EIMS | ENVIRONMENTAL IMPACT MANAGEMENT SERVICES

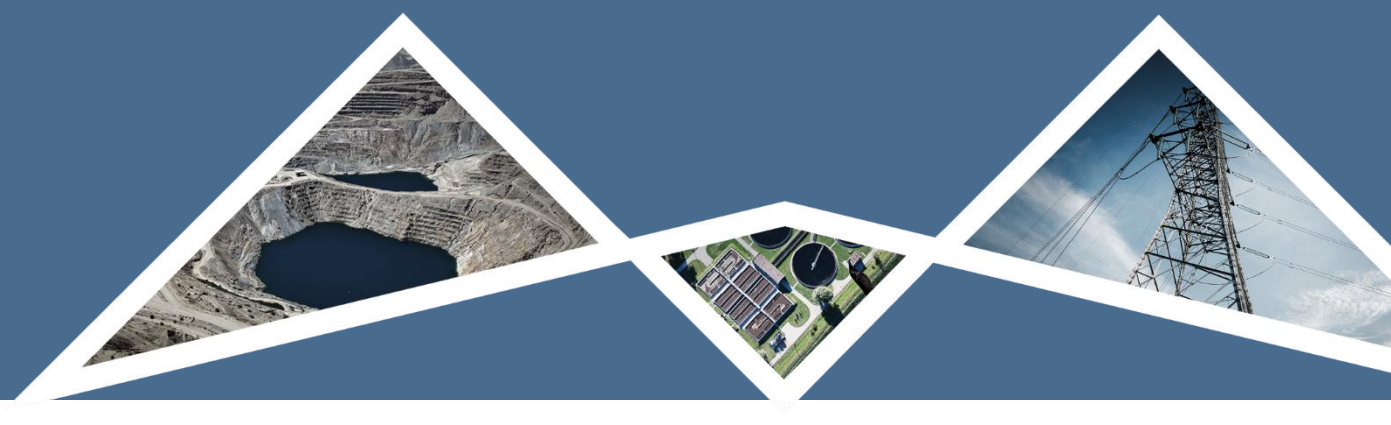
T 011 789 7170 E info@eims.co.za W www.eims.co.za

BASIC ASSESSMENT REPORT

GLENCORE WCM KROONDAL MINE INFRASTRUCTURE

DMRE Ref: NW30/5/1/2/2/254MR

DWS Ref: (WU37566) - 27/2/2/A822/63/3



DOCUMENT DETAILS

EIMS REFERENCE:	1637
DOCUMENT TITLE:	GLENCORE WCM KROONDAL MINE INFRASTRUCTURE BASIC ASSESSMENT REPORT

DOCUMENT CONTROL

	NAME	SIGNATURE	DATE
COMPILED:	Jolene Webber	pp.	2025/07/23
CHECKED:	Brian Whitfield		2025/07/23
AUTHORIZED:	Liam Whitlow		2025/07/23

REVISION AND AMENDMENTS

REVISION DATE:	REV #	DESCRIPTION
2025/07/23	ORIGINAL DOCUMENT	Basic Assessment Report for Public Review

Table of Contents

Type text here

List of Figures

List of Tables

Appendices

Acronyms and Abbreviations

AIP	Alien and Invasive Plant
BA	Basic Assessment
BAR	Basic Assessment Report
BPDM	Bojanala Platinum District Municipality
CA	Competent Authority
CBA	Critical Biodiversity Area
CMA	Catchment Management Agency
CMS	Catchment Management Strategy
CR	Critically Endangered
CVB	Channelled valley-bottom
DFFE	Department of Forestry, Fisheries and the Environment
DMRE	Department of Mineral Resources and Energy
DWS	Department of Water and Sanitation
EA	Environmental Authorisation
EAP	Environmental Assessment Practitioner
EIA	Environmental Impact Assessment
EIMS	Environmental Impact Management Services (Pty) Ltd
EMF	Environmental Management Framework
EMPr	Environmental Management Programme
EN	Endangered
FEPA	Freshwater Ecosystem Priority Area

GN	Government Notice
HGM	Hydrogeomorphic
I&APs	Interested and Affected Parties
IBA	Important Bird and Biodiversity Area
IEM	Integrated Environmental Management
LC	Least Concern
MAP	Mean Annual Precipitation
MASL	Metres Above Sea Level
MBMP	Magaliesberg Biosphere Management Plan
NBA	National Biodiversity Assessment
NEMA	National Environmental Management Act (Act No. 107 of 1998)
NPAES	National Protected Area Expansion Strategy
NT	Near Threatened
OHL	Overhead Line
PAOI	Project Area of Influence
PCD	Pollution Control Dam
PES	Present Ecological State
PPP	Public Participation Process
RCM	Rustenburg Chrome Mine
RLM	Rustenburg Local Municipality
S&EIA	Scoping and Environmental Impact Assessment
SACAD	South Africa Conservation Areas Database
SAHRIS	South African Heritage Resources Information System
SAIIAE	South African Inventory of Inland Aquatic Ecosystems
SAPAD	South African Protected Areas Database
SCC	Species of Conservation Concern
SEI	Site Ecological Importance
SWMP	Stormwater Management Plan
SWSA	Strategic Water Source Areas
TOPS	Threatened or Protected Species
TSF	Tailings Storage Facilities
UVB	Unchanneled valley-bottom
VU	Vulnerable
WCM	Western Chrome Mines
WMA	Water Management Area
WWW	World Wide Web

EXECUTIVE SUMMARY

This non-technical summary provides a high-level overview of this Basic Assessment Report (BAR). The reader is urged to consult later sections of this report should more specific information or detail be required on various aspects.

INTRODUCTION AND OVERVIEW

Glencore Operations South Africa (Pty) Ltd – Western Chrome Mines (WCM) (hereafter referred to as the Applicant) is in the process of acquiring a portion of the mining and surface rights from the Clover Alloys Rustenburg Chrome Mine (RCM). A portion of the existing RCM mining right (Ref: NW30/5/1/2/2/336MR) will be transferred to the existing Glencore mining right (Ref: NW30/5/1/2/2/254MR). Similarly, certain authorised RCM Water Uses (Licence No: 07/A22H/ACIGJ/9460) will be transferred into Glencore's new Water Use License (WUL) which is currently being prepared for submission to the Department of Water and Sanitation.

The acquisition of the surface rights on Portion 62[1] of the farm Rietfontein 338 JQ and mining right (MR336) is expected to reduce the miners' travel time by 50% to reach the underground working area, thereby increasing the mining facetime which will in turn increase productivity, ensuring the long-term survival of the business. In addition to utilizing the existing infrastructure at Clover Alloys RCM, the applicant wishes to develop additional facilities to use in the life of mine. This application relates to the construction of infrastructure to compliment the mining activities of Kroondal Mine but not the mining activity itself as mining is already approved.

The proposed development necessitates a Basic Assessment (BA) as it constitutes listed activities in terms of NEMA Listing Notice 1 and 3. The applicant has appointed Environmental Impact Management Services (EIMS) as the Environmental Assessment Practitioner (EAP) to assist with undertaking the necessary authorisation processes, including compiling the necessary reports and undertaking the statutory consultation processes, in support of the following applications:

- Environmental Authorisation (EA) in accordance with National Environmental Management Act- NEMA (Act 107 of 1998- as amended) to be submitted to the Department of Mineral Resources & Energy (DMRE) for the following listed activities:
    - GNR983 Listing Notice 1, Activities 12, 14, 19, 21D, 27, and 48;
    - GNR985 Listing Notice 3, Activities 2, 4, 10, 12, 14, and 23.
- Water Use Licence (WUL) in accordance with the National Water Act – NWA (Act 36 of 1998) to be submitted to the Department of Water and Sanitation for the following listed activities:
    - Section 21 (c) and (i)
- Amendment of Rights, Programmes, Authorisations and/or Plans in accordance with Section 102 of the Mineral and Petroleum Resources Development Act – MPRDA (Act 28 of 2002) – to be submitted by the applicant.
- Part 1 amendment application in terms of Regulation 29 of the NEMA Environmental Impact Assessment (EIA) Regulations (GRN982 of 2014, as amended) – to be submitted by the applicant.

PROJECT OVERVIEW

Kroondal mining operations are situated approximately 10 km east of Rustenburg, North-West Province. Mining at Kroondal has historically consisted of both opencast and underground mining. Currently only underground mining is undertaken, and the old opencast areas have been closed and rehabilitated. The current underground mining is taking place in close proximity to the Clover Alloys RCM mining rights areas. Miners' underground travel time will be reduced by approximately 50% through Glencore WCM acquiring the surface rights on Portion

[1] At the time that the specialist studies were undertaken, the property was referred to as "portion of Portion 11 of the farm Rietfontein 338 JQ". The property has subsequently been formally subdivided and is now referred to as "Portion 62 of the farm Rietfontein 338 JQ" in this report. Where reference is made to "Portion 11" in any document or map, this should be understood to be in reference to "Portion 62".

62 of the farm Rietfontein 338 JQ and mining right (MR336), which will in turn increase production and ensure the long-term survival of the business.

The proposed new developments include (but are not limited to):

- A parking area for permanent employees
- A parking area for visitors and contractors
- Employee drop-off/pick-up zone
- Salvage yard
- Sewage plant
- Shaft Laydown Area / Explosives Delivery Bay
- Surface laydown area
- Meeting venue hall (Lekgotla Hall)
- Access and escape roads
- Two water storage dams
- Compressor house
- One 11kV Powerline connection to an existing 11kV Powerline
- Administration Offices
- Change houses
- Engineering workshop
- Stores
- Temporary laydown area (historic LanXess Chrome Mining village area)
- Clean stormwater infrastructure including passive attenuation wetland feature

PUBLIC PARTICIPATION

The Public Participation Process (PPP) is designed to provide sufficient and accessible information to Interested and Affected Parties (I&APs) in an objective manner to assist them to:

During the Environmental Authorisation:

- Verify that their issues have been recorded;
- Comment on the findings of the environmental assessments; and
- Provide relevant local information and knowledge to the environmental assessment.

The PPP is a requirement of several pieces of South African Legislation and aims to ensure that all relevant I&APs are consulted, involved and their opinions are taken into account and a record included in the reports submitted to Authorities. The process ensures that all stakeholders are provided this opportunity as part of a transparent process which allows for a robust and comprehensive environmental study.

INITIAL NOTIFICATION AND CALL TO REGISTER

The PPP for this application has been undertaken in accordance with the requirements of the NEMA EIA Regulations. The PPP commenced on the 16th of October 2024 with an initial notification and call to register. The initial notification was undertaken in English and Afrikaans, and was given in the following manner:

- Registered letters, faxes, emails and/or SMS's: Notifications were distributed to all pre-identified I&APs including Organs of State and other key I&APs on the 16th of October 2024.
- Newspaper Advertisement describing the proposed project and BA process were placed in the Rustenburg Herald Newspaper with circulation in the vicinity of the study area on the 18th of October 2024.
- Gazette Notice was placed in the North West Provincial Gazette on the 29th of October 2024.
- Four (4) A1 Correx site notices were placed at 4 locations around the proposed project study area on the 15th of October 2024.

NOTIFICATION OF BAR AVAILABILITY

Notification (in English and Afrikaans) regarding the availability of the Basic Assessment Report (BAR) for public review and comment will be provided to pre-identified and registered I&APs. The notifications will be distributed through either email, registered mail, fax, and/or SMS, where contact details are available. Additional site notices, and advertisements (a Newspaper advert and Gazette Notice) will be placed regarding the availability of the BAR for public review and comment. Contact details will be provided to I&APs should they require assistance accessing the information or require copies of the reports.

A hard copy of the BAR will be made available for public review and comment for a period of 30 days at Rustenburg Public Library as required for the NEMA EA application while the BAR will also fulfil the requirements of the NWA WUL technical report and will be available for comment for a total of 60 days as required by the WUL Application and Appeals Regulations

All comments and/or queries received during the initial call to register to date have been included in the Public Participation Report (PPR) and will be updated for submission to the competent authority, the Department of Mineral Resources & Energy (DMRE), following the 30-day public review period.

IMPACT ASSESSMENT AND MITIGATION

Several specialist studies have been commissioned to investigate key issues and impacts. The findings from these studies are included in this report. The specialist study reports are included in **Appendix D**. A list of the specialist studies conducted to inform this BA process is included below:

- Terrestrial Ecology
- Wetland and Aquatic Ecology
- Soils and Agriculture
- Hydropedology
- Heritage
- Palaeontology

A list of biophysical and social impacts have been identified and assessed during this BA process, as well as the pre-mitigation and post-mitigation environmental risk, and final significance when applying a priority factor is presented below. This list is representative of the preferred alternative identified in the alternative analysis of this report. Note that a full impact matrix is found in **Appendix E** of this report.

Table 1: Summary of identified impacts and significance of the preferred alternative (AL2) assessed in this BA process.

Identifier	Impact	Phase	Event	Pre-Mitigation Significance Score	Pre-Mitigation Significance	Post-mitigation Significance Score	Post-Mitigation Significance	Final score	Final Significance
TB1	Destruction, further loss and fragmentation of the vegetation community	Construction	Normal operations or events	-11	Medium to high -	-9	Medium to high -	-10.13	Medium to high -
TB2	Introduction of alien species, especially plants	Construction	Normal operations or events	-11	Medium to high -	-6	Medium to low -	-6.75	Medium to low -

Identifier	Impact	Phase	Event	Pre-Mitigation Significance Score	Pre-Mitigation Significance	Post-mitigation Significance Score	Post-Mitigation Significance	Final score	Final Significance
TB3	Erosion due to storm water runoff and wind	Construction	Normal operations or events	-8.25	Medium to low -	-5.25	Medium to low -	-5.91	Medium to low -
TB4	Displacement of faunal community due to habitat loss, direct mortalities and disturbance (road collisions, noise, light, dust, vibration and poaching).	Construction	Normal operations or events	-9	Medium to high -	-6	Medium to low -	-6.75	Medium to low -
TB5	Potential leaks, discharges, pollutant from machinery and storage leaching into the surrounding environment.	Construction	Normal operations or events	-9	Medium to high -	-4	Low -	-4.50	Medium to low -
TB6	Continued encroachment of an indigenous vegetation community by alien invasive plant species as well as erosion due to disturbed soils and environmental pollution due to water/ mine drainage runoff	Operation	Normal operations or events	-14	High -	-8.25	Medium to low -	-10.31	Medium to high -
TB7	Continued displacement and fragmentation of the faunal community due to ongoing anthropogenic disturbances (noise, dust, and vibrations) and habitat degradation/loss (litter, pollution, road mortalities and/or poaching).	Operation	Normal operations or events	-9.75	Medium to high -	-7.5	Medium to low -	-8.44	Medium to low -
TB8	Potential leaks, discharges, pollutant from sewage pipeline overflowing or leak due to damage spreading into the surrounding environment.	Operation	Normal operations or events	-13	Medium to high -	-7.5	Medium to low -	-9.38	Medium to high -

Identifier	Impact	Phase	Event	Pre-Mitigation Significance Score	Pre-Mitigation Significance	Post-mitigation Significance Score	Post-Mitigation Significance	Final score	Final Significance
TB9	Continued encroachment of an indigenous vegetation community by alien invasive plant species as well as erosion due to disturbed soils and environmental pollution due to water/ mine drainage runoff	Decommissioning	Normal operations or events	-11	Medium to high -	-6.75	Medium to low -	-8.44	Medium to low -
TB10	Continued displacement and fragmentation of the faunal community due to ongoing anthropogenic disturbances (noise, dust, and vibrations) and habitat degradation/loss (litter, pollution, road mortalities and/or poaching).	Decommissioning	Normal operations or events	-9	Medium to high -	-6	Medium to low -	-6.75	Medium to low -
W1	Indirect loss, disturbance and degradation of wetlands.	Construction	Normal operations or events	-8	Medium to low -	-4.5	Medium to low -	-5.63	Medium to low -
W2	Increased bare surfaces, runoff and potential for erosion	Construction	Normal operations or events	-8.25	Medium to low -	-6	Medium to low -	-7.50	Medium to low -
W3	Degradation of wetland vegetation and the introduction and spread of alien and invasive vegetation	Construction	Normal operations or events	-8.25	Medium to low -	-3.5	Low -	-4.38	Low -
W4	Increased sediment loads to downstream reaches	Construction	Normal operations or events	-8.25	Medium to low -	-3.5	Low -	-4.38	Low -

Identifier	Impact	Phase	Event	Pre-Mitigation Significance Score	Pre-Mitigation Significance	Post-mitigation Significance Score	Post-Mitigation Significance	Final score	Final Significance
W5	Contamination of wetlands with hydrocarbons due to machinery leaks and eutrophication of wetland systems with human sewerage and other waste.	Construction	Normal operations or events	-9	Medium to high -	-4.5	Medium to low -	-5.63	Medium to low -
W6	Alteration of hydrological regime	Construction	Normal operations or events	-7.5	Medium to low -	-3	Low -	-3.75	Low -
W7	Increased water inputs (clean) to downstream wetlands	Operation	Normal operations or events	-13	Medium to high -	-6.75	Medium to low -	-8.44	Medium to low -
W8	Improved ecosystem services, notably water quality enhancement	Operation	Normal operations or events	8.25	Low to medium +	11	Medium to high +	12.38	Medium to high +
W9	Degradation of wetland vegetation and proliferation of alien and invasive species	Decommissioning	Normal operations or events	-9	Medium to high -	-3.5	Low -	-4.38	Low -
W10	Disruption of wetland soil profile, hydrological regime and increased sediment loads	Decommissioning	Normal operations or events	-8.25	Medium to low -	-4	Low -	-5.00	Medium to low -

Identifier	Impact	Phase	Event	Pre-Mitigation Significance Score	Pre-Mitigation Significance	Post-mitigation Significance Score	Post-Mitigation Significance	Final score	Final Significance
G1	Soil erosion, compaction and degradation	Construction	Normal operations or events	-10.5	Medium to high -	-5	Medium to low -	-6.88	Medium to low -
G2	Decrease in subsurface lateral flow and return flow on the environment	Construction	Normal operations or events	-15	High -	-5	Medium to low -	-6.88	Medium to low -
G3	Soil erosion, compaction and degradation	Operation	Normal operations or events	-5	Medium to low -	-4	Low -	-5.50	Medium to low -
G4	Decrease in subsurface lateral flow and return flow on the environment	Operation	Normal operations or events	-5	Medium to low -	-4	Low -	-5.50	Medium to low -
G5	Soil erosion, compaction and degradation	Decommissioning	Normal operations or events	-6	Medium to low -	-3.5	Low -	-4.38	Low -
G6	Decrease in subsurface lateral flow and return flow on the environment	Decommissioning	Normal operations or events	-6	Medium to low -	-3.5	Low -	-4.38	Low -

Identifier	Impact	Phase	Event	Pre-Mitigation Significance Score	Pre-Mitigation Significance	Post-mitigation Significance Score	Post-Mitigation Significance	Final score	Final Significance
G7	Loss of land capability; Soil degradation; soil fertility; Soil compaction; Soil contamination	Construction	Normal operations or events	-5	Medium to low -	-2	Low -	-2.75	Low -
G8	Loss of land capability; Soil degradation; soil fertility; Soil compaction; Soil contamination	Operation	Normal operations or events	-7.5	Medium to low -	-2	Low -	-2.75	Low -
G9	Loss of land capability; Soil degradation; soil fertility; Soil compaction; Soil contamination	Decommissioning	Normal operations or events	-4.5	Medium to low -	-3.5	Low -	-4.38	Low -
G10	Loss of land capability; Soil degradation; soil fertility; Soil compaction; Soil contamination	Rehab and Closure	Normal operations or events	-3.5	Low -	-1.25	Low -	-1.41	Low -
C1	Destruction or displacement of identified LSA single finds	Construction	Normal operations or events	-15	High -	-5	Medium to low -	-6.25	Medium to low -
C2	Destruction or displacement of identified Iron Age single find	Construction	Normal operations or events	-15	High -	-5	Medium to low -	-6.25	Medium to low -

Identifier	Impact	Phase	Event	Pre-Mitigation Significance Score	Pre-Mitigation Significance	Post-mitigation Significance Score	Post-Mitigation Significance	Final score	Final Significance
P1	Impacts on fossil heritage	Construction	Normal operations or events	-3.25	Low -	-3.25	Low -	-3.66	Low -
S1	Job Creation during Construction	Construction	Normal operations or events	4	Low +	4	Low +	4.00	Low +
S2	Job Creation during Operation	Operation	Normal operations or events	7	Low to medium +	7	Low to medium +	7.00	Low to medium +

ENVIRONMENTAL IMPACT STATEMENT

The findings of the assessment and associated specialist studies conclude that there are no environmental fatal flaws that should prevent the proposed project from proceeding, provided that the recommended mitigation and management measures are implemented. Based on the nature and extent of the proposed project, the local level of disturbance predicted as a result of the proposed development activities, the findings of the specialist studies, and the understanding of the significance level of potential environmental impacts, it is the opinion of the project team and the EAP that the significance levels of the majority of identified negative impacts can generally be reduced to an acceptable level by implementing the recommended mitigation measures and the project should be authorized.

The following three impacts resulted in the highest overall significance scores of all impacts that were assessed and were determined to have a potentially medium to high negative final significance after mitigation however, these impacts and the significance thereof does not pose an unacceptable risk to the environment or on the EAPs opinion that the project should be authorised:

- Destruction, further loss and fragmentation of the vegetation community;
- Continued encroachment of an indigenous vegetation community by alien invasive plant species as well as erosion due to disturbed soils and environmental pollution due to water/ mine drainage runoff;
- Potential leaks, discharges, pollutant from sewage pipeline overflowing or leak due to damage spreading into the surrounding environment.

The incorporation of a constructed passive wetland in the proposed Stormwater Management Plan is expected to have a medium to high positive significance. The passive wetland system is considered favourable by the EAP and specialist team as it supports passive treatment of stormwater as well as enhances biodiversity and maintains interflow pathways.

The potential impact on HGM 1 as a result of the Lekgotla Hall has been adequately reduced through the selection of an alternative site location for the hall.

1 INTRODUCTION

Glencore Operations South Africa (Pty) Ltd – Western Chrome Mines (WCM) (hereafter referred to as the Applicant) appointed Environmental Impact Management Services (EIMS) as the Environmental Assessment Practitioner (EAP) to assist with undertaking the necessary authorisation processes, including compiling the necessary reports and undertaking the statutory consultation processes, in support of the following applications:

- Environmental Authorisation (EA) in accordance with National Environmental Management Act- NEMA (Act 107 of 1998- as amended) to be submitted to the Department of Mineral Resources & Energy (DMRE) for the following listed activities:
    - GNR983 Listing Notice 1, Activities 12, 14, 19, 21D, 27, and 48;
    - GNR985 Listing Notice 3, Activities 2, 4, 10, 12, 14, and 23.
- Water Use Licence (WUL) in accordance with the National Water Act – NWA (Act 36 of 1998) to be submitted to the Department of Water and Sanitation for the following listed activities:
    - Section 21 (c) and (i)
- Amendment of Rights, Programmes, Authorisations and/or Plans in accordance with Section 102 of the Mineral and Petroleum Resources Development Act – MPRDA (Act 28 of 2002) – to be submitted by the applicant.
- Part 1 amendment application in terms of Regulation 29 of the NEMA Environmental Impact Assessment (EIA) Regulations (GRN982 of 2014, as amended) – to be submitted by the applicant.

The applicant is in the process of acquiring a portion of the mining and surface rights from the Clover Alloys Rustenburg Chrome Mine (RCM) to reduce the time taken to travel to the face at its Kroondal Mine and increase the mining facetime which will in turn increase productivity. In addition to utilizing the existing infrastructure at Clover Alloys RCM, the applicant wishes to develop additional facilities to use in the life of mine. This application relates to the construction of infrastructure associated with the mining activities of Kroondal Mine but not the mining activity itself as mining is already approved. A portion of the existing RCM mining right (Ref: NW30/5/1/2/2/336MR) will be transferred to the existing Glencore mining right (Ref: NW30/5/1/2/2/254MR). Similarly, certain authorised RCM Water Uses (Licence No: 07/A22H/ACIGJ/9460) will be transferred into Glencore's new WUL which is currently being prepared for submission to the Department of Water and Sanitation.

The proposed new developments include (but are not limited to):

- A parking area for permanent employees
- A parking area for visitors and contractors
- Employee drop-off/pick-up zone
- Salvage yard
- Sewage plant
- Shaft Laydown Area / Explosives Delivery Bay
- Surface laydown area
- Meeting venue hall (Lekgotla Hall)
- Access and escape roads
- Two water storage dams
- Compressor house
- One 11kV Powerline connection to an existing 11kV Powerline
- Administration Offices
- Change houses
- Engineering workshop
- Stores
- Temporary laydown area (historic LanXess Chrome Mining village area)
- Clean stormwater infrastructure including passive attenuation wetland feature

Kroondal mining operations are situated approximately 10 km east of Rustenburg, North-West Province. Mining at Kroondal has historically consisted of both opencast and underground mining. Currently only underground mining is undertaken, and the old opencast areas have been closed and rehabilitated. The current underground mining is taking place in close proximity to the Clover Alloys RCM mining rights areas. Miners' underground travel time will be reduced by approximately 50% through Glencore WCM acquiring the surface rights on Portion 62 of the farm Rietfontein 338 JQ and mining right (MR336), which will in turn increase production and ensure the long-term survival of the business.

The Basic Assessment Report (BAR) was made available to Interested and Affected Parties (I&APs) for public review and comment for a minimum of 30 days. All comments received during this period will be included in the BAR that will be submitted to the DMRE for their consideration in the decision-making process.

1.1 REPORT STRUCTURE

This report has been compiled in accordance with the NEMA EIA Regulations, 2014, as amended. A summary of the report structure, and the specific sections that correspond to the applicable regulations, is provided in **Table 2** below.

Table 2: Report structure

Environmental Regulation	Description – NEMA Regulation 982 (2014) as amended	Section in Report
Appendix 3(1)(a)	Details of – i. The Environmental Assessment Practitioner (EAP) who prepared the report; and ii. The expertise of the EAP, including a curriculum vitae;	**Section 1.2** and **Appendix A**
Appendix 3(1)(b)	The location of the activity. Including – i. The 21-digit Surveyor General code of each cadastral land parcel; ii. Where available, the physical address and farm name; iii. Where the required information in items (i) and (ii) is not available, the coordinates of the boundary of the property or properties;	**Section 2**
Appendix 3(1)I	A plan which locates the proposed activity or activities applied for at an appropriate scale, or, if it is – i. A linear activity, a description and coordinates of the corridor in which the proposed activity or activities is to be undertaken; or ii. On a land where the property has not been defined, the coordinates within which the activity is to be undertaken;	**Section 2**
Appendix 3(1)(d)	A description of the scope of the proposed activity, including – i. All listed and specified activities triggered and being applied for; and	**Section 3**

Environmental Regulation	Description – NEMA Regulation 982 (2014) as amended	Section in Report
	ii. A description of the associated structures and infrastructure related to the development;	
Appendix 3(1)I	A description of the policy and legislative context within which the development is proposed including- i. an identification of all legislation, policies, plans, guidelines, spatial tools, municipal development planning frameworks, and instruments that are applicable to this activity and have been considered in the preparation of the report; and ii. how the proposed activity complies with and responds to the legislation and policy context, plans, guidelines, tools frameworks, and instruments	**Section 4**
Appendix 3(1)(f)	A motivation for the need and desirability for the proposed development including the need and desirability of the activity in the context of the preferred location;	**Section 5**
Appendix 3(1)(g)	A motivation for the preferred site, activity and technology alternative	**Sections 3, 6, 9** and **10.3**
Appendix 3(1)(h)	A full description of the process followed to reach the proposed preferred alternative within the site, including: – i. Details of the development footprint alternatives considered; ii. Details of the public participation process undertaken in terms of regulation 41 of the Regulations, including copies of the supporting documents and inputs; iii. A summary of the issues raised by interested and affected parties, and an indication of the manner in which the issues were incorporated, or the reasons for not including them; iv. The environmental attributes associated with the alternatives focusing on the geographical, physical, biological, social, economic, heritage and cultural aspects; v. The impacts and risks identified for each alternative, including the nature, significance, consequence, extent, duration and probability of the impacts, including the degree to which these impacts – a. Can be reversed; b. May cause irreplaceable loss or resources; and c. Can be avoided, managed or mitigated;	**Sections 6, 7, 8, 9** and **10.3**

Environmental Regulation	Description – NEMA Regulation 982 (2014) as amended	Section in Report
	vi. The methodology used in determining and ranking the nature, significance, consequences, extent, duration and probability of potential environmental impacts and risks associated with the alternatives; vii. Positive and negative impacts that the proposed activity and alternatives will have on the environment and on the community that may be affected focusing on the geographical, physical, biological, social, economic, heritage and cultural aspects; viii. The possible mitigation measures that could be applied and level of residual risk; ix. The outcome of the site selection matrix; x. If no alternatives, including alternative locations for the activity were investigated, the motivation for not considering such; and; xi. A concluding statement indicating the preferred alternatives, including preferred location of the activity.	
Appendix 3(1)(i)	A full description of the process undertaken to identify, assess and rank the impacts the activity will impose on the preferred location through the life of the activity, including – i. A description of all environmental issues and risks that were identified during the environmental impact assessment process; and ii. An assessment of the significance of each issue and risk and an indication of the extent to which the issue and risk could be avoided or addressed by the adoption of mitigation measures;	**Sections 6, 7, 8** and **9**
Appendix 3(1)(j)	An assessment of each identified potentially significant impact and risk, including – i. Cumulative impacts; ii. The nature, significance and consequences of the impact and risk; iii. The extent and duration of the impact and risk; iv. The probability of the impact and risk occurring; v. The degree to which the impact and risk can be reversed; vi. The degree to which the impact and risk may cause irreplaceable loss of resources; and vii. The degree to which the impact and risk can be mitigated;	**Sections 6, 7, 8** and **9**

Environmental Regulation	Description – NEMA Regulation 982 (2014) as amended	Section in Report
Appendix 3(1)(k)	Where applicable, a summary of the findings and impact management measures identified in any specialist report complying with Appendix 6 to these Regulations and an indication as to how these findings and recommendations have been included in the final report;	**Section 10**
Appendix 3(1)(l)	An environmental impact statement which contains – i. A summary of the key findings of the environmental impact assessment; ii. A map at an appropriate scale which superimposes the proposed activity and its associated structures and infrastructure on the environmental sensitivities of the preferred site indicting any areas that should be avoided, including buffers; and iii. A summary of the positive and negative impacts and risks of the proposed activity and identified alternatives;	**Section 10**
Appendix 3(1)(m)	Based on the assessment, and where applicable, recommendations from specialist reports, the recording of proposed impact management outcomes for the development for inclusion in the EMPr;	**Section 10.5**
Appendix 3(1)(n)	Any aspects which were conditional to the findings of the assessment either by the EAP or specialist which are to be included as conditions of authorisation;	**Section 10.5**
Appendix 3(1)(o)	A description of any assumptions, uncertainties and gaps in knowledge which relate to the assessment and mitigation measures proposed;	**Section 11**
Appendix 3(1)(p)	A reasoned opinion as to whether the proposed activity should or should not be authorised, and if the opinion is that it should be authorised, any conditions that should be made in respect of that authorisation;	**Section 10**
Appendix 3(1)(q)	Where the proposed activity does not include operational aspects, the period for which the environmental authorisation is required and the date on which the activity will be concluded and the post construction monitoring requirements finalised;	**N/A**
Appendix 3(1)I	An undertaking under oath or affirmation by the EAP in relation to – iv. The correctness of the information provided in the reports; v. The inclusion of comments and inputs from stakeholders and interested and affected parties;	**Section 12**

Environmental Regulation	Description – NEMA Regulation 982 (2014) as amended	Section in Report
	vi. The inclusion of inputs and recommendations from the specialist reports where relevant; and vii. Any information provided by the EAP to interested and affected parties and any responses by the EAP to comments or inputs made by interested or affected parties;	
Appendix 3(1)(t)	Any specific information that may be required by the competent authority; and	None requested at this time
Appendix 3(1)(u)	Any other matters required in terms of section 24(4)(a) and (b) of the Act.	This entire BAR speaks to Section 24(4)(a) and (b) of the NEMA for the CA's consideration in decision making.

1.2 DETAILS OF THE EAP

The contact details of the EIMS consultants and EAPs who compiled this Report are as follows:

Table 3: EAP Details

Designation	Project Manager/Registered EAP	Report Compilation/ Candidate EAP
Name of Practitioner	Mr Brian Whitfield	Miss Jolene Webber
Tel No.	+ 27 11 789 7170	+ 27 11 789 7170
Fax No.	+27 86 571 9047	+27 86 571 9047
E-mail	GlencoreRCM@eims.co.za	GlencoreRCM@eims.co.za
EAPASA Reference Number	Registered EAP (2022/4496)	Candidate EAP (2023/7704)

In terms of Regulation 13 of the EIA Regulations, 2014, as amended, an independent EAP, must be appointed by the applicant to manage the application. EIMS is compliant with the definition of an EAP as defined in Regulations 1 and 13 of the EIA Regulations, as well as Section 1 of the NEMA. This includes, inter alia, the requirement that EIMS is:

- Objective and independent;
- Has expertise in conducting EIA's;
- Comply with the NEMA, the environmental regulations and all other applicable legislation;
- Considers all relevant factors relating to the application; and
- Provides full disclosure to the applicant and the relevant environmental authority.

EIMS is a private and independent environmental management-consulting firm that was founded in 1993. EIMS has in excess of 30 years' experience in conducting EIA's. Please refer to the EIMS website (www.eims.co.za) for further details of expertise and experience.

Mr Brian Whitfield is a senior project manager at EIMS and has over 20 years of experience as an EAP. He holds a BSc (Botany and Zoology) and a BSc Honours degree in Botany from the University of the Witwatersrand. Brian is a registered Professional Natural Scientist with the South African Council for Natural Scientific Professions (400447/13) and a registered EAP (2022/4496) with the Environmental Assessment Practitioners Association of South Africa (EAPASA). Brian's broad range of experience includes managing and/or undertaking projects in various sectors, including Energy, Mining, Oil and Gas, Water and Infrastructure. He is conversant with the South African environmental legislation as well as sustainability auditing, including Equator Principles, IFC Performance Standards and World Bank EHS guidelines. Brian's other experience includes Site Assessments, Water-use licensing, Environmental Monitoring and Auditing, Due Diligence Assessments, Competent Persons Reporting, Environmental Management Plans and Strategic Environmental Assessments.

Miss Jolene Webber is currently working as an Environmental Consultant since June 2023. She holds a BSc (Geography and Geospatial Sciences) and a BSc Honours degree in Geography from the University of the Witwatersrand. Jolene is a registered Candidate EAP (2023/7704) with the EAPASA. She has been involved in several projects, working in Public Participation and as a GIS consultant. She also has experience with General Authorisations, Site Sensitivity Verification and Environmental Compliance/Auditing in the Infrastructure and Mining sectors.

The Curriculum Vitae of the EAPs responsible for the compilation of this Report is included in **Appendix A**.

2 DESCRIPTION OF THE PROJECT AREA

Table 4 indicates the details of the project area for the proposed project including details on the project location as well as the distance from the proposed project area to the nearest towns. The proposed infrastructure is located on one farm portion, as described in the table below.

Table 4: Locality details

Project Area	The proposed project is located approximately 5.3km east of Kroondal with the proposed new infrastructure located on Portion 62 of the farm Rietfontein 338 JQ in the Rustenburg Local Municipality, North West Province.
Application Area (ha)	The surface rights boundary is approximately 78 ha, with the proposed developments covering less than approximately 12 ha.
Cadastral description	**Farm Name:** Farm Rietfontein 338 JQ portion 62 **21-Digit SG Code:** T0JQ00000000033800062 *Note: Portion 62 is a recent subdivision of Portion 11 of the farm Rietfontein 338 JQ and therefore where Portion 11 is referred to in this report, it should be understood that it has recently been subdivided into Portion 62.*
District Municipality	Bojanala Platinum District Municipality
Local Municipalities	Rustenburg Local Municipality

The locality of the proposed project is shown in **Figure 1**.

