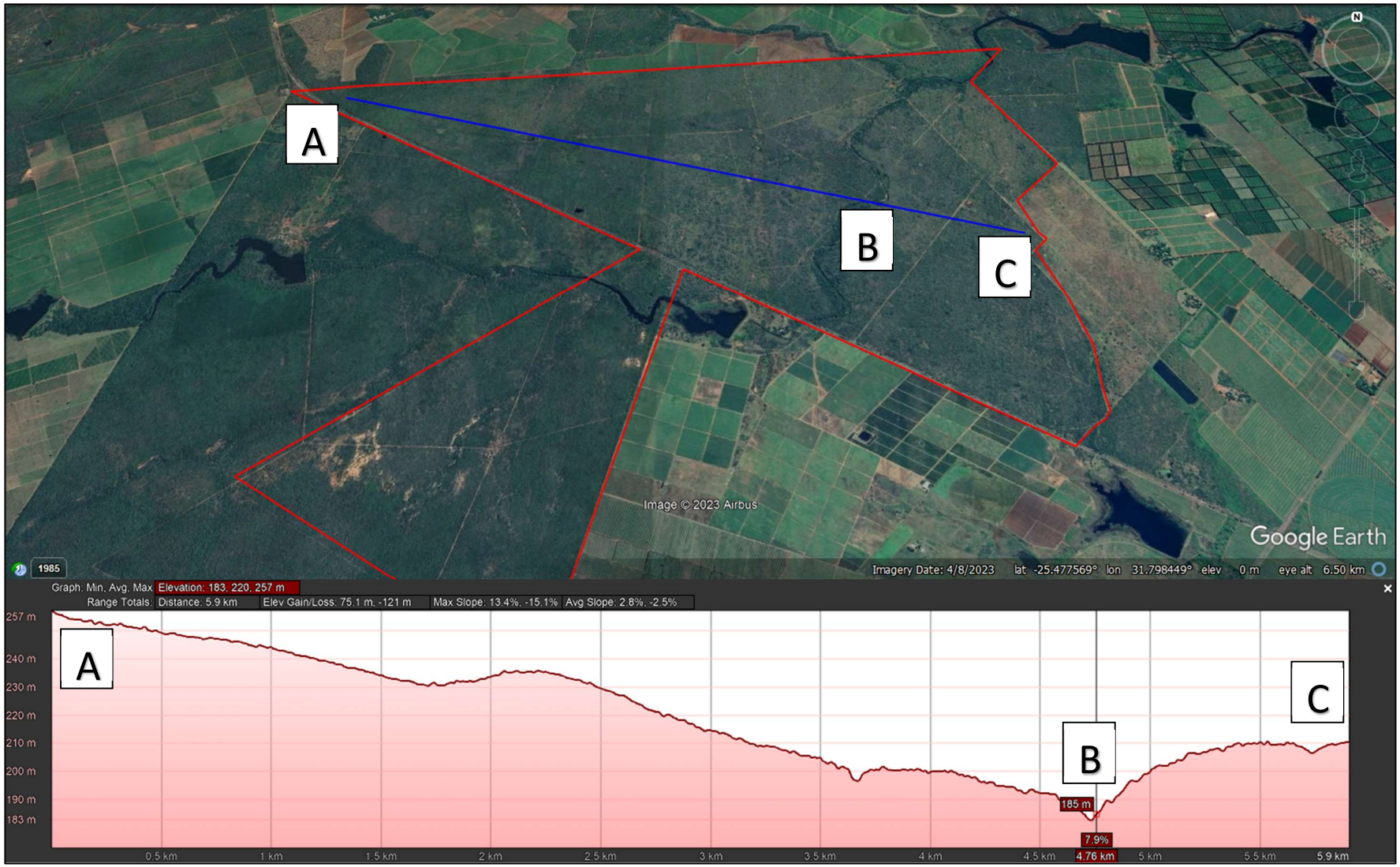

Figure 7: Elevation Profile (maximum elevation at point A and minimum at point B))

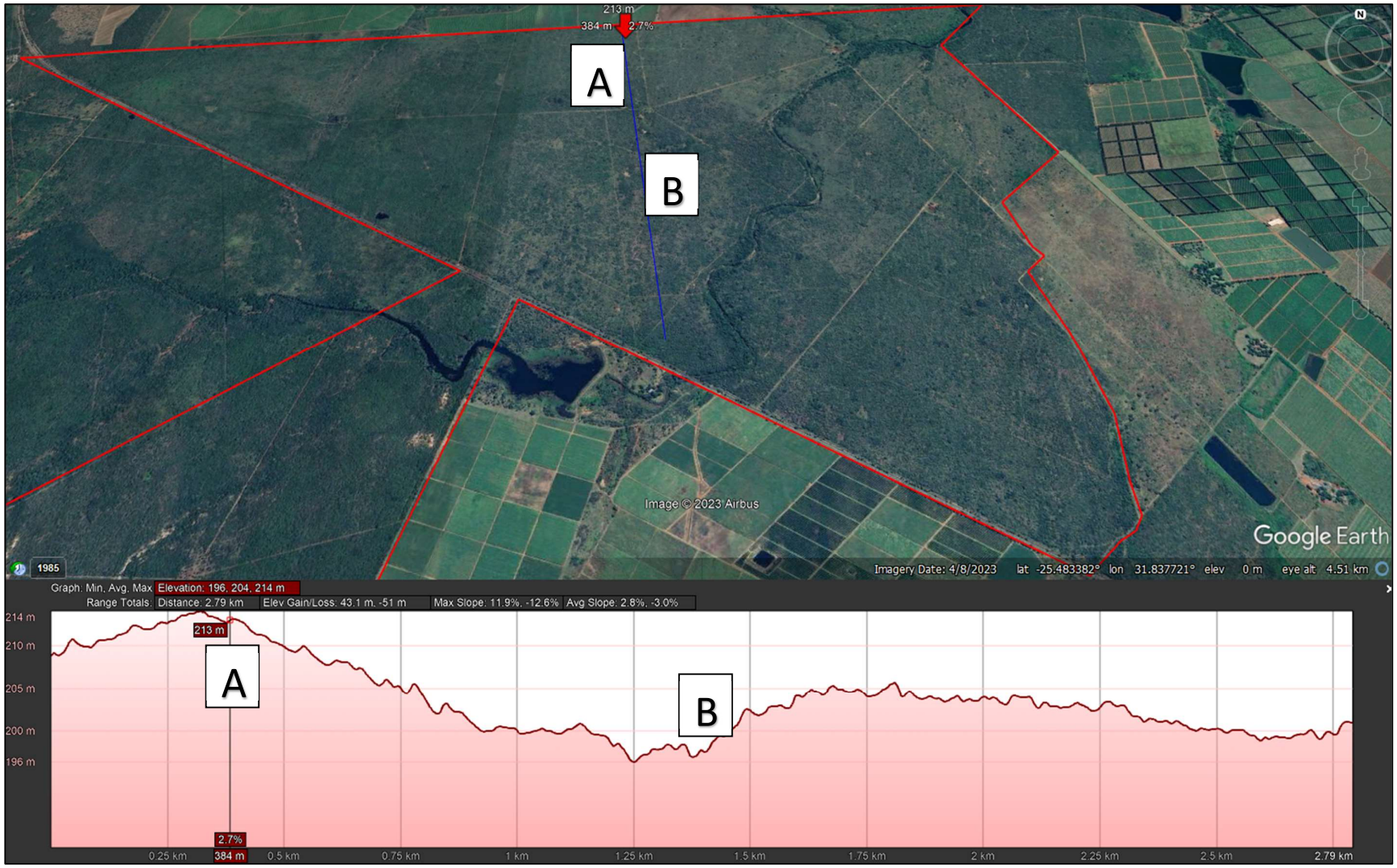

Figure 8: Elevation Profile from north to south (maximum elevation at point A and minimum at point B))

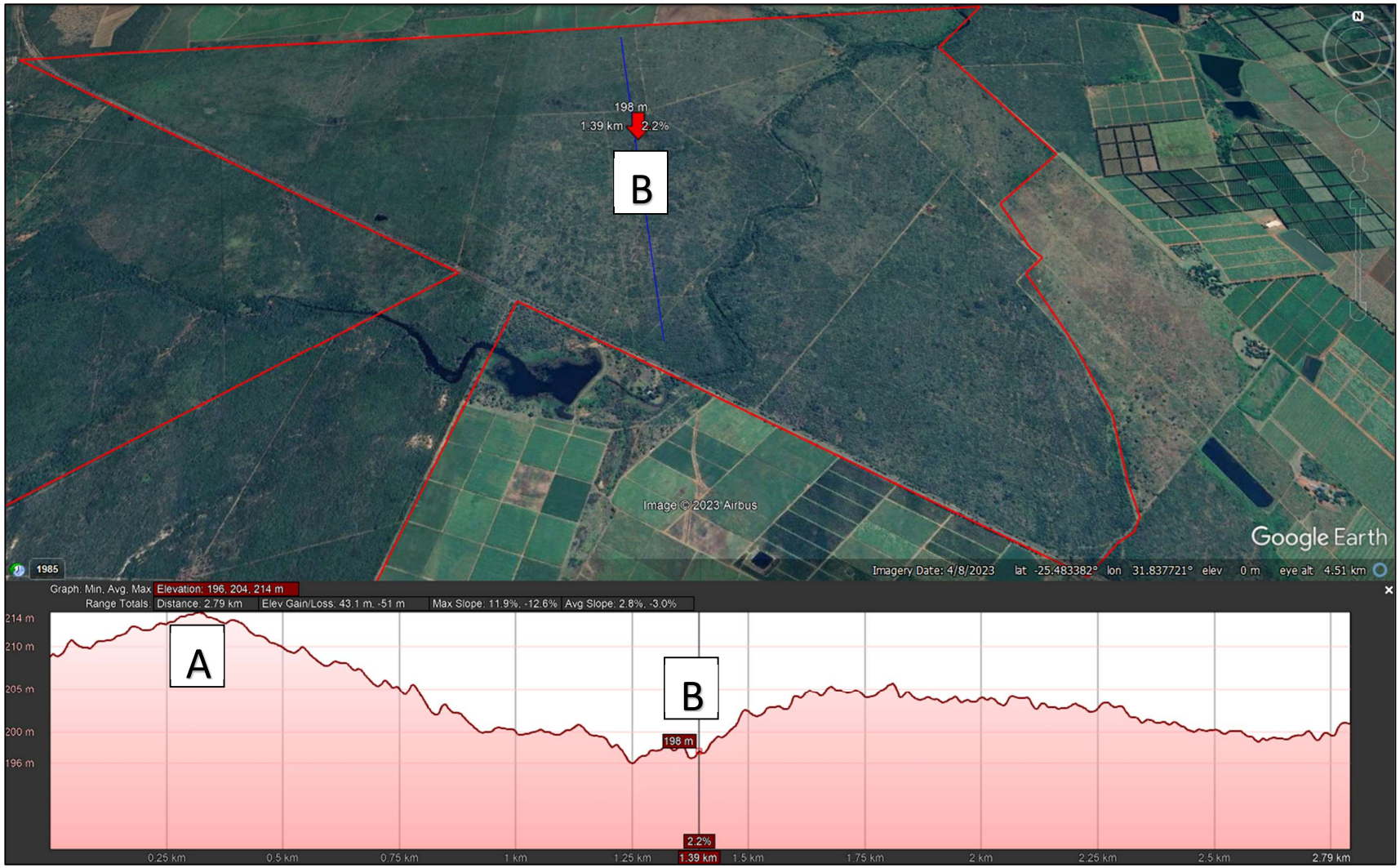

Figure 9: Elevation Profile from north to south (maximum elevation at point A and minimum at point B))

Table 1: Desktop study attributes and descriptions relevant to the study area.

Hydrological Setting (DWS, 2012)	
Water Management Area (WMA)	Inkomati Water Management Area
Sub-WMA	Komati North Water Management Area
Quaternary Catchment Area	X13L
Sub-Quaternary Reach (SQR)	X13L – 01000 – X13L-00995 PES: Class D (Moderately modified)
Ecoregion (Kleynhans *et al.*, 2005) (bold indicates most dominate attributes)	
ATTRIBUTES	**Lowveld (3)**
Terrain Morphology: Broad division (dominant types in bold) (Primary)	Plains; Low Relief; **Plains; Moderate Relief;** Lowlands, Hills and Mountains; Moderate and High Relief (limited); Open Hills, Lowlands; Mountains; Moderate to High Relief; (limited); Closed Hills; Mountains; Moderate and High Relief (Limited)
Vegetation types (dominant types in bold) (Primary)	**Mopane Bushveld;** Mopane Shrubveld; **Mixed Lowveld Bushveld;** Sour Lowveld Bushveld; Sweet Lowveld Bushveld; Natal Lowveld Bushveld; Lebombo Arid Mountain Bushveld; Mixed Bushveld Northeastern Mountain Grassland;
Altitude (m a.m.s.l) (secondary)	0-700, 700-1300 (very limited)
MAP (mm) (modifying)	200 – 1000
Coefficient of Variation (% of annual precipitation)	< 20 to 35
Rainfall concentration index	30 - > 65
Rainfall seasonality	Early to late summer
Mean annual temp. (°C)	16 - > 22
Mean daily max. temp. (°C): February	24 - 32
Mean daily max. temp. (°C): July	18 - > 24
Mean daily min. temp. (°C): February	14 - > 20
Mean daily min temp. (°C): July	4 - > 10
Median annual simulated runoff (mm) for quaternary catchment	10 - > 250
Landcover within the study area (DEA, 2020)	
Landcover Category (DEA, 2020)	
Desktop Delineation	**Site Conditions**
Dense forests & woodlands.	The onsite conditions for the most part mimic the presumed desktop landcover classes.
Open woodlands.	
Fallow lands & old fields.	
Herbaceous wetlands.	