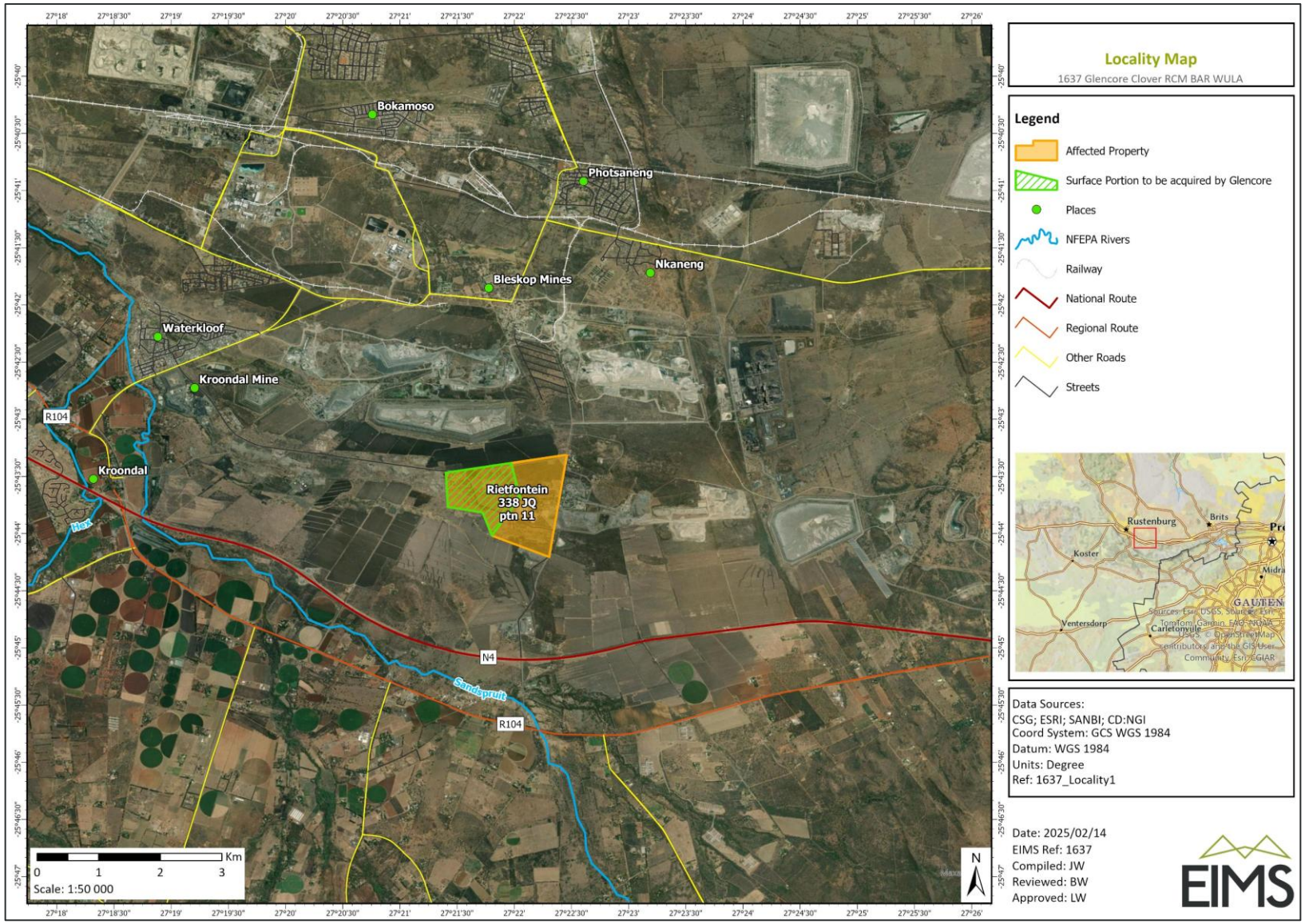


Figure 1: Locality map.

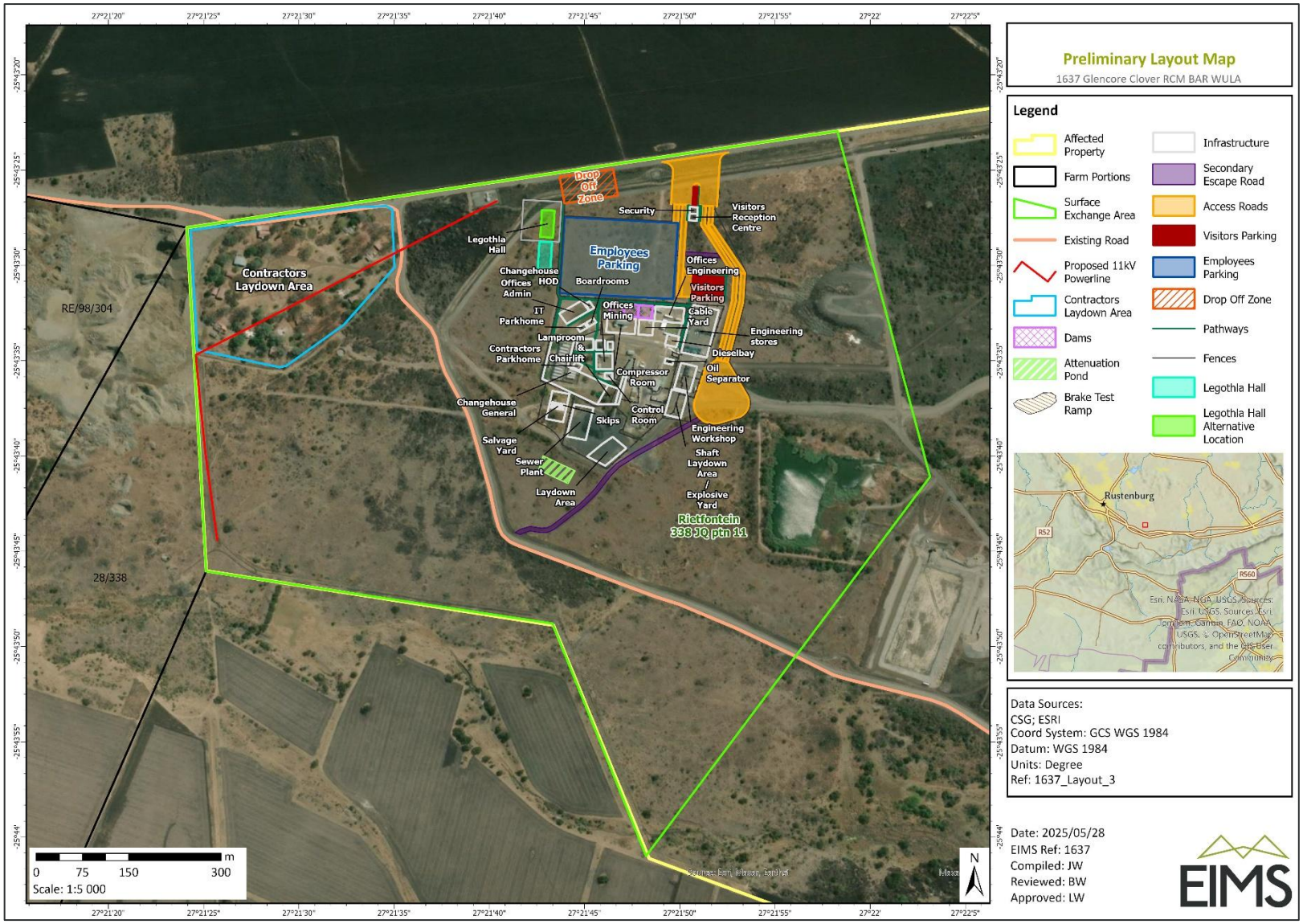


Figure 2: Layout Map.

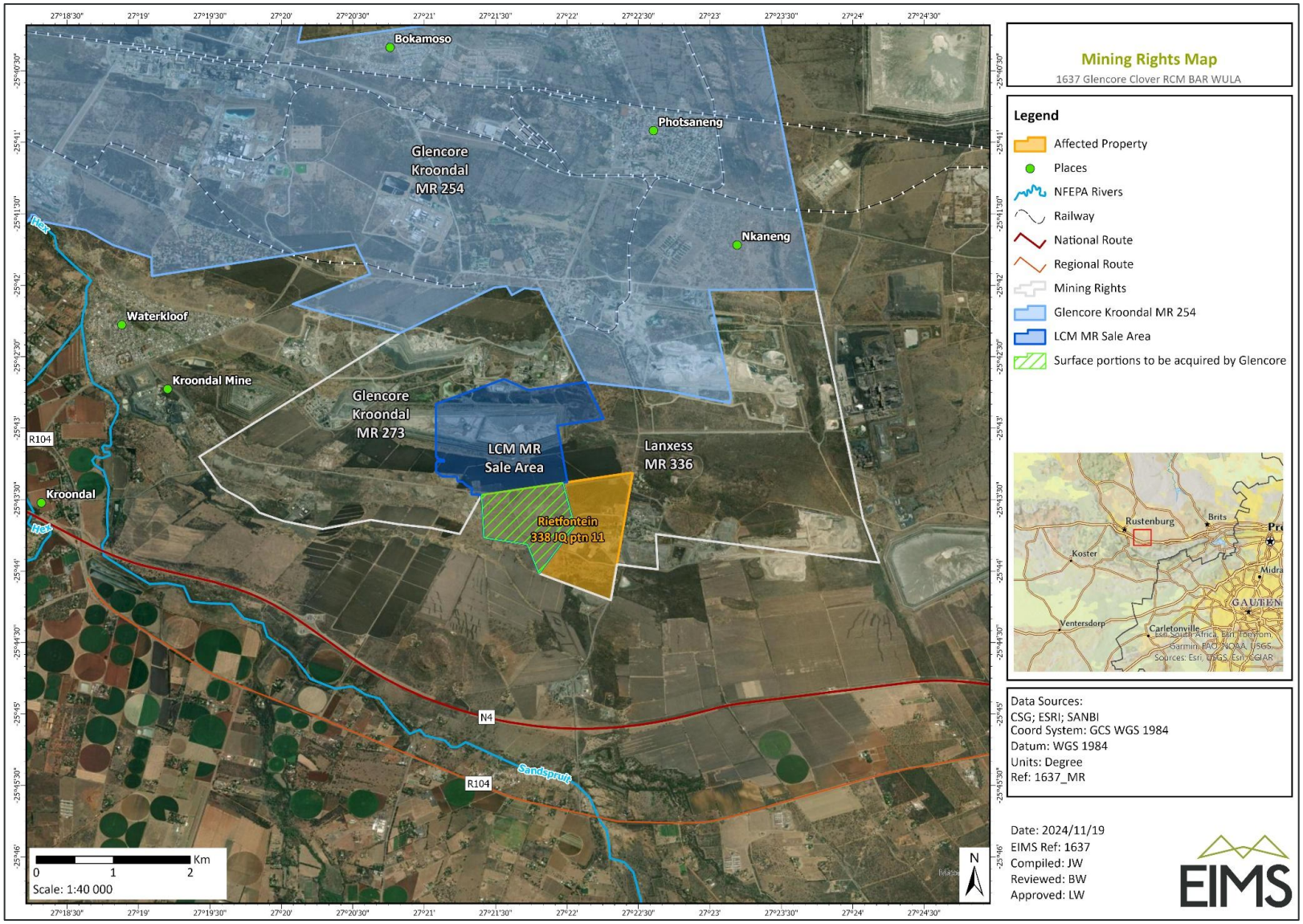


Figure 3: Mining Rights and Exchange Areas Map.

3 DESCRIPTION AND SCOPE OF THE PROPOSED ACTIVITY

The sections below provide a detailed description of the proposed Glencore WCM Kroondal Mine Infrastructure project. The aim of the project description is to indicate the proposed activities to take place and to facilitate an understanding of the preliminary impacts identified and assessed in this Basic Assessment Report.

3.1 PROJECT DESCRIPTION

The applicant is in the process of acquiring a portion of the mining and surface rights from the Clover Alloys Rustenburg Chrome Mine (RCM) to reduce the time taken to travel to the face at its Kroondal Mine and increase the mining facetime which will in turn increase productivity. In addition to utilizing the existing infrastructure at Clover Alloys RCM, the applicant wishes to develop additional facilities to use in the life of mine detailed in the subsections below.

3.1.1 PROJECT OVERVIEW

Kroondal mining operations are situated approximately 10 km east of Rustenburg, North-West Province. Mining at Kroondal has historically consisted of both opencast and underground mining. Currently only underground mining is undertaken, and the old opencast areas have been closed and rehabilitated. The current underground mining is taking place in close proximity to the Clover Alloys RCM mining rights areas.

The acquisition of the surface rights on Portion 62 of the farm Rietfontein 338 JQ and mining right (MR336) is expected to reduce the miners' travel time by 50% to reach the underground working area, thereby increasing the mining facetime which will in turn increase productivity, ensuring the long-term survival of the business. In addition to utilizing the existing infrastructure at Clover Alloys RCM, the applicant wishes to develop additional facilities to use in the life of mine.

3.1.2 PROJECT TIMELINE

Surface construction is planned to begin in July of 2025. The project is planned to be fully operational by September 2026.

3.1.3 PROJECT COMPONENTS

This section will break down the proposed infrastructure into distinct components. The proposed infrastructure is listed below and is presented in Figure 2:

- A parking area for permanent employees (32 102m^2)
- A parking area for visitors and contractors (1 200m^2)
- Employee drop-off/pick-up zone (3 500m^2)
- Salvage yard (~850m^2)
- Sewage plant (1 500m^2 with a capacity of approximately 140m^3/day, less than 15 000m^3 per annum)
- Shaft Laydown Area / Explosives Delivery Bay (1 000m^2)
- Surface laydown area (1 300m^2)
- Meeting venue hall (Lekgotla Hall) (3 650m^3)
- Access and escape roads
- Two water storage dams (each 400m^3)
- Compressor house (~1 000m^2)
- One 11kV Powerline (less than 1km long) connection to an existing 11kV Powerline
- Administration Offices
- Change houses (total area of 3 700m^2)
- Engineering workshop (1 000m^2)
- Stores (3 000m^2)
- Temporary laydown area (~5.8 ha, historic LanXess Chrome Mining village area)
- Clean stormwater infrastructure including passive attenuation wetland feature

3.1.3.1 PROPOSED 11KV POWERLINE

The proposed overhead line (OHL) will be less than 1km long and connects to an existing powerline on the south west corner of the farm Rietfontein 338 JQ portion 11. The powerline will connect to an existing substation in order to supply additional power to the shaft.

3.1.3.2 WATER STORAGE DAMS

Two additional water storage dams, each with a capacity of 400m^3, will be constructed alongside the existing water storage dam and will store municipal water. These dams do not trigger water uses (Section 21(b)) as they will be storing municipal water.

3.1.3.3 ROADS, PARKING AREAS AND OTHER PAVED SURFACES

Paved roads will be constructed for entry to the employees parking area (~50m) and visitors parking area (~150m) for light vehicles. Heavy vehicle access roads (2 roads at approximately 300m in length) will be constructed for deliveries to the site which will end in a turning circle alongside the shaft laydown area / explosives delivery bay. Secondary escape roads will be constructed connecting the employees parking and the delivery roads, as well as from the turning circle to an existing access road.

Parking spaces will be located outside the entrance near the security office. Two main parking areas will be constructed:

- One undercover parking area (covered with shade-netting) for permanent employees. This will entail ~458 parking spaces with the undercover area covering 13 500m^2, and the total parking area covering 32 102m^2.
- One visitors parking area for visitors and contractors with ~30 parking spaces covering a total area of 1 200m^2.

An employee drop-off/pick-up zone will be constructed alongside the main road and covers an area of 3 500m^2. A pathway will be constructed that connects to the main site alongside the employees parking area.

3.1.3.4 SEWAGE PLANT

A small sewage treatment plant will be constructed in the area that has been used as a stockpile area by the current Clover Alloys RCM operation. The sewage plant will be approximately 1 500m^2 with a daily capacity of ~140m^3. The annual capacity will not exceed 15 000m^3 and therefore does not trigger a listed activity. The sewage plant will be used to treat raw sewage with the sludge being removed by a service provider for disposal at a licenced facility while the treated water will be reused. The treated water will be used for irrigation of gardens and/or dust suppression.

3.1.3.5 SHAFT LAYDOWN AREA AND EXPLOSIVES DELIVERY BAY

The shaft laydown area/explosives delivery bay will be located next to the turning circle for deliveries. The total area is approximately 1 000m^2. Explosives will be received at the delivery bay for transport down the shaft. The existing Glencore Kroondal Mine Explosives Procedure will be used to guide the construction of the Explosives Delivery Bay and the handling of explosives.

3.1.3.6 TEMPORARY CONTRACTORS' LAYDOWN AREAS, OFFICES AND ABLUTION FACILITIES

The historic LanXess Chrome Mining Village area will be used as a temporary laydown area for contractors during construction. The village is approximately 5.8 hectares and is highly disturbed due to previous human activities, including gardening practices and the development of dirt roads and houses. The old houses have been stripped of asbestos and other materials and are no longer inhabited or suited for housing of people. This area was therefore chosen for the Contractors' temporary laydown site to limit further disturbance to the undisturbed natural habitat areas on the property.

Temporary offices and ablution facilities will be used to minimize disturbance to the area. All facilities and infrastructure used at the contractors' camp will be removed after completion of construction.

3.2 ASSOCIATED ACTIVITIES AND INFRASTRUCTURE

3.2.1 WASTE MANAGEMENT

Waste management best practices will be implemented throughout the construction, operation and decommissioning phases.

3.2.1.1 GENERAL WASTE

The following types of waste will be generated during construction and operation:

- Construction waste;
- Scrap metal; and
- Domestic solid waste

Waste will be sorted into waste streams and reused, if possible, otherwise the waste will be stored for removal to a licensed waste disposal facility. Waste generated during the construction phase will be temporarily stored on site in $6m^3$ bins. Once the bins are full, an approved, licenced waste contractor will collect the waste for removal and disposal at a registered general waste disposal facility. No new landfills will be established as a result of the project within the project boundary. Rubble material generated from the demolition of old infrastructure will be collected and repurposed for use in foundations.

3.2.1.2 HAZARDOUS WASTE

Minimal hazardous waste is expected to be generated on site with the use of various construction machinery and vehicles. Hazardous waste, including but not limited to hydrocarbon containing waste (e.g., used oil, diesel, lubricants and grease) will be stored in clearly labelled skip bins (solid waste) and bins (liquid waste) that will be placed in hard, impervious, bunded hazardous waste storage facilities. Hazardous waste will be collected by an appointed approved, licensed hazardous waste contractor for safe disposal or recycling companies. A safe waste disposal certificate will be required from the contractor and kept on record to ensure safe disposal.

3.2.2 WATER MANAGEMENT

Water is required during construction, operation and decommissioning phases. Water for construction and domestic purposes will be sourced from existing municipal supplies (Rand Water).

3.2.3 SEWAGE AND WASTEWATER

Temporary ablution facilities will be used during construction. During the operation phase, sewage will be treated through the Sewage Plant as described in **Section 3.1.3.4** above.

3.2.4 STORMWATER MANAGEMENT

The proposed infrastructure development will result in an increase in impervious surfaces such as paved areas (roads, parking areas) and the proposed buildings which can impede natural infiltration and increase surface runoff. Without appropriate stormwater management, this could result in increased erosion and sedimentation of nearby watercourses, etc. A Stormwater Management Plan (SWMP) is therefore essential to ensure that stormwater is managed in a sustainable and responsible manner.

The proposed SWMP for the development area has been developed by FIJ Consulting Engineers in consultation with The Biodiversity Company (TBC). The proposed SWMP design is shown in **Figure 4**. Stormwater will be diverted into an attenuation pond in a controlled manner to prevent scouring, sedimentation or erosion from forming. The existing chrome stockpile and conveyor associated with the current Clover Alloys RCM operations will be rehabilitated and repurposed into a chairlift for access to the shaft, thereby converting the area from a dirty water zone to a clean water zone.

The attenuation pond will act as a constructed passive wetland, and the design thereof has been guided by specialist inputs from TBC. The passive wetland will be conceptually designed with the primary purpose of

increasing water retention and promoting low velocity flows toward the artificial seep wetland (refer to **Figure 35**), which thereby reduces erosion. The secondary objectives of the constructed wetland are the:

- Improvement in water quality of discharge received from the clean water catchment; and
- The provision of a transitional habitat that is integrated with the environment to encourage and support local wildlife.

For further information regarding the conceptual design of the passive wetland or the Stormwater Management Plan, please refer to **Appendix H**.

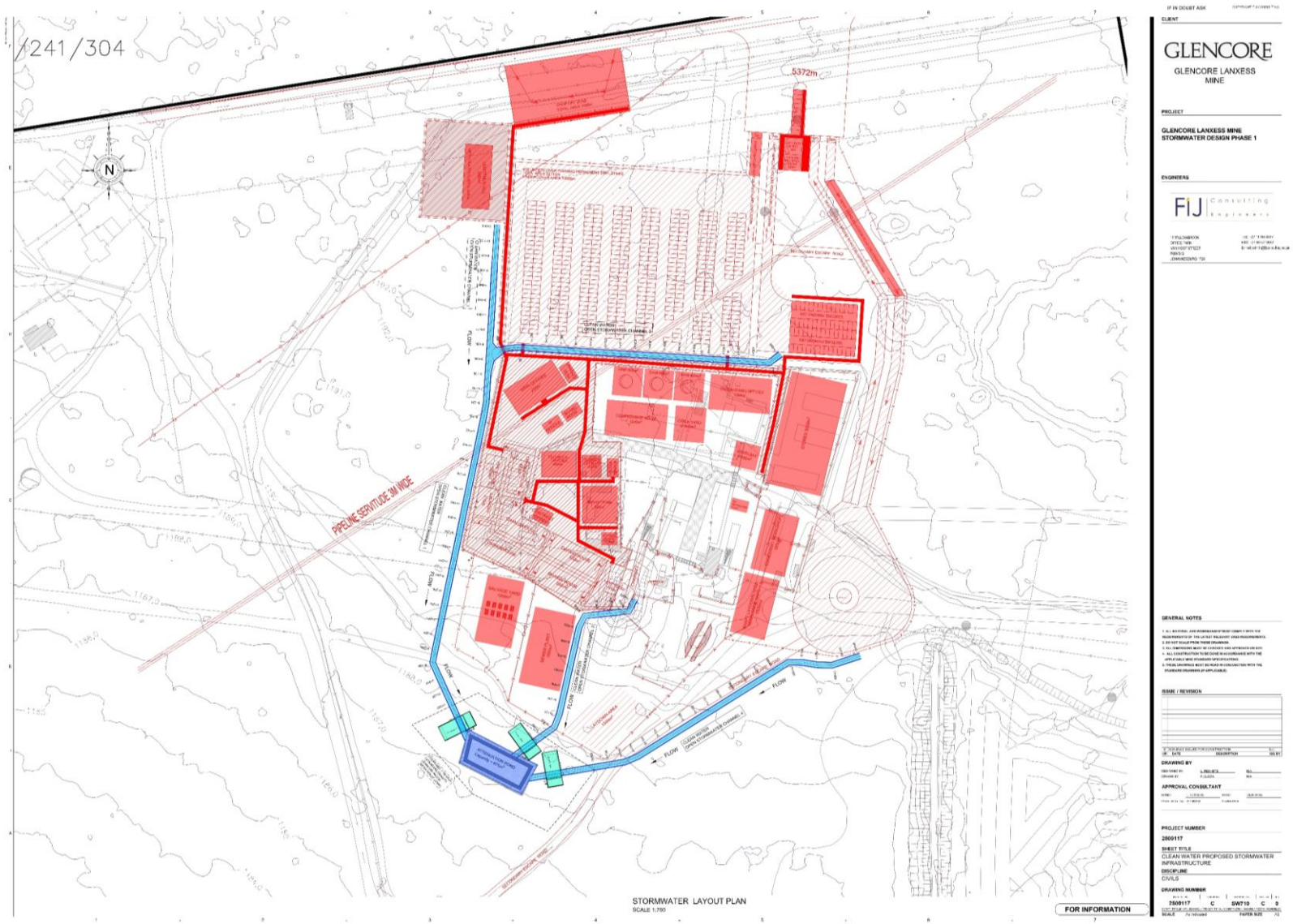


Figure 4: Proposed Glencore Stormwater Design (FIJ Consulting Engineers, 2025).

4 POLICY AND LEGISLATIVE CONTEXT

This section provides an overview of the governing legislation identified which relates to the proposed project.

4.1 NATIONAL LEGISLATION

4.1.1 CONSTITUTION OF THE REPUBLIC OF SOUTH AFRICA

The constitution of any country is the supreme law of that country. The Bill of Rights in chapter 2 section 24 of the Constitution of South Africa Act (Act No. 108 of 1996) makes provisions for environmental issues and declares that: *"Everyone has the right -*

a) to an environment that is not harmful to their health or well-being; and

b) to have the environment protected, for the benefit of present and future generations, through reasonable legislative and other measures that:

i. *prevent pollution and ecological degradation;*

ii. *promote conservation; and*

iii. secure ecologically sustainable development and use of natural resources while promoting justifiable economic and social development".

The EIA and associated impact mitigation actions are conducted to fulfil the requirement of the Bill of Rights.

4.1.2 MINERAL AND PETROLEUM RESOURCES DEVELOPMENT ACT (MPRDA)

The aim of the MPRDA is to *"make provision for equitable access to and sustainable development of the nation's mineral and petroleum resources"*. The MPRDA outlines the procedural requirements that need to be met to acquire mining rights in South Africa. The MPRDA also requires adherence with related legislation, chief amongst them is the National Environmental Management Act (Act No. 107 of 1998, NEMA) and the National Water Act (Act No. 36 of 1998, NWA).

In terms of the MPRDA, the applicant will apply for the following:

- An application to amend the existing Glencore EMPr to include the new infrastructure being applied for in this application, on Portion 62 of the Farm Rietfontein 338JQ, in accordance with Section 102 of the MPRDA (Act 28 of 2002).
- An application to transfer a portion of the Clover Alloys RCM Mining Right area into the Glencore Mining Right Area (MR336), in accordance with Section 11 of the MPRDA (Act 28 of 2002).

4.1.3 NATIONAL ENVIRONMENTAL MANAGEMENT ACT (NEMA)

The main aim of the National Environmental Management Act, 1998 (Act 107 of 1998 – NEMA) is to provide for co-operative governance by establishing decision-making principles on matters affecting the environment. In terms of the NEMA EIA Regulations, the applicant is required to appoint an EAP to undertake the EIA process, as well as conduct the public participation process towards an application for EA. In South Africa, EIA's became a legal requirement in 1997 with the promulgation of regulations under the Environment Conservation Act (ECA). Subsequently, NEMA was passed in 1998. Section 24(2) of NEMA empowers the Minister and any MEC, with the concurrence of the Minister, to identify activities which must be considered, investigated, assessed and reported on to the competent authority responsible for granting the relevant EA. On 21 April 2006, the Minister of Environmental Affairs and Tourism (now Department of Forestry, Fisheries and the Environment – DFFE) promulgated regulations in terms of Chapter 5 of the NEMA. These regulations, in terms of the NEMA, were amended a number of times between 2010 and 2022. The NEMA EIA Regulations, 2014, as amended, are applicable to this project.

The objective of the EIA Regulations is to establish the procedures that must be followed in the consideration, investigation, assessment and reporting of the listed activities that are triggered by the proposed project. The purpose of these procedures is to provide the competent authority with adequate information to make informed

decisions which ensure that activities which may impact negatively on the environment to an unacceptable degree are not authorised, and that activities which are authorised are undertaken in such a manner that the environmental impacts are managed to acceptable levels.

NEMA sets out the general objectives of Integrated Environmental Management (IEM) in South Africa (section 23(2)) of which the following two are of relevance for this report:

- Identify, predict and evaluate the actual and potential impact on the environment, socio-economic conditions and cultural heritage, the risks and consequences and alternatives and options for mitigation of activities. This is to be done with a view to minimising negative impacts, maximising benefits and promoting compliance with the principles of environmental management set out in section 2 (of NEMA).
- Ensure that the effects of activities on the environment receive adequate consideration before actions are taken in connection with them.

4.1.3.1 **LISTED ACTIVITIES**

In accordance with the provisions of Sections 24(5) and Section 44 of the NEMA the Minister has published Regulations (GN R. 982) pertaining to the required process for conducting BAs EIAs in order to apply for, and be considered for, the issuing of an EA. These EIA Regulations provide a detailed description of the process to be followed when applying for EA for any listed activity.

In terms of these regulations a Basic Assessment process is required for the proposed project. The **Table 5** below identifies the listed activities the proposed project triggers and consequently requires authorisation prior to commencement.

Table 5: NEMA listed activities to be authorised

Activity	Activity Description	Applicability
Listing Notice 1 GNR 983		
12	The development of- (i) dams or weirs, where the dam or weir, including infrastructure and water surface area, exceeds 100 square metres; or (ii) infrastructure or structures with a physical footprint of 100 square metres or more; where such development occurs- (a) within a watercourse; (b) in front of a development setback; or (c) if no development setback exists, within 32 metres of a watercourse, measured from the edge of a watercourse;- excluding- (aa) the development of infrastructure or structures within existing ports or harbours that will not increase the development footprint of the port or harbour; (bb) where such development activities are related to the development of a port or harbour, in which case activity 26 in Listing Notice 2 of 2014 applies; (cc) activities listed in activity 14 in Listing Notice 2 of 2014 or activity 14 in Listing Notice 3 of 2014, in which case that activity applies; (dd) where such development occurs within an urban area; (ee) where such development occurs within existing roads, road reserves or railway line reserves; or (ff) the development of temporary infrastructure or structures where such infrastructure or structures will be removed within 6 weeks of the	The development is within close proximity to HGM1 (less than 32m) and overlaps artificial wetlands.

Activity	Activity Description	Applicability
	commencement of development and where indigenous vegetation will not be cleared.	
14	The development and related operation of facilities or infrastructure, for the storage, or for the storage and handling, of a dangerous good, where such storage occurs in containers with a combined capacity of 80 cubic metres or more but not exceeding 500 cubic metres.	The explosives temporary storage area will not exceed 500 cubic metres but may at times exceed 80 cubic metres.
19	The infilling or depositing of any material of more than 10 cubic metres into, or the dredging, excavation, removal or moving of soil, sand, shells, shell grit, pebbles or rock of more than 10 cubic metres from a watercourse; but excluding where such infilling, depositing, dredging, excavation, removal or moving- (a) will occur behind a development setback; (b) is for maintenance purposes undertaken in accordance with a maintenance management plan; (c) falls within the ambit of activity 21 in this Notice, in which case that activity applies; (d) occurs within existing ports or harbours that will not increase the development footprint of the port or harbour; or (e) where such development is related to the development of a port or harbour, in which case activity 26 in Listing Notice 2 of 2014 applies.	More than 10 cubic metres of topsoil will be removed as part of construction and artificial wetlands are found on site.
21D	Any activity including the operation of that activity which requires an amendment or variation to a right or permit in terms of section 102 of the Mineral and Petroleum Resources Development Act, as well as any other applicable activity contained in this Listing Notice or in Listing Notice 3 of 2014, required for such amendment.	Glencore will submit a S102 for the amendment of their current mining right (Ref: NW30/5/1/2/2/254MR) to include Portion 62 of the Farm Rietfontein 338JQ which currently falls within the Clover Alloys RCM Mining Right (Ref: NW30/5/1/2/2/336MR).
27	The clearance of an area of 1 hectares or more, but less than 20 hectares of indigenous vegetation, except where such clearance of indigenous vegetation is required for-	Approximately 7 hectares of indigenous vegetation is expected to be cleared for the construction of the proposed development.

Activity	Activity Description	Applicability
	(i) the undertaking of a linear activity; or (ii) maintenance purposes undertaken in accordance with a maintenance management plan.	
48	The expansion of- (i) infrastructure or structures where the physical footprint is expanded by 100 square metres or more; or (ii) dams or weirs, where the dam or weir, including infrastructure and water surface area, is expanded by 100 square metres or more; where such expansion occurs- (a) within a watercourse; (b) in front of a development setback; or (c) if no development setback exists, within 32 metres of a watercourse, measured from the edge of a watercourse; excluding- (aa) the expansion of infrastructure or structures within existing ports or harbours that will not increase the development footprint of the port or harbour; (bb) where such expansion activities are related to the development of a port or harbour, in which case activity 26 in Listing Notice 2 of 2014 applies; (cc) activities listed in activity 14 in Listing Notice 2 of 2014 or activity 23 in Listing Notice 3 of 2014, in which case that activity applies; (dd) where such expansion occurs within an urban area; or (ee) where such expansion occurs within existing roads, road reserves or railway line reserves.	Some of the existing infrastructure will be utilized and the physical footprint will be expanded by more than 100 square metres with additional infrastructure. There are artificial wetlands found on site.
Listing Notice 3 GNR 985		

Activity	Activity Description	Applicability
2	The development of reservoirs, excluding dams, with a capacity of more than 250 cubic metres.	The two storage dams will have a capacity of 400m^3 each.
4	The development of a road wider than 4 metres with a reserve less than 13,5 metres.	The main development falls within a Critical Biodiversity Area (CBA) as defined by the North West Biodiversity Sector Plan. The proposed development includes the development of numerous roads including access roads for visitors, employees and contractors, as well as new escape roads. The main roads will be wider than 4m.
10	The development and related operation of facilities or infrastructure for the storage, or storage and handling of a dangerous good, where such storage occurs in containers with a combined capacity of 30 but not exceeding 80 cubic metres.	The main development falls within a CBA as defined by the North West Biodiversity Sector Plan. The explosives temporary storage area will include the temporary storage of dangerous goods in containers that may at times have a combined capacity of more than 30 cubic metres.
12	The clearance of an area of 300 square metres or more of indigenous vegetation except where such clearance of indigenous vegetation is required for maintenance purposes undertaken in accordance with a maintenance management plan.	The site falls within a CBA and more than 300m^2 of clearance of indigenous vegetation will be undertaken with the construction of the proposed development.
14	The development of- (i) dams or weirs, where the dam or weir, including infrastructure and water surface area exceeds 10 square metres; or (ii) infrastructure or structures with a physical footprint of 10 square metres or more; where such development occurs- (a) within a watercourse; (b) in front of a development setback; or (c) if no development setback has been adopted, within 32 metres of a watercourse, measured from the edge of a watercourse;	The footprint of the two proposed storage dams is expected to exceed 10m^2. The proposed infrastructure is within close proximity to HGM1 (less than 32m) and overlaps artificial wetlands.

Activity	Activity Description	Applicability
	excluding the development of infrastructure or structures within existing ports or harbours that will not increase the development footprint of the port or harbour.	
23	The expansion of- (i) dams or weirs where the dam or weir is expanded by 10 square metres or more; or (ii) infrastructure or structures where the physical footprint is expanded by 10 square metres or more; where such expansion occurs- (a) within a watercourse; (b) in front of a development setback adopted in the prescribed manner; or (c) if no development setback has been adopted, within 32 metres of a watercourse, measured from the edge of a watercourse; excluding the expansion of infrastructure or structures within existing ports or harbours that will not increase the development footprint of the port or harbour.	Some of the existing infrastructure will be utilized and the physical footprint will be expanded by more than 10 square metres with additional infrastructure. There are artificial wetlands found on site.

The DFFE have published a number of guidelines and protocols which have been considered in the compilation of this report and include but not limited to:

- Public Participation Guideline in terms of NEMA EIA Regulations (2017).
- Need and desirability Guideline in terms of NEMA (2012).
- National guideline on minimum information requirements for preparing Environmental Impact Assessments for mining act activities that require environmental authorisation (2018).
- 2004 Information Series covering various aspects of the EIA process.
- Procedures for assessment and minimum criteria for specialist studies.

4.1.3.2 SCREENING TOOL

A Screening Tool Report was generated from the DFFE Screening Tool as per the requirements of Regulation 16 (1)(b)(v) of the EIA Regulations 2014, as amended, and was included in the Application for EA. The Screening Tool provided a list of specialist studies for consideration and inclusion in the process. The Screening Tool identified environmental sensitivities are presented in **Table 6**.

Table 6: Screening Tool environmental sensitivities.

Theme	Very High Sensitivity	High Sensitivity	Medium Sensitivity	Low Sensitivity
Agriculture Theme			**X**	
Animal Species Theme			**X**	
Aquatic Biodiversity Theme	**X**			
Archaeological and Cultural Heritage Theme				**X**
Civil Aviation Theme		**X**		
Defence Theme				**X**
Palaeontology Theme			**X**	
Terrestrial Biodiversity Theme				**X**

In this regard, as Site Sensitivity Verification Report (SSVR) has been compiled to consider the recommendations of the DFFE Screening Tool Report and to provide a rationale for the selection of specialist studies included in the assessment report. Please refer to **Table 7** for a summary of the verification process. Please refer to **Appendix B** for the SSVR.

Table 7: SSVR findings and motivation.

Screening Tool identified specialist study	Screening Tool Sensitivity	Suggested Sensitivity	Required level of assessment	Motivation
Agriculture Theme	High	Medium	Full Assessment	The DFFE Screening Tool indicated that the proposed development is situated within a High Agricultural Sensitivity Theme. The main activities were noted to be mining related

Screening Tool identified specialist study	Screening Tool Sensitivity	Suggested Sensitivity	Required level of assessment	Motivation
				activities and agricultural activities (crop farming and cattle grazing). The main proposed infrastructure is situated on a disturbed area that is used for mining related activities. A Full Agricultural Assessment has been commissioned to verify the site's Agricultural Sensitivity
Landscape/Visual Impact Assessment	Not defined in the Screening Tool Report	Low	None	A Landscape/Visual Impact Assessment was not undertaken for this proposed project as the proposed development is not expected to have new significant visual changes in the area. The area is predominantly mining in nature with no nearby sensitive visual receptors and therefore this proposed development is in line with the current surrounding land use.
Archaeological and Cultural Theme	Low	Low	Full Assessment	A Phase I DFFE and SAHRA/NHRA compliant specialist assessment has been commissioned to verify the site's Archaeological and Cultural Sensitivity.
Palaeontology Theme	Medium	Low	Desktop Study	A Palaeontological Desktop Study by a suitably qualified specialist has been commissioned to verify the site's Palaeontological Sensitivity.
Terrestrial Biodiversity Theme	Very High	High	Full Assessment	A DFFE compliant Terrestrial Biodiversity Assessment by a suitably qualified specialist has been commissioned to verify the site's Terrestrial Biodiversity Sensitivity.
Aquatic Biodiversity Theme	Very High	Low	Full Assessment	A DFFE compliant Aquatic Ecology Assessment by a suitably qualified specialist has been commissioned to verify the site's Aquatic Biodiversity Sensitivity.
Socio-Economic Assessment	Not defined in the Screening Tool Report	Low	None	A Socio-Economic Assessment will not be undertaken for this proposed development as the development is not expected to have any negative socio-economic impacts.

Screening Tool identified specialist study	Screening Tool Sensitivity	Suggested Sensitivity	Required level of assessment	Motivation
Plant Species Assessment	Low	Medium	Full Assessment	A DFFE compliant Terrestrial Biodiversity Assessment by a suitably qualified specialist has been commissioned and will cover the plant species theme.
Animal Species Assessment	Medium	Low	Full Assessment	A DFFE compliant Terrestrial Biodiversity Assessment by a suitably qualified specialist has been commissioned and will cover the animal species theme.