Continuous low forests & thicket.	
National Wetland Map Version 5 (NWM5), National Freshwater Ecosystem Priority Areas (NFEPA's) (Driver *et al*., 2011) and Strategic Water Source Areas (SWSA) (Le Maitre *et al*., 2017)	
NWM5	Various wetlands occur within the area of interest as well as throughout the complete mining right.
Fish sanctuary	The project area does fall within a catchment that has been flagged as a fish sanctuary.
NFEPA Rivers	A NFEPA river falls within the study area, being the Ngweti River.
NFEPA Wetlands	The project infrastructure area and mining right does consist of artificial wetlands. A wetland is found in proximity of the Ngweti river that runs through the centre of Portion 548.
WetVeg	The project area falls over WetVeg units Lowveld Group 2 and Lowveld Group 4.
SWSA	The project area does not fall within a SWSA.
Geology and Soils (Council for Geosciences 2008; Schultze *et al*., 1992; MacFarlane & Bredin, 2016)	
Geology and Soil	The infrastructure farm portion is underlain by the Shale, sandstone, coal and mudstone from the Karoo Supergroup. The remaining mining right consists of Dolerite sills and dykes, as well as fine grained sandstone, siltstone and basic volcanic rocks. The soils are mostly one or more of vertic, melanic and/or red structured horizons.
Conservation Attributes (SANBI, 2018; SANBI, 2006-18; DFFE, 2021)	
CBA	• CBAs are areas that are important for conserving biodiversity. The infrastructure farm portion along with the mining right are within a heavy to moderately modified area and is therefore not classified as a CBA area.
ESA	• ESAs are areas that are important to ensure the long-term persistence of species or functioning of other important ecosystems. The infrastructure farm portion along with the mining right are within a heavy to moderately modified area. Towards the north the Kruger National Park is evident which is a National Park and is a protected area. The site occurs within a ESA 1.
Threatened Ecosystems	The project area does not fall within a threatened ecosystem.
Protected Areas	These are areas that are considered protected and imperative for conservation purposes:
Vegetation Types	The primary or reference vegetation unit of the study area is the Tshokwane-Hlane Basalt Lowveld as well as the Delagoa Lowveld. It falls within the Savanna Biome, and Lowveld Bio- and Ecoregion. This vegetation unit is classified as 'Moderately and Low Protected' respectively (Skowno *et al*, 2019), however of low concern. During the infield assessment, the general vegetation structure was observed to be highly transformed by agricultural activities.

Key:

CBA – Critical Biodiversity Area

EI: Ecological Importance

ES: Ecological Sensitivity

ESA – Ecological Support Area

m a m s l: Metres Above Mean Sea Level

NFEPA: National Freshwater Ecosystem Priority Area

NWM5: National Wetland Map Version 5;
PA – Protected Areas
PES: Present Ecological State
REC: Recommended Ecological Class
SWSA: Strategic Water Source Area

Refer to Section 5.1 for figures that illustrate various views from and of the site from different angles. These provide a visual indication of the current state and possible areas of importance for the determination of the possible impact.

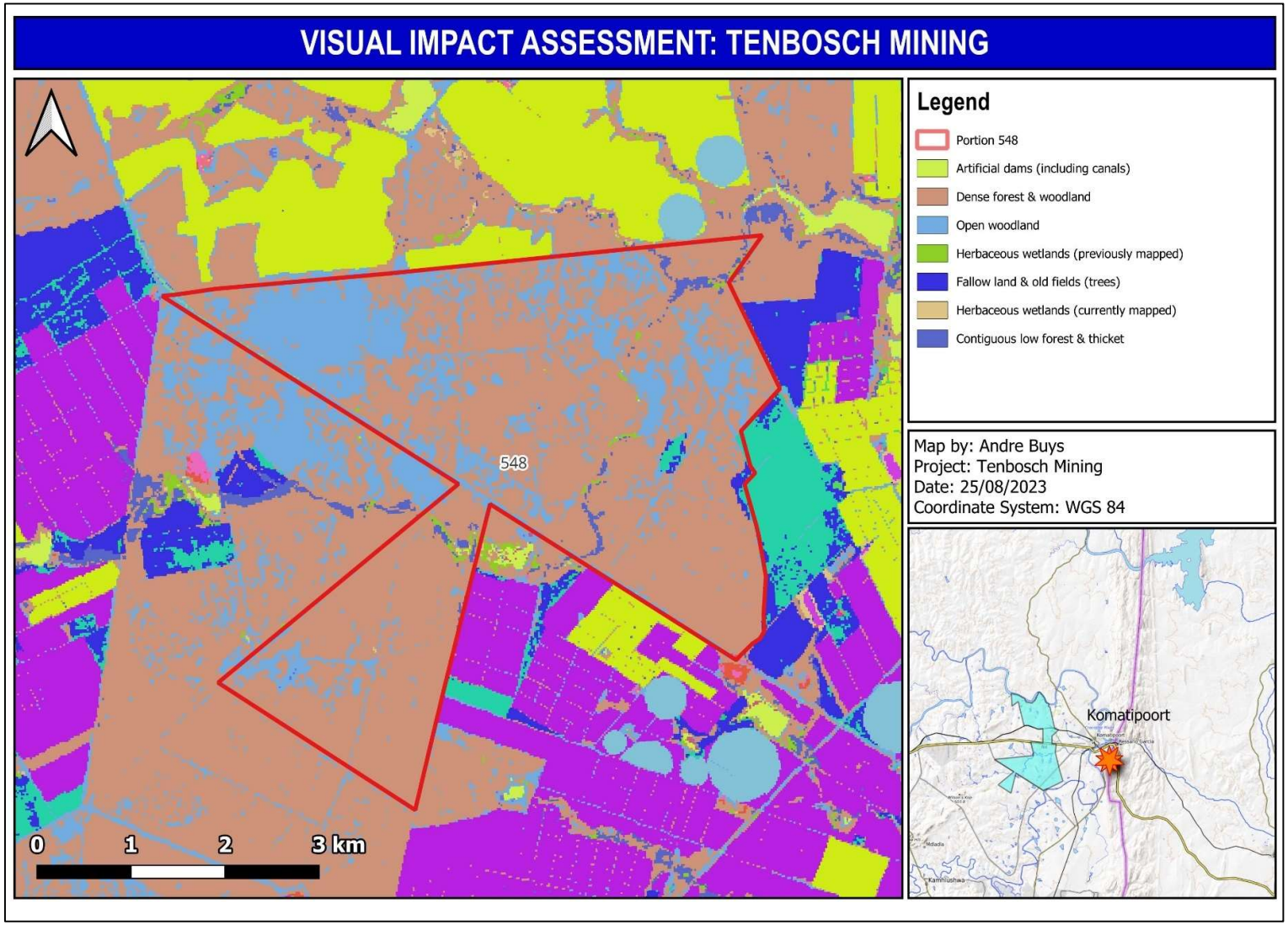

Figure 10: Infrastructure layout Landcover

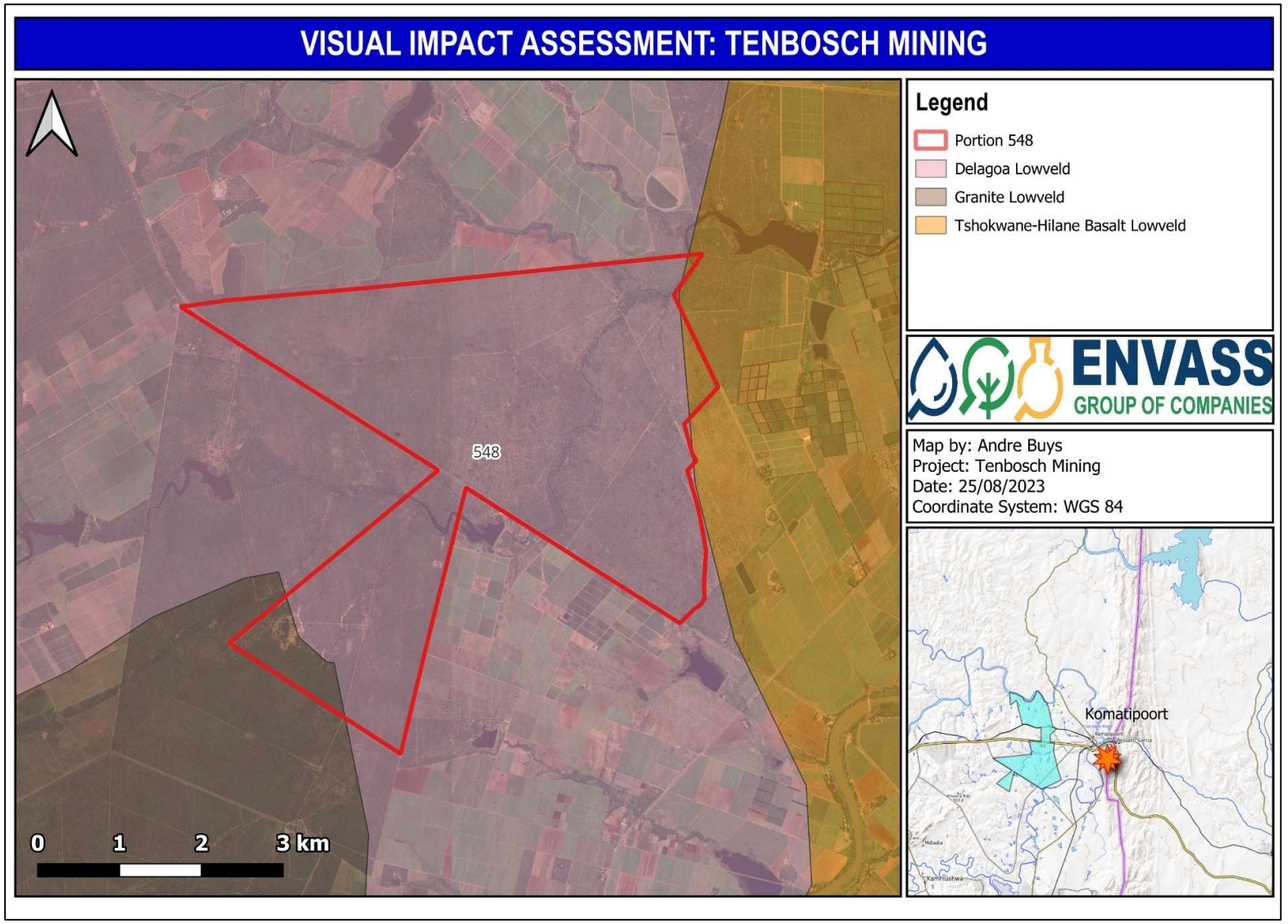

Figure 11: Infrastructure layout Vegetation Cover

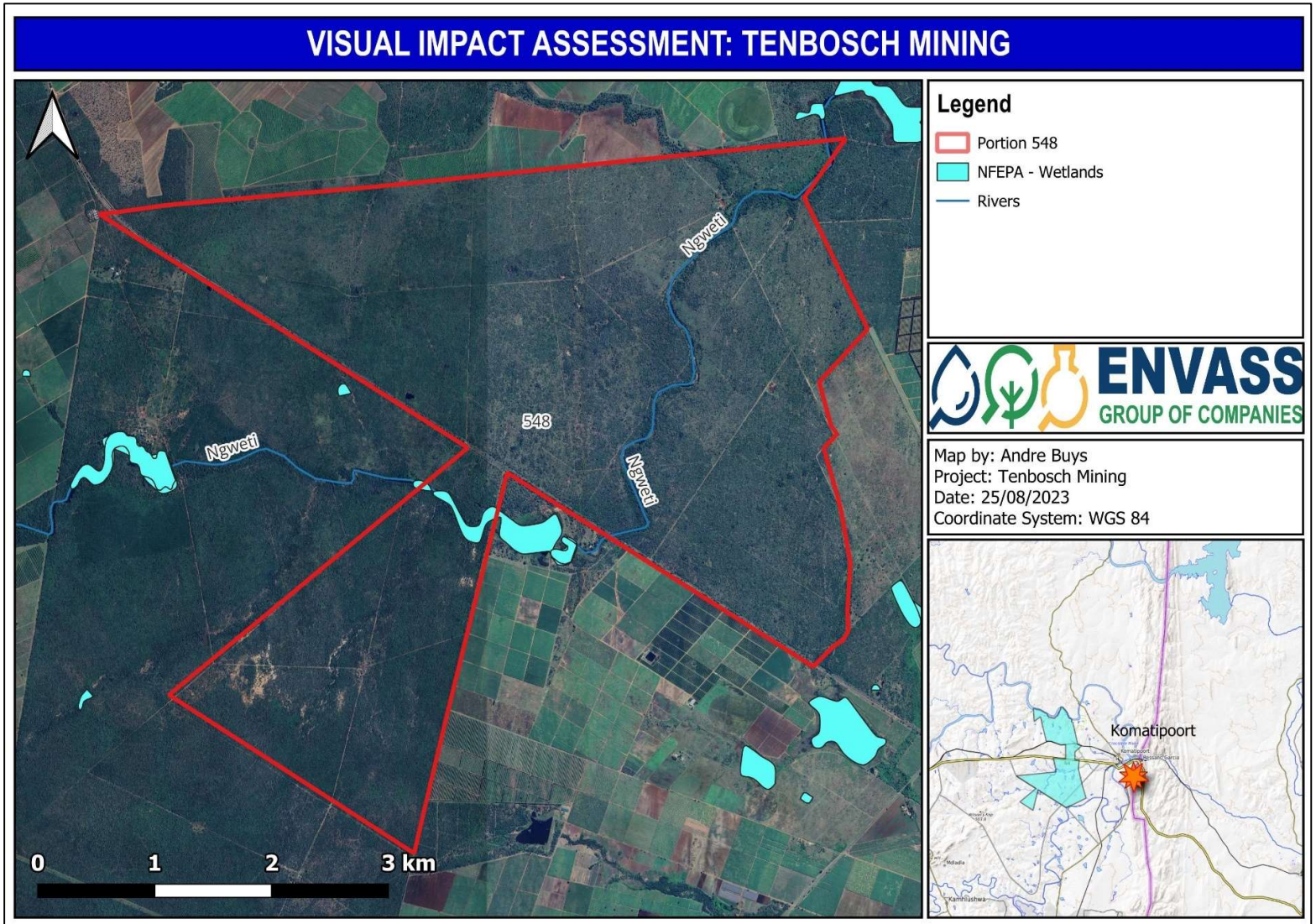

Figure 12: Infrastructure layout Watercourses

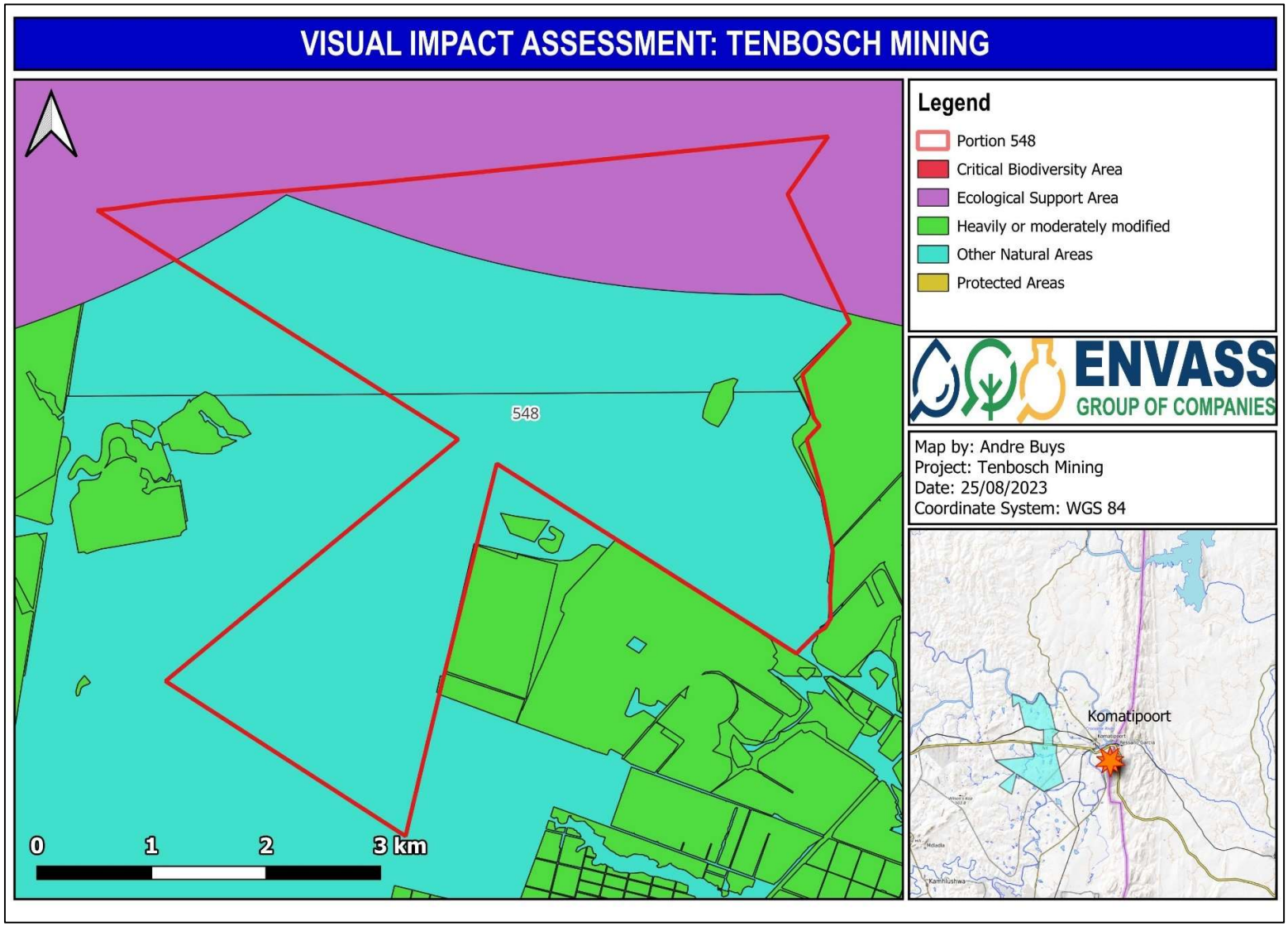

Figure 13: Critical and Ecological Biodiversity Areas

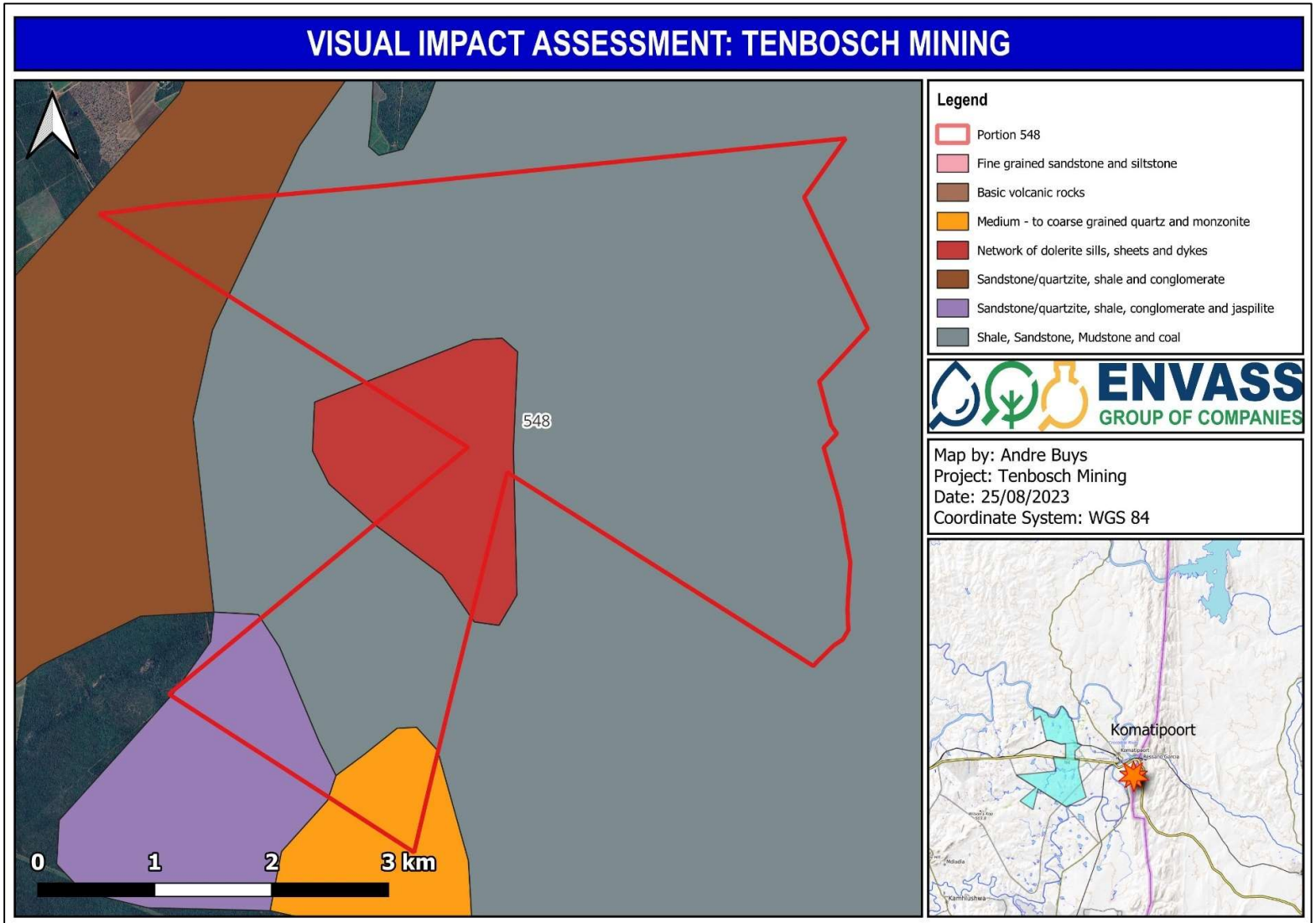

Figure 14: Infrastructure layout Geology

4.5 SENSE OF PLACE

Sense of place is a unique collection of qualities and characteristics that include visual, cultural, social, and environmental. Sense of place is what makes one city or town different from another and what makes our physical surroundings unique. The town of Komatipoort is the closest major town to the proposed site and is situated between the Komati - and Crocodile Rivers. The following information was sourced from an electronic source, namely SA Venues (https://www.savenues.com/attractionsmpl/komatipoort.php#:~:text=It%20is%20true%20that%20Komatipoort,for%20their%20mouth%20watering%20flavour).

The town of Komatipoort came into being in the late 1800's. During 1887, the name was derived from the Swazi named 'Komati River', literally meaning river of cows. Due to the climate in the area, little previous temptations for European settlers existed. The discovery of gold however resulted in the building of a branch line from the main Johannesburg to Lourenco Marques line to service the goldfileds. Komatipoort was where the mainline would sprout that branch. The great bridge across the Crocodile River can be seen as one enters the Kruger National Park just north of the study area.

Komatipoort therefore serves as a customs centre, where local farmers produce some of the world's most wonderful sub-tropical fruits that, no doubt, have the delicious summer heat to thank for their mouth-watering flavour.

The town is also a big tourist attraction for the access to local wildlife, golf, tiger fishing in the Komati River and elephant back safaris that make a trip to the lowveld an amazing experience. Further east of the town, the border post between South-Africa and Mozambique is found.

Whilst it sounds like a quiet little town on the way to nowhere, nothing could be further from the truth. Komatipoort lies just 8 kilometres from the Crocodile Bridge gate into the Kruger National Park, 5 kilometres from the Mozambique border and only 65 kilometres from the Swazi border, making day trips to each of these places incredibly easy.

The town of Komatipoort is probably most famous for the Nkomati Accord - a nonaggression treaty signed in 1984 between the Mozambican government and the apartheid government of the Republic of South Africa - its focus, on the one hand to prevent Mozambique from supplying material to the ANC (African National Congress), and on the other South Africa from supplying Renamo (Mozambican National Resistance).

5. VISUAL CHARACTERISATION

5.1 VIEWPOINTS

Since topography and visual landscape modification has already occurred as a result of various activities in the area, the viewshed is only a theoretical study. For this VIA to be more accurate, viewpoints have been identified and a visual inspection was conducted from these points to identify the current state of the environment and to provide information that can assist in determining the severity of the visual impact of the proposed activity. As indicated in Figure 16, twenty-five (25) viewpoints were identified from where inspections were conducted, and corresponding visual influence and characteristics have been defined. No access could be obtained to Viewpoint 13.