4.1.4 NATIONAL ENVIRONMENTAL MANAGEMENT: PROTECTED AREAS ACT

The National Environmental Management Protected Areas Act (Act No. 57 of 2003 – NEMPAA) is intended to *"provide for the protection and conservation of ecologically viable areas representative of South Africa's biological diversity and its natural landscapes and seascapes"* and creating a *"national system of protected areas in South Africa as part of a strategy to manage and conserve its biodiversity".*

The NEMPAA defines various kinds of protected areas, namely: *"special nature reserves, national parks, nature reserves (including wilderness areas) and protected environments; world heritage sites; marine protected areas; specially protected forest areas, forest nature reserves and forest wilderness areas declared in terms of the National Forests Act, 1998 (Act 84 of 1998); and mountain catchment areas declared in terms of the Mountain Catchment Areas Act, 1970 (Act 63 of 1970)".*

The South African Protected Areas Database (SAPAD) and South Africa Conservation Areas Database (SACAD) contains spatial data for the conservation of South Africa. It includes spatial and attribute information for both formally protected areas and areas that have less formal protection. The database is updated on a continuous basis and forms the basis for the Register of Protected Areas which is a legislative requirement under the National Environmental Management: Protected Areas Act, Act 57 of 2003. The site is located within the Magaliesberg Biosphere Reserve 'Transition' zone, and approximately 8.7 km from the Magaliesberg Protected Natural Environment.

The National Protected Area Expansion Strategy (NPAES) provides spatial information on areas that are suitable for terrestrial ecosystem protection. These focus areas are large, intact and unfragmented and are therefore, of high importance for biodiversity, climate resilience and freshwater protection. The site overlaps with a Priority Focus Area as per the NPAES dataset (refer to **Figure 5** below).

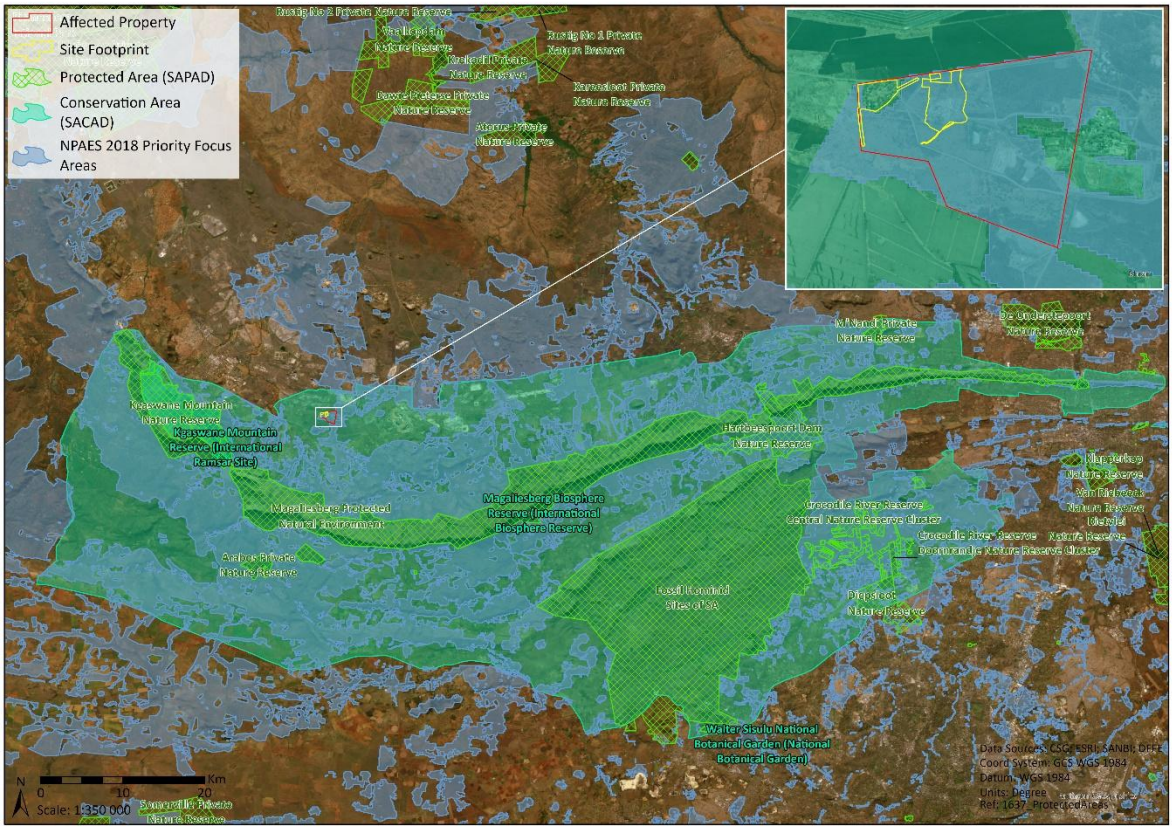


Figure 5: Protected Areas Map.

4.1.5 NATIONAL ENVIRONMENTAL MANAGEMENT BIODIVERSITY ACT (NEMBA)

The National Environmental Management Biodiversity Act (Act No. 10 of 2004 – NEMBA) provides for the management and conservation of South Africa's biodiversity within the framework of the NEMA as well as the protection of species and ecosystems that warrant national protection. Within the framework of this act, various regulations are promulgated which provide specific requirements and management measures relating to protecting threatened ecosystems, threatened or protected species as well as the control of alien and invasive species. A summary of these regulations is presented below.

The National List of Ecosystems that are Threatened and Need of Protection (GN 1002 of 2011) are promulgated under the NEMBA and these Regulations provide for listing of threatened or protected ecosystems in one of the following categories:

- **Critically Endangered (CR)** ecosystems, being ecosystems that have undergone severe degradation of ecological structure, function or composition as a result of human intervention and are subject to an extremely high risk of irreversible transformation;
- **Endangered (EN)** ecosystems, being ecosystems that have undergone degradation of ecological structure, function or composition as a result of human intervention, although they are not critically endangered ecosystems;
- **Vulnerable (VU)** ecosystems, being ecosystems that have a high risk of undergoing significant degradation of ecological structure, function or composition as a result of human intervention, although they are not critically endangered ecosystems or endangered ecosystems; and
- **Protected ecosystems**, being ecosystems that are of high conservation value or of high national or provincial importance, although they are not listed as critically endangered, endangered or vulnerable.

Further regulations published under the NEMBA are the threatened or protected Species Regulations (GN R 152 OF 2007) which aims to:

(a) further regulate the permit system set out in Chapter 7 of the Biodiversity Act insofar as that system applies to restricted activities involving specimens of listed threatened or protected species;

(b) provide for the registration of captive breeding operations, commercial exhibition facilities, game farms, nurseries, scientific institutions, sanctuaries and rehabilitation facilities and wildlife traders;

(c) provide for the regulation of the carrying out of a specific restricted activity, namely hunting;

(d) provide for the prohibition of specific restricted activities involving specific listed threatened or protected species;

(e) provide for the protection of wild populations of listed threatened species; and

(f) provide for the composition and operating procedure of the Scientific Authority.

The Alien and Invasive Species Lists are promulgated under the NEMBA with the aim of protecting the quality and quantity of arable land in South Africa. Loss of arable land should be avoided and declared Weeds and Invaders in South Africa are categorised according to one of the following categories, and require control or removal:

- **Category 1a Listed Invasive Species:** Category 1a Listed Invasive Species are those species listed as such by notice in terms of section 70(1)(a) of the Act as species which must be combated or eradicated;
- **Category 1b Listed Invasive Species:** Category 1b Listed Invasive Species are those species listed as such by notice in terms of section 70(1)(a) of the Act as species which must be controlled;
- **Category 2 Listed Invasive Species:** Category 2 Listed Invasive Species are those species listed by notice in terms of section 70(1)(a) of the Act as species which require a permit to carry out a restricted activity within an area specified in the Notice or an area specified in the permit, as the case may be; and
- **Category 3 Listed Invasive Species:** Category 3 Listed Invasive Species are species that are listed by notice in terms of section 70(1)(a) of the Act, as species which are subject to exemptions in terms of section 71(3) and prohibitions in terms of section 71A of Act, as specified in the Notice.

In giving effect to the above, the Alien and Invasive Species Regulations (GNR 1020 of 2020) provide for amongst others, the prevention of the spread or allowing the spread of, any specimen of a listed invasive species.

Alien Invasive Plants (AIPs) have an average density of <5% over the entire Bojanala Platinum District Municipality and are not considered to be an overall issue within the District Municipality. However, the local municipalities such as Rustenburg, Madibeng and Kgetlengrivier Local Municipalities experience greater issues with AIP densities of greater than 5% and exceeding 20%. Invasions of AIPs within these areas are likely associated with grasslands, as well as broken terrain in river systems, valleys and ridges. Invasions by alien plants have significant impacts on the economy due to loss of agricultural productivity and the cost involved for AIP management, as well as harmful impacts on ecosystem services and biodiversity (BPDM EMF: Status Quo report (Final Rev13), 2018).

The site overlaps the endangered Marikana Thornveld (SVcb 6) vegetation type. The Marikana Thornveld is endangered, with a conservation target of 19%. Less than 1% of this vegetation type is statutorily conserved in conservation areas like the Magaliesberg Nature Area. This vegetation type has been significantly transformed (approximately 48%), mainly by urban sprawl and cultivation (Mucina and Rutherford, 2006; TBC, 2025). This habitat loss is the main contributor endangering this vegetation type and further loss and fragmentation should be minimised (RLM SDF Draft, 2023).

The site falls within the Magaliesberg Important Bird Area. Important Bird and Biodiversity Areas (BirdLife South Africa, 2015) – Important Bird and Biodiversity Areas (IBAs) constitute a global network of over 13 500 sites, of which 112 sites are found in South Africa. IBAs are sites of global significance for bird conservation, identified through multi-stakeholder processes using globally standardised, quantitative and scientifically agreed criteria

(TBC, 2025). The Cape Vulture, an important bird species, is found within the Magaliesberg IBA. IBAs are typically considered when delineating Critical Biodiversity Areas (CBAs), however, additional buffer areas may be necessary around CBAs with respect to developments that are particularly sensitive to birds such as windfarms (RLM SDF Draft, 2023).

4.1.6 THE NATIONAL ENVIRONMENTAL MANAGEMENT WASTE ACT (NEMWA)

On 2 June 2014, the NEMWA came into force. The objectives of this Act are:

a) to protect health, well-being and the environment by providing reasonable measures for-
   i. minimising the consumption of natural resources;
   ii. avoiding and minimising the generation of waste;
   iii. reducing, re-using, recycling and recovering waste;
   iv. treating and safely disposing of waste as a last resort;
   v. preventing pollution and ecological degradation;
   vi. securing ecologically sustainable development while promoting justifiable economic and social development;
   vii. promoting and ensuring the effective delivery of waste services;
   viii. remediating land where contamination presents, or may present, a significant risk of harm to health or the environment; and
   ix. achieving integrated waste management reporting and planning;
b) to ensure that people are aware of the impact of waste on their health, well-being and the environment;
c) to provide for compliance with the measures set out in paragraph (a); and
d) generally, to give effect to section 24 of the Constitution in order to secure an environment that is not harmful to health and well-being.

Section 16 of the NEMWA states:

1. A holder of waste must, within the holder's power, take all reasonable measures to-
   a) "*Avoid the generation of waste and where such generation cannot be avoided, to minimise the toxicity and amounts of waste that are generated;*
   b) Reduce, re-use, recycle and recover waste;
   c) Where waste must be disposed of, ensure that the waste is treated and disposed of in an environmentally sound manner;
   d) Manage the waste in such a manner that it does not endanger health or the environment or cause a nuisance through noise, odour, or visual impacts;
   e) Prevent any employee or any person under his or her supervision from contravening the Act; and
   f) *Prevent the waste from being used for unauthorised purposes.*"

The NEMWA provides for specific waste management measures to be implemented, as well as providing for the licensing and control of waste management activities. However, the proposed development does not trigger any listed activities in terms of GNR 921. Therefore, there will be no application for a Waste Management Licence (WML). However, there will be waste associated with the development and proposed activities where general duty in respect of waste management is applicable.

4.1.7 THE NATIONAL WATER ACT (NWA)

The purpose of the National Water Act, 1998 (Act 36 of 1998 – NWA) is to ensure that the nation's water resources are protected, used, developed, conserved, managed and controlled in ways which take into account amongst other factors:

a) meeting the basic human needs of present and future generations;

b) promoting equitable access to water;

c) redressing the results of past racial and gender discrimination;

d) promoting the efficient, sustainable and beneficial use of water in the public interest;

e) facilitating social and economic development;

f) providing for growing demand for water use;

g) protecting aquatic and associated ecosystems and their biological diversity;

h) reducing and preventing pollution and degradation of water resources;

i) meeting international obligations;

j) promoting dam safety;

k) managing floods and droughts,

and for achieving this purpose, to establish suitable institutions and to ensure that they have appropriate community, racial and gender representation.

The NWA makes provision for two types of applications for water use licences (WULs), namely individual applications and compulsory applications. The NWA also provides that the responsible authority may require an assessment by the applicant of the likely effect of the proposed licence on the resource quality, and that such assessment be subject to the NEMA EIA Regulations. A person may use water if the use is –

- Permissible as a continuation of an existing lawful water use (ELWU);
- Permissible in terms of a general authorisation (GA);
- Permissible under Schedule 1; or
- Authorised by a licence.

The above water use processes are described in **Figure 6**.

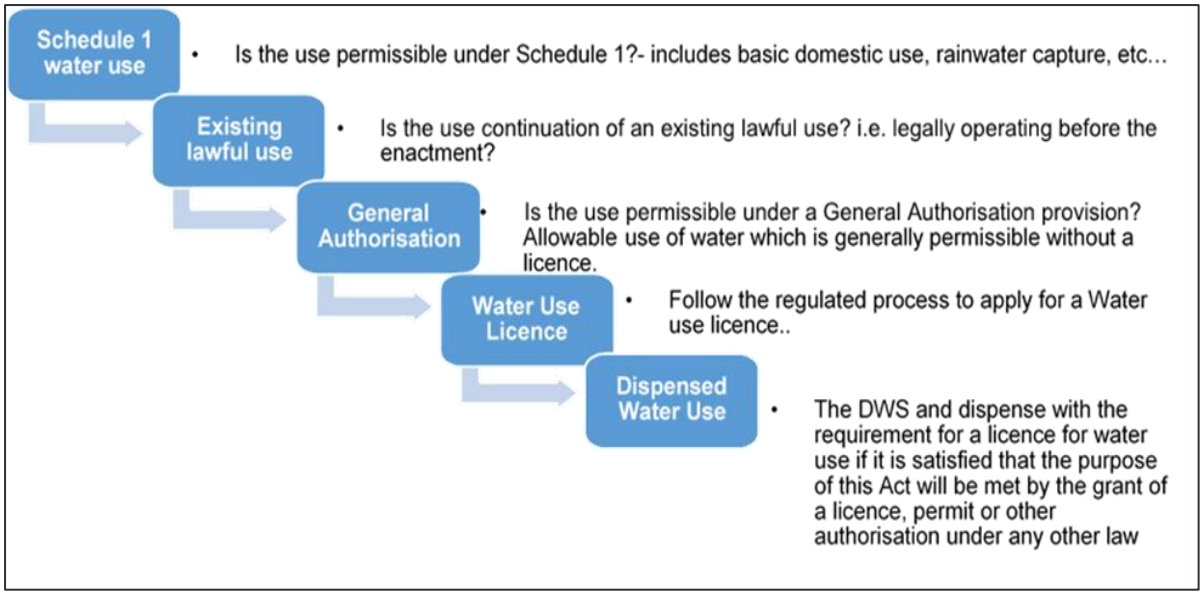


Figure 6: Authorisation processes for new water uses.

The NWA defines 11 water uses in Section 21 of the Act. A water use may only be undertaken if authorised by the DWS. The water uses for which an authorisation or licence can be issued include:

a) Taking water from a water resource;

b) Storing water;

c) Impeding or diverting the flow of water in a watercourse;

d) Engaging in a stream flow reduction activity contemplated in section 36;

e) Engaging in a controlled activity identified as such in section 37(1) or declared under section 38(1);

f) Discharging waste or water containing waste into a water resource through a pipe, canal, sewer, sea outfall or other conduits;

g) Disposing of waste in a manner which may detrimentally impact on a water resource;

h) Disposing in any manner of water which contains waste from, or which has been heated in, any industrial or power generation process;

i) Altering the bed, banks, course or characteristics of a watercourse;

j) Removing, discharging or disposing of water found underground if it is necessary for the efficient continuation of an activity or for the safety of people; and

k) Using water for recreational purposes.

A watercourse is defined in terms of the Act as follows:

a) a river or spring;

b) a natural channel in which water flows regularly or intermittently;

c) a wetland, lake or dam into which, or from which, water flows; and

d) any collection of water which the Minister may, by notice in the Gazette, declare to be a watercourse, and a reference to a watercourse includes, where relevant, its bed and banks;

The regulated area of a watercourse for section 21(c) or (i) of the Act water uses, is similarly defined in terms of the Act as follows:

a) The outer edge of the 1 in 100-year flood line and/or delineated riparian habitat, whichever is the greatest distance, measured from the middle of the watercourse of a river, spring, natural channel, lake or dam;

b) In the absence of a determined 1 in 100-year flood line or riparian area the area within 100m from the edge of a watercourse where the edge of the watercourse is the first identifiable annual bank fill flood bench (subject to compliance to section 144 of the Act); or

c) A 500 m radius from the delineated boundary (extent) of any wetland or pan.

As part of this EA process, the relevant water uses will be identified and applied for. The water uses applicable to this project are presented in **Table 8** below and shall be discussed and agreed upon with the DWS during the WULA process.

Table 8: Likely NWA Section 21 water uses triggered by this project.

Section 21 water use	Description	Applicability
c & i	Impeding or diverting the flow of water in a watercourse and/or altering the bed, banks, course or characteristics of a watercourse.	A small non-perrenial pan/wetland (HGM 1) was identified on the site as well as some artificial wetlands created by the existing mining activities and therefore, the development falls within the regulated area of a watercourse in terms of Section 21(c&i) of the NWA. A WUL application is being prepared for submission along with this EA application.

The required water use licencing application will run concurrently with this EIA process and in consultation with the DWS, additional water uses may be identified.

South Africa is divided into nine Water Management Areas (WMAs). The delegation of water resource management from central government to catchment level is achieved by establishing Catchment Management Agencies (CMAs) at WMA level. Each CMA progressively develops a Catchment Management Strategy (CMS) for the protection, use, development, conservation, management and control of water resources within its WMA. This is to ensure that on a regional scale, water is protected, used, developed, conserved, managed and controlled in a sustainable and equitable manner for the benefit of all persons. The main instrument that guides and governs the activities of a WMA is the CMS which, while conforming to relevant legislation and national strategies, provides detailed arrangements for the protection, use, development, conservation, management and control of the region's water resources.

The project is situated in the secondary catchment A2 of the Limpopo-Olifants Water Management Area, within the A22H Quaternary Catchment. The total drainage area of the Limpopo-Olifants WMA covers 183 125km^2 and borders the neighbouring Zimbabwe and Botswana with the Limpopo River. The Crocodile River is one of the major tributaries of the Limpopo River which eventually discharges into the Indian Ocean through Mozambique (DWS, 2022). The WMA is currently experiencing challenges due to increased urban growth and expansion of key economic sectors such as agriculture and mining. According to the Business Case for the Limpopo-Olifants Catchment Management Agency (2022) it is expected that water demand will have increased by 46% by 2025. The agriculture sector is said to account for 60% of the water use in the Limpopo-Olifants WMA (DWS, 2022).

Strategic Water Source Areas (SWSAs) are areas that supply a disproportionate amount of mean annual runoff to a geographical region of interest. The areas supplying ≥ 50% of South Africa's water supply (which were represented by areas with a mean annual runoff of ≥ 135 mm/year) represent national Strategic Water Source Areas (SANBI, 2013). These are key ecological infrastructure assets and the effective protection of surface water SWSAs areas is vital for national security because a lack of water security will compromise national security and human wellbeing. Groundwater and interflow play a key role in sustaining surface water flows during the dry

season and account for up to 42% of river baseflow, thereby sustaining aquatic and water-dependent biota. Therefore, the protection and management of these areas are imperative (Le Maitre *et al*., 2018).

According to the SWSAs of South Africa, Lesotho and Swaziland, the proposed site is overlapping with the Kroondal / Marikana groundwater strategic water source areas (Lotter and Le Maitre, 2021). Ecological infrastructure in this region should be protected as far as possible, and emphasis should be placed on management of land uses and associated activities with high potential for surface water pollution (RLM SDF Draft, 2023).

4.1.8 NATIONAL HERITAGE RESOURCES ACT (NHRA)

The National Heritage Resources Act (Act 25 of 1999 – NHRA) stipulates that cultural heritage resources may not be disturbed without authorisation from the relevant heritage authority. Section 34(1) of the NHRA states that, "*no person may alter or demolish any structure or part of a structure which is older than 60 years without a permit issued by the relevant provincial heritage resources authority…*" The NHRA is utilised as the basis for the identification, evaluation and management of heritage resources and in the case of Cultural Resource Management (CRM) those resources specifically impacted on by development as stipulated in Section 38 of NHRA, and those developments administered through the NEMA, MPRDA and the Development Facilitation Act (FDA) legislation. In the latter cases the feedback from the relevant heritage resources authority is required by the State and Provincial Departments managing these Acts before any authorisations are granted for a development. The last few years have seen a significant change towards the inclusion of heritage assessments as a major component of Environmental Impact Processes required by the NEMA and MPRDA.

The NEMA 23(2)(b) gives effect to the NHRA and states that an integrated environmental management plan should, "*…identify, predict and evaluate the actual and potential impact on the environment, socio-economic conditions and cultural heritage*". A study of subsections (23)(2)(d), (29)(1)(d), (32)(2)(d) and (34)(b) and their requirements reveals the compulsory inclusion of the identification of cultural resources, the evaluation of the impacts of the proposed activity on these resources, the identification of alternatives and the management procedures for such cultural resources for each of the documents noted in the Environmental Regulations. A further important aspect to be taken into account of in the EIA Regulations under the NEMA relates to the Specialist Report requirements (Appendix 6 of EIA Regulations 2014, as amended) which apply to Heritage Impact Assessments.

The MPRDA also gives effect to the NHRA as this Act defines 'environment' as it is in the NEMA and, therefore, acknowledges cultural resources as part of the environment. Section 39(3)(b) of this Act specifically refers to the evaluation, assessment and identification of impacts on all heritage resources as identified in Section 3(2) of the NHRA that are to be impacted on by activities governed by the MPRDA. Section 40 of the MPRDA requires the consultation with any State Department administering any law that has relevance on such an application through Section 39 of the MPRDA. This implies the evaluation of Heritage Assessment Reports in Environmental Management Plans or Programmes by the relevant heritage authorities.

In accordance with the legislative requirements and EIA rating criteria, the regulations of the South African Heritage Resources Agency (SAHRA) and Association of Southern African Professional Archaeologists (ASAPA) have also been incorporated to ensure that a comprehensive and legally compatible Heritage Report is compiled.

A Heritage Impact Assessment (HIA) was undertaken by a suitably qualified specialist, please refer to **Appendix D** for the HIA report.

4.1.9 ENVIRONMENT CONSERVATION ACT (ECA)

The ECA (Act 73 of 1989) was, prior to the promulgation of the NEMA, the backbone of environmental legislation in South Africa. To date the majority of the ECA has been repealed by various other Acts, however Section 25 of the Act and the Noise Regulations (GN R. 154 of 1992) promulgated under this section are still in effect. These Regulations serve to control noise and general prohibitions relating to noise impact and nuisance.

In terms of section 25 of the ECA, the National Noise Control Regulations (GN R. 154 – NCRs) published in Government Gazette No. 13717 dated 10 January 1992, were promulgated. The NCRs were revised under GN R.

55 of 14 January 1994 to make it obligatory for all authorities to apply the regulations. Provincial noise control regulations have been promulgated in Gauteng, Free State and Western Cape Provinces.

The NCRs will need to be considered in relation to the potential noise that may be generated mainly during the construction phase of the proposed project. The two key aspects of the NCRs relate to disturbing noise and noise nuisance.

Section 4 of the Regulations prohibits a person from making, producing or causing a disturbing noise, or allowing it to be made produced or caused by any person, machine, device or apparatus or any combination thereof. A disturbing noise is defined in the Regulations as "*a noise level which exceeds the zone sound level or if no zone sound level has been designated, a noise level which exceeds the ambient sound level at the same measuring point by 7 dBA or more*."

Section 5 of the NCRs in essence prohibits the creation of a noise nuisance. A noise nuisance is defined as "*any sound which disturbs or impairs or may disturb or impair the convenience or peace of any person".* The South African National Standard 10103 also applies to the measurement and consideration of environmental noise and should be considered in conjunction with these Regulations.

There are a few South African National Standards (SANS) relevant to noise from mines, industry and roads. They are:

- South African National Standard (SANS) 10103:2008 – 'The measurement and rating of environmental noise with respect to annoyance and to speech communication';
- SANS 10210:2004 – 'Calculating and predicting road traffic noise';
- SANS 10328:2008 – 'Methods for environmental noise impact assessments';
- SANS 10357:2004 – 'The calculation of sound propagation by the Concave method';
- SANS 10181:2003 – 'The Measurement of Noise Emitted by Road Vehicles when Stationary'; and
- SANS 10205:2003 – 'The Measurement of Noise Emitted by Motor Vehicles in Motion'.

The relevant standards use the equivalent continuous rating level as a basis for determining what is acceptable. The levels may take single event noise into account, but single event noise by itself does not determine whether noise levels are acceptable for land use purposes. With regards to SANS 10103:2008, the recommendations are likely to inform decisions by authorities, but non-compliance with the standard will not necessarily render an activity unlawful per se. A noise impact assessment will not be undertaken for this project due to the low noise impact nature of this development.

4.1.10 THE CONSERVATION OF AGRICULTURAL RESOURCES ACT (CARA)

The law on Conservation of Agricultural Resources (Act 43 of 1983) aims to provide for the conservation of the natural agricultural resources of the Republic by the maintenance of the production potential of land, by the combating and prevention of erosion and weakening or destruction of the water sources, and by the protection of the vegetation and the combating of weeds and invader plants. In order to achieve the objectives of this Act, control measures related to the following may be prescribed to land users to whom they apply:

- The cultivation of virgin soil;
- The utilisation and protection of land which is cultivated;
- The irrigation of land;
- The prevention or control of waterlogging or salination of land;
- The utilisation and protection of vleis, marshes, water sponges, water courses and water sources;
- The regulating of the flow pattern of run-off water;
- The utilisation and protection of the vegetation;

- The grazing capacity of veld, expressed as an area of veld per large stock unit;
- The maximum number and the kind of animals which may be kept on veld; The prevention and control of veld fires;
- The utilisation and protection of veld which has burned;
- The control of weeds and invader plants;
- The restoration or reclamation of eroded land or land which is otherwise disturbed or denuded;
- The protection of water sources against pollution on account of farming practices;
- The construction, maintenance, alteration or removal of soil conservation works or other structures on land; and
- Any other matter which the Minister may deem necessary or expedient in order that the objects of this Act may be achieved.

Further, different control measures may be prescribed in respect of different classes of land users or different areas or in such other respects as the Minister may determine. Impacts on the soil, biodiversity and water resources have been identified with regards to the proposed project, and mitigation and management measures recommended.

4.1.11 THE SPATIAL PLANNING AND LAND USE MANAGEMENT ACT (SPLUMA)

The Spatial Planning and Land Use Management Act (Act 16 of 2013 – SPLUMA) is set to aid effective and efficient planning and land use management, as well as to promote optimal exploitation of minerals and mineral resources. The SPLUMA was developed to legislate for a single, integrated planning system for the entire country. Therefore, the Act provides a framework for a planning system for the country and introduces provisions to cater for development principles; norms and standards; inter-governmental support; Spatial Development Frameworks (SDFs) across national, provincial, regional and municipal areas; Land Use Schemes (LUS); and municipal planning tribunals.

4.1.12 OCCUPATIONAL HEALTH AND SAFETY ACT

The Occupational Health and Safety Act (Act 85 of 1993 - OHSA) provides for the health and safety of persons at work and for the health and safety of persons in connection with the use of plant and machinery; the protection of persons other than persons at work against hazards to health and safety arising out of or in connection with the activities of persons at work; to establish an advisory council for occupational health and safety; and to provide for matters connected therewith. Worker safety will form part of the contractor's safety requirements and be guided by the OHSA. This would entail a full health and safety file including but not limited to pre-mobilization medical assessments, work environment and task specific risk assessments and method statements etc. The project will be required to comply with the OHSA and or Mine Health and Safety Act (dependent on the specific aspect of the production operations). Therefore, safety of all personnel will be guided by overarching South African legislation.

The Major Hazard Installation Regulations (GNR 692 of 30 July 2001) are promulgated under the OHSA and apply to employers, self-employed persons and users, who have on their premises, either permanently or temporarily, a major hazard installation or a quantity of a substance which may pose a risk that could affect the health and safety of employees and the public.

A "major hazard installation" means an installation-

a) where more than the prescribed quantity of any substance is or may be kept, whether permanently or temporarily; or

b) where any substance is produced, processed, used, handled or stored in such a form and quantity that it has the potential to cause a major incident.

The proposed project components will not trigger the Major Hazard Installation Regulations. The existing Glencore Kroondal Mine Explosives Procedure will be used to guide the construction of the Explosives Delivery Bay and the handling of explosives.

4.2 PROVINCIAL POLICY AND PLANNING CONTEXT

4.2.1 NORTH WEST BIODIVERSITY SECTOR PLAN

The North West Biodiversity Sector Plan (READ, 2015) classifies areas within the province on the basis of their contributions to reaching the associated conservation targets within the province. These areas are primarily classified as either Critical Biodiversity Areas (CBAs) or Ecological Support Areas (ESAs). These biodiversity priority areas, together with protected areas, are important for the persistence of a viable representative sample of all ecosystem types and species, as well as the long-term ecological functioning of the landscape as a whole.

- CBAs are areas of the landscape that need to be maintained in a natural or near-natural state to ensure the continued existence and healthy functioning of important species and ecosystems and the delivery of ecosystem services. Thus, if these areas are not maintained in a natural or near natural state then provincial biodiversity targets cannot be met (SANBI, 2017).

- ESAs are areas that are not essential for meeting biodiversity representation targets but play an important role in supporting the ecological functioning of ecosystems as well as adjacent Critical Biodiversity Areas, and/or in delivering ecosystem services that support socio-economic development (SANBI, 2017).

Provincial CBAs and ESAs are often further classified into sub-categories, such as CBA1 and CBA2 or ESA1 and ESA2. These present fine scale habitat and biodiversity area baseline requirements and associated land management objectives or outcomes. The highest categorisation level is often referred to as an 'Irreplaceable Critical Biodiversity Area' which usually represents pristine natural habitat that is very important for conservation.

The main proposed infrastructure is located within a CBA 2 area according to the North West Terrestrial Biodiversity plan, while the temporary laydown area is located within an ESA 1. A section of the southern most escape road crosses into an ESA 1 area of the North West Aquatic Biodiversity plan.

4.2.2 THE MAGALIESBERG BIOSPHERE MANAGEMENT PLAN

The Magaliesberg Biosphere Management Plan (2015) (hereafter MBMP (2015)) states that the Transition Zones are to be co-operative where various activities are allowed such as settlements, agriculture, mining, support services and infrastructure. However, the focus of this area is for collaboration of various stakeholders to increase environmental public awareness, education and specialist training aimed at reducing the impact on the Magaliesberg area while also enhancing community benefits and promoting sustainable development practices (MBMP, 2015). The evaluation criteria for development/activity proposals within the Transitional Area as described in Annexure 1 of the Magaliesberg Biosphere Management Plan should be considered.

4.3 MUNICIPAL POLICY AND PLANNING CONTEXT

The Bojanala Platinum District Municipality Environmental Management Framework (EMF) (2018) (hereafter referred to as the BPDM EMF (2018)) aims to provide a decision support tool regarding environmental impact matters of proposed developments and human activities. An EMF is an Integrated Environmental Management (IEM) tool that assists competent authorities with their decisions regarding the granting or refusal of environmental authorisations by also providing geographical context of the environmental impacts that could occur as a result of the proposed development.

The BPDM EMF (2018) covers the local municipalities of Rustenburg, Moretele, Madibeng, Kgetlengrivier and Moses Kotane in the North West Province. The site falls within the outer area of the Magaliesberg Biosphere Reserve Transitional Area (Zone), as such, the BPDM EMF (2018) requires that the management authority of the Magaliesberg Biosphere is consulted for new developments. The Magaliesberg Biosphere Management Authority drafted land use guidelines that are to be considered in the EIA process.

The Rustenburg Local Municipality Integrated Development Plan (IDP) is a strategic planning instrument intended to guide and inform budgeting, planning, management and the decision-making process. The priorities and objectives are aimed at addressing strategic challenges within the Rustenburg Local Municipality (RLM).

The Rustenburg Spatial Development Framework (SDF) is a policy document that is designed to guide spatial planning and development within the RLM and is mandated in terms of Section 12(1) of SPLUMA. The document is intended to guide and inform decisions regarding land use and development within the RLM, and to give effect to the goals, objectives and visions of the municipal IDP.

5 NEED AND DESIRABILITY OF THE PROPOSED ACTIVITY

The needs and desirability analysis component of the "Guideline on need and desirability in terms of the EIA Regulations (Notice 819 of 2014)" includes, but is not limited to, describing the linkages and dependencies between human well-being, livelihoods and ecosystem services applicable to the area in question, and how the proposed development's ecological impacts will result in socio-economic impacts (e.g. on livelihoods, loss of heritage site, opportunity costs, etc.). **Table 9** presents the needs and desirability analysis undertaken.

Table 9: Needs and desirability analysis for the proposed project

Ref No.	Question	Response
1	Securing ecological sustainable development and use of natural resources	
1.1	How were the ecological integrity considerations taken into account in terms of: Threatened Ecosystems, Sensitive and vulnerable ecosystems, Critical Biodiversity Areas, Ecological Support Systems, Conservation Targets, Ecological drivers of the ecosystem, Environmental Management Framework, Spatial Development Framework (SDF) and global and international responsibilities.	The site falls within the Marikana Thornveld region which is classified as poorly protected and endangered. Majority of the proposed infrastructure is located within a CBA2 area as per the North West Terrestrial Biodiversity plan, whereas parts of the powerline and the Contractors Laydown area are situated within an ESA1 area. Small sections of the development intersect the ESA1 in terms of the North West Aquatic Biodiversity Plan (refer to **Figure 30**). The integrity of these systems was taken into account by minimizing disturbance to surrounding ecosystems as much as possible. The Contractors Laydown site will be situated in an already highly disturbed area in the old LanXess Chrome Mining village to minimize unnecessary disturbance of natural habitat. Majority of the proposed infrastructure falls within the borders of the existing Clover Alloys RCM operations. A number of specialist studies have been conducted to inform this application and environmental impact assessment, which includes: • Soil, Agriculture and Hydropedology Impact Assessments • Aquatic and Wetland Impact Assessment • Terrestrial Biodiversity Impact Assessment • Heritage Impact Assessment • Palaeontological Desktop Assessment These specialist studies informed areas of Threatened Ecosystems, Sensitive and vulnerable ecosystems, Critical Biodiversity Areas, Ecological Support

Ref No.	Question	Response
		Systems, Conservation Targets and the Ecological drivers of the ecosystem for consideration in the proposed development. The entire site falls within the outer edge of the Magaliesberg Biosphere Reserve – known as the "Transition Zone" (refer to **Figure 5**). Please refer to **Section 4.2.1** for the consideration of the relevant SDFs and EMFs.
1.2	How will this project disturb or enhance ecosystems and / or result in the loss or protection of biological diversity? What measures were explored to avoid these negative impacts, and where these negative impacts could not be avoided altogether, what measures were explored to minimise and remedy the impacts? What measures were explored to enhance positive impacts?	A Terrestrial Biodiversity Assessment and an Aquatic and Wetland Assessment was undertaken to inform any negative impacts on biological diversity that could be imposed due to the development. The specialist's provided mitigation measures to ensure that disturbance to ecosystems is minimized as much as reasonably possible. Please refer to **Sections 9.3.2** and **9.3.3** for the Aquatic and Wetland, and the Terrestrial Biodiversity (respectively) mitigation measures, as well as **Sections 10.5.4** and **10.5.5** for the recommendations from the Aquatics and Wetland, and the Terrestrial Biodiversity specialist studies (respectively).
1.3	How will this development pollute and / or degrade the biophysical environment? What measures were explored to either avoid these impacts, and where impacts could not be avoided altogether, what measures were explored to minimise and remedy the impacts? What measures were explored to enhance positive impacts?	The main impacts will occur during the construction phase as vegetation and soil will be cleared for construction. Mitigation measures have been included to reduce the impacts of potential hydrocarbon and hazardous substance spills that could occur during the construction phase. A stormwater management plan will be implemented to prevent unnecessary pollution of the environment and degradation caused from concentrated flowpaths as a result of the increase in hard surfaces. Please refer to **Sections 9.3.1**, **9.3.2** and **9.3.3** for the mitigation measures for the identified impacts on Geology and Soils, Surface Water/ Wetlands and Terrestrial Biodiversity (respectively).
1.4	What waste will be generated by this development? What measures were explored to avoid waste, and where waste could not be avoided altogether, what measures were explored to minimise, reuse and / or recycle the waste? What measures have been explored to safely treat and/or dispose of unavoidable waste?	The proposed project is anticipated to generate waste during the construction phase where the waste streams include general waste, construction and demolition waste. **Section 3.2.1** and **Section 9** provide further details regarding the waste management practices that should be followed during construction phase.

Ref No.	Question	Response
1.5	How will this project disturb or enhance landscapes and / or sites that constitute the nation's cultural heritage? What measures were explored to firstly avoid these impacts, and where impacts could not be avoided altogether, what measures were explored to minimise and remedy the impacts? What measures were explored to enhance positive impacts?	The proposed project is not anticipated to have impacts on heritage resources as per the findings of the Heritage Impact Assessment (**Appendix D**) which are summarised in **Section 8.3.9**. It is understood that there are nearby heritage sites, therefore, a chance find protocol is to be implemented. Refer to the impacts and the mitigation measures outlined in **Section 9.3.5**.
1.6	How will this project use and / or impact on non-renewable natural resources? What measures were explored to ensure responsible and equitable use of the resources? How have the consequences of the depletion of the non-renewable natural resources been considered? What measures were explored to firstly avoid these impacts, and where impacts could not be avoided altogether, what measures were explored to minimise and remedy the impacts? What measures were explored to enhance positive impacts?	Refer to Section 4 and the EMPr contained in **Appendix F**.
1.7	How will this project use and / or impact on renewable natural resources and the ecosystem of which they are part? Will the use of the resources and / or impacts on the ecosystem jeopardise the integrity of the resource and / or system taking into account carrying capacity restrictions, limits of acceptable change, and thresholds? What measures were explored to firstly avoid the use of resources, or if avoidance is not possible, to minimise the use of resources? What measures were taken to ensure responsible and equitable use of the resources? What measures were explored to enhance positive impacts?	
1.7.1	Does the proposed project exacerbate the increased dependency on increased use of resources to maintain economic growth or does it reduce resource dependency (i.e. de-materialised growth)?	The proposed project will make use of existing infrastructure on-site where possible. Waste will be sorted into waste streams and reused, if possible, otherwise the waste will be stored for removal to a licensed waste disposal facility. Waste generated during the construction phase will be temporarily stored on site in $6m^3$ bins. Once the bins are full, an approved, licenced waste contractor will collect the waste for removal and disposal at a registered general waste disposal facility. No new landfills will be established as a result of the project within the project boundary. Rubble material generated from the demolition of old infrastructure will be collected and repurposed for use in foundations.

Ref No.	Question	Response
1.7.2	Does the proposed use of natural resources constitute the best use thereof? Is the use justifiable when considering intra- and intergenerational equity, and are there more important priorities for which the resources should be used?	The proposed project will utilize existing mining-related infrastructure and the existing shaft. Most of the proposed additional infrastructure is to be constructed on land that is already developed and disturbed in order to minimise the unnecessary use of further natural resources. The proposed project will reduce the miners' underground travel time by gaining access to the existing shaft, thereby increasing the mining facetime. This will in turn ensure the long-term survival of the business by increasing productivity of the mine.
1.7.3	Do the proposed location, type and scale of development promote a reduced dependency on resources?	The proposed project will utilize existing mining-related infrastructure and the existing shaft. Most of the proposed additional infrastructure is to be constructed on land that is already developed and disturbed in order to minimise the unnecessary use of further natural resources.
1.8	How were a risk-averse and cautious approach applied in terms of ecological impacts:	
1.8.1	What are the limits of current knowledge (note: the gaps, uncertainties and assumptions must be clearly stated)?	Refer to **Section 11** for a detailed description of the gaps, uncertainties and assumptions.
1.8.2	What is the level of risk associated with the limits of current knowledge?	The level of risk associated with the limits of current knowledge is considered low.
1.8.3	Based on the limits of knowledge and the level of risk, how and to what extent was a risk-averse and cautious approach applied to the development?	A risk-averse and cautious approach was applied to the development by undertaking specialist studies, a detailed impact assessment and a development/updating of the EMPr (**Appendix F**).
1.9	How will the ecological impacts resulting from this development impact on people's environmental right in terms following?	
1.9.1	Negative impacts: e.g. access to resources, opportunity costs, loss of amenity (e.g. open space), air and water quality impacts, nuisance (noise, odour, etc.), health impacts, visual impacts, etc. What measures were taken to firstly avoid negative impacts, but if avoidance is not possible, to minimise, manage and remedy negative impacts?	Refer to the identified impacts, their assessment and recommended mitigation measures in **Section 9** of this report.

Ref No.	Question	Response
1.9.2	Positive impacts: e.g. improved access to resources, improved amenity, improved air or water quality, etc. What measures were taken to enhance positive impacts?	Refer to the identified impacts, their assessment and recommended mitigation measures in **Section 9** of this report.
1.10	Describe the linkages and dependencies between human wellbeing, livelihoods and ecosystem services applicable to the area in question and how the development's ecological impacts will result in socio-economic impacts (e.g. on livelihoods, loss of heritage site, opportunity costs, etc.)?	Refer to **Section 8** for the Environmental Attributes and Baseline Environment where the baseline ecological and socio-economic context of the area is discussed, as well as the identified impacts, their assessment and recommended mitigation measures in Section 9 of this report.
1.11	Based on all of the above, how will this development positively or negatively impact on ecological integrity objectives / targets / considerations of the area?	Refer to the identified impacts, their assessment and recommended mitigation measures in **Section 9** of this report.
1.12	Considering the need to secure ecological integrity and a healthy biophysical environment, describe how the alternatives identified (in terms of all the different elements of the development and all the different impacts being proposed), resulted in the selection of the "best practicable environmental option" in terms of ecological considerations?	Refer to **Section 6** for details of the alternatives considered.
1.13	Describe the positive and negative cumulative ecological / biophysical impacts bearing in mind the size, scale, scope and nature of the project in relation to its location and existing and other planned developments in the area?	Refer to the identified impacts, their assessment and recommended mitigation measures in **Section 9** of this report.
2	Promoting justifiable economic and social development	
2.1	What is the socio-economic context of the area, based on, amongst other considerations, the following:	
2.1.1	The IDP (and its sector plans' vision, objectives, strategies, indicators and targets) and any other strategic plans, frameworks or policies applicable to the area	Details of the socio-economic context of the area in terms of the Bojanala Platinum District Municipality IDP and Rustenburg Local Municipality IDP are detailed **Section 8.3**.
2.1.2	Spatial priorities and desired spatial patterns (e.g. need for integrated of segregated communities, need to upgrade informal settlements, need for densification, etc.),	The project area is located a fair distance from any human habitation and is in line with the SDF for the area.

Ref No.	Question	Response
2.1.3	Spatial characteristics (e.g. existing land uses, planned land uses, cultural landscapes, etc.), and	Refer to **Section 8** for the Environmental Attributes and Baseline Environment.
2.1.4	Municipal Economic Development Strategy ("LED Strategy").	The proposed project will promote and support the sustainable economic growth of the business.
2.2	Considering the socio-economic context, what will the socio-economic impacts be of the development (and its separate elements/aspects), and specifically also on the socio-economic objectives of the area?	The proposed development will increase the mining facetime which will in turn increase productivity of the mine, thereby ensuring the long-term survival of the business.
2.2.1	Will the development complement the local socio-economic initiatives (such as local economic development (LED) initiatives), or skills development programs?	The proposed development will ensure the long-term survival of the business which will in turn complement the local socio-economic initiatives of the area.
2.3	How will this development address the specific physical, psychological, developmental, cultural and social needs and interests of the relevant communities?	Refer to the Public Participation Process undertaken for this project (**Section 7**) as well as the identified impacts, their assessment and recommended mitigation measures in **Section 9** of this report.
2.4	Will the development result in equitable (intra- and inter-generational) impact distribution, in the short- and long-term? Will the impact be socially and economically sustainable in the short- and long-term?	The proposed development will increase the mining facetime which will in turn increase productivity of the mine, thereby ensuring the long-term survival of the business.
2.5	In terms of location, describe how the placement of the proposed development will:	
2.5.1	Result in the creation of residential and employment opportunities in close proximity to or integrated with each other.	Existing employees from the nearby Kroondal Mine will be moved to the operation, therefore, there is no further increase in residential opportunities expected as a result of the proposed development.
2.5.2	Reduce the need for transport of people and goods.	The proposed development will give access to the existing shaft on the property that will reduce the travel-time underground to the face. The design includes a drop-off/pick-up bay for employees travelling by public transport/taxis.

Ref No.	Question	Response
2.5.3	Result in access to public transport or enable non-motorised and pedestrian transport (e.g. will the development result in densification and the achievement of thresholds in terms of public transport),	The design includes a drop-off/pick-up bay for employees travelling by public transport/taxis.
2.5.4	Compliment other uses in the area,	The property is currently used for mining by Clover Alloys RCM. There are adjacent mining-related activities/developments such as TSFs. The proposed project is to construct surface infrastructure related to mining activities and will not change the current land use of the property.
2.5.5	Be in line with the planning for the area.	The project is in line with the SDF for the area.
2.5.6	For urban related development, make use of underutilised land available with the urban edge.	Not applicable. The proposed project area is outside an urban area.
2.5.7	Optimise the use of existing resources and infrastructure,	The proposed development is situated on an active mining operation by Clover Alloys RCM. Existing infrastructure will be used in addition to the proposed new infrastructure.
2.5.8	Opportunity costs in terms of bulk infrastructure expansions in non-priority areas (e.g. not aligned with the bulk infrastructure planning for the settlement that reflects the spatial reconstruction priorities of the settlement),	The proposed development is situated in a predominantly mining area and intends to make use of existing infrastructure that is currently in use for mining-related activities whilst constructing additional infrastructure on the property.
2.5.9	Discourage “urban sprawl” and contribute to compaction / densification.	The proposed project will not expand onto other properties and encourages the re-use of existing infrastructure.
2.5.10	Contribute to the correction of the historically distorted spatial patterns of settlements and to the optimum use of existing infrastructure in excess of current needs,	Not applicable.
2.5.11	Encourage environmentally sustainable land development practices and processes	The proposed project will make use of land that is already utilized for mining-related activities and will make use of the existing infrastructure as far as possible.

Ref No.	Question	Response
2.5.12	Take into account special locational factors that might favour the specific location (e.g. the location of a strategic mineral resource, access to the port, access to rail, etc.),	The location of the proposed development takes into account the access provided by the existing shaft that will reduce the underground travel time of miners travelling to the face.
2.5.13	The investment in the settlement or area in question will generate the highest socio-economic returns (i.e. an area with high economic potential).	The proposed development will increase the mining facetime which will in turn increase productivity of the mine, thereby ensuring the long-term survival of the business.
2.5.14	Impact on the sense of history, sense of place and heritage of the area and the socio-cultural and cultural-historic characteristics and sensitivities of the area, and	A suitably qualified Archaeologist and Palaeontologist undertook a Heritage Impact Assessment and a Palaeontological Desktop Assessment (respectively). The results of which can be found in **Appendix D**. No significant impacts on the heritage of the area are expected since the area is already highly disturbed.
2.5.15	In terms of the nature, scale and location of the development promote or act as a catalyst to create a more integrated settlement?	It is not anticipated that the project will have an impact on the existing settlements in the area.
2.6	How was a risk-averse and cautious approach applied in terms of socio-economic impacts:	
2.6.1	What are the limits of current knowledge (note: the gaps, uncertainties and assumptions must be clearly stated)?	Refer to **Section 11** for the Assumptions and Limitations.
2.6.2	What is the level of risk (note: related to inequality, social fabric, livelihoods, vulnerable communities, critical resources, economic vulnerability and sustainability) associated with the limits of current knowledge?	Refer to **Section 9** for the Impact Assessment. Overall, the impact and risk are considered low.
2.6.3	Based on the limits of knowledge and the level of risk, how and to what extent was a risk-averse and cautious approach applied to the development?	The development poses a low potential impact on the socio-economic environment.
2.7	How will the socio-economic impacts resulting from this development impact on people's environmental right in terms following:	
2.7.1	Negative impacts: e.g. health (e.g. HIV-Aids), safety, social ills, etc. What measures were taken to firstly avoid negative impacts, but if avoidance is not possible, to minimise, manage and remedy negative impacts?	Refer to the identified impacts, their assessment and recommended mitigation measures in **Section 9** of this report.

Ref No.	Question	Response
2.7.2	Positive impacts. What measures were taken to enhance positive impacts?	
2.8	Considering the linkages and dependencies between human wellbeing, livelihoods and ecosystem services, describe the linkages and dependencies applicable to the area in question and how the development's socioeconomic impacts will result in ecological impacts (e.g. over utilisation of natural resources, etc.)?	
2.9	What measures were taken to pursue the selection of the "best practicable environmental option" in terms of socio-economic considerations?	
2.10	What measures were taken to pursue environmental justice so that adverse environmental impacts shall not be distributed in such a manner as to unfairly discriminate against any person, particularly vulnerable and disadvantaged persons (who are the beneficiaries and is the development located appropriately)? Considering the need for social equity and justice, do the alternatives identified, allow the "best practicable environmental option" to be selected, or is there a need for other alternatives to be considered?	
2.11	What measures were taken to pursue equitable access to environmental resources, benefits and services to meet basic human needs and ensure human wellbeing, and what special measures were taken to ensure access thereto by categories of persons disadvantaged by unfair discrimination?	The potential impacts have been identified assessed as part of this Basic Assessment Report and mitigation measures have been recommended to prevent negative impacts in this regard. Refer to the identified impacts, their assessment and recommended mitigation measures in **Section 9** of this report.
2.12	What measures were taken to ensure that the responsibility for the environmental health and safety consequences of the development has been addressed throughout the development's life cycle?	Refer to the identified impacts, their assessment and recommended mitigation measures in **Section 9** of this report.
2.13	What measures were taken to:	
2.13.1	Ensure the participation of all interested and affected parties.	

Ref No.	Question	Response
2.13.2	Provide all people with an opportunity to develop the understanding, skills and capacity necessary for achieving equitable and effective participation,	Refer to **Section 7** for details regarding the public participation process undertaken for this project. The public participation process will continue as planned for the duration of the Basic Assessment review period. Notification of Interested & Affected Parties have included: • Notification Letters via Emails, Faxes and/or Registered Mail where details were available. • SMS notifications. • Publication of Newspaper Advertisements. • Publication of a Gazette Notice (North West Provincial Gazette).
2.13.3	Ensure participation by vulnerable and disadvantaged persons,	
2.13.4	Promote community wellbeing and empowerment through environmental education, the raising of environmental awareness, the sharing of knowledge and experience and other appropriate means,	
2.13.5	Ensure openness and transparency, and access to information in terms of the process,	
2.13.6	Ensure that the interests, needs and values of all interested and affected parties were taken into account, and that adequate recognition were given to all forms of knowledge, including traditional and ordinary knowledge,	
2.13.7	Ensure that the vital role of women and youth in environmental management and development were recognised and their full participation therein will be promoted?	
2.14	Considering the interests, needs and values of all the interested and affected parties, describe how the development will allow for opportunities for all the segments of the community (e.g. a mixture of low-, middle-, and high-income housing opportunities) that is consistent with the priority needs of the local area (or that is proportional to the needs of an area)?	
2.15	What measures have been taken to ensure that current and / or future workers will be informed of work that potentially might be harmful to human health or the environment or of dangers associated with the work, and what measures have been taken to ensure that the right of workers to refuse such work will be respected and protected?	Workers will be educated on a regular basis as to the environmental and safety risks that may occur within their work environment. Furthermore, adequate measures will be undertaken to ensure that the appropriate personal protective equipment is issued to workers based on the areas that they work and the requirements of their job. Their right to refuse work (if considered dangerous) will be included in the education programme.

Ref No.	Question	Response
2.16	Describe how the development will impact on job creation in terms of, amongst other aspects:	
2.16.1	The number of temporary versus permanent jobs that will be created.	Temporary jobs will be created during the construction phase of the project. The existing contractors will need to hire additional people for the construction. Approximately 20 new un-skilled employment opportunities will be created during the construction phase. The existing employees of Kroondal will be moved to the new location of the development. Additional contracted security and housekeeping personnel will be required during the operation phase.
2.16.2	Whether the labour available in the area will be able to take up the job opportunities (i.e. do the required skills match the skills available in the area).	Approximately 20 new un-skilled employment opportunities will be created during the construction phase as existing contractors will need to hire additional workers for construction. The existing employees of Kroondal will be moved to the new location of the development. Additional contracted security and housekeeping personnel will be required during the operation phase.
2.16.3	The distance from where labourers will have to travel.	Approximately 5 to 15km.
2.16.4	The location of jobs opportunities versus the location of impacts.	The location of job opportunities is in the same location as the impacts as assessed in this report. It is important to note however that minimal new jobs will be created by this proposed development as the development will mainly support the existing Kroondal mine workers.
2.16.5	The opportunity costs in terms of job creation.	The opportunity costs in terms of job creation is considered low.
2.17	What measures were taken to ensure:	
2.17.1	That there were intergovernmental coordination and harmonisation of policies, legislation and actions relating to the environment.	The Basic Assessment process requires governmental departments to communicate regarding any application. In addition, all relevant Departments

Ref No.	Question	Response
2.17.2	That actual or potential conflicts of interest between organs of state were resolved through conflict resolution procedures.	and key stakeholders have been notified about the project by the EAP and registered as Interested and Affected Parties. They will continue to be notified and engaged with regarding the project throughout the Basic Assessment process. Should any conflicts of interest between organs of state be identified, these will be resolved through the appropriate channels.
2.18	What measures were taken to ensure that the environment will be held in public trust for the people, that the beneficial use of environmental resources will serve the public interest, and that the environment will be protected as the people's common heritage?	Environmental attributes that may be impacted by this project have been identified and where relevant, specialist input has been solicited to ensure that a rigorous impact assessment process is undertaken. Where positive impacts on the interests of the public have been identified (e.g. job creation, impact on existing land use, etc.), mitigation measures are put forward to enhance positive impacts and/or reduce negative impacts. Refer to the identified impacts, their assessment and recommended mitigation measures in **Section 9** of this report.
2.19	Are the mitigation measures proposed realistic and what long-term environmental legacy and managed burden will be left?	Refer to the identified impacts, their assessment and recommended mitigation measures in **Section 9** of this report.
2.20	What measures were taken to ensure that the costs of remedying pollution, environmental degradation and consequent adverse health effects and of preventing, controlling or minimising further pollution, environmental damage or adverse health effects will be paid for by those responsible for harming the environment?	The applicant has financial provisions in place for the existing Mining Right (Ref: NW30/5/1/2/2/254MR) which shall be updated in line with the calculated closure costs for this development (refer to **Appendix H** for the closure cost report relating to this development).
2.21	Considering the need to secure ecological integrity and a healthy bio-physical environment, describe how the alternatives identified (in terms of all the different elements of the development and all the different impacts being proposed), resulted in the selection of the best practicable environmental option in terms of socio-economic considerations?	Refer to **Section 6** for details of the alternatives considered.
2.22	Describe the positive and negative cumulative socio-economic impacts bearing in mind the size, scale, scope and nature of the project in relation to its location and other planned developments in the area?	Refer to the identified impacts, their assessment and recommended mitigation measures in **Section 9** of this report.

6 PROJECT ALTERNATIVES

The identification of alternatives is a key aspect of the success of the impact assessment process. All reasonable and feasible alternatives must be identified and screened to determine the most suitable alternatives to consider and assess. There are, however, some significant constraints that have to be taken into account when identifying alternatives for a project of this scope. Such constraints include social, financial and environmental issues, which will be discussed as part of the evaluation of the alternatives for this project. Alternatives can typically be identified according to:

- Location alternatives (including design and layout);
- Scheduling alternatives;
- Process alternatives;
- Technology alternatives; and
- Activity alternatives (including the No-Go option).

For any alternative to be considered feasible, such an alternative must meet the need and purpose of the development proposal without presenting significantly high associated impacts. **Section 5** provides an overview of the project need and desirability.

In this section the various alternatives considered are described and their advantages and disadvantages are presented where applicable. Furthermore, the feasibility of the considered alternatives, from both a technical as well as environmental perspective, is determined and the result thereof are the alternatives that will be investigated further in the EIA phase, towards the selection of preferred alternatives. Essentially, alternatives represent different means of meeting the general purpose and need of the proposed project through the identification of the most appropriate and feasible method of development, all of which are discussed below.

Alternatives can further be distinguished into discrete or incremental alternatives. Discrete alternatives are overall development options, which are typically identified during the pre-feasibility, feasibility and or scoping phases of the EIA process. Incremental alternatives typically arise during the EIA process and are usually suggested as a means of addressing identified impacts. These alternatives are closely linked to the identification of mitigation and management measures and are not specifically identified as distinct alternatives. This section provides information on the Project's location, process, technology and activity alternatives considered and assessed.

The assessment of alternatives is discussed in **Section 10.3** of this report.

6.1 LOCATION ALTERNATIVES

Location alternatives can apply to the entire Project (e.g. the strategic decision to locate the proposed development at a specific geographical location), as well as more specific footprints of individual components of the project.

6.1.1 DEVELOPMENT LOCATION ALTERNATIVES

The proposed development location was identified to reduce the miners' underground travel time to the face at Kroondal Mine by gaining access to the chairlift on the property. Therefore, no location alternatives have been considered.

6.1.2 DESIGN OR LAYOUT ALTERNATIVES

The Wetlands and Aquatic Specialist study identified that the initial proposed location of the Lekgotla Hall (hereafter referred to as "AL1") would overlap with a small non-perennial pan/wetland (identified as HGM1 by the specialist). Therefore, an alternative location for the Lekgotla Hall (hereafter referred to as "AL2") has been identified so as to avoid the loss of and reduce the impact of the hall on the wetland (Refer to **Figure 2** for the original location and alternative location of the Lekgotla Hall and **Figure 35** for the delineated wetlands).

6.2 SCHEDULING ALTERNATIVES

Scheduling alternatives are sometimes known as sequencing or phasing alternatives. In this case an activity may comprise a number of components, which can be scheduled in a different order or at different times and as such produce different impacts. No specific scheduling alternatives have been assessed as discrete alternatives, however various mitigation measures contain scheduling requirements to reduce the overall impacts of the development.

6.3 PROCESS ALTERNATIVES

Process alternatives imply the investigation of alternative processes or methods to achieve the same goal for the proposed Project. This includes using environmentally friendly designs or materials and re-using scarce resources like water and non-renewable energy sources. Process alternatives will be defined and implemented as incremental alternatives during the assessment and incorporated into the EMPr. No process alternatives are considered reasonable and/or feasible and therefore have not been considered.

6.4 TECHNOLOGY ALTERNATIVES

The selection of the technology alternatives or techniques to be adopted for the construction and operation of the Project are described in this section. No technology alternatives are considered reasonable and/or feasible and therefore have not been considered.

6.5 ACTIVITY ALTERNATIVES

Activity alternatives refer to project alternatives which requires a change in the nature of the proposed activity. No activity alternatives are considered reasonable and/or feasible and therefore have not been considered.

6.6 NO GO ALTERNATIVE

The “No Go” or “No Action” alternative refers to the alternative of not embarking on the proposed project at all. It assumes that the activity does not go ahead, implying a continuation of the current situation or the status quo. It is important to note that the No Go alternative is the baseline against which all other alternatives and the development proposal are assessed. When considering the No Go alternative, the impacts (both positive and negative) associated with any other specific alternative, or the current project proposal would not occur and in effect the impacts of the No Go alternative are therefore inadvertently assessed by assessing the other alternatives. In addition to the direct implications of retaining the status quo, there are certain other indirect impacts, which may occur should the No Go alternative be followed. The ‘no-go’ alternative provides the means to compare the impacts of project alternatives with the scenario of a project not going ahead. In evaluating the ‘no-go’ alternative it is important to take into account the implications of foregoing the benefits of the proposed project.

7 STAKEHOLDER ENGAGEMENT

The Public Participation Process (PPP) is a requirement of several pieces of South African Legislation and aims to ensure that all relevant Interested and Affected Parties (I&APs) are consulted, involved and their opinions are taken into account and a record included in the reports submitted to Authorities. The process ensures that all stakeholders are provided this opportunity as part of a transparent process which allows for a robust and comprehensive environmental study. The PPP for the necessary authorisation required for the project needs to be managed sensitively and according to best practises in order to ensure and promote:

- Compliance with international best practice options;
- Compliance with national legislation;
- Establishment and management of relationships with key stakeholder groups; and
- Encouragement of involvement and participation in the environmental study and authorisation/approval process.

As such, the purpose of the PPP and stakeholder engagement process is to:

- Introduce the proposed project and process for the authorisation project;
- Explain the environmental authorisation;
- Determine and record issues, concerns, suggestions, and objections to the project;
- Provide opportunity for input and gathering of local knowledge;
- Establish and formalise lines of communication between the I&APs and the project team;
- Identify all significant issues for the project; and
- Identify possible mitigation measures or environmental management plans to minimise and/or prevent negative environmental impacts and maximise and/or promote positive environmental impacts associated with the project.

The PPP commenced on the 16th of October 2024 with an initial call to register notification. Notification letters (in English and Afrikaans) were distributed to pre-identified I&APS through either faxes, SMSs, registered mail, and/or emails. The Public Participation Report (PPR) (**Appendix C**) lists all verbal and written issues raised by I&APs during the call to register period to date.

7.1 IDENTIFICATION OF INTERESTED AND AFFECTED PARTIES

An initial I&AP database has been compiled from historic projects in the area, and Windeed searches were conducted to obtain the contact details of the surrounding landowners. The I&APs referred to in the PPR include:

- Pre-identified and registered landowners and surrounding landowners;
- Pre-identified and registered key stakeholders;
- Regulatory authorities;
- Specialist interest groups; and
- All I&APs who responded to the initial notifications and requested to be registered.

Efforts to pre-identify key I&APs involved various avenues such as consultation with the proponent and known landowners within the study area, review of related previously conducted studies, and identification of key interest groups and authorities within the vicinity of the study area and municipality. Refer to **Appendix C** for the Key Stakeholder/I&AP Database.

7.1.1 LIST OF ORGANS OF STATED IDENTIFIED AND NOTIFIED

The following key I&APs, but not limited to, were notified of the proposed project and invited to participate in the public participation process:

- Agricultural Research Council.
- Bojanala Platinum District Municipality.
- Council of Geoscience
- National Department of Agriculture Land Reform and Rural Development.
- National Department of Co-operative Governance and Traditional Affairs.
- National Department of Forestry, Fisheries and the Environment (DFFE).
- National Department of Human Settlements.
- National Department of Mineral Resources & Energy (DMRE).
- National Department of Rural Development and Land Affairs.
- National Department of Tourism.
- National Department of Transport.
- National Department of Water and Sanitation.
- National Energy Regulator of South Africa.
- National Transmission Company of South Africa SOC (Ltd).
- North West Department of Community Safety and Management.
- North West Department of Cooperative Governance and Traditional Affairs.
- North West Department of Human Settlements.
- North West Department of Minerals and Energy.
- North West Department of Water and Sanitation.
- North West Department Public Works and Roads.
- North West Department of Economic Development, Environment, Conservation and Tourism.
- North West Development Corporation Soc Ltd
- North West Parks Board.
- North West Provincial Government: Department of Community Safety and Transport Management.
- North West Provincial Government: Department of Social Development.
- North West Provincial Heritage Resources Authority.
- Rustenburg Local Municipality.
- South African Civil Aviation Authority (SACAA).
- South African Heritage Resources Agency (SAHRA).
- South African National Parks.
- South African National Roads Agency Limited (SANRAL).
- Transnet SOC Limited.
- Ward Councillors.

7.1.2 LIST OF OTHER KEY I&APS IDENTIFIED AND NOTIFIED

- Pre-identified and registered landowners and surrounding landowners
- AgriCulture South Africa (AgriSA).
- BirdLife South Africa
- Botanical Society
- Centre for Environmental Rights
- Conservation South Africa (CSA)
- Earth Life Africa
- Endangered Wildlife Trust
- Federation for a Sustainable Environment
- GroundWork SA

- Mining Affected Communities United in Action (MACUA)
- Mining and Environmental Justice Community Network of South Africa
- Natural Justice
- North West Wetland Forum.
- Wildlife and Environment Society of South Africa (WESSA).
- World Wildlife Fund.

7.2 INITIAL NOTIFICATION OF KEY I&APS

The PPP commenced on the 16th of October 2024 with an initial call to register notification. Notification during this initial consultation was given in the manner described below.

7.2.1 FAXES, REGISTERED MAIL AND EMAILS

Notification letters (in English and Afrikaans) were distributed to pre-identified I&APS through either faxes, SMSs, registered mail, and/or emails on the 16th of October 2024. Please refer to **Appendix C** for the initial notification. The notification documents included the following information:

- Authorisations required;
- Sufficient detail of the proposed development to enable I&APs to assess/surmise what impact the development will have on them or the use of their land;
- The purpose of the proposed project;
- Details of the application processes associated with proposed activities;
- Details of the affected properties;
- Details of the South African environmental legislation that must be adhered to;
- Contact details of the EAP.

7.2.2 NEWSPAPER AND GAZETTE ADVERTISEMENTS

Advertisements (in English and Afrikaans) describing the proposed project and BA process were placed in the Rustenburg Herald Newspaper with circulation in the vicinity of the study area on the 18th of October 2024. The Gazette Notice was placed in the North West Provincial Gazette on the 29th of October 2024. Please refer to **Appendix C** for proof of the advert and gazette notice placed. The newspaper and Gazette Notice adverts included the following information:

- Project name;
- Applicant name;
- Project location;
- Nature of the activity;
- Legislative requirements; and
- Relevant EIMS contact person for the project.

7.2.3 SITE NOTICE PLACEMENT

Four (4) A1 Correx site notices (in English and Afrikaans) were placed at 4 locations around the proposed project study area on the 15th of October 2024. Please refer to **Appendix C** for proof of site notice and site notice distribution. The on-site notices included the following information:

- Project name;
- Applicant name;

- Project location;
- Map of proposed project area;
- Project description;
- Legislative requirements; and
- Relevant EIMS contact person for the project.

7.3 NOTIFICATION OF INTERESTED & AFFECTED PARTIES OF BAR AVAILABILITY

Notification (in English and Afrikaans) regarding the availability of the Basic Assessment Report (BAR) for public review and comment will be provided to pre-identified and registered I&APs. The notifications will be distributed through either email, registered mail, fax, and/or SMS, where contact details are available. Additional site notices, and advertisements (a Newspaper advert and Gazette Notice) will be placed regarding the availability of the BAR for public review and comment. Contact details will be provided to I&APs should they require assistance accessing the information or require copies of the reports.

A hard copy of the BAR will be made available for public review and comment for a period of 30 days at Rustenburg Public Library as required for the NEMA EA application while the BAR will also fulfil the requirements of the NWA WUL technical report and will be available for comment for a total of 60 days as required by the WUL Application and Appeals Regulations.

7.4 RECORD OF ISSUES RAISED

Comments on the proposed project were solicited from pre-identified and registered I&APs and key stakeholders. To date, the following comments have been received:

- I&AP registration.
- Request for project description, shapefile, and locality map.

All comments and/or queries received to date are included in the PPR. Please refer to **Appendix C** for all comments and/or queries received. This section will be updated for submission to the competent authority, the Department of Mineral Resources & Energy (DMRE), following the 30-day public review period.

8 ENVIRONMENTAL ATTRIBUTES AND BASELINE ENVIRONMENT

This section of the BA Report provides a description of the environment that may be affected by the proposed project. Aspects of the biophysical, social and economic environment that could be directly or indirectly affected by, or could affect, the proposed development have been described. This information has been sourced from existing information available for the area and where relevant specialist assessments.

8.1 PHYSICAL ENVIRONMENT

8.1.1 CLIMATE AND WEATHER

8.1.1.1 **CURRENT CLIMATE**

The site is located approximately 13km East-South-East of Rustenburg, within the Bojanala Platinum District Municipality (BPDM). The BPDM is situated in the Highveld Climatic Zone that experiences mild temperatures. The region north of the Magaliesberg Mountains experience moderate winters and hot summers where temperatures in the shade are known to reach a maximum of 35°C - 40°C (BPDM EMF: Status Quo report (Final Rev13), 2018).

Rustenburg is known to experience long, warm summers with the warm season starting in mid-late September and ending mid-late March with an average daily high of 27°C. Winters are short and cold with the cool season between late May and early August with an average high of 22°C (Weather Spark, 2024).

Summer rainfall patterns are experienced in the BPDM region with afternoon showers, and occasional rains during winter occur due to the passing of frontal systems. Large-scale flooding is known to occur in the region and north of the Magaliesberg Mountains. Spatial variation in the mean annual precipitation occurs across the BPDM with the southern region and Pilanesberg area experiencing more rain than the northern and western low-lying regions. Summer experiences north-westerly prevailing winds while winter experiences light south-westerly prevailing winds (BPDM EMF: Status Quo report (Final Rev13), 2018).

The wet season in Rustenburg occurs between early-mid September to mid-May, with the most rain occurring in January. The dry season occurs in the remaining months, with the driest month being July (Weather Spark, 2024). **Figure 7** below shows the average monthly rainfall and temperature experienced in the Rustenburg area.

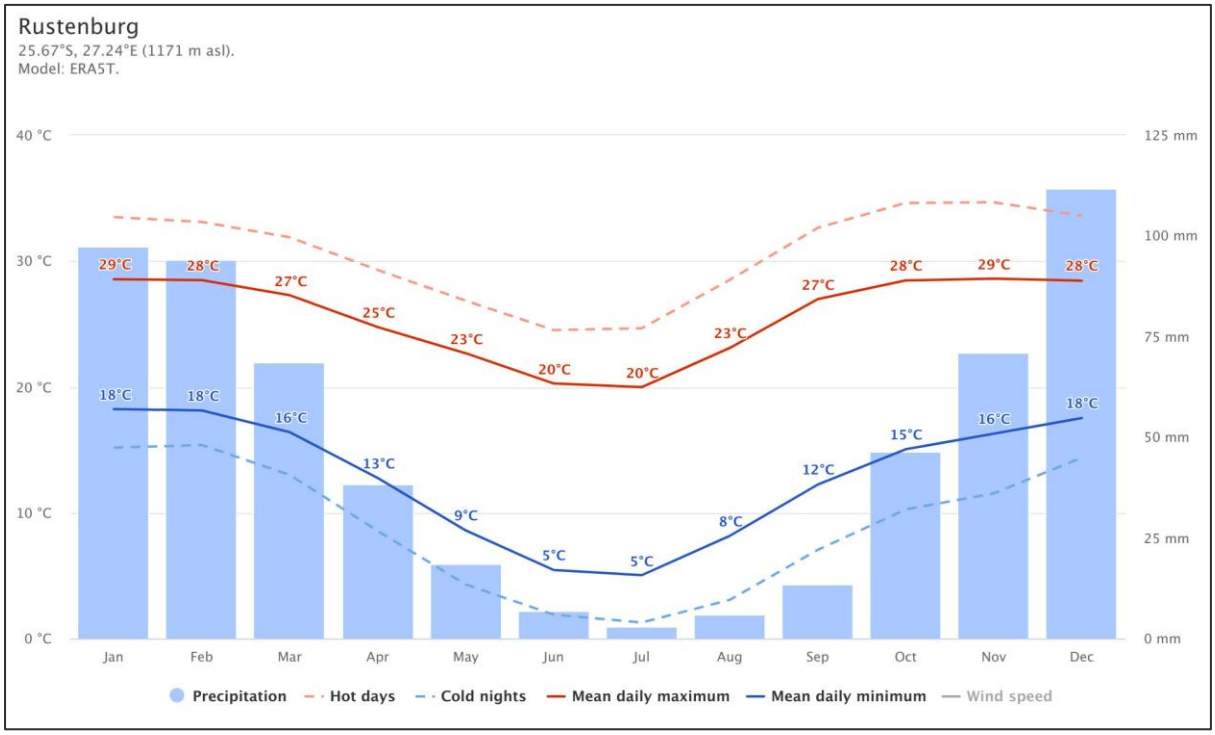


Figure 7: Graph showing the average annual precipitation (right axis) and temperature (left axis) in Rustenburg (Simulated historical climate & weather data for Rustenburg, 2024)

8.1.1.2 PREDICTED FUTURE CLIMATE

The future climate of the North West province faces challenges such as increased drought periods, increasing temperatures and rainfall variability, as well as an increase in the number of storm and flood events. The agricultural sector, rural livelihoods and natural ecosystems are most vulnerable due to these impacts. The mining sector is of concern due to the predicted increase in drought and rainfall variability due to the sector's heavy reliance on water resources, as well as susceptibility to increased temperatures affecting working conditions (BPDM EMF: Status Quo report (Final Rev13), 2018; RLM SDF Draft, 2023).

In terms of the Rustenburg Local Municipality, and according to the RLM SDF (2023), a number of climatic changes are expected to occur such as: an increase of 0-80mm in rainfall, which is expected to be offset by increased evaporation as a result of higher temperatures; an increase in temperatures of up to 3°C in the northern regions of the RLM, and 2.5°C in the southern regions; an increase in the number of "very hot days" (days exceeding 35°C) by ~35 days in the northern regions and; an increase in the predicted number of fire-danger days. The RLM will face increasing pressures on water resources. It is expected that by the population will have increased by 69.94%, regional urban water supply will increase by 0.06%, whereas mean annual evaporation will increase by 11.46% while mean annual run-off will decrease by 15.72%. There is little to no change expected for groundwater recharge in the RLM, with Molote identified as the only settlement to be at moderate risk for groundwater depletion (RLM SDF Draft, 2023). **Table 10** below represents the sectors.

Table 10: Sectors of the Rustenburg Local Municipality vulnerable to climate change as per the vulnerability index

Sector	Vulnerability Index[2]
Economic	8.49
Socio-economic	2.32
Physical	6.80
Environmental	6.19

(*Data Source:* RLM SDF Draft (2023), p. 51)

8.1.2 GEOLOGY, SOILS, AND LAND CAPABILITY

The Bojanala Platinum District Municipality region has a diverse geological profile with the major feature being the Bushveld Igneous Complex – a volcanic intrusive rock. This complex is known for its rock formations which are rich in various minerals thus attracting mining activities throughout the region (BPDM EMF: Status Quo report (Final Rev13), 2018).