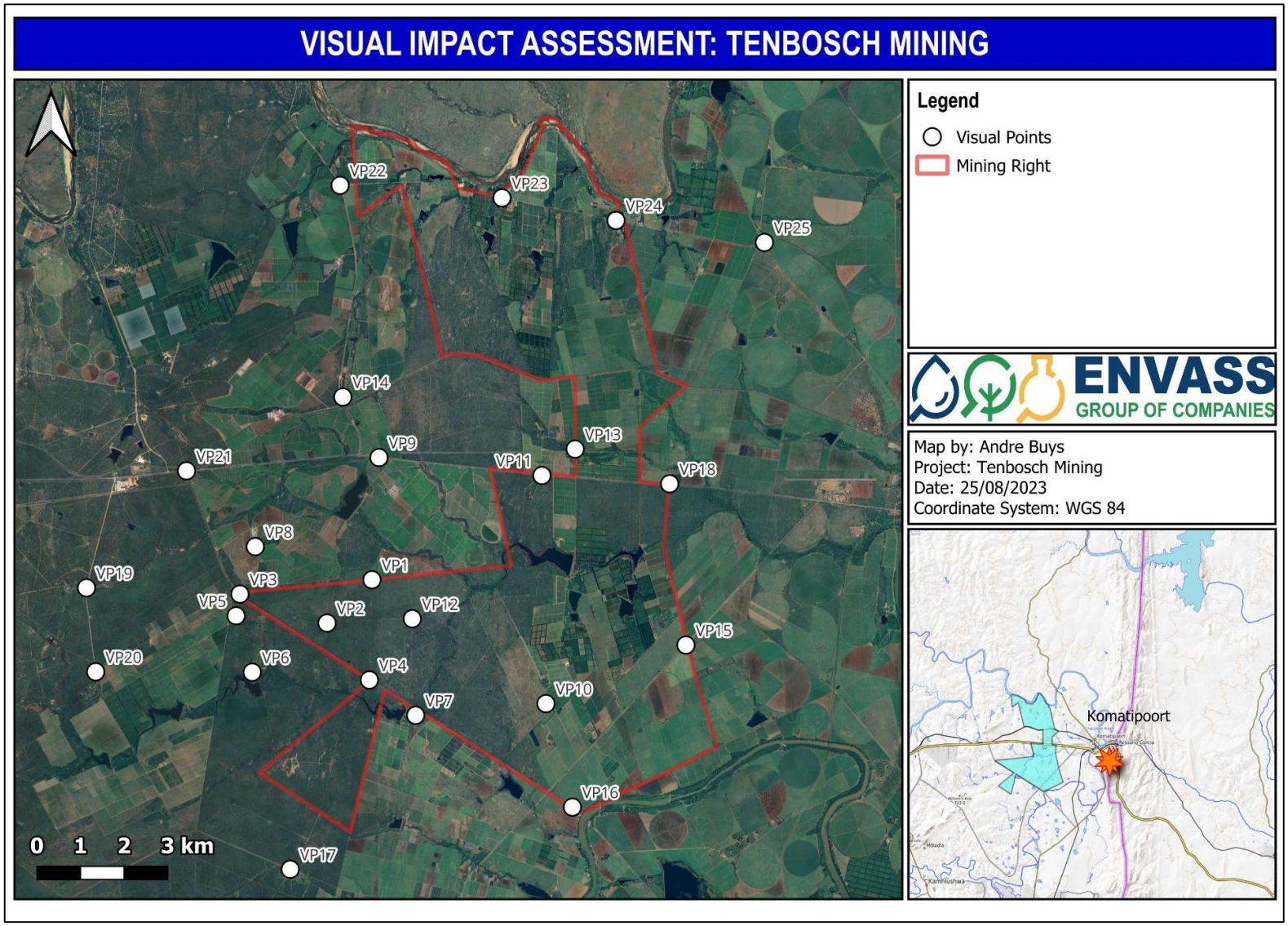

Figure 15: Viewpoints of the proposed Tenboch Mine visual assessment

5.1.1 Viewpoint 1 (VP1):

Viewpoint 1 is located along a Gravel Road towards the northern border of the Portion 548 on which all infrastructure will be constructed. From the viewpoint, the visual character comprises of a predominantly flat terrain. The area comprises predominately Savanna Biome vegetation, with grass, trees and shrubs as far as can be observed. The area is surrounded by Banana orchards. View 3 (south) has been taken towards the infrastructure layout area.

Figure 16: View 1 (North)

Figure 17: View 2 (East)

Figure 18: View 3 (South)

Figure 19: View 4 (West)

5.1.2 Viewpoint 2 (VP2):

Viewpoint 2 is located along a Gravel Road towards an informal shack / house in the centre of the infrastructure layout area. The Product stockpile will be directly east of the viewpoint. From the viewpoint, the visual character comprises of a predominantly flat terrain. The area comprises predominately Savanna Biome vegetation, with grass, trees and shrubs as far as can be observed. The area is surrounded by land used for grazing. All Views has been taken towards the infrastructure layout area.

Figure 20: View 1 (North)

Figure 21: View 2 (East)

Figure 22: View 3 (South)

Figure 23: View 4 (West)

5.1.3 Viewpoint 3 (VP3):

Viewpoint 3 is located along a Tar Road (R582) towards the western border of the Portion 548 on which all infrastructure will be constructed. From the viewpoint, the visual character comprises of a predominantly flat terrain. The area comprises predominately Savanna Biome vegetation, with trees and shrubs as far as can be observed. The area is surrounded by land used for grazing. View 2 (east) has been taken towards the infrastructure layout area.

Figure 24: View 1 (North)

Figure 25: View 2 (East)

Figure 26: View 3 (South)

Figure 27: View 4 (West)

5.1.4 Viewpoint 4 (VP4):

Viewpoint 4 is located along a Tar Road (R582) towards the southern border of the Portion 548 on which all infrastructure will be constructed. From the viewpoint, the visual character comprises of a predominantly flat terrain. The area comprises predominately Savanna Biome vegetation, with trees and shrubs as far as can be observed. The area is surrounded by land used for grazing. View 1 (North) has been taken towards the infrastructure layout area, with the proposed PCD just north of the viewpoint.

Figure 28: View 1 (North)

Figure 29: View 2 (East)

Figure 30: View 3 (South)

Figure 31: View 4 (West)

5.1.5 Viewpoint 5 (VP5):

Viewpoint 5 is located along a gravel Road just outside the western border of the Portion 548 on which all infrastructure will be constructed. From the viewpoint, the visual character comprises of a predominantly flat terrain. The area comprises predominately agricultural land with seedlings planted. Towards the east and south trees and shrubs is evident as far as can be observed. View 2 (East) has been taken towards the infrastructure layout area.

Figure 32: View 1 (North)

Figure 33: View 2 (East)

Figure 34: View 3 (South)

Figure 35: View 4 (West)

5.1.6 Viewpoint 6 (VP6):

Viewpoint 6 is located along a gravel road west of the western boundary of Portion 548 on which all infrastructure will be constructed. From the viewpoint, the visual character comprises of a predominantly flat terrain. The area comprises predominately Savanna Biome vegetation, with trees and shrubs as far as can be observed. The area is surrounded by land used for grazing. View 2 (East) and View 3 (South) has been taken towards the infrastructure layout area.

Figure 36: View 1 (North)

Figure 37: View 2 (East)

Figure 38: View 3 (South)

Figure 39: View 4 (West)

5.1.7 Viewpoint 7 (VP7):

Viewpoint 7 is located along a Tar Road (R582) towards the southern border of the Portion 548 on which all infrastructure will be constructed. From the viewpoint, the visual character comprises of a predominantly flat terrain. The area comprises predominately Savanna Biome vegetation, with trees and shrubs as far as can be observed. A Residential house is evident to the west of the Viewpoint. The area is surrounded by land used for grazing. View 1 (North) has been taken towards the infrastructure layout area.

Figure 40: View 1 (North)

Figure 41: View 2 (East)

Figure 42: View 3 (South)

Figure 43: View 4 (West)

5.1.8 Viewpoint 8 (VP8):

Viewpoint 8 is located along a Tar Road (R582) towards the western border of the Portion 548 on which all infrastructure will be constructed. From the viewpoint, the visual character comprises of a predominantly flat terrain. The area comprises predominately Savanna Biome vegetation, with trees and shrubs as far as can be observed. The area is surrounded by private owned agricultural land where Banana orchards were witnessed. View 3 (South) has been taken towards the infrastructure layout area.

Figure 44: View 1 (North)

Figure 45: View 2 (East)

Figure 46: View 3 (South)

Figure 47: View 4 (West)

5.1.9 Viewpoint 9 (VP9):

Viewpoint 9 is located along the N4 highway Komatipoort. Portion 548 on which all infrastructure will be constructed is located to the South. From the viewpoint, the visual character comprises of a predominantly flat terrain. The area is surrounded by Banana Orchards.

Figure 48: View 1 (North)

Figure 49: View 2 (East)

Figure 50: View 3 (South)

Figure 51: View 4 (West)

5.1.10 Viewpoint 10 (VP10):

Viewpoint 10 is located along a gravel road towards a private owned farm's Residential setup. It occurs on Portion 548 on which all infrastructure will be constructed. From the viewpoint, the visual character comprises of a predominantly flat terrain. The area comprises predominately agricultural land, with trees and shrubs as far as can be observed. View 4 (West) has been taken towards the infrastructure layout area.

Figure 52: View 1 (North)

Figure 53: View 2 (East)

Figure 54: View 3 (South)

Figure 55: View 4 (West)

5.1.11 Viewpoint 11 (VP11):

Viewpoint 11 is located along the N4 highway Komatipoort. Portion 548 on which all infrastructure will be constructed is located to the Southwest. From the viewpoint, the visual character comprises of a predominantly flat terrain. The area is surrounded by Banana Orchards to the south and Savanna Biome Trees and Grass to the North.

Figure 56: View 1 (North)

Figure 57: View 2 (East)

Figure 58: View 3 (South)

Figure 59: View 4 (West)

5.1.12 Viewpoint 12 (VP12):

Viewpoint 12 is located to the centre of Portion 548 on which all infrastructure will be constructed. From the viewpoint, the visual character comprises of a predominantly flat terrain. The area is surrounded by agricultural land used for grazing.

Figure 60: View 1 (North)

Figure 61: View 2 (East)

Figure 62: View 3 (South)

Figure 63: View 4 (West)

5.1.13 Viewpoint 13 (VP13):

Viewpoint 13 is located towards private owned farms and no access could be obtained.

5.1.14 Viewpoint 14 (VP14):

Viewpoint 14 is located along the Tenboch road to the North. The road will lead to access on the northern portions of the mining area. The Portion 548 where the infrastructure layout will be constructed on is to the south. The viewpoint is surrounded by private farms where extensive Banana farming takes place. From the viewpoint, the visual character comprises of a predominantly flat terrain.

Figure 64: View 1 (North)

Figure 65: View 2 (East)

Figure 66: View 3 (South)

Figure 67: View 4 (West)

5.1.15 Viewpoint 15 (VP15):

Viewpoint 15 is located along the Strydom block tar on the south-eastern boundary of the southern mining right. Portion 548 on which all infrastructure will be constructed is located to the West. From the viewpoint, the visual character comprises of a predominantly flat terrain. The area is surrounded by Orchards.

Figure 68: View 1 (North)

Figure 69: View 2 (East)

Figure 70: View 3 (South)

Figure 71: View 4 (West)

5.1.16 Viewpoint 16 (VP16):

Viewpoint 16 is located along the Tar Road (R582) towards the southern boundary of Portion 548 on which all infrastructure will be constructed. The centre of the infrastructure layout is located to the north. From the viewpoint, the visual character comprises of a predominantly flat terrain. The area is surrounded by farms under irrigation (pivots) as well as the komati river to the east.

Figure 72: View 1 (North)

Figure 73: View 2 (East)

Figure 74: View 3 (South)

Figure 75: View 4 (West)

5.1.17 Viewpoint 17 (VP17):

Viewpoint 17 is located directly south-west of the southern boundary of the mining right. From the viewpoint, the visual character comprises of a predominantly flat terrain. The area comprises predominately farming lands and irrigation areas. View 1 (North) have been taken towards the proposed Infrastructure area. In addition, shrubs and trees of various heights are visible in the distance.

Figure 76: View 1 (North)

Figure 77: View 2 (East)

Figure 78: View 3 (South)

Figure 79: View 4 (West)

5.1.18 Viewpoint 18 (VP18):

Viewpoint 18 is located on the N4 towards Komatipoort. The southern portion of the mining right is evident to the south. Portion 548 is located to the South-west. From the viewpoint, the visual character comprises of a predominantly flat terrain. The area comprises of irrigated areas as well as lush bush and trees. View 4 (West) have been taken towards the proposed infrastructure layout area. In addition, shrubs and trees of various heights are visible in the distance.

Figure 80: View 1 (North)

Figure 81: View 2 (East)

Figure 82: View 3 (South)

Figure 83: View 4 (West)

5.1.19 Viewpoint 19 (VP19):

Viewpoint 19 is located along a gravel road towards a private farm located to the west of Portion 548 on which all infrastructure will be constructed. From the viewpoint, the visual character comprises of a predominantly flat terrain. The area is surrounded by farming activities and also farming setups, including residential houses and storerooms.

Figure 84: View 1 (North)

Figure 85: View 2 (East)

Figure 86: View 3 (South)

Figure 87: View 4 (West)

5.1.20 Viewpoint 20 (VP20):

Viewpoint 20 is located along a gravel road towards a private farm located to the west of Portion 548 on which all infrastructure will be constructed. The point is slightly further south from Viewpoint 19. From the viewpoint, the visual character comprises of a predominantly flat terrain. The area is surrounded by farming activities and farming setups, including residential houses and storerooms.

Figure 88: View 1 (North)

Figure 89: View 2 (East)

Figure 90: View 3 (South)

Figure 91: View 4 (West)

5.1.21 Viewpoint 21 (VP21):

Viewpoint 21 is located at the intersection between the N4 and the R 582. The infrastructure layout area is located t the south-east. From the viewpoint, the visual character comprises of a predominantly flat terrain, with heavy disturbed areas due to the N4 road construction. The area comprises predominately of a flat terrain with trees and shrubs next to the tar roads. View 3 (South) have been taken towards the proposed infrastructure layout area. In addition, shrubs and trees of various heights are visible in the distance.