A Simplified Geology map is depicted in **Figure 8** below. The site is underlain by the Schilpadnest and Vlakfontein Subsuites of the Rustenburg Layered Suite of the Bushveld Complex. The Bushveld Complex comprise of the largest mafic intrusion in the world and underlie an area of almost 65 000 km^2. The maximum thickness of these rocks is almost 8 km while individual layers can be followed for about 150 km. This intrusion is world renowned for the ore reserves of platinum-group elements namely chromium and vanadium. The Bushveld Complex is divided in 4 groups namely the Lebowa Granite Suite, Rashoop Granophyre Suite, Rustenburg Layered Suite and Rooiberg Group. The latter Group of felsic and minor volcanic rocks may be genetically closer related to the Bushveld event as to the Transvaal Supergroup (Hutton and Schweitzer, 1995). The Rustenburg Layered Suite reveals a complete differentiation sequence of magma and is made up of various rock layers ranging from dunite, gabbro, norite, and pyroxenite, and anorthosite to magnetite and apatite- rich diorite. Mainly vertic melanic

[2] Vulnerability Index ranges from 1 (low vulnerability) to 10 (high vulnerability)

clays with some dystrophic or mesotrophic plinthic catena and some freely drained, deep soils. The land types associated with this geology are Ea, Ba and Ae.

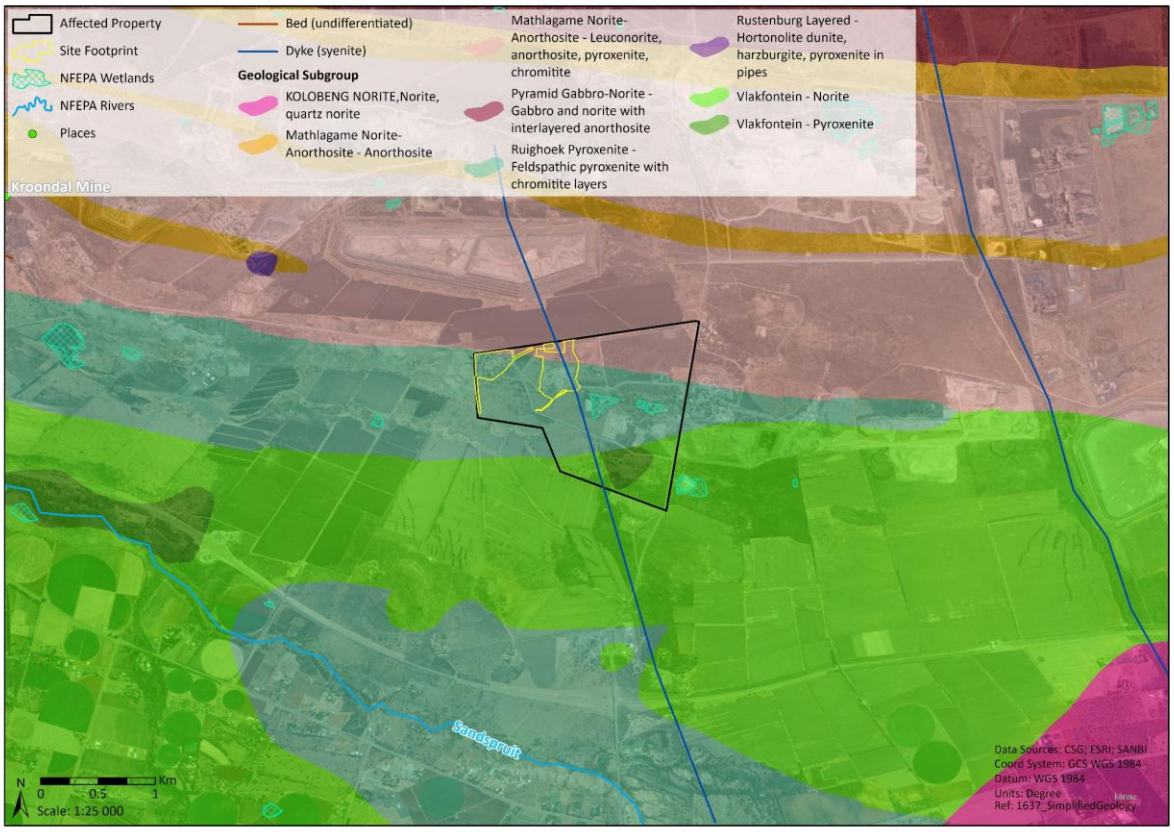


Figure 8: Simplified Geology Map (Council for Geoscience, 2022).

8.1.2.1 SOILS AND LAND CAPABILITY

According to the land type database (Land Type Survey Staff, 1972 - 2006) the transects relevant to the project is located in the Ea 3 and Ib 116 land types (see **Figure 10** and **Figure 11** below). The Ea 3 land type mainly consists of Arcadia, Oakleaf soil forms and rocky areas, according to the Soil classification working group (1991), with the occurrence of other soils within the landscape. The Ib 116 land type mainly consists of Arcadia and Rensburg soil forms, with rocky areas, associated with the occurrence of other soils in the landscape.

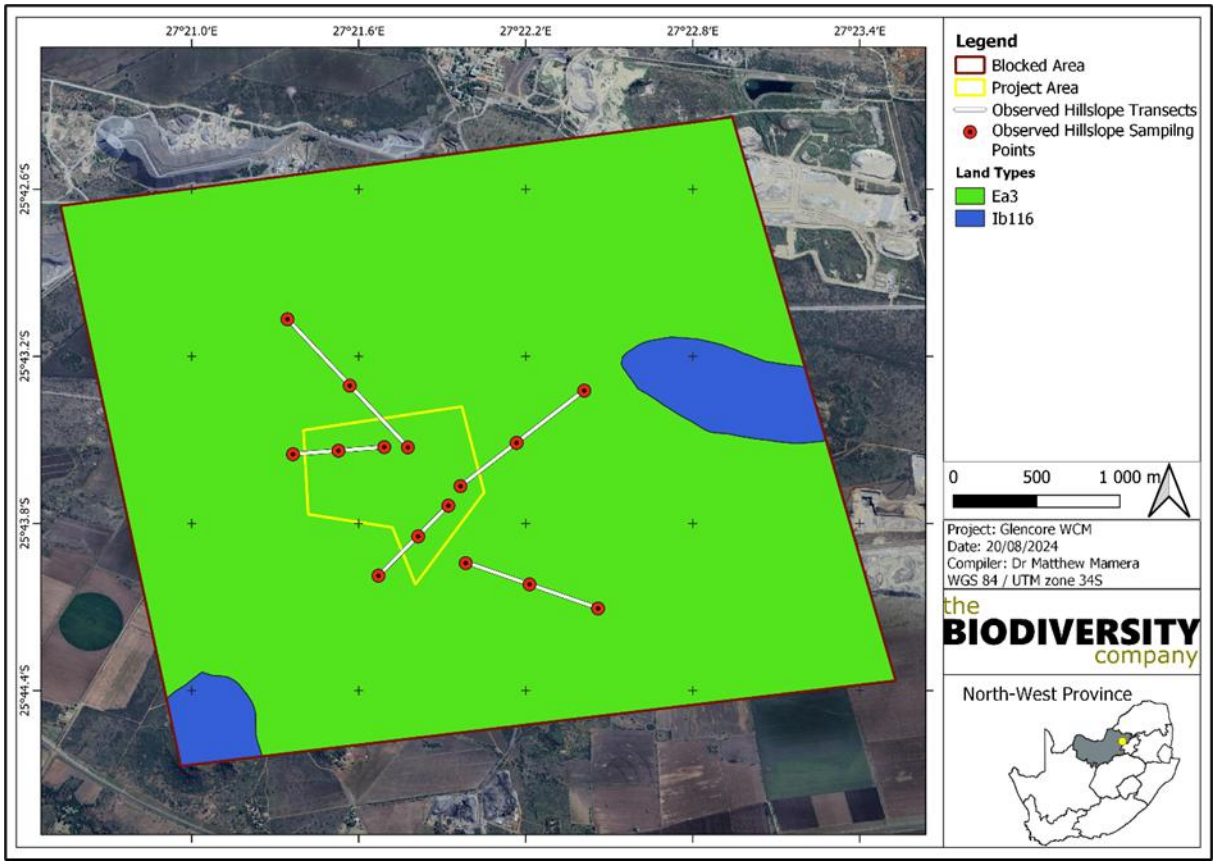


Figure 9: Land types present within and surrounding the proposed project area (TBC, 2025)

The Ea land type is characterised by vertic, melanic, red-structured diagnostic horizons and undifferentiated soils. The Ib land types have miscellaneous land classes and soils with rocky areas being dominant in the terrain.

The relevant terrain units for the land types are in the respective figures (**Figure 10** and **Figure 11**) and tables (**Table 11** and **Table 12**) below.

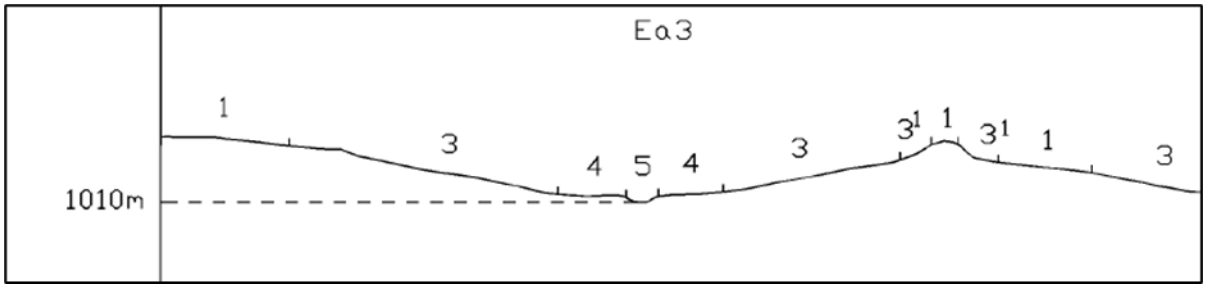


Figure 10: Illustration of land type Ea 3 terrain units (Land Type Survey Staff, 1972 - 2006)

Table 11: Soils expected at the respective terrain units within the Ea 3 land type (Land Type Survey Staff, 1972 - 2006)

Terrain Units									
1 (30%)		**1 (0.5%)**		**3 (44.5%)**		**4 (15%)**		**5 (9%)**	
Arcadia	70%	Bare Rocks	80%	Arcadia	76%	Arcadia	89%	Oakleaf	67%
Bare rock	14%	Mispah	20%	Bare Rocks	10%	Hutton	3%	Arcadia	22%
Mispah	9%			Mispah	6%	Shortlands	3%	Shortlands	6%

Terrain Units									
Hutton	4%			Hutton	4%	Swartland	3%	Hutton	5%
Shortlands	3%			Shortlands	3%	Bare Rocks	2%		
				Swartland	1%				

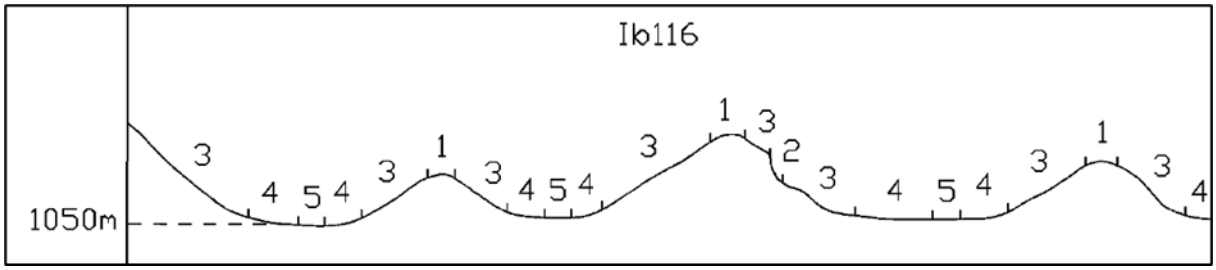


Figure 11: Illustration of land type Ib 116 terrain units (Land Type Survey Staff, 1972 - 2006)

Table 12: Soils expected at the respective terrain units within the Ib 116 land type (Land Type Survey Staff, 1972 - 2006)

Terrain Units									
1 (5%)		**2 (1%)**		**3 (50%)**		**4 (39%)**		**5 (5%)**	
Bare Rock	60%	Bare Rocks	100%	Bare Rocks	86%	Bare Rocks	45%	Rensburg	40%
Mispah	40%			Mispah	14%	Arcadia	39%	Arcadia	40%
						Mispah	16%	Mispah	12%
								Bare Rocks	8%

A Simplified Soils baseline map is depicted in **Figure 12** below.

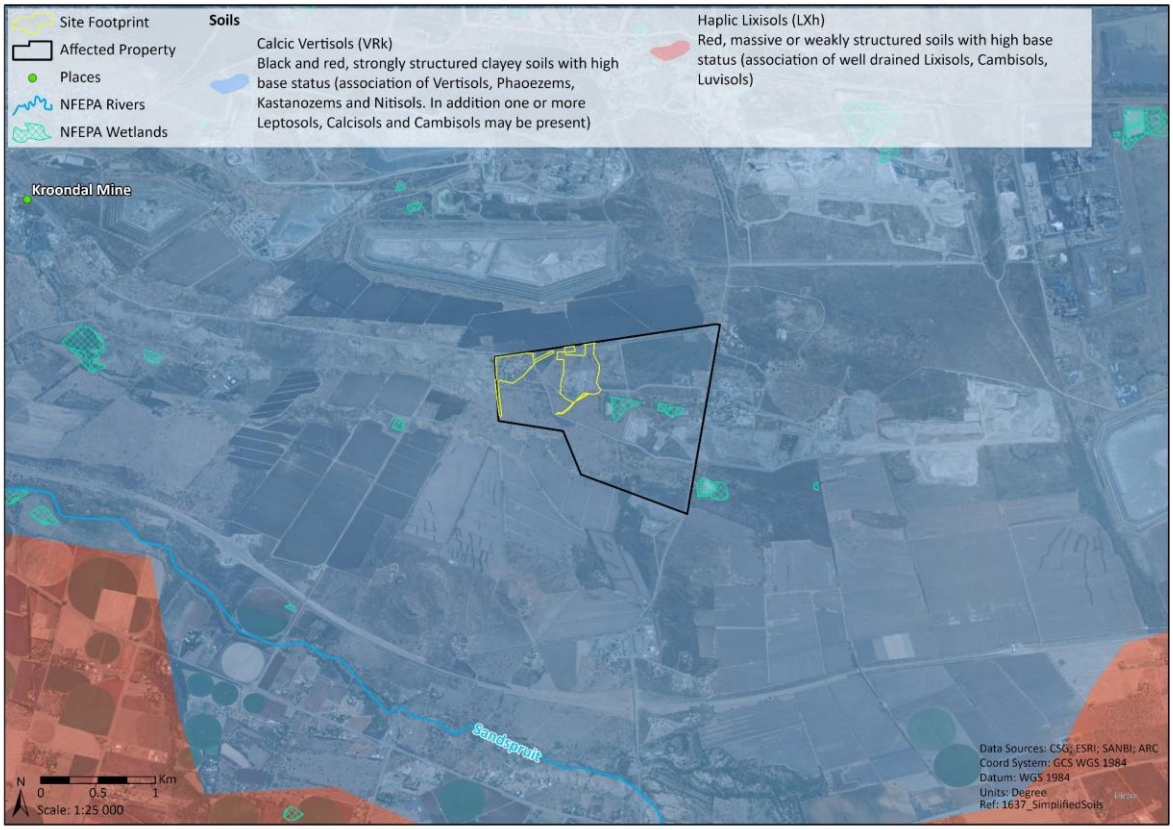


Figure 12: Simplified Soils Map

According to the Soils and Hydropedological studies, the following soil forms were identified on-site:

- Arcadia (Vertic topsoil on top of a lithic horizon below);
- Rustenburg (Vertic topsoil on top of a Hardrock substratum below);
- Rensburg (Vertic topsoil on top of a Gley horizon below);
- Mispah (Orthic topsoil on top of a hard rock layer below); and
- Witbank (Transported anthropogenic material from mining activities with some evidence of the original diagnostic horizons or partially processed saprolithic material).

Figure 13 and **Figure 14** below illustrates the locations of where the soil forms were identified within representative hillslope transects. Photographs of the diagnostic soil horizons identified on site are further depicted in **Figure 15**. A description of the characteristics associated with the soils identified above will be provided in **Section 8.1.2.2.1**.

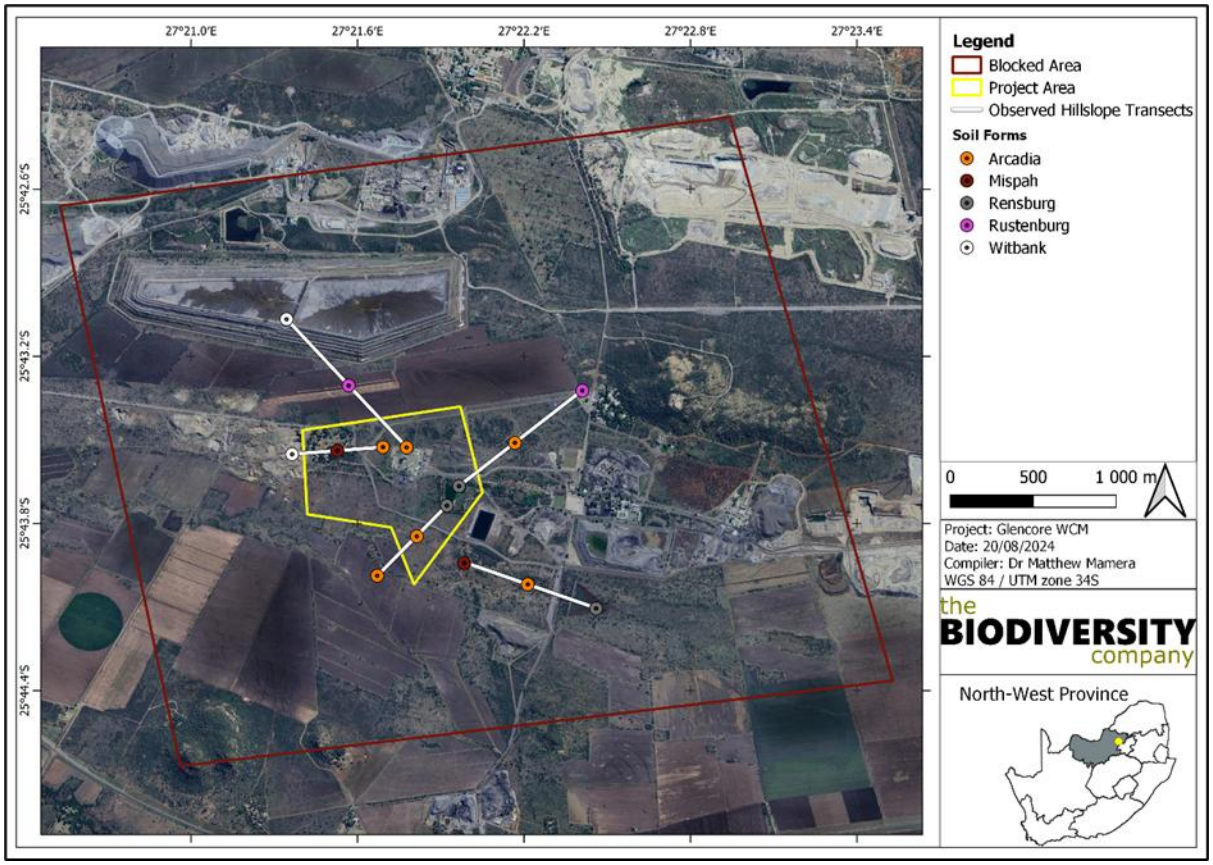


Figure 13: Soil forms identified within representative hillslope transects (TBC, 2025).

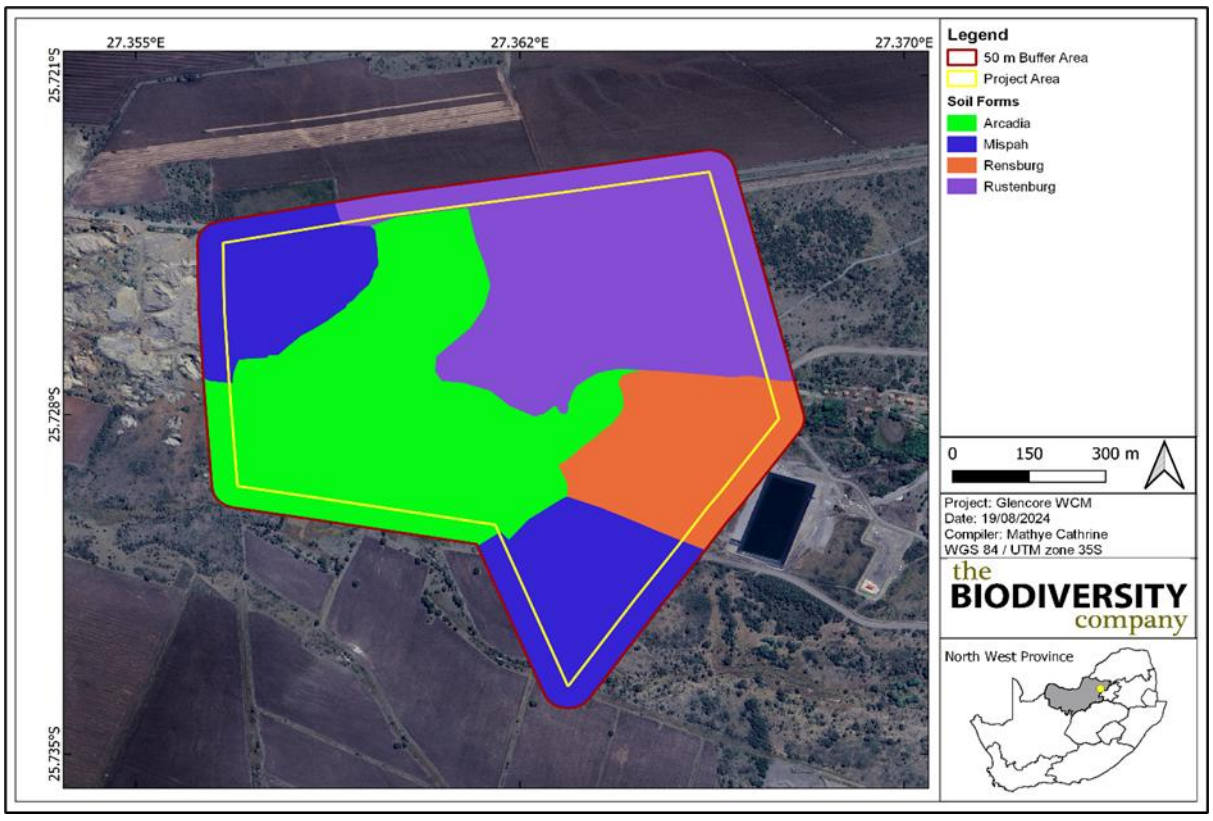


Figure 14: Soil forms found within the proposed project area (TBC, 2025).

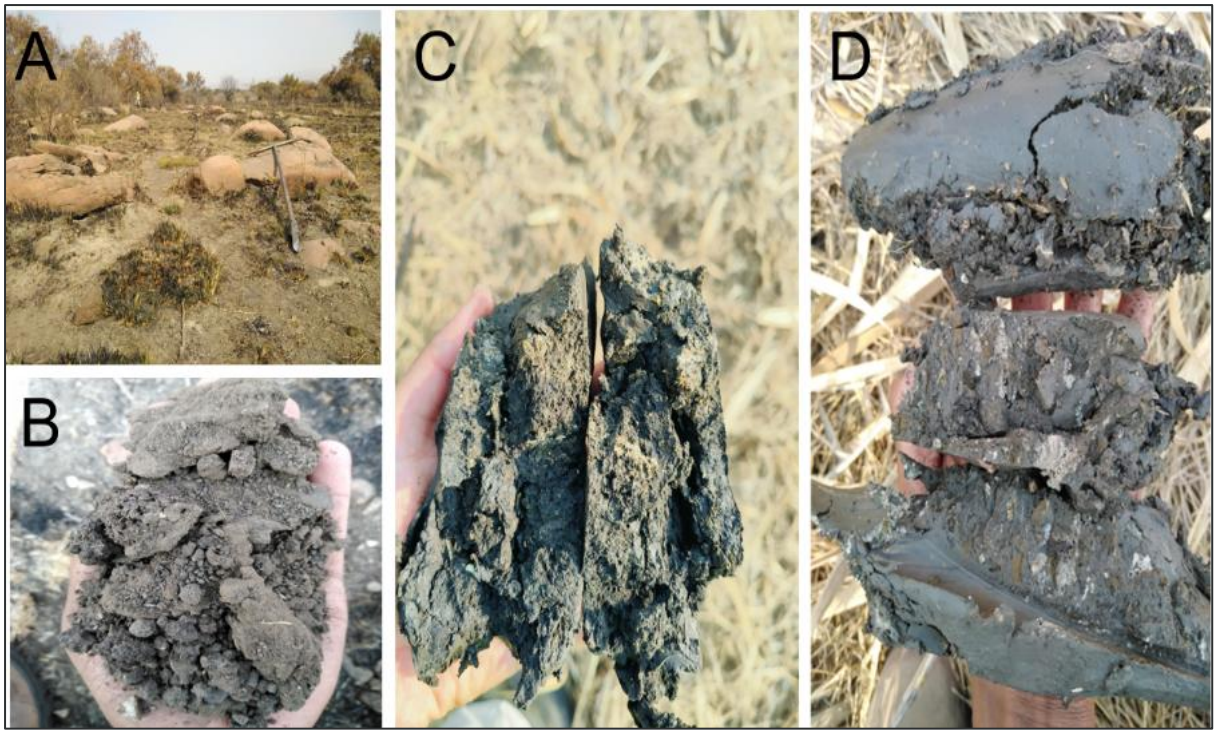


Figure 15: Diagnostic soil horizons identified on-site: A) Mispah soil form (Hard rock); B) Rustenburg soil form; C) Rensburg soil form (Gley horizon) and D) Arcadia soil form. (TBC, 2025).

The vertic soils including Arcadia, Rensburg and Rustenburg soil forms are characterized by their homogenous dark colours, strong structure and high clay content. These soils have the shrinking and swelling clay properties promoting cracks on the surface and exhibit slickenside. The vertic soils are generally poorly drained when wet which leads to waterlogging conditions. These soil forms have limiting morphological soil properties for cultivation such high clay contents which restrict root penetration. It should be noted that farming activities were found on the Rustenburg soil form (See **Figure 16** below).

Furthermore, the Mispah soil form is characterised by weak and structureless soils with shallow depth. They usually have low organic matter. They have shallow effective rooting depth that hinders penetration of deep-rooted crops. The Mispah soil form has a restrictive subsoil horizon which makes the soils to be considered less productive for agricultural purposes (crop farming). All the identified soil horizons within the proposed project area, as well as the current land uses are illustrated in **Figure 15** and **Figure 16**, respectively.

The land capability classes of the above-mentioned soils have been determined to be class “III,” “V” and “VI,” according to Smith (2006). The land capability class “III” is characterised by moderate limitations and some erosion hazards and is suitable for rotation of crops and ley (50%). The land capability “V” is characterised by water course, land with wetness limitations and is suitable for improved pastures and afforestation. The land capability class “VI” is characterised by very severe limitations that are mostly suitable for natural vegetation. A climate capability level 8 has been assigned to the area given the low Mean Annual Precipitation (MAP) and the high Mean Annual Potential Evapotranspiration (MAPE) rates. By using the determined land capability classes and the determined climate capability, land potential “Vlei,” “L6” and “L7” were calculated. According to Smith (2006), the proposed project area is found to be non-arable.

The following land potential levels have been determined;

- Land potential level 6 (this land potential is characterised by very restricted potential. Regular and /or severe limitations due to soil, slope, temperatures or rainfall). Non-arable;
- Land potential level 7 (this land potential level is characterised by low potential. Severe limitations due to soil, slope, temperatures, or rainfall). Non-arable; and

- Vlei.

Land potential levels of the proposed area are illustrated in **Figure 17**.

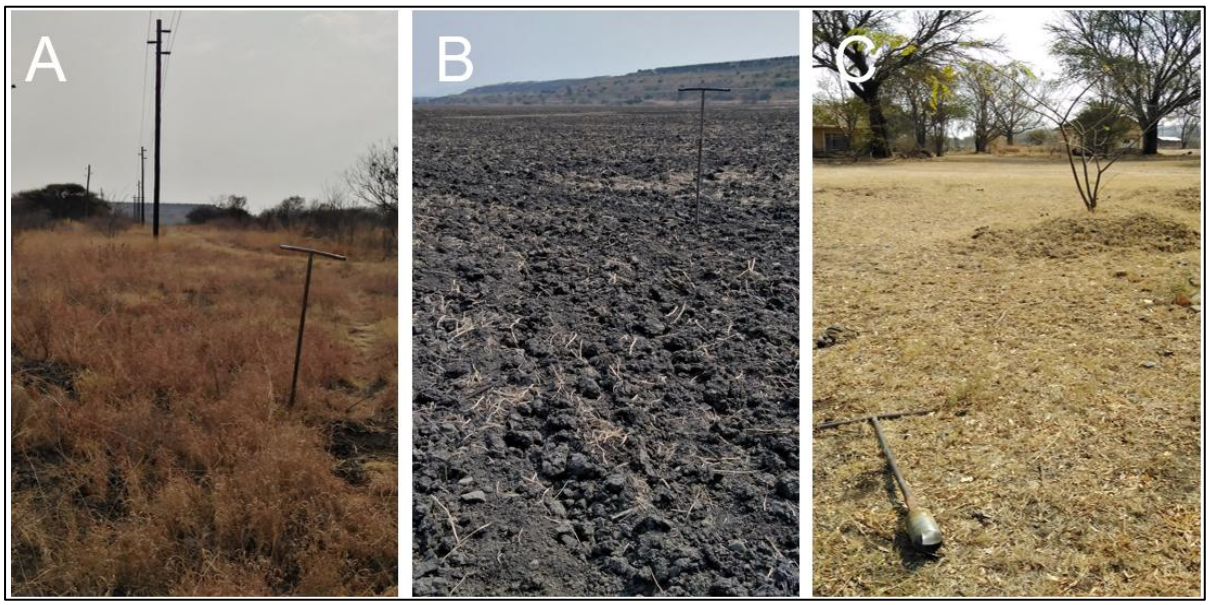


Figure 16: Different land uses found within the 50 m buffer of the proposed project area; A) Natural Veld; B) Crop fields and C) Old residential houses for miners (TBC, 2025).

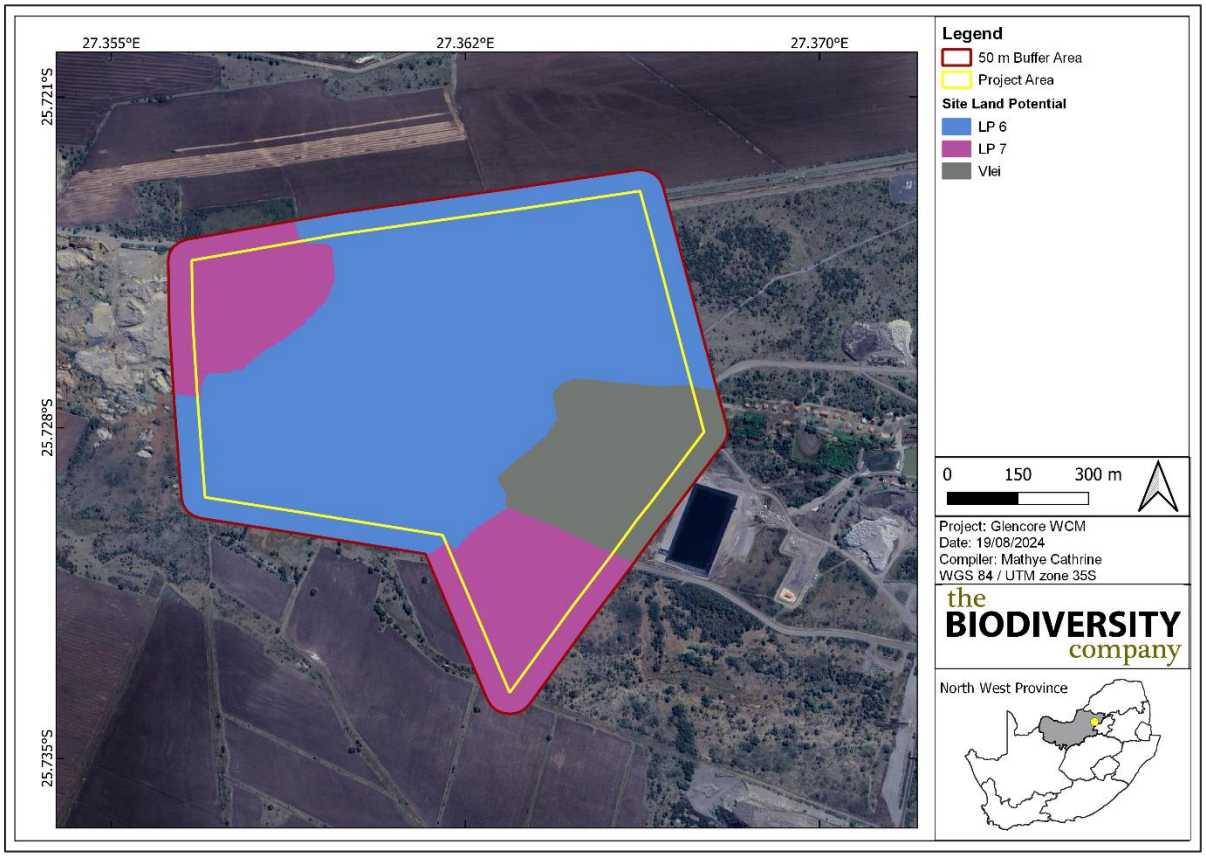


Figure 17: Land Potential of the proposed project area (TBC, 2025).

The land capability dataset (DAFF, 2017) indicates that the proposed project area falls within the "Low to Moderate" sensitivity (Land Capability 6 to 8) (see **Figure 18**). Furthermore, highly sensitive field crop boundaries

were also identified within the 50 m buffer area of the proposed project area using the agricultural theme tool (DFFE, 2024; **Figure 19**).

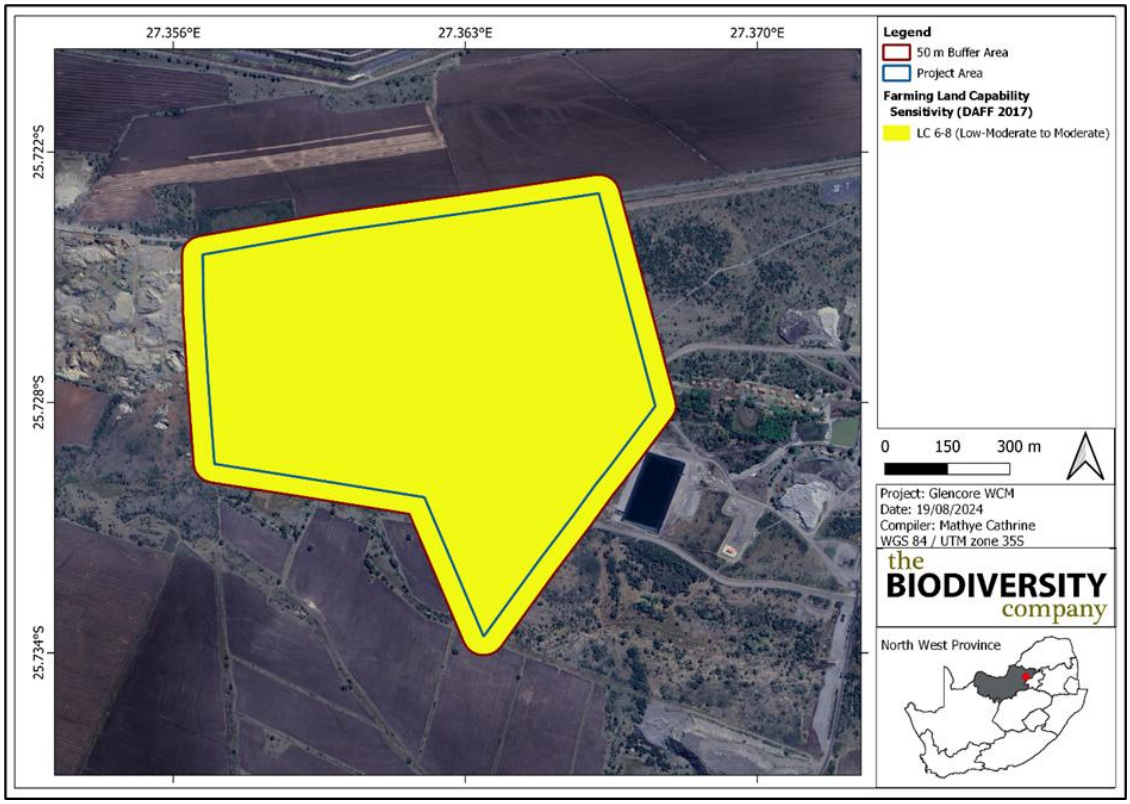


Figure 18: Land Capability Sensitivity (DAFF, 2017; TBC, 2025).

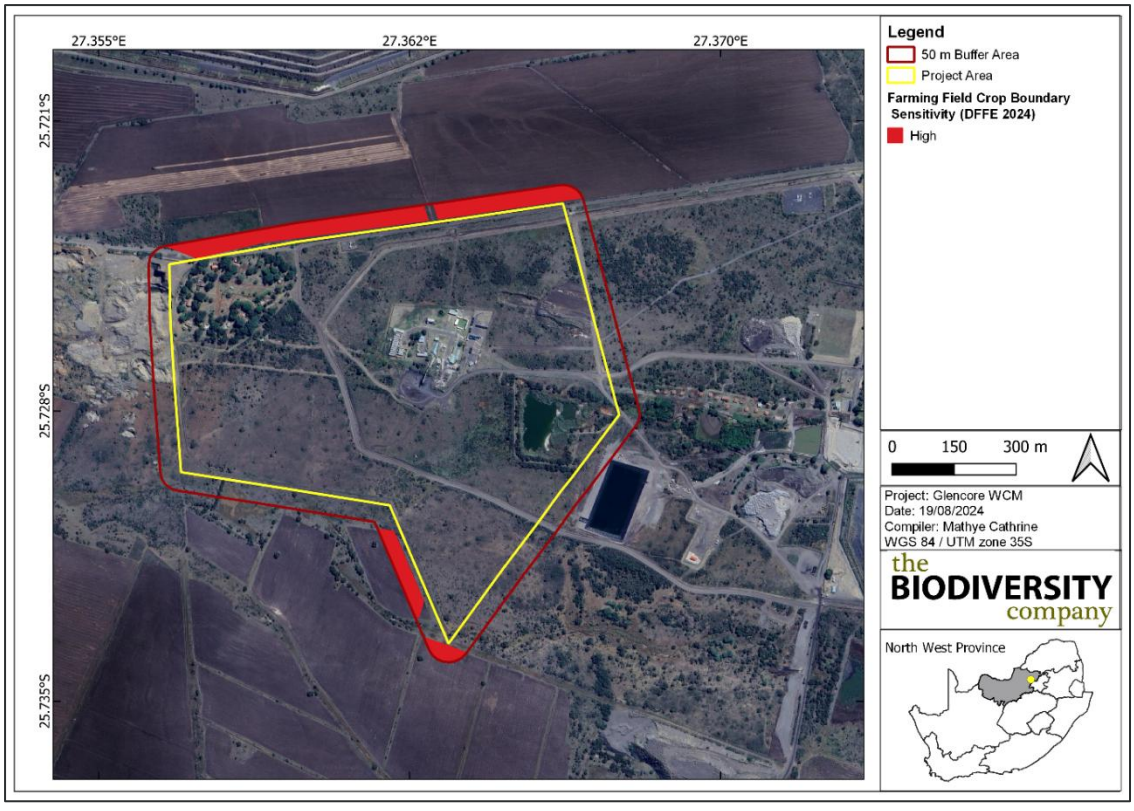


Figure 19: Field Crop Boundary Sensitivity (DFFE 2024; TBC, 2025)

The baseline soil findings, current land uses and the calculated land potential does not correlate with the agricultural theme tool, in areas demarcated with "low moderate to moderate" land capability sensitivities (see **Appendix B** for the DFFE Screening Tool Report). They further concur with the agricultural theme tool on all areas demarcated as highly sensitive for field crop boundaries found within the 50 m buffer of the project area. The active crop fields were found on the low potential soils such as Mispah and Rustenburg.

Therefore, the proposed project is expected to have negligible impact on the soil resources and disruption of arable lands after the construction phase.

Considering the soil properties, agricultural potential as well as the current land use of the proposed development area, the area has a predominate "low" agricultural sensitivity with marginal "Medium sensitivity around active crop fields within the 50 m regulated area (**Figure 20**). Based on the confirmed sensitivities, the overall sensitivity of the proposed project area is also categorized as "Low" with marginal "Medium" sensitive areas. The allocated sensitivities for the theme are either disputed or validated in **Table 13** below.

Table 13: Summary of the screening tool vs specialist assigned sensitivities (TBC, 2025).

Screening Tool Theme	Screening Tool	Specialist	Tool Validated or Disputed by Specialist - Reasoning
Agricultural Theme	High	Medium	Disputed – Low Moderate to Moderate land capability. Presence of active crop fields on low potential soils including Rustenburg and Mispah. These soils have a restrictive characteristic which limits root penetration, aeration, and drainage due to their high clay content and the impermeable layer in the sub-horizons. No irrigation infrastructure.
	Medium	Low	Disputed – Very Low to Low land capability. Presence of low potential soils including Rustenburg, Arcadia, Rensburg and Mispah. These soils have a restrictive characteristic which limits root penetration, aeration, and drainage due to their high clay content and the impermeable layer in the sub-horizons.

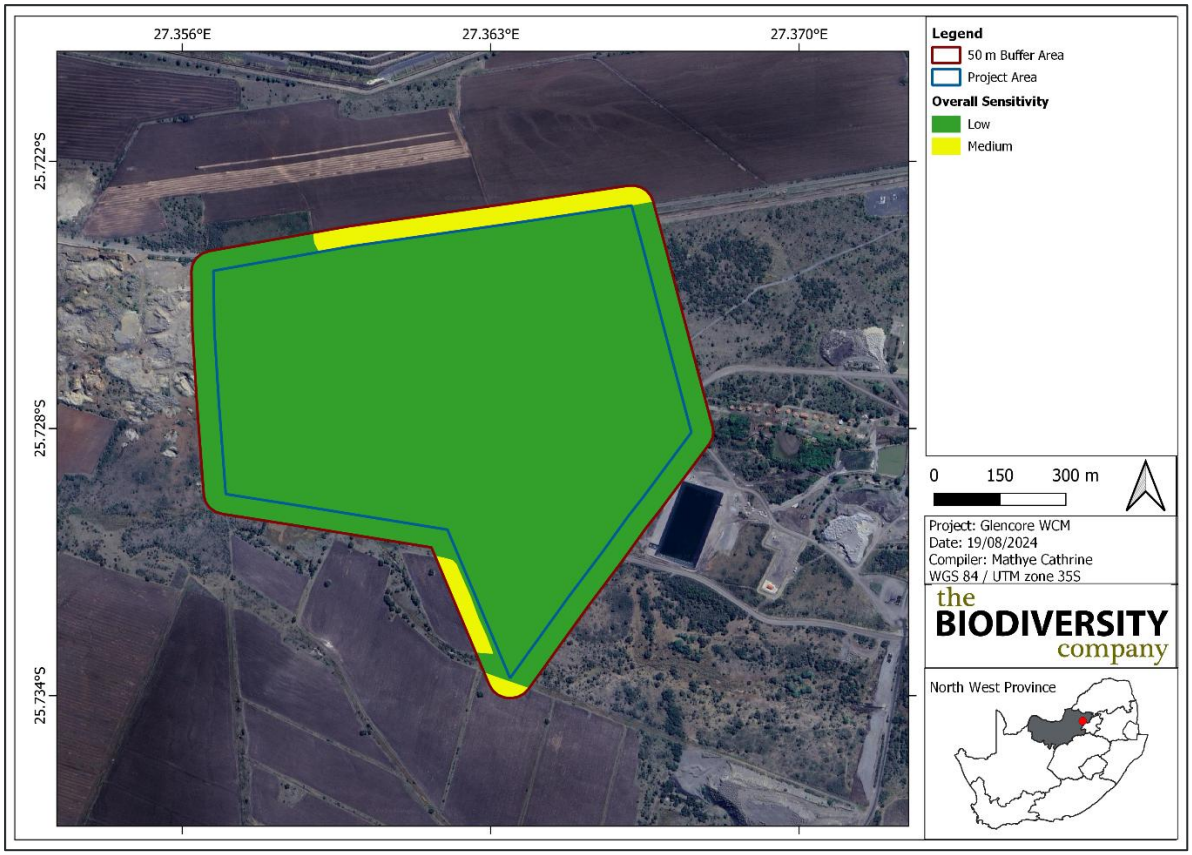


Figure 20: Overall site verified sensitivity of the project area (TBC, 2025).

8.1.2.2 SOIL AND HYDROPEDOLOGY

A Soil and Hydropedological Impact Assessment was undertaken. Soil physical properties and hydrology play significant roles in the fundamentals of hydropedology. Physical properties including porosity, hydraulic conductivity, infiltration etc. determine micro preferential flow paths through a soil profile. The hydrology in turn is responsible for the formation of various morphological processes in soil, including mottling, colouration and the accumulation of carbonate (van Tol *et al*., 2017).

These processes are used to construct models illustrating sub-surface flow paths, storage and interconnection between these flow paths. Hydropedology can therefore be used for a variety of functions. These functions include process-based modelling, digital soil mapping, pollution control management, impact of land use change on water resources, wetland protection, characterising ground and sub-surface flows as well as wetland protection and rehabilitation. The main focus of the Soil and Hydropedological Impact assessment is on the latter – wetland protection and rehabilitation – which enables effective water resource management regarding wetlands and sub-surface flows in general.

Figure 21 below represents examples of three type of hydropedological soils, namely:

a) **Recharge soil** – termed due its ability to recharge ground and surface water sources. This soil type will typically have a vertical flow path throughput the soil profile. Water will therefore infiltrate the topsoil and freely drain into the profile to such an extent that the water rapidly reaches the bedrock. After reaching this layer, water will penetrate the ground water source or be transported horizontally towards lower laying areas.

b) **Interflow soil** - Lateral flows are dominant in this soil type and occurs due to differences in the hydraulic conductivity of soil horizons. The “sp” soil horizon restricts vertical movement and promotes lateral flows at the A/B interface. The lighter colour in this profile indicates leaching which is caused by lateral flows which often occurs on top of a bedrock layer due to the impermeable nature thereof. Mottles

often occurs above this impermeable layer due to fluctuating water levels, see the magnified illustration in **Figure 21 (b-i)**.

c) **Responsive soil** - characterised (in this case) by a dark top-soil and a grey coloured sub-soil. Other indicators include mottling and gleying. These soil types are saturated for very long periods. Therefore, rainfall is unlikely to infiltrate this layer and would likely be carried off via overland flow and are mostly fed by lateral sub-surface flows. Shallow soils are equally responsive in the sense that the soil profile will rapidly be saturated during precipitation, after which rainfall will be carried off by means of overland flows.

Refer to the Soil and Hydropedological Impact Assessment report in **Appendix D**. for further information regarding the mechanisms behind hydropedological behaviour of different soil types and hydropedological processes.

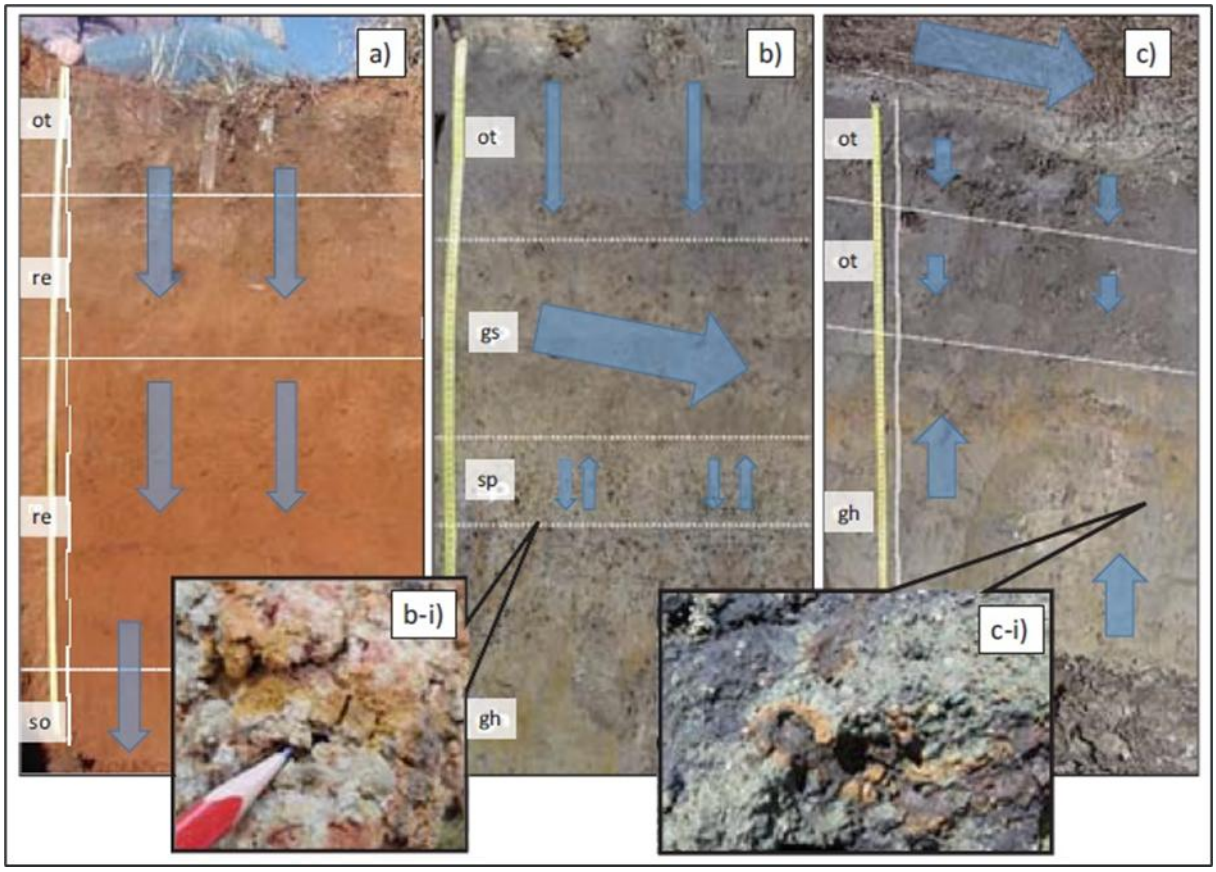


Figure 21: Illustration of different hydropedological soil types (van Tol *et al*., 2017).

Soil types have been identified according to the South African soil classification system (Soil Classification Working Group, 2018) after which the link between soil forms and hydropedological response were established (van Tol & Le Roux, 2019), and the soils regrouped into various hydropedological soil types as shown in **Table 14**.

Table 14: Hydrological soil types of the studied hillslopes (van Tol *et al*., 2019; TBC, 2025)

Hydrological soil type	Description	Subgroup	Symbol
Recharge	Soils without any morphological indication of saturation. Vertical flow through and out the profile into the underlying bedrock is the	Shallow	

Hydrological soil type	Description	Subgroup	Symbol
	dominant flow direction. These soils can either be shallow on fractured rock with limited contribution to evapotranspiration or deep freely drained soils with significant contribution to evapotranspiration.	Deep	
Interflow (a/b)	Duplex soils where the textural discontinuity facilitates build-up of water in the topsoil. Duration of drainable water depends on rate of ET, position in the hillslope (lateral addition/release) and slope (discharge in a predominantly lateral direction).	A/B	
Interflow (soil/bedrock)	Soils overlying relatively impermeable bedrock. Hydromorphic properties signify temporal build of water on the soil/bedrock interface and slow discharge in a predominantly lateral direction.	Soil/Bedrock	
Responsive (shallow)	Shallow soils overlying relatively impermeable bedrock. Limited storage capacity results in the generation of overland flow after rain events.	Shallow	
Responsive (saturated)	Soils with morphological evidence of long periods of saturation. These soils are close to saturation during rainy seasons and promote the generation of overland flow due to saturation excess.	Saturated	
Stagnating	In these soils outflow of water is limited or restricted. The A and/or B horizons are permeable but morphological indicators suggest that recharge and interflow are not dominant. These includes soils with carbonate accumulations in the subsoil, accumulation and cementation by silica, and precipitation of iron as concretions and layers. These soils are frequently observed in climate regions with a very high evapotranspiration demand. Although infiltration occurs readily, the dominant hydrological flow path in the soil is upward, driven by evapotranspiration.		

8.1.2.2.1 HILLSLOPE HYDROLOGY

The survey was conducted to obtain information regarding the soil morphology and hydropedological flow paths relevant to the hillslope by means of several representative transects (see **Table 15** below).

Table 15: Identified hillslope dominant soil forms and hydropedological groups (TBC, 2025).

Terrain Morphological Unit (TMU)							
1		**3**		**4**		**5**	
Soil form	**Hydroped**	**Soil form**	**Hydroped**	**Soil form**	**Hydroped**	**Soil form**	**Hydroped**
Witbank	Recharge (deep)	Rustenburg	Interflow (A/B)	Acardia	Interflow (A/B)	Acardia	Interflow (A/B)
Witbank	Recharge (deep)	Mispah	Recharge (shallow)	Acardia	Interflow (A/B)	Acardia	Interflow (A/B)
Acardia	Interflow (A/B)	Acardia	Interflow (A/B)	Acardia	Interflow (A/B)	Rensburg	Responsive (Saturated)
Mispah	Recharge (shallow)	Acardia	Interflow (A/B)	Acardia	Interflow (A/B)	Rensburg	Responsive (Saturated)

Terrain Morphological Unit (TMU)							
Rustenburg	Interflow (A/B)	Acardia	Interflow (A/B)	Acardia	Interflow (A/B)	Rensburg	Responsive (Saturated)

The hillslope hydrology of slopes intersected by the proposed Glencore Kroondal Mine and associated infrastructure development are characterised by their distinct hydropedological patterns. The majority of the slopes for the first distinctive hydropedological patterns are characterised by recharge (Deep and Shallow) (see **Figure 22**) hydropedological types. These patterns occur from the crest to the mid-slope transecting into interflow (A/B) towards the valley bottom merging to a watercourse.

The second to fourth distinctive hydropedological pattern is characterised with recharge (Shallow) or interflow (A/B) hydropedological soil types (**Figure 23** to **Figure 24**) from the crest to lower mid-slope section, which transects to a responsive saturated hydropedological type at the valley bottom section. Restrictions in the water flow occurs within the responsive soils due to the presence of a high clay content and partially or unfractured parent material (see **Figure 24** to **Figure 25**).

The shallow Mispah soil forms and deep Witbank soil forms identified on-site are characterised with well drained profiles. The Mispah soil forms consist of an orthic topsoil with a hard rock layer below. The Witbank soil forms consist of anthropogenic transported material from the mining activities, with evidence of the inherent diagnostic horizons. Clear horizons of red and yellow apedal horizons were evident and visible in the profile. These profiles are characterised by extremely high permeability soil hydraulic conductivity (Ks) rates, including the lower lithic horizon which can also be available below the B1 subsurface horizon in most cases.

No signs of leaching or oxidation/reduction processes were identified throughout the soil profiles, which, together with the high Ks emphasises rapid vertical recharge of the groundwater storage as being the dominant flow path.

The soil form relevant to some of the mid-slope to foot slope areas has been classified as an interflow (A/B) hydropedological types. These soil forms are characterised by vertic horizons. The interflow (A/B) between the soil and or bedrock, is an indicative of lateral sub-surface flows between the topsoil, subsurface soils and bedrock layer. The subsurface layer or bedrock layer displays a very low Ks, which has limited percolation into the bedrock, which can ultimately result in interflow.

Vertic horizons are often characterised by strongly structured, dark clay horizons, with a high smectite clay content that gives rise to pronounced swell-shrink processes. Sometimes, red or gley variants occur. Thicker vertic horizons exhibits slickensides and wedge-shaped structural aggregates at some depth. They may also exhibit self-mulching properties at the surface. Mechanical disturbances of vertic horizons may give rise to massive or altered surface structural aggregates. Vertic horizons crack strongly when dry and sticky when wet. Some vertic horizons have a strong tendency to invert, depositing calcium carbonate nodules, and/or stones and rocks on the surface. Vertic soils may also exhibit gilgai microrelief (Soil Classification Working Group (2018).

The valley bottom regions are characterised by responsive (wet) hydropedological types. The soil form relevant to this observation point is that of the Rensburg soil forms. The Rensburg soil forms are characterised by a gley horizon as the subsoil, which is indicative of prolonged/permanently saturated soils which result in the formation of “responsive soils.” Responsive soils will be subject to overland/return flow during precipitation events (due to the naturally high-water content which will ensure rapid saturation). Between rainfall events, these soil forms will steadily feed watercourses and will lose moisture by means of Evapotranspiration (ET).

Gley horizons that are well developed and have homogenous dark to light grey colours with smooth transitions. Stagnant and reduced water over long periods is the main factor responsible for the formation of a gley horizon and could be characterised by green or blue tinges due to the presence of a mineral called Fougerite which includes sulphate and carbonate complexes. Even though grey colours are dominant, yellow and/or red striations can be noticed throughout a gley horizon. The structure of a gley horizon mostly is characterised as strong pedal, with low hydraulic conductivities due to high clay content (clayey texture), although sandy gley horizons are also known to occur. The gley soil form commonly occurs at the toe of hillslopes (or benches) where lateral water inputs (sub-surface) are dominant and the underlaying geology is characterised by a low hydraulic

conductivity. The gley horizon usually is second in diagnostic sequence in shallow profiles yet is known to be lower down in sequence and at greater depths (Soil Classification Working Group, 2018).

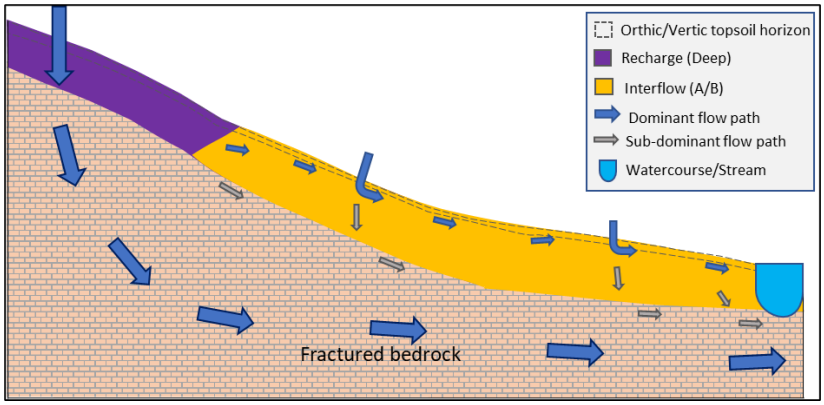


Figure 22: Hillslope hydrology one of four of the distinct hydropedological patterns prior to construction of the proposed development (TBC, 2025).

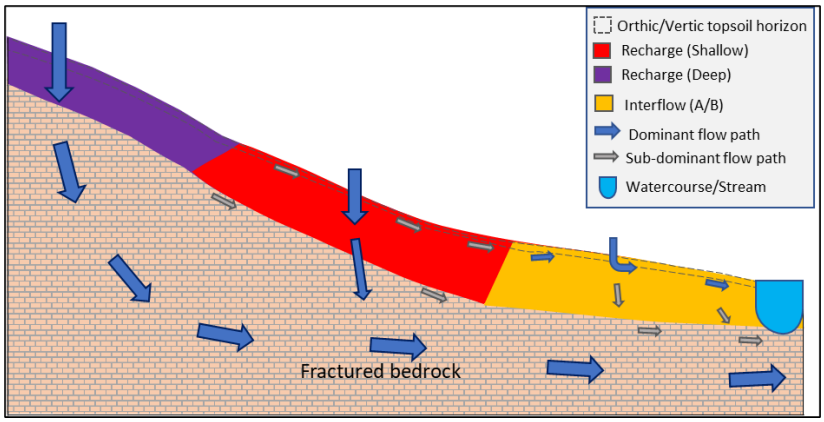


Figure 23: Hillslope hydrology two of four of the distinct hydropedological patterns prior to construction of the proposed development (TBC, 2025).

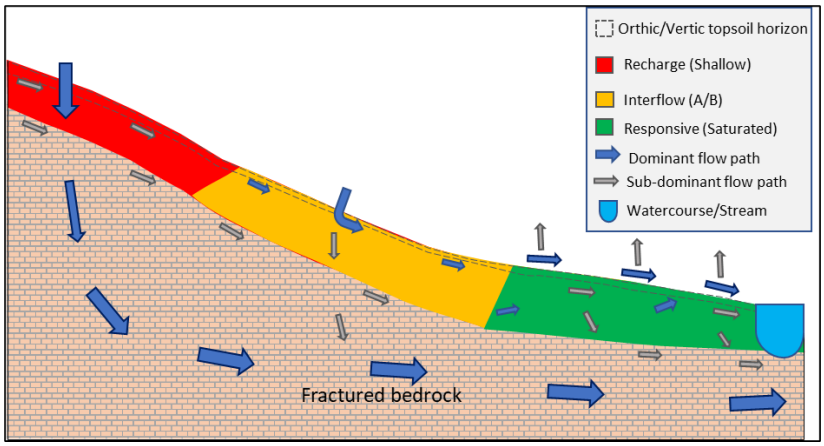


Figure 24: Hillslope hydrology three of four of the distinct hydropedological patterns prior to construction of the proposed development (TBC, 2025).

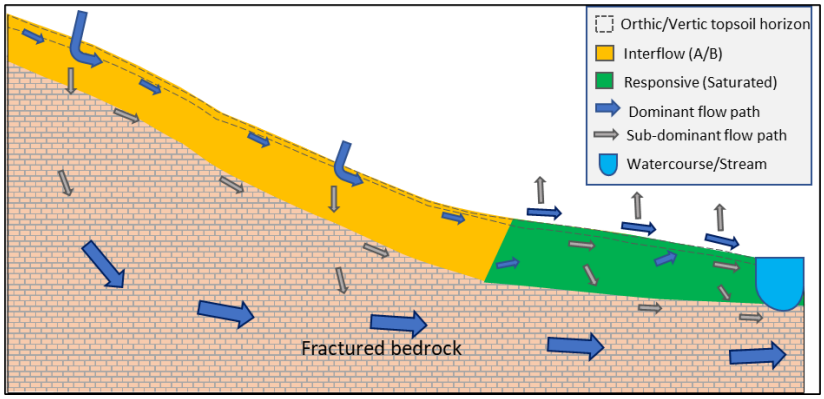


Figure 25: Hillslope hydrology four of four of the distinct hydropedological patterns prior to construction of the proposed development (TBC, 2025).

8.1.3 GROUNDWATER

Groundwater occurs throughout the Bojanala Platinum District Municipal area, although high potential groundwater resources are restricted to few dolomitic aquifers and associated fountains. Groundwater is a particularly important water source for rural areas and the drier regions in particular, where groundwater is often the main source of water for rural domestic use, stock watering, and for the towns (BPDM EMF: Status Quo report (Final Rev13), 2018). The fractured, and fractured and intergranular aquifers in the Western Bushveld Complex Hydrogeological region, as well as most of the Rustenburg Municipal area have a low to medium development potential (BPDM EMF: Status Quo report (Final Rev13), 2018; RLM SDF Draft, 2023). Mining in the belt north of the Magaliesberg Mountain Range has led to extensive dewatering, the impacts of which affect agriculture and natural vegetation in the region (BPDM EMF: Status Quo report (Final Rev13), 2018; RLM SDF Draft, 2023).The groundwater quality is relatively good in the BPDM, however, contributions to groundwater pollution include activities associated with mining and agriculture, as well as industrial activities, insufficient treatment of water at waste water treatment plants, and landfill sites (BPDM EMF: Status Quo report (Final Rev13), 2018).

Strategic Water Source Areas (SWSAs) are areas that supply a disproportionate amount of mean annual runoff to a geographical region of interest. The areas supplying ≥ 50% of South Africa's water supply (which were represented by areas with a mean annual runoff of ≥ 135 mm/year) represent national Strategic Water Source Areas (SANBI, 2013). These are key ecological infrastructure assets and the effective protection of surface water SWSAs areas is vital for national security because a lack of water security will compromise national security and human wellbeing. Groundwater and interflow play a key role in sustaining surface water flows during the dry season and account for up to 42% of river baseflow, thereby sustaining aquatic and water-dependent biota. Therefore, the protection and management of these areas are imperative (Le Maitre *et al*., 2018).

According to the SWSAs of South Africa, Lesotho and Swaziland, the proposed site is overlapping with the Kroondal / Marikana groundwater strategic water source areas (Lotter and Le Maitre, 2021). Ecological infrastructure in this region should be protected as far as possible, and emphasis should be placed on management of land uses and associated activities with high potential for surface water pollution (RLM SDF Draft, 2023).

8.1.4 SURFACE WATER AND DRAINAGE

The site is situated within the Limpopo stem of the Limpopo-Olifants Water Management Area (WMA) in the A22H Quaternary Catchment. The region has a semi-arid climate with the Limpopo stem of the WMA experiencing a wide range in Mean Annual Precipitation (MAP) with the southern regions experiencing the most rainfall. The southern regions of the WMA can experience up to 600mm of annual rainfall during the driest years. The main economic activities within the region include mining and farming (livestock and irrigation). The WMA is currently experiencing challenges due to increased urban growth and expansion of key economic sectors such as agriculture and mining. According to the Business Case for the Limpopo-Olifants Catchment Management Agency (2022) it is expected that water demand will increase by 46% by 2025. The agriculture sector is said to

account for 60% of the water use in the Limpopo-Olifants WMA (DWS, 2022). The WMA is currently receiving ~500 million cubic metres of water from the Orange-Senqu River Basin to accommodate the demand for water in the region – water usage is exceeding the water generated in the WMA via surface runoff (Limpopo-Olifants CMA Annual Performance Plan: 2024/25 to 2026/27, 2024).

The rivers within the Rustenburg Local Municipality area form part of the Crocodile River system and drainage is generally towards the north east. The Hex River and its tributaries, including the Sandspruit are considered the main rivers within the RLM (refer to **Figure 26**). The four major dams in the RLM include Bospoort, Buffelspoort, Olifantsnek and Vaalkop dams (RLM SDF Draft, 2023).

Surface water quality within the RLM is considered poor in general, with main concerns associated with pollution from anthropogenic activities such as agriculture, mining, and the poor functioning of wastewater treatment works (RLM SDF Draft, 2023).

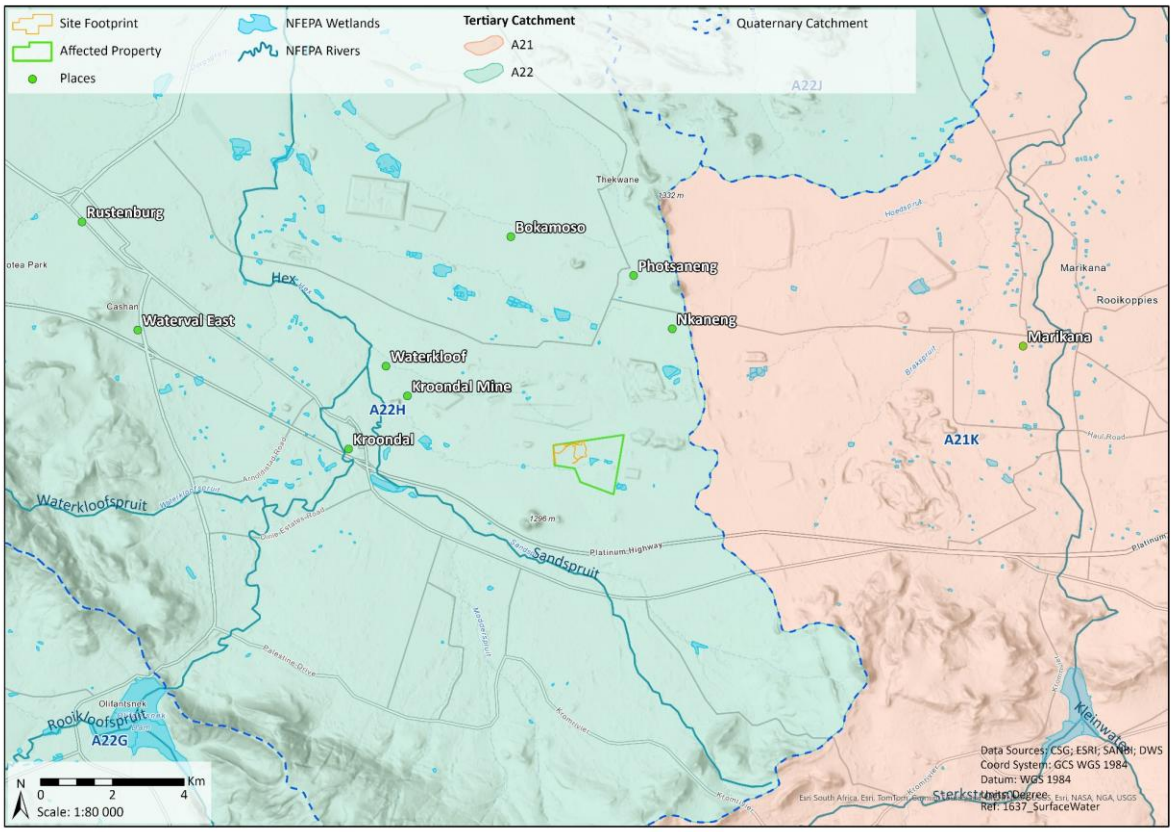


Figure 26: Surface Water Features Map

8.1.5 TOPOGRAPHY

The topography of the site is generally flat with a gradient incline in elevation from ~1177m in the West (near the west end of the powerline) to ~1195m in the East (near the eastern edge of the proposed developments). There is a very gentle North to South decline towards the drainage channel seen south of the property. The topography of the area is depicted in **Figure 27**. No erosion channels, rocky outcrops or unstable slopes were noted on site. The area can be classified as Highveld plateau.

Figure 27: Topography of the site.

8.1.6 LANDSCAPE QUALITY AND VISUAL

The current landscape of the area depicts various TSFs and some agricultural crops north of the site (see **Figure 28**), and distant koppies to the South-West and East of the site (refer to **Figure 27**). However, the current activity on site is mining, various infrastructure will be reused in this application. Therefore, the landscape quality and visual characteristics are unlikely to significantly change as a result of the proposed additional infrastructure. No Visual Impact Assessment was deemed necessary for this application.

Figure 28: View of the TSF and agricultural crop situated north of the proposed development.

Figure 29: View of the existing infrastructure on site.

8.2 BIOLOGICAL ENVIRONMENT

The terrestrial and aquatic environment has been assessed by The Biodiversity Company (TBC) and the associated specialist reports are included in **Appendix D**. The baseline biological environments and specialist findings are presented in the following subsections.

The spatial data collected and analysed to determine the desktop ecological sensitivity of the site is listed in **Table 16** below, and a desktop sensitivity map is presented in **Figure 30**.

Table 16: List of sensitive ecological landscape features relevant to the project area.

Desktop Information Considered	Relevance	Reasoning
Ecosystem Threat Status	Relevant	Overlaps with a 'Endangered' Ecosystem – Marikana Thornveld (RLE, 2021).
Ecosystem Protection Level	Relevant	Overlaps with a 'Poorly Protected' Ecosystem.
Provincial Conservation Plan (Terrestrial)	Relevant	The PAOI overlaps with a 'Critical Biodiversity Area 2' of the North West Conservation Plan, as well as a small section of an 'Ecological Support Area 1', and marginally with an 'Ecological Support Area 2' to the south.
Provincial Conservation Plan (Aquatic)	Relevant	The PAOI overlaps with Aquatic Ecological Support Areas of the North West Biodiversity Sector Plan.
South Africa Protected Areas Database (SAPAD) and South Africa Conservation Areas Database (SACAD)	Relevant	Located within the Magaliesberg Biosphere Reserve 'Transition' zone, and approximately 8.7 km from the Magaliesberg Protected Natural Environment (refer to **Section 4.1.4** and **Figure 5**).
National Protected Areas Expansion Strategy (NPAES)	Relevant	Overlaps with Priority Focus Area (NPAES, 2018; refer to **Section 4.1.4** and **Figure 5**).
Important Bird & Biodiversity Areas (IBA)	Relevant	Overlaps with the Magaliesberg IBA (refer to **Section 4.1.5**).
South African Inventory of Inland Aquatic Ecosystems (SAIIAE)	Relevant	The 500 m regulated area overlaps with NBA water resources – a depression and channelled valley-bottom.
National Freshwater Priority Area (NFEPA)	Relevant	The 500 m regulated area overlaps with NFEPA wetlands, including one natural non-priority wetland within the project site, and two artificial non-priority wetlands.
Strategic Water Source Areas (SWSA)	Relevant	The PAOI overlaps with a SWSA – Kroondal/Marikana Groundwater SWSA (refer to **Section 8.1.3**).
SANBI 2012 Mine Guide – Biodiversity Priority Areas	Relevant	The PAOI overlaps with 'High Biodiversity Importance – High Risk to Mining' areas.

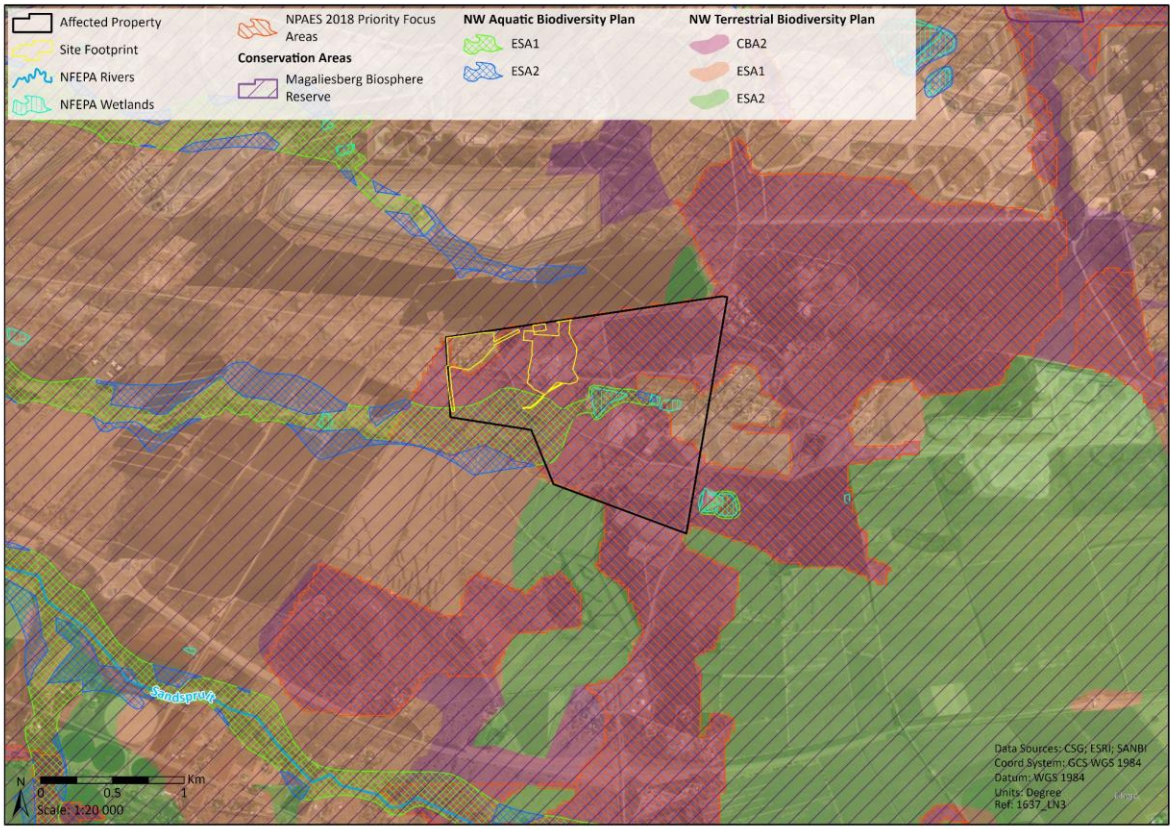


Figure 30: Listing Notice 3 Applicability Map

8.2.1 TERRESTRIAL ECOLOGY

The site is situated in the Savanna biome. The savanna vegetation of South Africa represents the southernmost extension of the most widespread biome in Africa (Mucina & Rutherford, 2006). On a fine-scale vegetation type, the site overlaps only with the Marikana Thornveld (SVcb 6) vegetation type (**Figure 31**). The Marikana Thornveld and Norite Koppies Bushveld vegetation Grassland vegetation is distributed throughout the Gauteng and North-West provinces and occurs on the Rustenburg plains in the west, through Marikana to Brits in the east. The altitude of the Marikana Thornveld ranges from 1 050 to 1 450 Metres Above Sea Level (MASL) (Mucina and Rutherford, 2006). This vegetation type is characterised by shrublands, which are denser in drainage features and rocky outcrops. The landscape features include Open *Acacia karoo* woodland, occurring in valleys and slightly undulating plains, and some lowland hills. Shrubs are denser along drainage lines, on termitaria and rocky outcrops or in other habitat protected from fire (Mucina & Rutherford, 2006).