Figure 92: View 1 (North)

Figure 93: View 2 (East)

Figure 94: View 3 (South)

Figure 95: View 4 (West)

5.1.22 Viewpoint 22 (VP22):

Viewpoint 22 is located north-west of the western boundary of the northern section of the mining right. It is located on the R 571 towards crocodile bridge. From the viewpoint, the visual character comprises of a predominantly flat terrain surrounded by agricultural land under irrigation. View 2 (East) have been taken towards the northern mining right portion. View 3 (South), is taken towards the infrastructure layout area.

Figure 96: View 1 (North)

Figure 97: View 2 (East)

Figure 98: View 3 (South)

Figure 99: View 4 (West)

5.1.23 Viewpoint 23 (VP23):

Viewpoint 23 is located north of the northern boundary of the northern section of the mining right. It is located on the R 571 towards crocodile bridge. From the viewpoint, the visual character comprises of a predominantly flat terrain surrounded by agricultural land under irrigation. View 3 (South) have been taken towards the northern mining right portion (North). View 3 (South), is taken towards the infrastructure layout area. The viewpoint was taken at an entrance to private owned farming setup.

Figure 100: View 1 (North)

Figure 101: View 2 (East)

Figure 102: View 3 (South)

Figure 103: View 4 (West)

5.1.24 Viewpoint 24 (VP24):

Viewpoint 24 is located north-east of the northern boundary of the northern section of the mining right. It is located on the R 571 towards crocodile bridge. From the viewpoint, the visual character comprises of a predominantly flat terrain surrounded by agricultural land under irrigation. View 3 (South) have been taken towards the northern mining right portion (North). View 3 (South), is taken towards the infrastructure layout area. The viewpoint was taken at an entrance to private owned farming setup.

Figure 104: View 1 (North)

Figure 105: View 2 (East)

Figure 106: View 3 (South)

Figure 107: View 4 (West)

5.1.25 Viewpoint 25 (VP25):

Viewpoint 25 is located north-east of the northern boundary of the northern section of the mining right. It is located on the intersection of the R 571 towards crocodile bridge. From the viewpoint, the visual character comprises of a predominantly flat terrain surrounded by agricultural land under irrigation. View 4 (West) have been taken towards the northern mining right portion (North). View 3 (South), is taken towards the infrastructure layout area.

Figure 108: View 1 (North)

Figure 109: View 2 (East)

Figure 110: View 3 (South)

Figure 111: View 4 (West)

5.2 VISUAL RESOURCE VALUE OF THE STUDY AREA

The visual resource value refers to the visual quality of an environment and how the environment appeal to our senses. According to Crawford (1994), landscape quality increases when:

- Prominent topographical features and rugged horizon lines exist.
- Water bodies such as streams or dams are present.
- Untransformed indigenous vegetation cover dominates.
- Limited presence of human activity, or land uses that are not visually intrusive or dominant prevail.

The criteria incorporated for the visual resource assessment is highlighted in the Table 2 below. The landscape is rated either high, moderate or low depending on factors such as sense of place, current views and aesthetic appeal.

Table 2: Visual Resource Value Criteria

Visual Resource Value	Criteria
High (3)	Pristine or near-pristine condition/little to no visible human intervention visible/ characterised by highly scenic or attractive natural features, or cultural heritage sites with high historical or social value and visual appeal/characterised by highly scenic or attractive features/areas that exhibit a strong positive character with valued features that combine to give the experience of unity, richness and harmony. These are landscapes that may be of particular importance to conserve and which may be sensitive to change.
Moderate (2)	Partially transformed or disturbed landscape/human intervention visible but does not dominate view, or that is characterised by elements that have some socio-cultural or historic interest but that is not considered visually unique/scenic appeal of landscape partially compromised/noticeable presence of incongruous elements/areas that exhibit positive character, but which may have evidence of degradation/erosion of some features resulting in areas of more mixed character. These landscapes are less important to conserve but may include certain areas or features worthy of conservation.
Low (1)	Extensively transformed or disturbed landscape/human intervention is of visually intrusive nature and dominates available views/scenic appeal of landscape greatly compromised/visual prominence of widely disparate or incongruous land uses and activities/areas generally negative in character with few, if any, valued features. Scope for positive enhancement frequently occurs.

- **Topography –** The proposed site is situated between approximately 254 to 183 as well as 213 to 198 mamsl and has a maximum slope of approximately 2,0 % and - 3,0 % over a distance of 5 900 and 2 900 m based on two cross-sectional profiles. The landscape specifically referring to the infrastructure layout area, is gentle and predominantly flat. Due to active agricultural activities occurring, the appeal of the landscape has been slightly compromised. The topographic value of the study area is therefore considered to have a **high** value.
- **Hydrology –** There is one visually prominent water drainage course within the proposed site. ESAs are also associated with the watercourse. Therefore, the aesthetic value of the river is **moderate**.

- **Vegetation cover –** Disturbed areas are present due to the agricultural activities within the study area. The areas comprise mainly of grass, shrub, bushes and various tree species of varying heights. Vegetation units are located within the proposed site and comprise of dense forests & woodlands, open woodlands, fallow lands & old fields, with areas characterized by artificial dams, herbaceous wetlands and continuous low forests & thicket. The visual resource value of the proposed site's vegetation cover is rated **moderate**.
- **Land use –** The main land use within the proposed site is agriculture. A portion of the proposed site's visual value has already been disturbed. The visual resource value of the study area is therefore considered to be **moderate**.

A resource value is subjectively applied, based on the specialist's expertise and experience in assessing visual impacts. A value is applied to the visual resources with each resource able to receive a maximum score of three (3) and counted to reach a final score out of twelve (12). The **total** is counted, and final score rated as:

- Low, equal to 4 – 6.
- Moderate, equal to 7 – 9, and
- High, equal to 10 - 12.

The values applied to the study area is detailed in Table 3 below.

Table 3: Visual resource value determination

VISUAL BASELINE ATTRIBUTES	TOPOGRAPHY	HYDROLOGY	VEGETATION	LAND USES
Visual resource value score	3	2	2	2
Total				9

Based on the above score ranges, the overall visual resource value of the study area is rated as **moderate** (9).

5.3 VISUAL ABSORPTION CAPACITY

According to Oberholzer (2008), Visual Absorption Capacity (VAC) can be defined as an '*estimation of the capacity of the landscape to absorb development without creating a significant change in visual character or producing a reduction in scenic quality*'. VAC was determined by considering the nature and occurrence of vegetation cover, topographical characteristics, and human structures. A further major factor is the degree of visual contrast between the proposed new project and the existing elements in the landscape.

5.3.1 Visual Absorption Capacity Weighting Factor

To account for the fact that visual impacts are expected to be more intrusive in landscapes with a lower VAC than in those with a higher VAC (regardless of the visual quality of the landscape), a weighting factor is incorporated into the impact magnitude determination, as indicated in Table 4.

Table 4: Visual absorption capacity weighting factor

VISUAL RESOURCE VALUE OF RECEIVING LANDSCAPE	LOW VAC	MODERATE VAC	HIGH VAC
High resource value	High (1.2)	High (1.2)	Moderate (1.0)
Moderate resource value	High (1.2)	Moderate (1.0)	Low (0.8)
Low resource value	Moderate (1.0)	Low (0.8)	Low (0.8)

The majority of vegetation cover is grassland and bush as well as seasonal crops/produce and the topographical characteristics (gently to predominantly flat) will result in a **low** VAC. The visual resource value of the study area has been determined to be **moderate**, while the VAC of the study area has been rated as **low**. Therefore, a **high** (1.2) weighting factor in terms of VAC is applied during the impact assessment.

5.4 VISUAL RECEPTOR SENSITIVITY AND INCIDENCES

Receptor sensitivity refers to the degree to which an activity will impact the receptors and depends on how many persons see the project, how frequently they are exposed to it and their perceptions regarding aesthetics. Receptors of the proposed project can be broadly categorised into two (2) main groups, namely:

- People who live or work in the area, and who will be frequently exposed to the project components (resident receptors); and
- People who travel through the area and are only temporarily exposed to the project components (transient receptors).

Resident receptors located outside the proposed site include:

- Resident receptors would include the employees of industrial operations, local residents, businesses and the local farming communities that are present outside the proposed mining right, especially referring to Portion 548 where the infrastructure will be constructed.

Transient receptors located outside the proposed site include:

- The N4, the R 571, Tenboch drive, the R 582 and the D 1837 are the main roads located near and run through the proposed site. The roads situated near the proposed site are predominately used for access to the surrounding towns, residential areas and agricultural activities. Tourism facilities are located near and surrounding the proposed site and tourists will utilise the roads surrounding the proposed site. The proposed area can mainly be seen from the N4 and R 582. The visual receptor sensitivity and incidence can be classified as high, moderate or low, as indicated in Table 5.

Table 5: Visual receptor and sensitivity criteria

NUMBER OF PEOPLE THAT WILL SEE THE PROJECT (INCIDENCE FACTOR)	
High	Towns and cities, along major national roads (e.g., thousands of people).
Moderate	Villages, typically less than 1 000 people.

Low	Less than 100 people (e.g., a few households).
RECEPTOR PERCEIVED LANDSCAPE VALUE (SENSITIVITY FACTOR)	
High	People attach a high value to aesthetics, such as in or around a game reserve or conservation area, and the project is perceived to impact significantly on this value of the landscape.
Moderate	People attach a moderate value to aesthetics, such as smaller towns, where natural character is still plentiful and in close range of residency.
Low	People attach a low value to aesthetics, when compared to employment opportunities, for instance. Environments have already been transformed, such as cities and towns.

The following ratings have therefore been applied to the identified visual receptor groups:

- **Resident Receptors:** Resident receptors comprise a high number of people (incidence factor) living around the proposed mining area:
    - People living and working in the surrounding areas will rate a moderate value (sensitivity factor) to the project; and

- **Transient Receptors:** People travelling through and near the proposed site will be high with local tourist attractions located near the proposed site. They will thus constitute a high number of people (incidence factor). It is expected that travellers will attach a moderate degree of value to the current setting and visual character of the proposed site (sensitivity factor) due to the various tourist attractions and agricultural activities already established in the area. Hence, this receptor group has also been given a **high** sensitivity rating.

To determine the magnitude of a visual impact, a weighting factor that accounts for receptor sensitivity is determined (Table 6), based on the number of people that are likely to be exposed to a visual impact (incidence factor) and their expected perception of the value of the visual landscape and project impact (sensitivity factor).

Table 6: Weighting factor for receptor sensitivity criteria

RECEPTOR SENSITIVITY	HIGH INCIDENCE	MODERATE INCIDENCE	LOW INCIDENCE
High Sensitivity	High (1.2)	High (1.2)	Moderate (1.0)
Moderate Sensitivity	High (1.2)	Moderate (1.0)	Low (0.8)
Low Sensitivity	Moderate (1.0)	Low (0.8)	Low (0.8)

Based on the receptor sensitivity assessment and the above criteria, a **high** weighting factor (1.2) in terms of this aspect is applied during the impact magnitude determination.

6. BASELINE VISUAL ASSESSMENT

6.1 IMPACT IDENTIFICATION

Coal mines (underground and/or open cast) are considered long-term in nature and long-term structures will be constructed. The primary visual impacts associated with a change from the current state of the site to an underground coal mine will have the greatest visual impact due to the visibility of the site from sensitive receptors. The visual impacts will be assessed based on a synthesis of criteria (nature of impact, extent, duration, probability, intensity, status, degree of confidence, level of significance and significance after mitigation) as defined by the NEMA Environmental Impact Assessment (EIA) regulations. The nature of the visual impacts will be the visual effect the activity would have on the receiving environment. These visual impacts would be:

- Change from dense forests & woodlands, open woodlands, fallow lands & old fields, with areas characterized by artificial dams, herbaceous wetlands and continuous low forests & thicket site to an underground coal mine, with surface infrastructure. The Tenbosch mining project will have a visual impact, as there will be a change in the visual character of the site from a predominately vegetated site to an opencast coal mine. It must be noted that only Portion 548 will consist of surface disturbance and infrastructure construction.

- Visibility from sensitive receptors. The proposed development will be visible from receptors outside the proposed mining area. These include:
    - Site personnel at the operation;
    - People travelling to work in the surrounding areas;
    - People travelling on the surrounding access routes to their place of residence;
    - Tourists visiting the surrounding areas;
    - Surrounding farming communities; and
    - Surrounding residential areas (Komatipoort and Marlothpark).

6.2 IMPACT MAGNITUDE CRITERIA

The magnitude of a visual impact is determined by considering the visual resource value and VAC of the landscape within which the project will take place, the receptors potentially affected by it, together with the level of visibility of the project components, their degree of visual intrusion and the potential visual exposure of receptors to the project, as further elaborated on in the sections below:

6.2.1 Theoretical Visibility

Theoretical visibility was determined by conducting a Viewshed analysis and using Geographic Information System software with three-dimensional topographical modelling capabilities:

- The Digital Elevation Model (DEM) for the Viewshed analysis was acquired from the USGS Earth Explorer; and
- A 5 km area surrounding the site was used due the topography of the area.

The Viewshed was modelled on the above-mentioned DEM and the mine plan supplied by Kimopax, using Esri ArcGIS for Desktop software, 3D Analyst Extension.