The purpose of the National Biodiversity Assessment (NBA) is to assess the state of South Africa's biodiversity based on best available science, with a view to understanding trends over time and informing policy and decision-making across a range of sectors. The NBA deals with all three components of biodiversity: genes, species and ecosystems; and assesses biodiversity and ecosystems across terrestrial, freshwater, estuarine and marine environments.

The two headline indicators assessed in the NBA are:

- **Ecosystem Threat Status** – indicator of an ecosystem's wellbeing, based on the level of change in structure, function or composition. Ecosystem types are categorised as Critically Endangered (CR), Endangered (EN), Vulnerable (VU), Near Threatened (NT) or Least Concern (LC), based on the proportion of the original extent of each ecosystem type that remains in good ecological condition. Red List of Ecosystems (RLE) 2021 – The list was first published in 2011 and has since been substantially revised by authors Dr Andrew Skowno and Mrs Maphale Monyeki (SANBI, 2022). This list is based on assessments that followed the International Union for Conservation of Nature (IUCN) Red List of

Ecosystems Framework (version 1.1) and covers all 456 terrestrial ecosystem types described in South Africa by Mucina and Rutherford (2006). A total of 120 of the 456 terrestrial ecosystem types assessed are categorised as threatened and together make up approximately 10% of the remaining natural habitat in the country. Of these 120 ecosystem types, 55 are Critically Endangered (CR), 51 Endangered (EN) and 14 are Vulnerable (VU). The remainder are categorised as Least Concern (LC) (SANBI, 2022; Skowno & Monyeki, 2021).

- **Ecosystem Protection Level** – indicator of the extent to which ecosystems are adequately protected or under-protected. Ecosystem types are categorised as Well Protected (WP), Moderately Protected (MP), Poorly Protected (PP), or Not Protected (NP), based on the proportion of the biodiversity target for each ecosystem type that is included within one or more protected areas. Not Protected, Poorly Protected or Moderately Protected ecosystem types are collectively referred to as under-protected ecosystems.

The Marikana Thornveld is endangered (EN), with a conservation target of 19%, and the Ecosystem Protection Level is classified as Poorly Protected (PP). Less than 1% of this vegetation type is statutorily conserved in conservation areas like the Magaliesberg Nature Area. This vegetation type has been significantly transformed (approximately 48%), mainly by urban sprawl and cultivation (Mucina and Rutherford, 2006). Habitat loss due to clearing of land for settlements, crops and mining are one of the main pressures identified for this vegetation type, as well as invasion of alien invasive species, overgrazing and climate change (RLM SDF Draft, 2023).

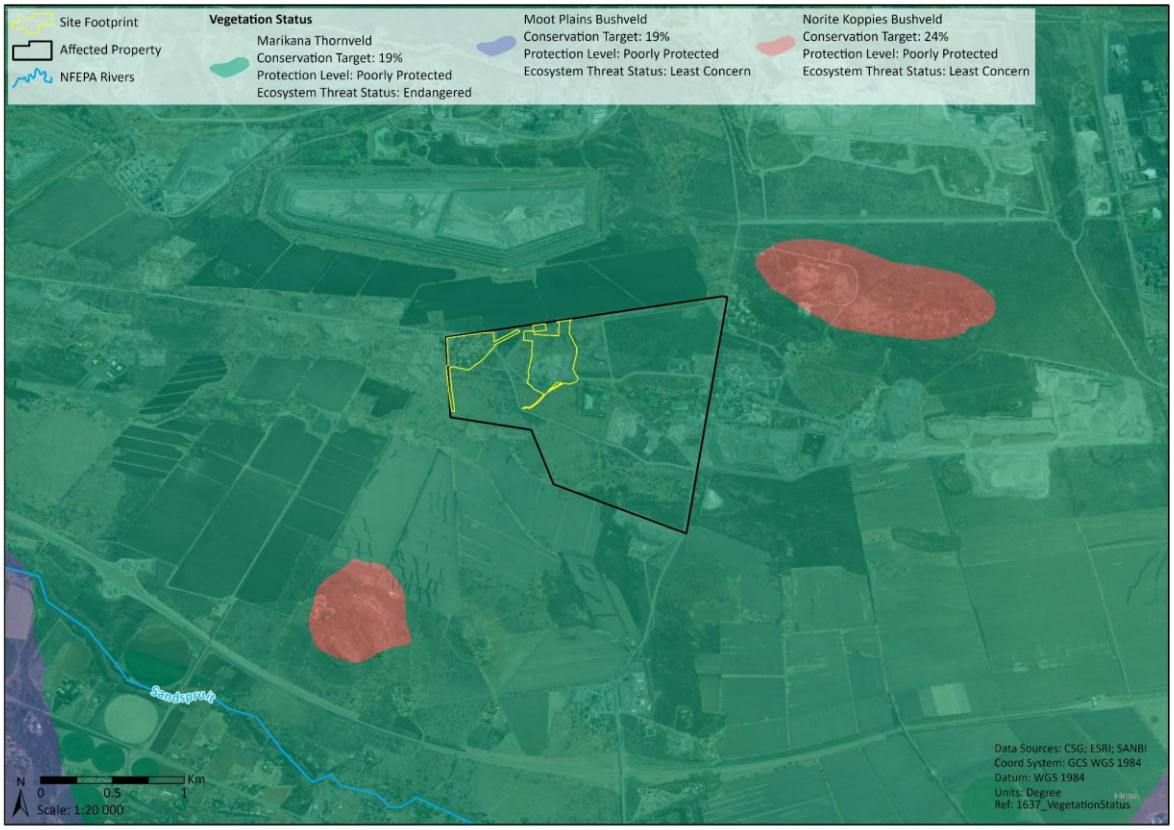


Figure 31: Vegetation Status Map.

8.2.1.1 HABITAT DELINEATION

The Terrestrial Biodiversity Impact Assessment report details the habitats found on site, namely: Modified; Disturbed thornveld; and Water Resources (see **Table 17**). These habitats are delineated in **Figure 32**. No flora or fauna Species of Conservation Concern (SCC) were noted or are expected on site. Various indigenous, exotic and alien invasive plant species were noted and described in the Terrestrial report. *Hystrix cristata* (Porcupine) is expected in the area as evidence of spoor was noted.

Table 17: Table providing descriptions of the habitat types delineated for the project area (TBC, 2025)

Habitat	Description and Condition
Modified	This habitat includes all areas that maintain little to no native vegetation and/or where anthropogenic activity has substantially modified an area's primary ecological functions and species composition. These areas include few, if any, indigenous species and are associated with alien and invasive plant species. **No fauna or flora SCC were observed, and none are expected for the habitat.**
Disturbed Thornveld	This habitat regarded as thornveld with some ecological functionality, including refuge and foraging opportunity, and a movement corridor between areas of anthropogenic land use, as well as also hosting some indigenous flora. However, high levels of anthropogenic disturbances have resulted in negative impacts and associated habitat degradation. Impacts mostly result from mining-related activities within the PAOI, and includes alien species infestations, old diggings, rubble, grazing, roads and vehicles, and edge effects from adjacent agriculture. **No fauna or flora SCC were observed, and none are expected for the habitat.**
Water Resource	Various wetland features were identified, collectively classed as water resources from a terrestrial perspective. The ecological integrity, importance and functioning of these areas play a crucial role as a water resource system and form an important habitat for various fauna and flora. This habitat provides surface water within the landscape and resource provision (such as food from aquatic and riparian biodiversity). Aids in trapping sediment and nutrients derived from land runoff. More information regarding this habitat and the state of the water resources can be found in the Wetland Functional and Impact Assessment report (TBC, 2025). **No fauna or flora SCC were observed nor are expected.**

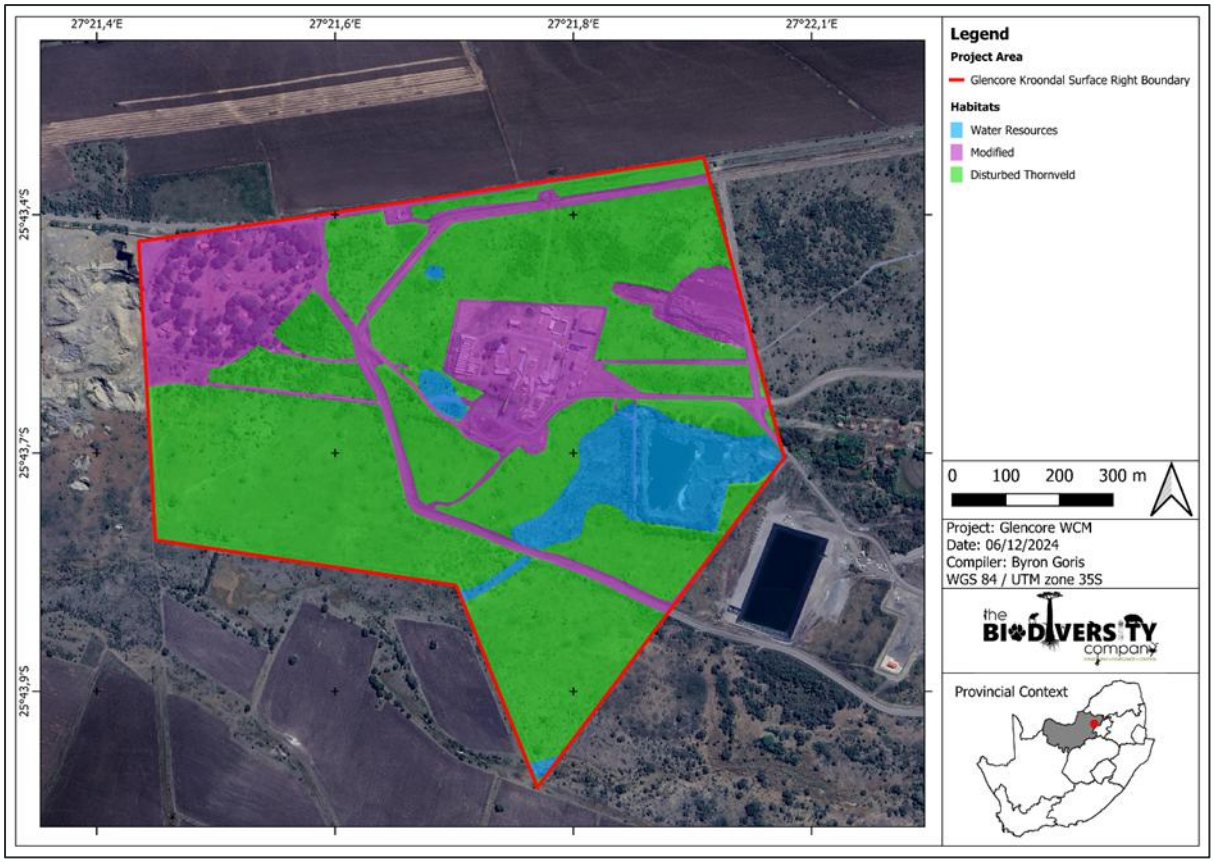


Figure 32: Terrestrial Habitats identified in the project area (TBC, 2025).

8.2.1.2 SITE ECOLOGICAL IMPORTANCE

All habitats within the Project Area of Influence (PAOI) were assigned a sensitivity category, i.e., a Site Ecological Importance (SEI) category. The PAOI was categorised as possessing habitats ranging from 'Very Low' to 'High' SEI (**Table 18** and **Figure 33**). This indicates that the findings of the Terrestrial Assessment are contrary to the DFFE Screening Tool Report (**Appendix B**) with respect to the Combined Terrestrial Biodiversity Theme sensitivity.

Table 18: Summary of habitat types delineated within the PAOI

Habitat Type	Conservation Importance	Functional Integrity	Biodiversity Importance	Receptor Resilience	Site Ecological Importance Guidelines
Modified	**Low**	**Very Low**	**Very Low**	**High**	**Very Low**
	< 50% of receptor contains natural habitat with limited potential to support SCC.	Several major current negative ecological impacts.		Habitat that can recover relatively quickly (~ 5–10 years) to restore > 75% of the original species composition and functionality of the receptor functionality	Minimisation mitigation – development activities of medium to high impact acceptable and restoration activities may not be required.
Disturbed Thornveld	**Low**	**Low**	**Low**	**Medium**	**Medium**
	< 50% of receptor contains natural habitat with limited potential to support SCC.	Mostly minor current negative ecological impacts, with some major impacts and a few signs of minor past disturbance.		Will recover slowly (~ more than 10 years) to restore > 75% of the original species composition and functionality of the receptor functionality, or species that have a moderate likelihood of: (i) remaining at a site even when a disturbance or impact is occurring, or (ii) returning to a site once the disturbance or impact has been removed.	Minimisation and restoration mitigation – development activities of medium impact acceptable followed by appropriate restoration activities.
Water Resources	**Medium**	**Medium**	**Medium**	**Low**	**High**
	> 50% of receptor contains natural habitat with potential to support SCC.	Only narrow corridors of good habitat connectivity. Mostly minor current negative ecological impacts, with some major impacts and a few signs of minor past disturbance.		Habitat that is unlikely to be able to recover fully after a relatively long period: > 15 years required to restore ~ less than 50% of the original species composition and functionality of the receptor functionality, or species that have a low likelihood of: (i) remaining at a site even when a disturbance or impact is occurring, or (ii) returning to a site once the disturbance or impact has been removed.	Avoidance mitigation wherever possible. Minimisation mitigation – changes to project infrastructure design to limit the amount of habitat impacted, limited development activities of low impact acceptable. Offset mitigation may be required for high impact activities.

The following is deduced from the National Web-based Environmental Screening Tool Regulation 16(1)(v) of the Environmental Impact Assessment Regulations 2014, as amended (**Appendix B**):

- Animal Species Theme sensitivity is Medium for the proposed development area, due to two (2) medium sensitivity mammal species, and two (2) medium sensitivity avifaunal species likely to occur within the PAOI;
- Plant Species Theme sensitivity is Low for the proposed development area; and
- Terrestrial Biodiversity Theme sensitivity is Very High for the proposed development area, due to the PAOI overlapping with CBA 2, ESA 1, ESA 2, NPAES areas, and the endangered (EN) Marikana Thornveld (refer to **Figure 30** and **Figure 31**).

The allocated sensitivities for each of the relevant themes in the DFFE Screening Tool Report (**Appendix B**) are either disputed or validated for the overall Project Area of Influence (PAOI) in **Table 19** below. A summative explanation for each result is provided as relevant. The specialist-assigned sensitivity ratings are based largely on the Site Ecological Importance (SEI) process followed, and consideration is given to any observed or likely presence of SCC or protected species. A map illustrating the overall SEI allocations for the PAOI can be seen in **Figure 33**.

Table 19: Summary of the screening tool vs specialist assigned sensitivities (TBC, 2025).

Screening Tool Theme	Screening Tool	Habitat	Specialist	Tool Validated or Disputed by Specialist - Reasoning
Animal Theme	**Medium**	**N/A**	**Low**	Disputed – This habitat is disturbed and/or modified due to anthropogenic activities (particularly mining), edge effects, and the presence of alien and invasive species, however it can still provide ecosystem services in terms of foraging/grazing, nesting and movement corridors. Limited potential for SCC inhabitants, which were also not observed.
Plant Theme	**Low**	**N/A**	**Low**	Validated – This habitat is disturbed and/or modified due to anthropogenic activities (particularly mining), edge effects, and the presence of alien and invasive species. No SCCs observed and limited potential for their occurrence.
Terrestrial Theme	**Very High**	**Degraded Thornveld**	**Medium**	Disputed – Habitat has been exposed to various disturbances such as mining-related activities and AIP invasions; however, the habitat does still exhibit limited thornveld ecosystem characteristics expected of this ecosystem type and hosts some important ecological functioning for the area – albeit substantial ecosystem functionality is lost due to anthropogenic impacts. No SCC observed and unlikely to occur.
		Water Resources	**High**	Disputed – Habitat disturbed due to historic and current anthropogenic activities (including various mining-related activities and artificial damming) and has therefore lost some ecosystem functionality as well as habitat integrity. However, this habitat-type does still play a role in water provision to the surrounding area.

Screening Tool Theme	Screening Tool	Habitat	Specialist	Tool Validated or Disputed by Specialist - Reasoning
		Modified	**Very Low**	Disputed – These areas have been modified and have little to no natural vegetation left, resulting in a loss of ecosystem functionality

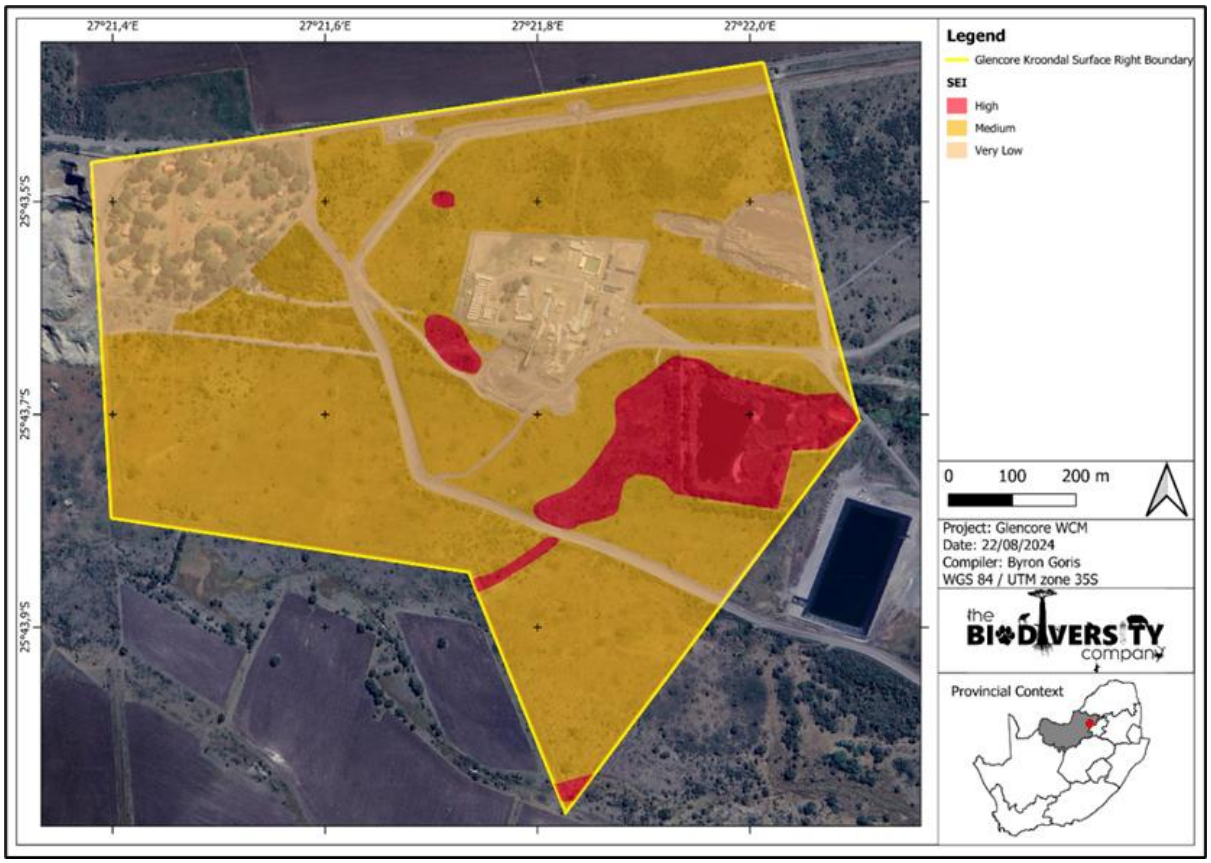


Figure 33: Map illustrating the site ecological importance for the PAOI (TBC, 2025).

8.2.2 WETLAND AND AQUATIC ECOLOGY

The datasets listed below were incorporated to establish the relation between the project and ecologically important or sensitive freshwater entities. Emphasis was placed around the following spatial datasets:

- South African Inventory of Inland Aquatic Ecosystems (SAIIAE), NBA 2018 Rivers and Wetlands (Van Deventer *et al*., 2019);
- National Freshwater Priority Areas, Rivers and Wetlands, 2011 (Nel *et al*., 2011);
- North West Biodiversity Sector Plan (READ, 2015) (refer to **Section 4.2.1**); and
- Strategic Water Source Areas, 2021 (refer to **Section 8.1.3**; Lötter & Le Maitre, 2021).

The South African Inventory of Inland Aquatic Ecosystems (SAIIAE) was established during the 2018 National Biodiversity Assessment (NBA), the SAIIAE is a collection of spatial data layers that represent the extent of river and inland wetland ecosystem types as well as the pressures on these systems. The same two headline indicators, and their associated categorisations, are applied as with the terrestrial ecosystem NBA, namely Ecosystem Threat Status and Ecosystem Protection Level. The Ecosystem Threat Status of river and wetland ecosystem types are based on the extent to which each ecosystem type had been altered from its natural

condition. One wetland type by means of the SAIIAE was identified within the southeastern PAOI. This wetland was identified as a depression (refer to the Wetland Assessment report **Appendix D**).

In an attempt to better conserve aquatic ecosystems, South Africa has categorised its inland aquatic systems according to set ecological criteria (i.e., ecosystem representation, water yield, connectivity, unique features, and threatened taxa) to identify Freshwater Ecosystem Priority Areas (FEPAs). The FEPAs are intended to be conservation support tools and it is envisioned that they will guide the effective implementation of measures to achieve the National Environment Management: Biodiversity Act's biodiversity conservation goals (Nel *et al*., 2011).

Two National Freshwater Ecosystem Priority Area (NFEPA) wetland types were identified within the PAOI, namely a channelled valley-bottom (CVB) and a unchanneled valley-bottom (UVB) wetland by means of the NFEPA dataset. From these two wetland types, one wetland is classified as a CVB while two wetlands are classified as UVB wetlands. In addition, only one wetland (CVB) is located within the proposed project site. The CVB wetland is classified to be a natural, non-priority wetland. The CVB was classified within the "C – Moderately Modified" condition which refers to systems with "25-75% of natural land cover remaining" category, as per the dataset. The UVB wetlands were classified to be artificial, non-priority wetlands. The artificial wetlands were classified with a condition within the "Z3 – Heavily to Critically Modified" range which refers to systems with "Less than 25% natural land cover remaining" (refer to the Wetland Assessment report **Appendix D**).

A small section of the proposed site traverses the Ecological Support Area 1 (**Figure 30**). In addition, the powerline route and proposed road traverses a small part of the Ecological Support Area 1. The remainder of the proposed infrastructure are situated outside of any of the North West Aquatic Biodiversity Sector Plan features.

According to the wetland specialist field survey, commonly encountered hydrophytes within wetland areas of the site included sedges, rushes, grasses and reed grasses (**Figure 34**). Some common genus encountered were Phragmites, Cyperus, Juncus, Imperata and Eragrostis.

Figure 34: Examples of the hydrophytic vegetation encountered within the Project Area of Influence. A) Hydrophytic grass, B, C & D) Hydrophytic rush and sedge.

8.2.2.1 WETLAND DELINEATION

Two wetland types, consisting of two hydrogeomorphic (HGM) units, have been identified in relation to the proposed project site and its respective PAOI. These two wetland types have been classified as; one depression (HGM 1) and one unchanneled valley-bottom (HGM 2). The wetland functional assessment has only been conducted for natural wetlands.

HGM 1 is located in the northwestern section of the proposed site and its respective PAOI and is traversed by the proposed site. HGM 2 is located on the border of the proposed site footprint before traversing the footprint in the south. HGM 2 has been previously impacted by crop fields as well as the development of impoundments within the HGM unit.

In addition to these two HGM units, several artificial watercourses were identified within the PAOI. These artificial watercourses include wetlands (depression, seep) and dams (collection dam, farm dam and pollution control dam). Apart from these features, one non-perennial drainage was identified within the PAOI (**Figure 35**).

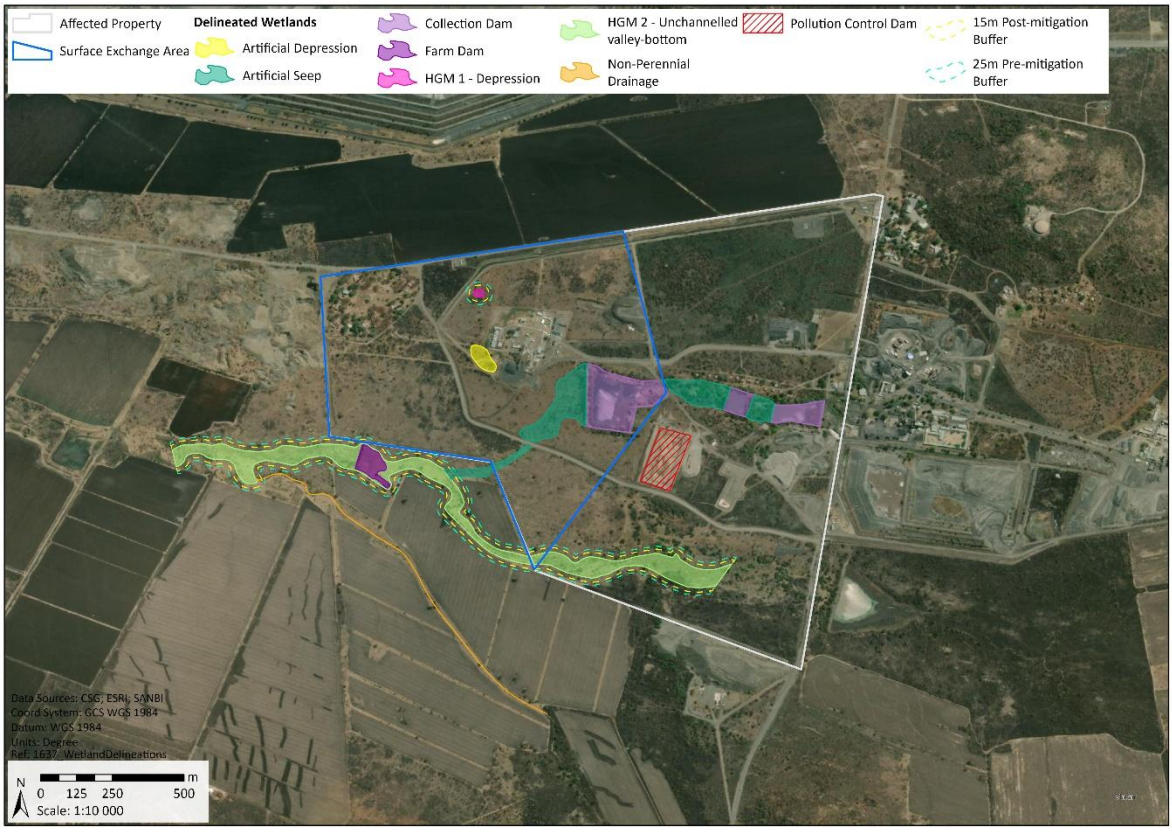


Figure 35: Delineation of wetland features within the Proposed Site and Project Area of Influence.

8.2.2.2 FUNCTIONAL AND ECOLOGICAL ASSESSMENT

The ecosystem services provided by the relevant wetland units on site were assessed and rated using the WET-EcoServices method (Kotze *et al*., 2009). Ecosystem services contributing to these scores include flood attenuation, stream flow regulation, nutrient and toxicant assimilation and the maintenance of biodiversity.

HGM 1 was scored within the “Low” ecosystem service score range. Some functions such as the assimilation of nutrients and toxicants, erosion control and streamflow regulation are supplied in a limited capacity attributed to the soil type in the area and relatively small size of the wetland. The wetland is expected to support biodiversity in a very limited capacity, particularly in the wetter months, attributed to the provisioning of water.

The unchanneled valley-bottom wetland naturally has a higher benefit provision than the depression due to the wetlands size and its connectivity (or potential) with other wetlands located downstream. The wetland has therefore been scored within the “Intermediate” ecosystem service score range. Flood attenuation is supported

due to the topography of the wetland and the presence of dams within the wetlands path which increases its storage limits. Furthermore, valley-bottoms usually host more robust vegetation due to frequent saturation from surrounding hillslopes which enhances their ability to provide water quality benefits. The wetland also serves an ecological corridor and therefore makes a notable contribution to the maintenance of biodiversity in an overall disturbed landscape.

The potential for all wetlands to be used for tourism and recreation is unlikely. Furthermore, the direct benefits such as the provisioning of harvestable resources and cultivated foods is also unlikely due to the type of vegetation present. The provisioning of water by HGM 2 is likely, given that the wetland does have dams within its path which support the storage of water and the use thereof by people. The use of the wetlands for cultural benefits and education and research is not supported.

8.2.2.3 PRESENT ECOLOGICAL STATE

The wetlands have exhibited some degree of modification, greater for HGM 2 than HGM 1, resulting from natural physical changes as well as anthropogenically induced impacts at both the local and catchment level. Resultingly, the wetlands have scored an average Present Ecological State (PES) score within the "C – Moderately Modified" and "D – Largely Modified" PES classes. The results of the wetland health and integrity assessment is provided in **Table 20**.

The delineated wetlands were not identified through the use of the available and relevant national wetland datasets. Therefore, changes from their original state were assessed through examining historical imagery to indicate changes in land use and consequently changes to the functioning of the wetland from its assumed natural state.

HGM 1 has exhibited some change to its natural hydrology due to alterations of the surrounding landscape which is considered to be the wetlands catchment. Changes to the hydrological patterns of the wetland are assumed to have resulted in the vegetation composition of the wetland being limited to fewer sedge and rush species. The geomorphic structure of the wetland is not perceived to have been altered significantly as no physical earth-moving changes within the wetland were evident and no erosional surfaces were noted in the immediate surrounds of the wetland.

HGM 2 has been subject to more disturbance than HGM 1 as the wetland contains geomorphic structural changes from impoundments and is presently intersected by roads. The impoundments and road crossing points have resulted in changes to the hydrology of the system by limiting natural flows and creating concentrated flows during wet seasons. The wetlands catchment is dominated by agricultural use which is assumed to have resulted in the loss of wetland vegetation in some approaches and, which play a role in changing the flow and sediment dynamics of the system. Since disturbance has occurred in the catchment and on the periphery of the wetland, the removal of natural vegetation has created opportunity for the proliferation of alien vegetation such as *Bidens Pilosa*, *Cirsium vulgare* and *Verbena bonariensis*. Furthermore, changes to the hydrology of the wetland have resulted in favourable conditions for sedges, rushes and grasses as opposed to reeds and reed grasses which are usually prevalent in valley-bottom wetlands.

Table 20: Summary of the scores for the wetland PES.

	Area (ha)	Hydrology		Geomorphology		Vegetation	
		Rating	**Score**	**Rating**	**Score**	**Rating**	**Score**
HGM 1	0.07	C: Moderately Modified	2.5	B: Largely Natural	1.4	C: Moderately Modified	2.3
	Overall PES	**2.1**		**Overall PES Class**		**C: Moderately Modified**	
HGM 2	12.29	D: Largely Modified	4.3	D: Largely Modified	3.1	D: Largely Modified	5.7
	Overall PES	**4.3**		**Overall PES Class**		**D: Largely Modified**	

8.2.2.4 SITE ECOLOGICAL IMPORTANCE AND SENSITIVITY

The Ecological Importance and Sensitivity (EIS) assessment was applied to the HGM units in conjunction with the ecosystem service scores in the preceding sections, to assess the levels of sensitivity and ecological importance of the wetland. Various components are considered for the EIS, including the overlap with Strategic Water Source Areas (SWSA), the NFEPA and NBA 2018 wetland type threat and the protection status and, the wetlands condition as displayed in **Table 21**. It should be noted that the delineated wetlands were not identified by the NBA 2018 dataset, hence the protection and threat status of the nearest wetlands of the same type within the catchment were used as a baseline for the assessment. The average EIS ratings were calculated to be "Low" for HGM 1 and "High" for HGM 2.

Table 21: Aspects considered in the Ecological Importance and Sensitivity assessment.

HGM Type	NFEPA Wet Type			NBA Wetlands			SWSA	CBA/ESA	EIS
	Type	**Ecosystem Threat Status**	**Ecosystem Protection Level**	**Wetland Condition**	**Ecosystem Threat Status 2018**	**Ecosystem Protection Level**	**(Y/N)**	**(Y/N)**	**Rating**
Depression (HGM 1)	Central Bushveld Group 2	Least Threatened	Poorly Protected	C Moderately Modified (Field Visit)	Least Concern	Poorly Protected	Y	N	D - Low
Unchanneled Valley-Bottom (HGM 2)		Vulnerable	Moderately Protected	D Largely Modified (Field Visit)	Critically Endangered	Not Protected	Y	Y	B - High

The allocated sensitivities for each of the relevant themes are either disputed or validated for the assessed areas in **Table 22** below. A summative explanation for each result is provided as relevant. It should be noted that the National Web-based Environmental Screening Tool allocates sensitivities to freshwater resources identified through the available national freshwater datasets based on their presence (very high) or absence (low) (**Appendix B**). The specialist-assigned sensitivity ratings presented herein for the natural and assessed wetlands have considered the PES and EIS assessment processes followed in the previous section, and consideration has been given to any observed or likely presence of sensitive fauna and flora. A map highlighting the Freshwater Sensitivity for the PAOI is depicted in **Figure 36**.

Table 22: Summary of the screening tool vs specialist assigned sensitivities.

Features	Screening Tool Theme	Environmental Screening Tool Sensitivity	Specialist Sensitivity	Tool Validated or Disputed by Specialist - Reasoning
HGM 1 (Depression)	Aquatic Biodiversity Theme	Low	Low	Screening Tool Sensitivity Validated – The wetland system has experienced moderate impacts from natural processes and anthropogenic sources. The wetland is perceived to be seasonal as no surface water was observed. Wetland vegetation within the system was present but was dominated by only a few species. The wetland presently has low service provision and a low EIS rating. The wetland has therefore been assigned a 'Low' sensitivity rating.
HGM 2 (UVB)	Aquatic Biodiversity Theme	Very High	Very High	Screening Tool Sensitivity Validated – This wetland system has experienced historical impact related to agriculture (crop fields) and impoundments. Even though largely modified the wetland still has functionality and this has contributed towards determining the sensitivity rating. The wetland has therefore been assigned a 'Very High' sensitivity rating.
Non-perennial Drainage	Aquatic Biodiversity Theme	Low	Moderate	Screening Tool Sensitivity Disputed – This watercourse has experienced historical impact related to agriculture (crop fields). The connectivity of the feature to downstream watercourses increases its importance in maintaining the hydrological functioning of these systems and provides a corridor to the larger watercourse. This has contributed towards determining the sensitivity rating. The watercourse has therefore been assigned a 'Moderate' sensitivity rating.
Farm Dam	Aquatic Biodiversity Theme	Low	Very High	Screening Tool Sensitivity Disputed – This is an instream feature and will adopt the sensitivity of the watercourse it occurs within and has therefore been assigned a 'Very High' sensitivity rating.

Features	Screening Tool Theme	Environmental Screening Tool Sensitivity	Specialist Sensitivity	Tool Validated or Disputed by Specialist - Reasoning
Artificial watercourses (Artificial seep and Collection Dam)	Aquatic Biodiversity Theme	Very High	Moderate	Screening Tool Sensitivity Disputed – These watercourses are artificial, and no functional assessments have been included for them. However, the wetlands are perceived to have some functionality as wetland vegetation was present and, seasonal saturation of the seeps is likely. The assigned sensitivity considers that the artificial features were identified through the North West Biodiversity Sector Plan as being an ecological corridor. The wetlands have been assigned a 'Moderate' sensitivity rating.
Artificial watercourses (PCD & Artificial depression)	Aquatic Biodiversity Theme	Low	Low	Screening Tool Sensitivity Validated – These watercourses are artificial, and no functional assessments have been included for them. The hydrological components of the depression are dependent on human intervention (stormwater runoff) and wetland conditions would cease without this intervention. The wetlands do have some functionality as wetland vegetation was present. The wetlands have been assigned a 'Low' sensitivity rating.
Remaining Area	Aquatic Biodiversity Theme	Low	Low	Screening Tool Sensitivity Validated – Much of the area has been historically modified through agricultural and mining activity. The proposed activities are not anticipated to significantly modify the hydrological characteristics of the entire area; therefore a 'Low' sensitivity has been assigned for these areas in relation to freshwater biodiversity.