Table 7: Rating of level of visibility

LEVEL OF THEORETICAL VISIBILITY OF PROJECT ELEMENTS	VISIBILITY RATING
More than half of the study area	High
Between a quarter and half of the study area	Moderate
Less than a quarter of the total project study area	Low

Taking into account the viewshed analysis the visibility rating is **High.**

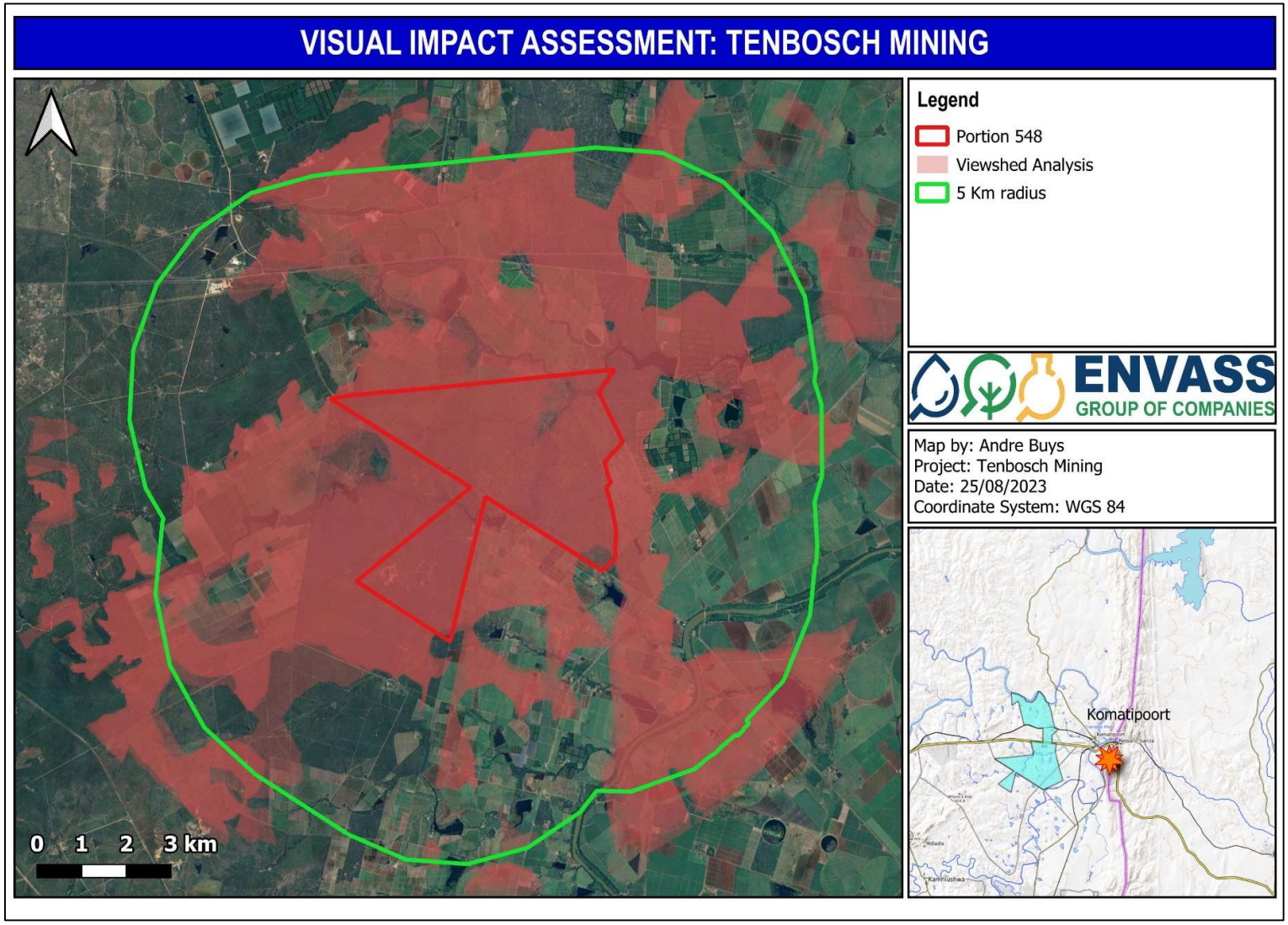

Figure 112: Viewshed Analysis

6.3 VISUAL INTRUSION

Visual intrusion deals with how well the project components fit into the ecological and cultural aesthetic of the landscape as a whole. An object will have a greater negative impact on scenes considered to have a high visual quality than on scenes of low quality.

Given that the study area has a **moderate** VAC (due to vegetation and gently to moderately undulating landscape) and **moderate** visual resource value, the proposed mining project will have a **high** (without mitigation measures) visual intrusion on surrounding sensitive receptors. Ensuring that vegetation is retained on the periphery of these areas, and wherever possible, lights be directed downwards as to avoid illuminating the sky, the visual impact on the surrounding environment will be **moderate** depending on the proximity to the sensitive receptors.

The altered visual environment during the construction, operational and decommissioning phases will lead to **moderate/high** (without mitigation measures) levels of visual intrusion, with **moderate** levels of compatibility with the surrounding land uses as well as limited visual contrast. The level of visual intrusion as a result of the proposed mining project, with specific mention of vegetation clearing, removal of topsoil, mine infrastructure, overburden and discard dumps, is considered to be **high** (without mitigation measures) during the construction and operational phases, in line with the **low** VAC. The perceived visual impacts associated with the construction, operational and decommissioning phases are considered to be **moderately/highly** (without mitigation measures) intrusive to the receiving environment.

6.4 VISUAL EXPOSURE

The visual impact of a development diminishes at an exponential rate as the distance between the observer and the object increases. The impact at 1 000 m would be 25% of the impact as viewed from 500 m. At 2 000 m it would be 10 % of the impact at 500 m. The inverse relationship of distance and visual impact has been an important component in visual analysis literature (Hull and Bishop, 1998).

For the purposes of this assessment, close-range views (equating to a high level of visual exposure) are views over a distance of 500 m or less, medium-range views (equating to a moderate level of visual exposure) are views of 500 m to 2 km, and long-range views are over distances greater than 2 km (low levels of visual exposure). Sensitive receptors within 2 km of the site were limited to people working in the area, local residents, tourists visiting the area and the number of farms surrounding the site. The main Sensitive Receptors identified were the residents of the private farms surrounding the infrastructure layout area as indicated in Figure 69 below within a 5 km radius.

For the purposes of this assessment, visual exposure in terms of all identified impacts has therefore been rated as **high** as high sensitivity, sensitive receptors, are located within five (5) km from the site.

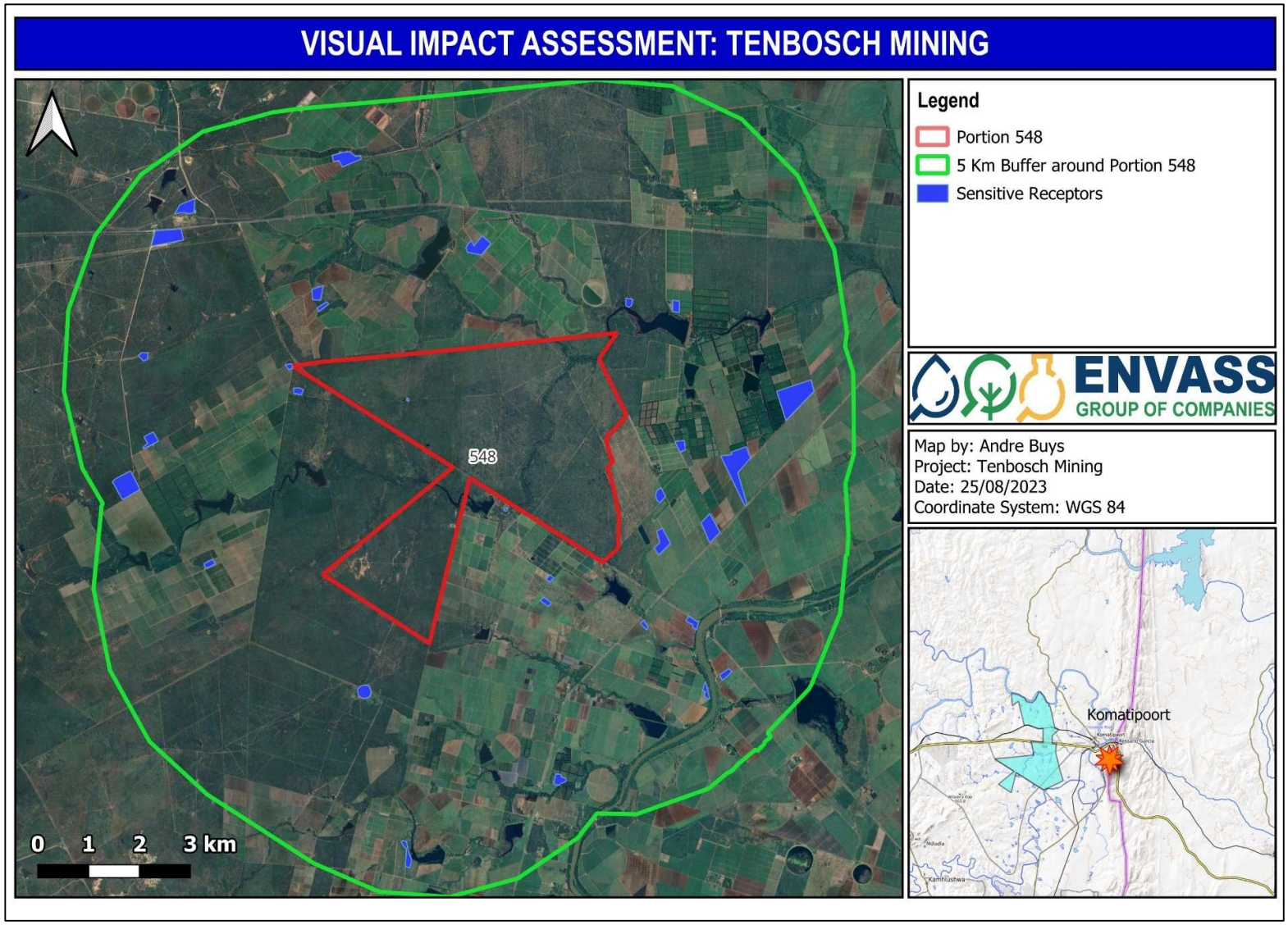

Figure 113: Sensitive Receptors

6.5 IMPACT MAGNITUDE METHODOLOGY

The expected impact magnitude of the proposed project was rated, based on the above assessment of the visual resource value of the site, as well as level of visibility, visual intrusion, visual exposure and receptor sensitivity as visual impact criteria. The process is summarised below:

- *Magnitude = [(Visual quality of the site x VAC factor) x (Visibility + Visual Intrusion + Visual Exposure)] x Receptor sensitivity factor.*

Table 8: Magnitude Criteria

MAGNITUDE SCORE	MAGNITUDE RATING
20.1≤	High
13.1 - 20.0	Moderate
6.1 - 13.0	Low
≤6.0	Negligible

6.5.1 Impact Magnitude Determination

Based on the visual resource, VAC, receptor sensitivity and impact assessment criteria assessed in the preceding sections, the magnitude of the various impacts identified was determined for each phase of the project.

Table 9: Construction Phase – Impact Magnitude (Without Mitigation)

VISUAL	STUDY AREA VISUAL RESOURCE VALUE	VAC WEIGHTING FACTOR	LEVEL OF VISIBILITY	VISUAL INTRUSION	VISUAL EXPOSURE	RECEPTOR SENSITIVITY FACTOR	IMPACT MAGNITUDE POINT SCORE (WITHOUT MITIGATION)
Site establishment • This will involve the vegetation clearance, stripping and stockpiling of soil in areas designated for surface infrastructure, stockpile areas, and the initial box cut. Site Clearing of the project footprint: • Removal of vegetation leading to increased visual contrast and loss of VAC and increase visual intrusion on sensitive receptors. • Alteration of current landscape features impacting on landscape character and sense of place. Soil stockpiling • The topsoil and subsoil recovered during stripping will be stockpiled separately. Construction of infrastructure • Upgrading and establishment of access and haul roads • ROM coal and product stockpile areas	2	1.2	3	3	3	1.2	25,92 (Moderate)

VISUAL	STUDY AREA VISUAL RESOURCE VALUE	VAC WEIGHTING FACTOR	LEVEL OF VISIBILITY	VISUAL INTRUSION	VISUAL EXPOSURE	RECEPTOR SENSITIVITY FACTOR	IMPACT MAGNITUDE POINT SCORE (WITHOUT MITIGATION)
• Overburden dump areas • Pollution Control Dams (PCDs) • Slurry dams • Clean and dirty water channels • Temporary berms/contour banks • Processing plant complex • Bulk fuel storage facility • Offices, and guard houses • Water and sewage treatment plants • Workshop areas and contractor yards. • Electricity supply infrastructure (Substation) Construction vehicle movement and increased human activity in and around MRA General and hazardous waste management Formation of dust plumes because of construction activities. Use of security lighting.							

VISUAL	STUDY AREA VISUAL RESOURCE VALUE	VAC WEIGHTING FACTOR	LEVEL OF VISIBILITY	VISUAL INTRUSION	VISUAL EXPOSURE	RECEPTOR SENSITIVITY FACTOR	IMPACT MAGNITUDE POINT SCORE (WITHOUT MITIGATION)
Topographical alteration which will lead to increased visual intrusion and potential impact on sense of place.							
Where for: visual resource value, visibility, visual intrusion and visual exposure: high=3; moderate=2; low=1; VAC and receptor sensitivity: high = factor 1.2; moderate = factor 1; low = factor 0.8							

Table 10: Operational Phase – Impact Magnitude (Without Mitigation)

VISUAL	STUDY AREA VISUAL RESOURCE VALUE	VAC WEIGHTING FACTOR	LEVEL OF VISIBILITY	VISUAL INTRUSION	VISUAL EXPOSURE	RECEPTOR SENSITIVITY FACTOR	IMPACT MAGNITUDE POINT SCORE (WITHOUT MITIGATION)
Topographical alteration which will lead to increased visual intrusion and potential impact on sense of place. Excavation of open pit will lead to visual intrusion and exposure of sensitive receptors. Topographical alteration which will lead to increased visual intrusion and potential impact on sense of place. Soil berm, stockpiles and dumps being visible. Coal handling, processing and disposal. Operational vehicle and increased human activity in and around the MRA. Nighttime illumination due to security lighting. Formation of dust plumes as a result of operational activities. Shafts:	2	1.2	3	3	3	1.2	25,92 (Moderate)

VISUAL	STUDY AREA VISUAL RESOURCE VALUE	VAC WEIGHTING FACTOR	LEVEL OF VISIBILITY	VISUAL INTRUSION	VISUAL EXPOSURE	RECEPTOR SENSITIVITY FACTOR	IMPACT MAGNITUDE POINT SCORE (WITHOUT MITIGATION)
• Underground mining and earth work activities • Ongoing vegetation clearance, soil stripping and stockpiling • Concurrent rehabilitation							
Where for: visual resource value, visibility, visual intrusion, and visual exposure: high=3; moderate=2; low=1; VAC and receptor sensitivity: high = factor 1.2; moderate = factor 1; low = factor 0.8							

Table 11: Decommissioning Phase – Impact Magnitude (Without Mitigation)

VISUAL	STUDY AREA VISUAL RESOURCE VALUE	VAC WEIGHTING FACTOR	LEVEL OF VISIBILITY	VISUAL INTRUSION	VISUAL EXPOSURE	RECEPTOR SENSITIVITY FACTOR	IMPACT MAGNITUDE POINT SCORE (WITHOUT MITIGATION)
General decommissioning and closure activities leading to visual intrusion on sensitive receptors. Final backfill and closure of shafts. Dismantling and removal of processing plant and associated mining infrastructure. Rehabilitation of compacted areas. Cleaning, landscaping, and replacement of soils over the disturbed area. Waste generation and disposal. Ineffective rehabilitation leading to landscape scarring, permanent visual contrast and a permanent alteration of the landscape character and sense of place.	2	1.2	2	2	2	1.2	17,28 (moderate)
Where for: visual resource value, visibility, visual intrusion and visual exposure: high=3; moderate=2; low=1; VAC and receptor sensitivity: high = factor 1.2; moderate = factor 1; low = factor 0.8							

6.6 IMPACT ASSESSMENT RATING METHODOLOGY

The significance of the identified impacts will be determined using the approach outlined below (terminology from the Department of Environmental Affairs and Tourism Guideline document on EIA Regulations, April 1998). This approach incorporates two aspects for assessing the potential significance of impacts, namely occurrence and severity, which are further sub-divided as follows:

Table 12: Ranking scales for assessment of occurrence and severity of factors

INTENSITY (MAGNITUDE)		
The intensity of the impact is determined by examining whether the impact is destructive or benign, whether it has a significant, moderate or insignificant visual impact.		
Insignificant	0	The visual impact of the development will have no effect on the environment.
Minor	2	The visual impact of the development is minor and will not result in an impact on processes.
Low	4	The visual impact of the development is low and will cause a slight impact on processes.
Moderate	6	The visual impact of the development is moderate and will result in processes continuing but in a modified way.
High	8	The visual impact of the development is high, processes are altered to extent that they temporarily cease.
Very high	10	The visual impact of the development is very high and results in complete destruction of patterns and permanent cessation of processes.
DURATION		
The lifetime of the impact that is measured in relation to the lifetime of the proposed development.		
(T)emporary	1	The impact either will disappear with mitigation or will be mitigated through a natural process in a period shorter than that of the construction phase. (0-1.5 years).
(S)hort term	2	The impact will be relevant through to the end of a construction phase (2 – 5 years).
(M)edium term	3	The impact will last up to the end of the development phases, where after it will be entirely negated. (5 – 15 years).
(L)ong term	4	The impact will continue or last for the entire operational lifetime i.e. exceed 30 years of the development, but will be mitigated by direct human action or by natural processes thereafter. (>15 years).
(P)ermanent	5	This is the only class of impact, which will be non-transitory. Mitigation either by man or natural process will not occur in such a way or in such a time span that the impact is transient.
SPATIAL SCALE (EXTENT)		
Classified of the physical and spatial aspect of the impact		
(F)ootprint	0/1	The impacted area extends only as far as the activity, such as footprint occurring within the total site area.
(S)ite	2	The impact could affect the whole, or a significant portion of the site.
(R)egional	3	The impact could affect the area including the neighbouring settlements, the transport routes and the adjoining towns.

(N)ational	4	The impact could have an effect that expands throughout the country (South Africa).
(I)nternational	5	Where the impact has international ramifications that extend beyond the boundaries of South Africa.
PROBABILITY		
This describes the likelihood of the impact occurring. The impact may occur for any length of time during the life cycle of the activity. The classes are rated as follows:		
(I)mprobable	0/1	The possibility of the Visual Impact occurring is none, due to the circumstances, design. The chance of this Visual Impact occurring is zero (0%)
(P)ossible	2	The possibility of the Visual Impact occurring is very low, due either to the circumstances or design. The chance of this Visual Impact occurring is defined as 25% or less
(L)ikely	3	There is a possibility that the impact will occur to the extent that provisions must therefore be made. The chances of the Visual Impact occurring are defined as 50%
(H)ighly Likely	4	It is most likely that the Visual Impacts will occur at some stage of the development. Plans must be drawn up before carrying out the activity. The chances of this impact occurring is defined as 75 %.
(D)efinite	5	The Visual impact will take place regardless of any prevention plans, and only mitigation actions or contingency plans to contain the effect can be relied on. The chance of this impact occurring is defined as 100 %.

6.7 POTENTIAL VISUAL IMPACT OF THE PROPOSED DEVELOPMENT

Potential visual impacts associated with the proposed preferred layout and the proposed alternative layout are similar in significance and are unlikely to make a material difference to the potential visual impacts, due to the fact that most parts of the activity will be underground. Due to the high sensitivity, sensitive receptors, being located within five (5) km from the site and near the boundary of the Tenbosch mining project, the visual exposure in terms of all identified impacts will be **high**. Using the above criteria, the results of the impact significance assessment before and after mitigation, for the Construction, Operation and Decommissioning Phases for the proposed Tenbosch mining project are presented below.

Table 15 below provides the ranking and score, which is used to determine the significance (with equation 1 below) and ranking of the possible impact on the proposed site. The score is then compared to Table 14 where the range of significance rating, with and without mitigation, is provided.

Table 13: Assessment Criteria and Ranking Scale

PROBABILITY (P)		MAGNITUDE (M)	
Description Meaning	Score	Description Meaning	Score
Definite / don't know	5	Very High	10

Highly likely	4	High	8
Likely	3	Moderate	6
Possible	2	Low	4
Improbable	1	Minor	2
Never	0	Insignificant	0
DURATION (D)		**SPATIAL SCALE (S)**	
Description Meaning	Score	Description /Meaning	Score
Permanent	5	International	5
Long Term	4	National	4
Medium	3	Regional	3
Short term	2	Local/Site	2
Temporary	1	Footprint	1/0

Equation 1: Significance Rating

SP (Significant Points) = Consequence (Extent + Duration + Severity) x Likelihood (Probability)

Table 14: Significance Rating Scale without mitigation and with mitigation

SR < 30	**LOW (L)**	Visual Impact with have little real effect and should not have an influence on or require modification of the project design or alternative mitigation. No mitigation is required.
30 > SR < 60	**MEDIUM (M)**	Where Visual Impact could have an influence on the decision unless it is mitigated. An impact or benefit, which is sufficiently important to require management. Of moderate significance - could influence the decisions about the project if left unmanaged.
SR > 60	**HIGH (H)**	Impact is significant, mitigation is critical to reduce impact and visual exposure. Resulting impact could influence the decision depending on the possible mitigation. An impact, which could influence the decision about whether or not to proceed with the project.

Table 15: Impact assessment before and after mitigation

Phase	Potential Visual Impacts	Visual Significance											
		Before Mitigation						After Mitigation					
		M	D	S	P	SP	RATING	M	D	S	P	SP	RATING
Construction	Site establishment • This will involve the vegetation clearance, stripping and stockpiling of soil in areas designated for surface infrastructure, stockpile areas, and the initial box cuts.	6	4	2	3	36	**Medium**	3	3	8	2	28	**Low**
	Site Clearing of the project footprint: • Removal of vegetation leading to increased visual contrast and loss of VAC and increase visual intrusion on sensitive receptors. • Alteration of current landscape features impacting on landscape character and sense of place.	6	4	2	3	36	**Medium**	3	3	8	2	28	**Low**
	Soil stockpiling • The topsoil and subsoil recovered during stripping will be stockpiled separately.	6	4	2	3	36	**Medium**	3	3	8	2	28	**Low**
	Construction of infrastructure • Upgrading and establishment of access and haul roads • ROM coal and product stockpile areas • Overburden dump areas • Pollution Control Dams (PCDs) • Slurry dams	6	4	2	3	36	**Medium**	3	3	8	2	28	**Low**

Phase	Potential Visual Impacts	Visual Significance											
		Before Mitigation						After Mitigation					
		M	D	S	P	SP	RATING	M	D	S	P	SP	RATING
	• Clean and dirty water channels • Temporary berms/contour banks • Processing plant complex • Bulk fuel storage facility • Offices, and guard houses • Water and sewage treatment plants • Workshop areas and contractor yards. • Electricity supply infrastructure (Substation)												
	Construction vehicle movement and increased human activity in and around MRA	6	4	2	3	36	**Medium**	2	3	4	2	18	**Low**
	General and hazardous waste management	6	4	2	3	36	**Medium**	2	3	4	2	18	**Low**
	Formation of dust plumes as a result of construction activities.	6	4	2	3	36	**Medium**	2	3	4	2	18	**Low**
	Use of security lighting.	6	4	2	3	36	**Medium**	2	3	4	2	18	**Low**
	Topographical alteration which will lead to increased visual intrusion and potential impact on sense of place.	6	4	2	3	36	**Medium**	2	3	4	2	18	**Low**

Phase	Potential Visual Impacts	Visual Significance											
		Before Mitigation						After Mitigation					
		M	D	S	P	SP	RATING	M	D	S	P	SP	RATING
Operational	Topographical alteration which will lead to increased visual intrusion and potential impact on sense of place.	6	4	2	3	36	**Medium**	2	3	4	2	18	**Low**
	Operational vehicle and increased human activity in and around the MRA	6	4	2	3	36	**Medium**	2	3	4	2	18	**Low**
	Shafts: • Mining and earth work activities • Ongoing vegetation clearance, soil stripping and stockpiling • Concurrent rehabilitation	6	4	2	3	36	**Medium**	2	3	4	2	18	**Low**
	Nighttime illumination due to security lighting.	6	4	2	3	36	**Medium**	2	3	4	2	18	**Low**
	Formation of dust plumes as a result of operational activities.	6	4	2	3	36	**Medium**	2	3	4	2	18	**Low**

Phase	Potential Visual Impacts	Visual Significance											
		Before Mitigation						After Mitigation					
		M	D	S	P	SP	RATING	M	D	S	P	SP	RATING
Decommissioning	General decommissioning and closure activities leading to visual intrusion on sensitive receptors	6	3	2	3	33	**Medium**	2	3	4	2	18	**Low**
	Final backfill and closing of the final void resulting in a depression in the landscape	6	3	2	3	33	**Medium**	2	3	4	2	18	**Low**
	Dismantling and removal of processing plant and associated mining infrastructure	6	3	2	3	33	**Medium**	2	3	4	2	18	**Low**
	Rehabilitation of compacted areas	6	3	2	3	33	**Medium**	2	3	4	2	18	**Low**
	Cleaning, landscaping, and replacement of soils over the disturbed area	6	3	2	3	33	**Medium**	2	3	4	2	18	**Low**
	Waste generation and disposal	6	3	2	3	33	**Medium**	2	3	4	2	18	**Low**
	Ineffective rehabilitation leading to landscape scarring, permanent visual contrast and a permanent alteration of the landscape character and sense of place.	6	3	2	3	33	**Medium**	2	3	4	2	18	**Low**

7. RESULTS AND DISCUSSION

Results of the visual impact assessment indicated that from a visual perspective, the proposed Tenbosch mining project and related activities are the main project components that are expected to result in a visual impact. Residential areas located on and in close proximity to the mining boundary will have the **highest** (without mitigation) visual impact. Within a 5 km radius of the mining development, residential areas will have a **moderate** (without mitigation) visual impact. Beyond the 5km study area, there are some areas where the development is discernible. However, the visual impacts are generally of **low** magnitude and impact. Local tree vegetation and seasonal agricultural crops/produce offered limited screening, however, for a significant portion of the year the agricultural crops are low or have been harvested resulting in low VAC and the proposed development will be easily visible to the sensitive receptors located near the mining boundary. Due to the mining project conducting concurrent rehabilitation, the visual impacts associated with the overburden stockpiles will be limited as the overburden stockpile will be used to fill the previous opencast void.

The visual impacts associated with the infrastructure on Portion 548, will occur once construction has been completed and will be evident over a long period. After the decommissioning, closure and rehabilitation phase has been completed, all of the infrastructure (including discard dump) will be removed.

In terms of the potential cumulative impacts, the proposed site is surrounded by Agricultural activities. The majority of the mining right boundary is currently under cultivation for bananas, citrus and/or sugar cane. The Portion 548, however consists of natural vegetation as found in the area which is the only area deemed that will be disturbed.

However, it must be noted that only portions of the site that will need to be disturbed will be cleared. As a consequence, the development of this site will add cumulatively to the loss of sense of place. While the result in a change in the sense of place for those areas that look onto the project site, the magnitude of the impact is likely to be **moderate** as the site is partially degraded.

Based on the results of the impact assessment, the majority of the potential visual impacts were considered to be **Moderate**. With regards to the proposed activities, due to the relatively flat terrain of the proposed boundary, natural vegetation, fluctuating VAC due to seasonal crops, and current land uses, the proposed activities are expected to result in a **moderate** visual impact on the receiving environment. The proposed activities will have a long-term temporal visual impact, due to the very nature of the mining activities. The activity will have a localised visual impact over a long-term duration. The activity will be able to continue with the implementation of appropriate mitigation strategies during the construction, operational and decommissioning phases.

8. FINDINGS

From the impact assessment results obtained, potential visual impacts may be present within the construction, operational and decommissioning phases. From the assessment, the proposed activities can conceivably have a **moderate** (without mitigation) visual impact on the surroundings and the natural and topographical environment.

Impacts are likely to be largely localised and within 5 km of the infrastructure layout area boundary, while significant visual impacts with regards to the proposed activities are expected at the sensitive receptors located within close proximity to the Portion 548. It should be mentioned that an estimation of the impact distance is difficult to determine in terms of the visual impact assessment as it does not incorporate distractive views in the form of vegetation or land use (infrastructure, buildings, etc.), however, with successful mitigating measures the significance can be reduced.

Cumulative impacts can result from individually minor, but collectively significant actions taking place over a period of time. Cumulative visual impacts resulting from landscape modifications as a result of the proposed activities in conjunction with other mining activities are likely to be of moderate significance.

Certain surface components may remain present once decommissioning has occurred, leading to a permanent alteration of the visual environment. The proposed activities are highly likely to add to a depression in the terrain. Alien vegetation, which is likely to proliferate as a result of disturbance from the mining activities, may also remain present after decommissioning. Some infrastructure, including shafts and conveyor bases might be just some infrastructure not to be completely removed.

9. MITIGATION MEASURES

As there are certain visual impacts from the proposed Tenbosch mining project, mitigation measures have been developed and are provided within this section.

Visual mitigation of a mine can be divided into two (2) options. Typically using a combination of the two (2) options is most effective. The first option is an attempt to "hide" the source of the visual impact from view, by placing visually appealing elements between the viewer and the source of the visual impact. The second option aims to minimise the severity of the visual impact itself. This can be achieved in numerous ways for example limiting heights or by blending the infrastructure to match the surrounding environment.

During the construction phase, the following mitigation measures should be implemented to minimise the visual impact.

- General site management:
    - Maintain the construction site in a neat and orderly condition at all times;
    - Plan the placement of lay-down areas and any potential temporary construction camps in order to minimise vegetation clearing;
    - Ensure that rubble, litter, and disused construction materials are managed and removed regularly; and
    - Ensure that all infrastructure and the site and general surroundings are maintained in a neat and appealing way.
- Infrastructure:
    - All constructed facilities and buildings should cause minimum visual disturbance by reducing the contrast and blending in with the surrounding vegetated natural area. This could be achieved by painting rooftops and walls of buildings in the hues and tones of the surrounding vegetation and/or by adding matt paints to highly reflective surfaces, as well as sharp protruding features on the structures. All of these solutions are subject to the technical design of individual buildings and facilities and should be pursued by the technical design and/or construction team, taking into consideration added value from reduced visibility, engineering feasibility and cost.
- Dust Management:
    - Implement dust suppression using a water cart to minimise airborne dust;
    - Apply chemical dust suppressants if deemed necessary;
    - Enforce a 50 km/h speed limit on-site for Light-Duty Vehicles and a 40 km/h speed limit for large construction vehicles and machinery; and
    - Implement a gravimetric dust fallout monitoring programme if high volumes of dust emissions are observed.

During the operational phase the following mitigation measures should be implemented to minimise the visual impact.

- Light pollution management:

- Plan the lighting requirements of the facilities to ensure that lighting meets the need to keep the site secure and safe, without resulting in excessive illumination;
- Avoid up-lighting of structures by rather directing lighting downwards and focusing on the area to be illuminated;
- Reduce the height and angle of illumination from which floodlights are fixed as much as possible while still maintaining the required levels of illumination.
- Lighting should be shielded in areas where specific objects are to be illuminated.
- Minimise the use of lighting, where possible.
- Lighting should exclude the blue-rich wavelengths and be closer to the red-rich wavelength spectrum. Globes used in lighting outside areas should be warm white. This also applies to light spilling out from within buildings. A colour temperature of no more than 3000 Kelvins is recommended for lighting.
- Light intensity of illuminating lights should be limited as far as possible, i.e., to limit lighting to areas required to serve operational functionality.
- Illumination where not permanently required should be fitted with timers, motion-activated sensors or be dimmable to reduce total light emitted.

- Dust Management: Same recommendations as to the construction phase.
- Site management:
  - Shape any slopes and embankments to a maximum gradient of 1:4 and vegetate, to prevent erosion and improve their appearance.
  - Utilise vegetation screens as visual screening devices around the proposed project, specifically buildings and pits.
  - Shape and vegetate topsoil stockpiles to prevent erosion.
  - Plant indigenous trees in all landscaped areas, as well as around plant infrastructure.
  - Keep stockpiles to a maximum height of fifteen (15) metres to limit visual exposure.

During decommissioning and closure phase, the following mitigation measures should be implemented to minimise the visual impact.

- Overburden to be stockpiled on site and used for backfilling of the previous mined-out void. This will limit the number of overburden stockpiles that will be visible;
- Concurrent rehabilitation of the pits using the roll over method to pre-determined maximum gradient/s which will prevent erosion and allow for adequate vegetation growth while taking the appearance of the natural topography into consideration;
- Stabilise and backfill the opencast pit, and contour to ensure it is free draining;
- Conduct on-going monitoring and maintenance of the rehabilitated pits to ensure that vegetation establishes successfully and that erosion does not occur;
- Eradicate invasive alien plant species;
- Remove all built infrastructure; and

- Re-shape all footprint areas to be as natural in appearance as possible and revegetate using locally occurring grass species.

10. CONCLUSION AND RECOMMENDATIONS

The project site and most of the surrounding land comprises of residential areas and farming. The topography is relatively flat with scattered trees. Residential, industrial and farming are the predominant land uses in the area.

Several potential risks to the receiving aesthetic and visual environment as a result of the proposed activities have been identified, relating to impacts on the visual character and sense of place, visual intrusion and visual exposure and visibility. The significance of these impacts may be reduced should appropriate and effective mitigation measures be implemented.

The proposed mining activities can conceivably have a moderate negative impact on the visual environment, while secondary impacts, such as dust emission and lighting at night, will also manifest as visual disturbances from project initiation. The study area comprises of residential settlements and agricultural activities, which have had a visual impact on the natural environment. Therefore, the proposed mining activities are predicted to have a **moderate** impact before mitigation on the visual environment. After appropriate and effective mitigation measures the impact is rated as **moderate to low**.

The proposed mining activities should therefore have a **moderate to low** visual impact on the receiving environment and is thus not fatally flawed from a visual impact perspective. Considering the project as a whole, it is the specialist's opinion that the proposed activities be allowed, provided that the findings within this report are considered along with the recommendations made towards the management of the proposed activity. All recommendations should be included in the Environmental Management Programme (EMPr) relevant to the proposed project.

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11. REFERENCES

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APPENDIX A – CURRICULUM VITAE

ENVIRONMENTAL ASSURANCE (PTY) LTD

ANDRE BUYS

ENVIRONMENTAL CONSULTANT / BUSINESS UNIT HEAD

394 Tram Street, New Muckleneuk, Pretoria, 0181

T: 012 460 9768 ; M : 083 555 4354; F : 012 460 3071 ; E mail : andre@envass.co.za

Date of Birth : 18 November 1991; Place of Birth : South Africa

Ethnic Group and Gender: White Male ; Disabilities : None

AREAS OF EXPERTISE

- Compliance Monitoring
- Project Management
- Potable, Ground and Surface Water Quality
- Scientific Report Writing
- Data Analysis & Interpretation
- Hydrogeology
- Soil classification
- Ambient Air and Particulate Matter Quality
- Noise Monitoring
- Geophysics
- GIS, Surfer, Wish and WRPLOT software
- Customer Relationships
- Specialist Report (Visual and Noise assessments)

CAREER HISTORY

Employer
Period
Position
Responsibilities

ENVIRONMENTAL ASSURANCE (PTY) LTD

Andre holds a B.Sc. in Environmental Sciences, followed by a B.Sc. (Hons) specializing in Geology, Geography and Hydrology. He has comprehensive experience and knowledge on compliance monitoring, project management and specialist reporting. As an environmental consultant, Andre has provided several environmental monitoring and geohydrological assessments and specialist input services.

BUSINESS UNIT HEAD / ENVIRONMENTAL SPECIALIST
Environmental Specialist, Environmental Control Officer and Auditor
June 2022 – Current

- Develop and maintain environmental compliance monitoring programmes in conjunction with site audits and assessments. Monitoring co-ordination and planning of all relevant projects. Maintaining data and results from monitoring programmes and databases. Determining financial provision of mine closures. Compile and overseeing reports on water-, soil-, air-quality and site findings, with interpretation of results and recommendations. Conduct and report on specialist assessments Maintain and build customer relationships with guidance on environmental matters and updates on environmental legislation. Market to potential clients with site specific marketing

material. Additionally, conducting Geohydrological studies including Groundwater resource development, Geophysical surveys, Conceptual modelling, Pump tests, Borehole siting, Borehole logging, Groundwater remediation programmes and hydrocensus'.

EDUCATION AND QUALIFICATIONS

North-West University; Honours BSc. Hydrogeology and Hydrology - 2014
North-West University; Degree BSc. Environmental Science Geology and Geography – 2013

PROFESSIONAL STATUS

Registration
Membership

Registered as a Professional Natural Scientist (119183) with the South African Council of Natural Scientific Professions (SACNASP)

PROJECT EXPERIENCE

PROJECT DESCRIPTION	CLIENT
Visual Impact Assessments	Nemai Consulting Grootvly Visual Assessment
	GIBB Environmental Rhino PV Visual Assessment
	GIBB Environmental Onderstepoort 1 PV Visual Assessment
	GIBB Environmental Onderstepoort 2 PV Visual Assessment
Environmental Compliance Monitoring	Assmang Dwarsrivier
	Tronox Namakwa Sands
	Tronox KZN
	Samancor Ferrometals
	CEMZA Cement
	Northam Platinum Zondereinde
	Northam Platinum Eland
	Northam Platinum Maroelabult
	Wescoal Mining Elandspruit
	Wescoal Mining Keaton
	Neosho Moabsvelden
	Wescoal Processing Plant
	Wescoal Khanyisa
	Exxaro Grootegeluk
	Exxaro Thabametsi
	Exxaro Grootegeluk Depot
	AECI Mining and Explosives
	Calodex Enstra Waste Disposal Facility
	Anglo American Whiskey Creek
	Keywest Shopping Centre
	Glencore Chrome Kroondal
	Glencore Chrome Rietvly
	Glencore Chrome Boshoek
	Kelvin Power Station
	Potchefstroom Dolomite Risk Project
Groundwater Resource Development and Geophysics	Ganyisa Groundwater Resource Development
	Moretele Groundwater Provision
	Polokwane Groundwater Resource Development
	Majakaneng Water Provision
	Steelpoort Pipeline Geophysical Investigation
	Swaziland Waste Disposal Site Investigation
Environmental Control Officer	Moretele Road Construction Phase 2
	Zululand Anthracite Colliery – Report Approval and Sign-off
Environmental Auditor	Makoya Blinkpan External EMPr Auditor

	Sephaku Cement External Water Use License Auditor
	Ocon Bricks External Water Use License Auditor
	Ocon Bricks External EMPr Auditor
Software Modelling and GIS	Ganyisa Groundwater Resource Development
	Moretele Groundwater Provision
	Polokwane Groundwater Resource Development
	Majakaneng Water Provision
	Steelpoort Pipeline Geophysical Investigation
	Swaziland Waste Disposal Site Investigation

CERTIFICATION

I, **ANDRE BUYS**

Declare that, to the best of my knowledge, all the information contained herein is true.

Signature: 

On the 28 day of August 2023.