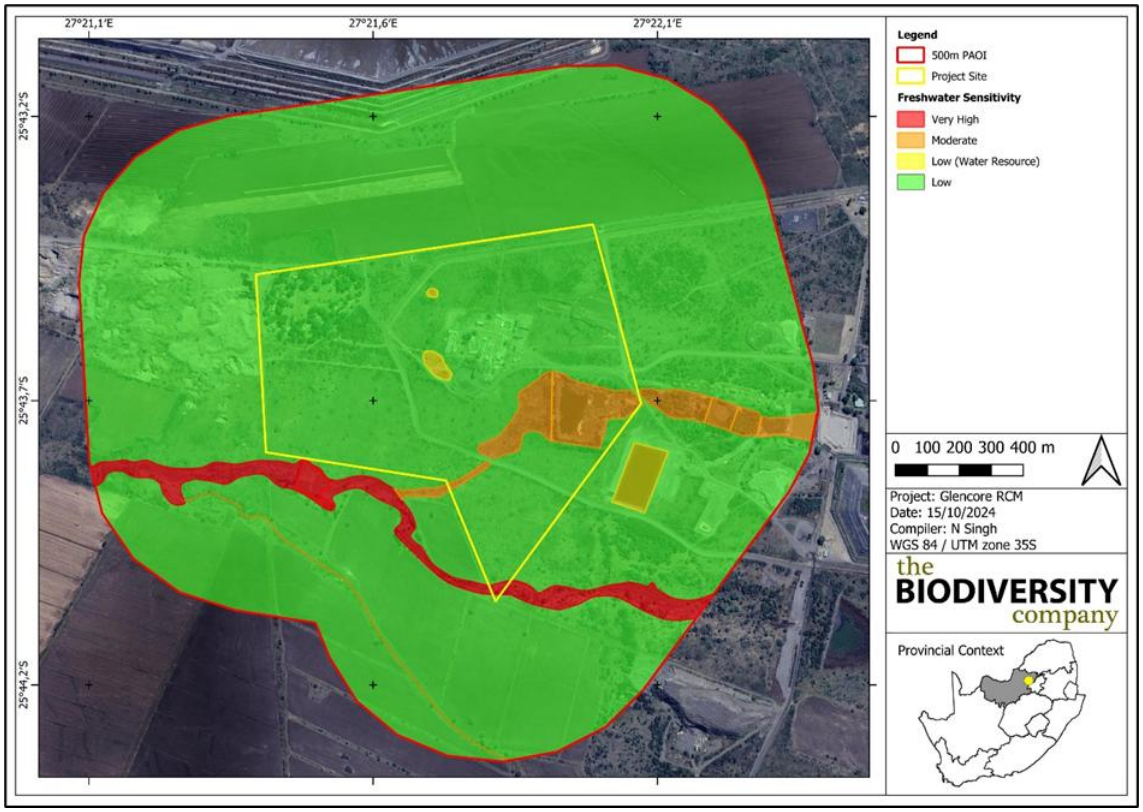


Figure 36: Freshwater Sensitivity Map for the project area of interest

8.2.2.5 BUFFER REQUIREMENTS

The buffer requirements for the wetlands were calculated using the Site-Based Tool: Determination of buffer zone requirements for wetland ecosystems (Macfarlane *et al*., 2014). The soil type and topography within the wetland and the catchment was considered in this assessment and contributed to the calculated buffer widths.

The recommended buffer zones for construction and operation are 25m (pre-mitigation) and 15m (post-mitigation), and are represented in **Figure 35**.

The following infrastructure components are noted to occur within the delineated wetlands:

- Salvage Yard and fence – within artificial depression; and
- Fence and road – within 10 m of artificial seep.

The construction of the above-mentioned infrastructure within the watercourses is deemed acceptable given the artificial nature of the watercourses. The artificial depression will be modified by the development of the salvage yard however, this is not anticipated to result in a significant loss to freshwater biodiversity as the wetland is isolated and dependent on stormwater runoff which has created the ideal conditions for wetland vegetation to establish. The activities in proximity to the artificial seep are deemed acceptable as the potential impacts can largely be mitigated against.

It is however advised that any disturbance to the systems be remedied through post-construction rehabilitation of the watercourses which aims to remove alien vegetation, revegetate disturbed and denuded areas within the watercourse and improve the hydrological functioning of the system in terms of the artificial seep.

8.2.3 ALIEN INVASIVE SPECIES

Alien and Invasive Plants (AIPs) have an average density of <5% over the entire Bojanala Platinum District Municipality and are not considered to be an overall issue within the District Municipality. However, the local municipalities such as Rustenburg, Madibeng and Kgetlengrivier Local Municipalities experience greater issues with AIP densities greater than 5% and exceeding 20%. Invasions of AIPs within these areas are likely associated

with grasslands, as well as broken terrain in river systems, valleys and ridges. Invasions by alien plants have significant impacts on the economy due to loss of agricultural productivity and the cost involved for AIP management, as well as harmful impacts on ecosystem services and biodiversity (BPDM EMF: Status Quo report (Final Rev13), 2018).

The Terrestrial Biodiversity Assessment report highlighted that high numbers of AIP species and naturalised exotics are present throughout the site.

NEMBA Category 1b Listed Invasive Species are those species listed as such by notice in terms of section 70(1)(a) of the Act as species which must be controlled. NEMBA Category 1b AIPs noted on site include:

- *Opuntia ficus-indica* (sweet prickly pear)
- *Cereus jamacaru* (Queen-of-the-night)

Unmitigated, concerns of alien invasive species establishment are evident. The spread of alien invasive species will result in the loss of habitat and water for indigenous fauna and flora. It can also contribute to the spreading of potentially dangerous diseases due to invasive - and pest species. Overall, the fauna assemblage will be changed. Activities that will contribute to this impact include:

- Vegetation removal and disturbance of soil;
- Vehicles potentially spreading seed;
- Unsanitary conditions surrounding infrastructure promoting the establishment of alien and/or invasive; and
- Eating area increasing pest species such as rats and flies.

The cumulative impact of would include loss of habitat for indigenous species and the spread of disease to surrounding areas. While irreplaceable loss of resources such as CBA 2, ESA 1, ESA 2, NPAES habitat (limited to the delineated Degraded Thornveld Habitat) would be possible.

Alien invasive vegetation is particularly opportunistic and has the potential to spread rapidly, especially in disturbed settings. These plants outcompete the natural vegetation and in turn alter the abiotic and biotic components of ecosystems. The control of such species is considered imperative in consideration of the proposed development and in maintaining the ecological integrity and functioning of such systems.

8.3 SOCIAL AND CULTURAL ENVIRONMENT

The proposed site is located in Ward 32 and Ward 35, and directly adjacent to Ward 33 of the Rustenburg Local Municipality (RLM) which falls under the Bojanala Platinum District Municipality (BPDM) of the North West Province.

8.3.1 BOJANALA PLATINUM DISTRICT MUNICIPALITY

The Bojanala Platinum District Municipality forms one of the four District Municipalities of the North West Province, and covers an area of approximately 18 300km^2. The neighbouring municipalities include Waterberg District Municipality in Limpopo, the West Rand District and Tshwane Metropolitan Municipalities in Gauteng, as well as the Ngaka Molema and Dr. Kenneth Kaunda District Municipalities of the North West Province. Five Local Municipalities fall within the BPDM including Madibeng, Rustenburg, Kgetlengrivier and Moses Kotane Local Municipalities. The seat of the BPDM is the city of Rustenburg in the Rustenburg Local Municipality. Due to the BPDM's rich source of mining minerals, especially the platinum group metals, mining is a large contributor to the BPDM's economy, as well as other industries such as agriculture and tourism.

8.3.2 RUSTENBURG LOCAL MUNICIPALITY

The Rustenburg Local Municipality (RLM) covers an area of 3 423km^2 within the Bojanala Platinum District Municipality. The Royal Bafokeng Nation is the traditional tribal community of the northern region of the RLM and covers an area of 1 500km^2. Rustenburg is situated approximately 120km from Johannesburg and Thswane,

linked by the R24 and the N4 Freeway. Most of the BPDM's platinum mining activities are located in the RLM, mainly within the 'N4 Platinum Development Corridor' that runs from the east of the RLM to the west. The platinum mining belt extends along the northern region of the Magalies Mountain range, from the Pilanesburg area to the City of Tshwane. The urban settlement pattern has been largely controlled by the Platinum mines and a number of informal settlements have been established in this mining region. Rural villages and small towns (mostly under traditional leadership) are located in more northern regions of the municipality (RLM IDP Review 2024/2025, 2024). Settlements such as Tlaseng, Thekwane, Photsaneng, Luka, Phokeng, Chaneng, and Rankelenyane fall under the Bafokeng tribal land (RLM IDP Review 2024/2025, 2024).

8.3.3 LAND-USE

The predominant land use observed on site is mining related activities. The proposed site is an existing mine (Clover Alloys RCM). Surrounding land uses observed on site were agricultural crops, cattle grazing, and Tailings Storage Facilities (TSFs). The areas extending along the N4 between the eastern part of the RLM and Kroondal are predominantly commercial agricultural areas. Irrigated agriculture in the RLM is mainly located in the southeastern region of the RLM and the regions southwest and south of Kroondal, whereas cultivated small holdings are more towards the centre of the RLM and around central Kroondal (RLM IDP Review 2024/2025, 2024).

68% of settlements in Rustenburg Local Municipality are in Urban areas, while 30% are in Tribal or Traditional areas, with 2% being farm areas (Stats SA, 2011).

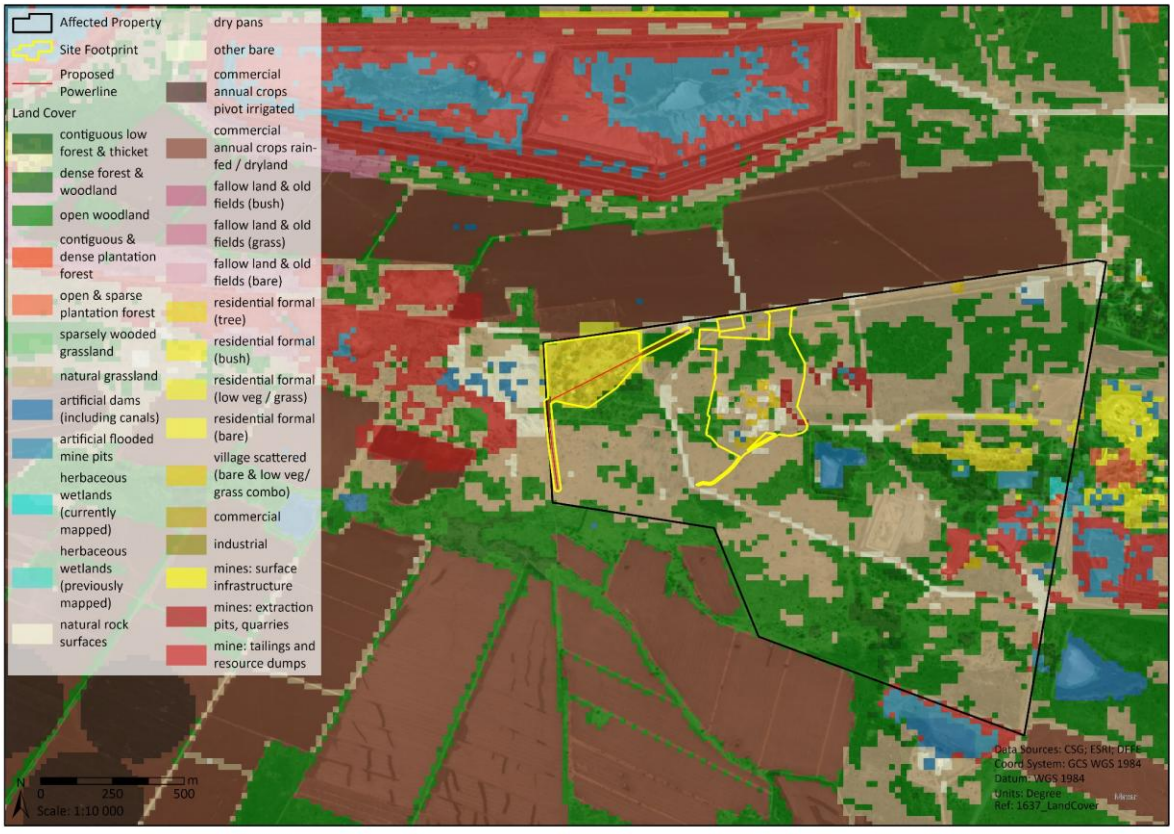


Figure 37: Land Use / Land Cover Map.

8.3.4 DEMOGRAPHICS

North West has a growing population of 3 804 547. Rustenburg Local Municipality has the highest population density in the North West with a population of 562 315. The working age population (aged between 15 and 64 years old) comprises 71.3% of the population in RLM (Stats SA, 2022).

The most common language spoken in the North West is Setswana (72.8%) followed by Sesotho (5.9%) and Afrikaans (5.2%) (Stats SA, 2022)

Table 23: Population growth rate estimates (sources: Census 2011, Census 2022)

Area	Population (2011)	Population (2022)	Population Growth (% p.a.)
North West Province	3 509 953	3 804 547	0.8
Bojanala Platinum District Municipality	1 507 505	1 624 428	0.7
Rustenburg Local Municipality	549 575	562 315	0.2

8.3.5 ECONOMY

The mining sector is generally the main contributor to economic growth in the North West Province. **Figure 38** represents the Gross Value Added (GVA) by Broad Economic Sector for the year 2021 as per the BPDM 2024/2025 Reviewed IDP. The GVA is an indicator of the sectors' contribution to the overall economy. The mining sector in 2021 contributed the most to the economies for the North West, the BPDM and RLM.

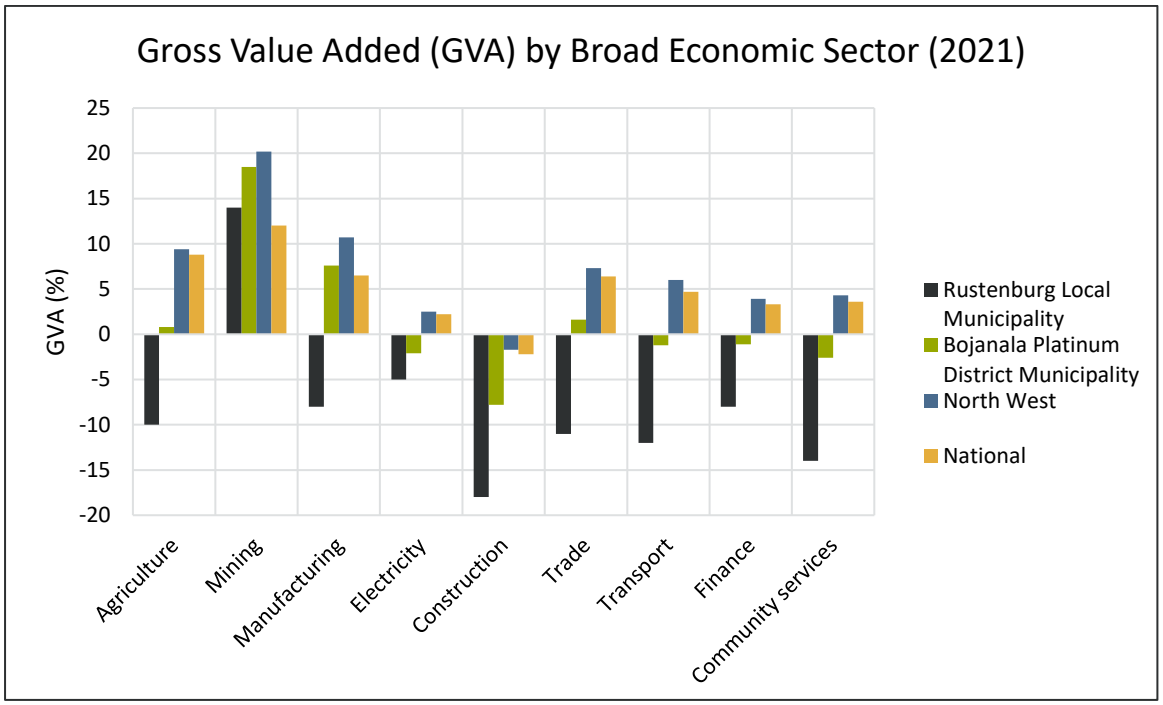


Figure 38: Gross Value Added (GVA) by Broad Economic Sector for the year 2021 (*Data source*: BPDM - 2024/2025 Reviewed IDP, p. 41 - 42)

The Rustenburg Local Municipality contributed 36.30% towards the Bojanala Platinum District Municipality's Gross Domestic Product (GDP) (R158 billion) in 2020 and is forecasted to have an annual GDP growth rate of 3.68% from 2020 to 2025. The GDP of RLM experienced an increase from R38.2 billion in 2010 to R57.3 billion in 2020. The Rustenburg Local Municipality's economy is heavily reliant on the mining sector which contributed to 80.5% (R43.7 billion) of the total Gross Value Added (GVA) of the RLM in 2020, this was followed by the finance (6.2%) and community services (5.0%) sectors. The lowest contributor to the RLM GVA was the agricultural sector (below 1%) in 2020 (RLM IDP Review 2024/2025, 2024).

Key contributors to the inhibition of economic development in the Bojanala Platinum District Municipality include factors such as high rates of unemployment and poverty, social inequality (mainly amongst women,

youth and people with disability), limited integration between stakeholders, poor roads infrastructure, shortages of energy and water, among others (BPDM - 2024/2025 Reviewed IDP).

8.3.6 EMPLOYMENT

Rustenburg Local Municipality has shown an increasing trend in unemployment with an unemployment rate of 56.6% recorded for 2021 (BPDM - 2024/2025 Reviewed IDP). Unemployment of the economically active youth population (142,219) was calculated to be at a rate of 34.7% (Stats SA, 2011). In 2020, it was estimated that 12.95% of households in the RLM received an annual income of R30 000 or less (RLM IDP Review 2024/2025, 2024). According to the RLM IDP Review 2024/2025 (2024), 49.1% of the Rustenburg Local Municipality's population is living in poverty.

A key challenge that is experienced by the RLM is that the main economic contributor is the mining sector, leading to a lack of diversity in the economic space, thereby limiting alternative job opportunities (RLM IDP Review 2024/2025, 2024).

8.3.7 INFRASTRUCTURE AND PUBLIC SERVICES

The Rustenburg Local Municipality is currently facing challenges with housing and development of settlements, according to the RLM IDP Review 2024/2025 (2024), there are approximately 400 000 families in Rustenburg that do not have adequate shelter. Of the total 203,658 households in the RLM, 53% of households have access to piped water, and 94.5% of households have access to electricity for lighting (Stats SA, 2022). Local authorities remove refuse from 75.6% of households at least once a week, and 1.6% of households less frequently. 72.8% of households have access to flushing toilets which is followed by 24% of households making use of pit toilets (Stats SA, 2022).

8.3.8 EDUCATION

According to Census 2022, over 31% of the population aged between 5 and 24 years old in the RLM did not attend an educational institution. 3.9% of the population over the age of 20 did not receive schooling, while 42.1% received a matric (Stats SA, 2022).

8.3.9 HERITAGE

A Heritage Impact Assessment was undertaken by Dr Lucien James (Environmental Impact Management Services (Pty) Ltd) (**Appendix D**).

8.3.9.1 **SITE SPECIFIC BACKGROUND**

The North West Province is associated with a long archaeological record that spans across pre-colonial and colonial periods. Most notable is the area's significance during the South African War (1899-1902). The closest town to the site in question being Kroondal, is specifically important in this regard.

8.3.9.1.1 IRON AGE STONE WALLED STRUCTURES

Firstly, Kroondal 304JQ (all portions included), that is the property with which the settlement shares a name, has been associated with Bafokeng or Batswana stone walled structures (Pistorius, 1999). The structures have been studied extensively with three main sites identified. These have been named KRO001, KRO002, and KRO003 respectively, with KRO002 being the subject of mapping and excavations. **Figure 39** provides an illustrated understanding of the present-day context of these sites. It is important to note that over the years, the three sites have been extensively disturbed by surrounding mining activity, however, much of these structures are still intact. Notably, these sites are now located adjacent to a Tailings Storage Facility. Given their distance from the project area in question, no further investigation or assessment of these structures was undertaken.

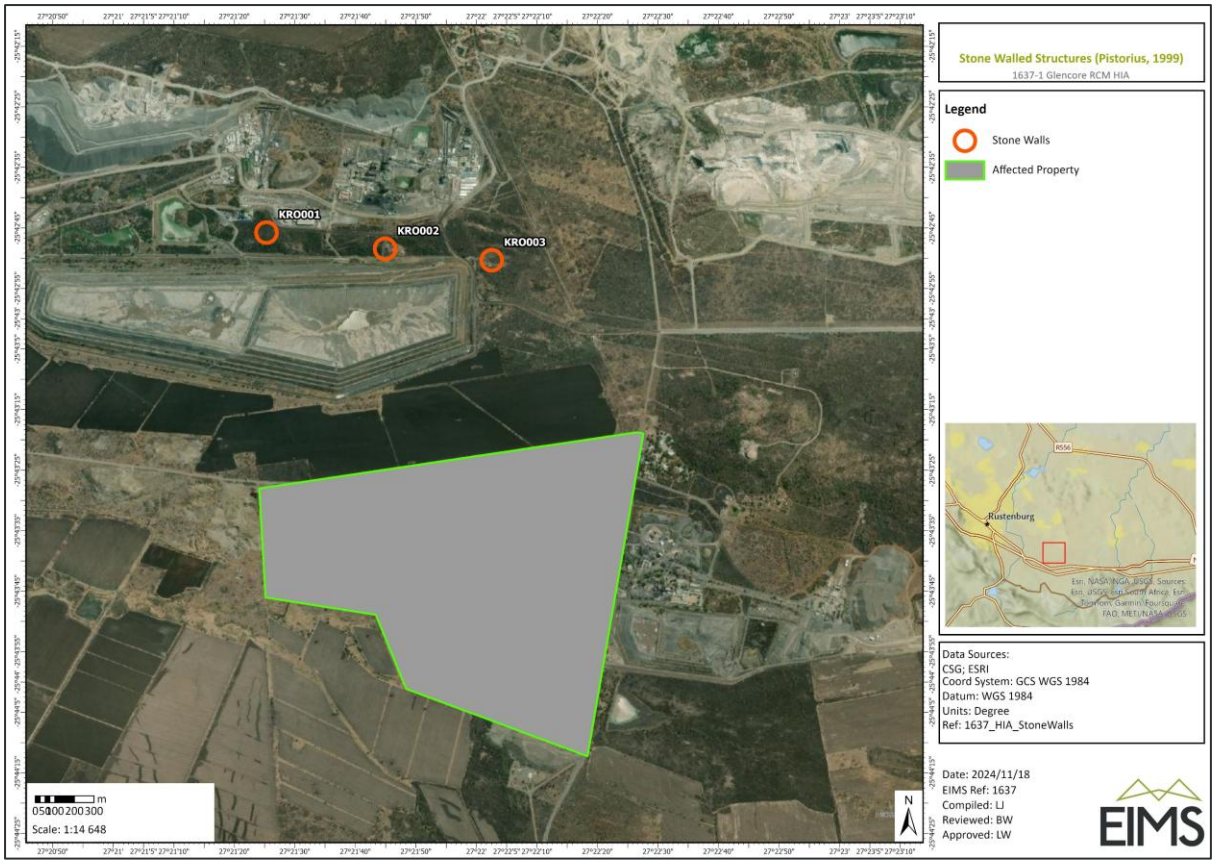


Figure 39: Stone walled structures identified by Pistorius (1999) on Farm Kroondal 304JQ. Location and integrity of the sites was not confirmed during this assessment.

Although no further assessment was undertaken as part of the desktop assessment, the research done on these structures was of interest to contextualise the heritage significance of the greater area. KRO002 was of particular interest in Pistorius's (1999) study, with a large section (KRO002.1) of the structure having been mapped and excavated. The structure is an example of more complex stone walled structures, which would have included multiple huts, cattle kraals, and courtyard areas. **Figure 40** is a map of the structure itself.

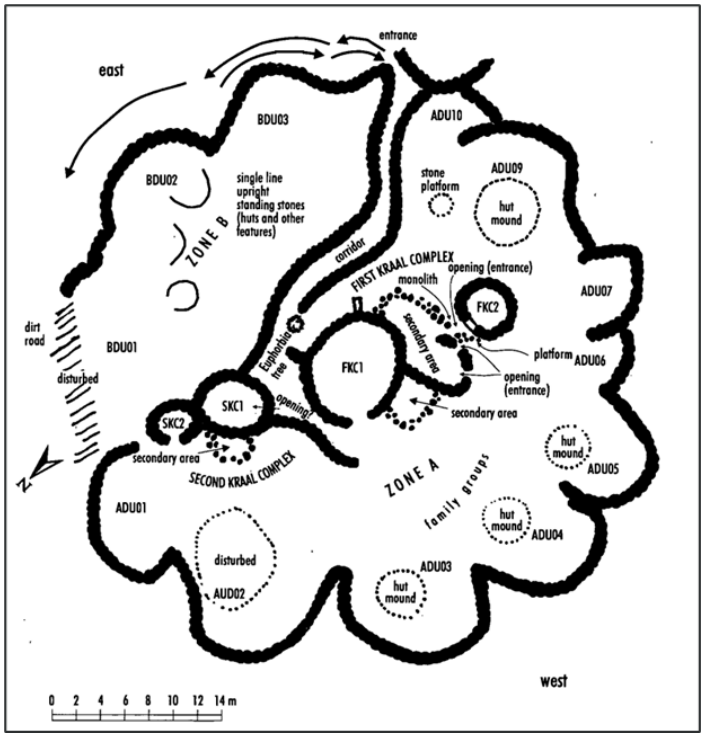


Figure 40: Mapped layout of KRO002.1, a section of KRO002. Layout includes different sections of the stone walled complex. (After Pistorius (1999)).

8.3.9.1.2 CULTURAL HERITAGE OF KROONDAL

Kroondal, the closest town to the study site, is associated with a unique cultural heritage background. Dating back to the late 1800s, Kroondal was founded by German missionaries (the Hermannsburg Mission) (Melck, 2012). Kroondal continued to develop during the 1800s, remaining exclusively German until and even throughout the South African War. Many of Kroondal's inhabitants participated in the war, and this had repercussions on the cultural integrity of the town, which at a point during the war was almost deserted or abandoned. However, the town remained and still is to this day, a rare representation of German culture in South Africa.

Key landmarks and tangible representations can be observed through the architecture of the town. The Kroondal Church, having been constructed in 1896, is a key feature and testimony of the town's German heritage. The integrity of the church has been preserved despite its age as a monument and symbol of Kroondal's German cultural heritage. The building is still in use with many German-speaking residents of the town continuing to attend religious events held at the church.

8.3.9.1.3 BATTLE SITES OF THE SOUTH AFRICAN WAR (1899-1902)

As previously noted, the overall area's heritage significance is mainly related to the events of the South African War. The Magaliesberg was a strategic battleground during the war as the mountain range stretches between Pretoria and Rustenburg. The mountain range's rugged terrain provided several benefits during combat such as natural barriers and locations from which surprise attacks could be launched. Surrounding towns and settlements were often involved with the conflicts that took place around this area. However, the most notable heritage features of this area related to the South African War are the battle sites. While none of these battle sites are located near the site in question, it is important to highlight the closest of these heritage markers.

The closest battle site related to the battle of Olifantsnek, is approximately 15km away from the study site. The battle itself was a key conflict related to British movement and occupation of major towns such as Pretoria and Rustenburg. Olifantsnek was a strategic pass between Pretoria and Rustenburg during the war. The Olifantsnek Dam has been since constructed in the area.

8.3.9.2 **FIELD ASSESSMENT RESULTS**

The appointed Archaeologist surveyed the various areas which fall within the proposed development footprint. The survey covered areas to be potentially disturbed by construction activities, as well as the intended laydown area. The field survey was conducted on two separate days during Winter and Spring.

The area proposed for development is highly disturbed. In this regard, it was noted that most of the area surrounding the current infrastructure includes paths and roads, with much of the area being regularly cleared. Further, evidence suggests that the area has also been used for the deposition of rocks and stones originating from the mine workings. As for most of the development footprint, the proposed infrastructure lies either in proximity to disturbed areas, in areas that have been disturbed in the recent past by the activities of Rustenburg Chrome Mines.

In relation to the laydown area, the site and all associated buildings such as existing houses have since been abandoned. Evidence was gathered suggesting that the area has been utilised for different purposes until as recently as 2019. After consulting with representatives on site, it was stated that the area was previously used by the LanXess mining operations. In the recent past, all the existing houses and buildings have been stripped of all asbestos, leaving only the skeletal structures of most of the buildings still on site. These buildings are of no heritage significance.

Although the site has been highly disturbed by the activities of the operations in the area, some archaeological finds were made during the field survey. These included the identification of historical structures, LSA lithic pieces, as well as a fragment of Iron Age pottery.

8.3.9.2.1 STONE AGE FINDS

Three individual LSA lithic pieces were identified during the field survey. This included a core, a shaped flake, and one formal tool. The below described single finds have been rated as Grade IV C. Following the EIMS Sensitivity Mapping and Environmental Impact Assessment Guide, the finds were rated as Low, that is, the proposed development will not have a significant effect on the inherent features status and sensitivity. This is mainly because the finds have already been displaced and affected by agricultural and mining activities of the area.

The LSA findings are summarized as follows:

- The LSA core included evidence of at least two flake removals as photographed in **Figure 41 (A)**. The core itself measured no more than 5 cm.
- A shaped flake including evidence of at least two removals on the dorsal surface was identified during the survey. As photographed in **Figure 41 (B)**, the flake had been exposed to dust from the operations and surrounding waste rock. Although the piece includes evidence of shaping, its condition has been heavily affected.
- The final LSA piece identified was a large LSA scraper (**Figure 41 (C)**). The piece was between 4-5 cm in size, with the distal end including removals and retouch defining the scraping edge. Most of the retouch was noted on the left edge of the tool (**Figure 41 (D)**).

A) LSA Core identified. One of the flake removals can be seen to the bottom right side of the core.

B) A shaped flake identified during the field survey. The flake had been exposed to dust of the surrounding activities and deposited waste rock.

C) A large LSA scraper identified during the field survey.

D) Photograph taken of the left edge of the scraper including evidence of retouch.

Figure 41: Photographs of the Stone Age Finds found on site.

8.3.9.2.2 IRON AGE FINDS

An Iron Age potsherd was identified during the survey. The potsherd was a piece of the lip of a vessel. The piece was a fragment of the lip exclusively, with no sign of decoration. The piece was very small, less than 2 cm in size (**Figure 42**). The piece was about 9 mm thick, indicating the overall thickness of the lip of the vessel itself. While the piece provided little information as to the decoration of the vessel it came from, it had signs of interior colouring. The piece also suggested that the vessel itself had a rounded lip (**Figure 43**). This single Iron Age find has been rated as Grade IV C. Following the EIMS Sensitivity Mapping and Environmental Impact Assessment Guide, the find was rated as Low, that is, the proposed development will not have a significant effect on the inherent features status and sensitivity. This is mainly because the find has already been displaced and affected by agricultural and mining activities of the area. Further, because the piece did not include any identifiable details such as motifs or decoration, it would not have been possible to associate it with any specific ceramic style or categorisation.

Figure 42: Photograph of the potsherd identified during the field survey. Photograph taken of the interior section of the potsherd including signs of a red colouring.

Figure 43: Photograph of the profile of the potsherd. Note the rounded lip highlighted.

8.3.9.2.3 HISTORICAL STRUCTURES

Historical structures forming one historical site were identified to the south of the proposed activities, mainly in proximity to the proposed powerline tie-in location. The structures included an enclosed farm dam with connected storage buildings (**Figure 44**), and a two-roomed building (**Figure 45**). Upon inspection on site, these buildings have been highly disturbed and damaged. Items such as stripped wiring of nearby power cables indicate that the buildings are presently frequently used or visited. Some signs also suggest that the buildings were only abandoned recently, for example, the inner walls of the two-roomed building have multiple layers of paint on them.

Figure 44: The enclosed farm dam and associated storage rooms of the historical structure complex.

Figure 45: Two-roomed building part of the historical structure complex.

Background research was done on these structures, and it was concluded that the buildings are older than 60 years as they appear on the 1955 aerial photographs. It is suggested that the structure is of heritage significance. The site itself is approximately 70m from the proposed activities in relation to the powerline tie-in. Therefore, it is expected that the project and associated activities will not have any impact on this site. The site has been rated as Grade III A and has been allocated the identifier GCK001 for the sake of this report. This suggests that the developer must be cognisant of the site, however, should the activities take place as proposed, the site will not be impacted, and no mitigation will be necessary. Following the EIMS Sensitivity Mapping and Environmental Impact Assessment Guide, the site itself was rated as Least Concern, that is, the proposed development will not have a significant effect on the inherent features status and sensitivity. It is important to note that this rating was allocated on the basis that the site is not to be affected by the activities proposed. Should activities proposed intersect with the site and or the 30-meter buffer, the site will be rated as Medium.

8.3.9.2.4 HISTORICAL PERIOD FINDS

Although no historical finds were noted during the survey, a fragment of what appeared to be a broken ceramic plate was found (**Figure 46**), as well as a metal plate which appeared to be a borehole cap or cover (**Figure 47**). Upon further analysis, the ceramic fragment was associated with broken powerline insulators spread around the site as part of waste in the area. These finds indicated activity in the area in the recent past, potentially related to the operations of Rustenburg Chrome Mines. These finds have no heritage significance.

Figure 46: A fragment of a broken ceramic powerline insulator.

Figure 47: Borehole cap or cover identified during the field survey.

8.3.9.2.5 SUMMARY OF FINDINGS

Altogether, four individual finds and one key site were identified during the field survey. A 30-meter buffer as prescribed by SAHRA was drawn around the site (GCK001). Although not affected by the proposed activities, GCK001 and the associated buffer was included in the mapping of the various finds. **Figure 48** presents a visual summary of the different findings and their location.

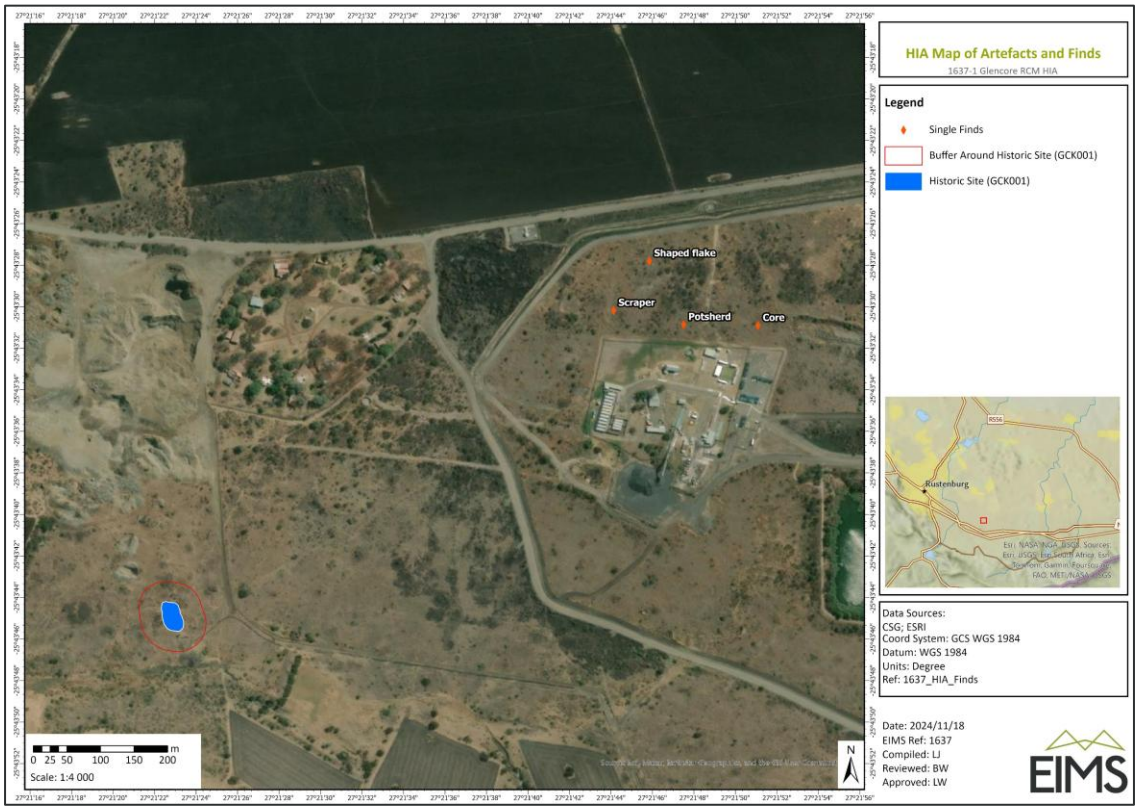


Figure 48: Map of heritage finds across the study site

8.3.10 PALAEONTOLOGY

A Palaeontological Desktop Study was undertaken by Elize Butler (Banzai Environmental (Pty) Ltd) (**Appendix D**).

The proposed site is underlain by Mathlagame Norite-Anorthosite and Bronzitite, Harzburgite and Norite of the Rustenburg Layered Suite (Bushveld Complex). Updated Geology (Council of Geosciences) refined the geological map and indicate that the proposed development is underlain by the Schilpadnest and Vlakfontein Subsuite (Rustenburg Layered Subsuite of the Bushveld Complex) (refer to **Section 8.1.2**).

According to the PalaeoMap of the South African Heritage Resources Information System (SAHRIS) the Palaeontological Sensitivity of the Rustenburg Layered Suite (Bushveld Complex) is Zero (Almond and Pether, 2009; Almond *et al*., 2013, Groenewald *et al* 2014) (**Figure 49**). The suggested location is classified as having a Medium Palaeontology Theme Sensitivity in the DFFE Screening Report (**Appendix B**). These sensitivities indicated that a site verification would not be necessary to ascertain the Palaeontological Sensitivity of the proposed site, therefore, a Desktop Assessment was conducted (**Appendix D**).

The desktop assessment indicates that the Bushveld Complex is unfossiliferous due to its igneous origin and concluded that fossil heritage of scientific and conservational interest in the development area is rare, therefore, a low significance was assigned to the development footprint. This is in agreement with the Zero Palaeontological Sensitivity allocated to the development area by the SAHRIS Palaeontological Sensitivity Map.

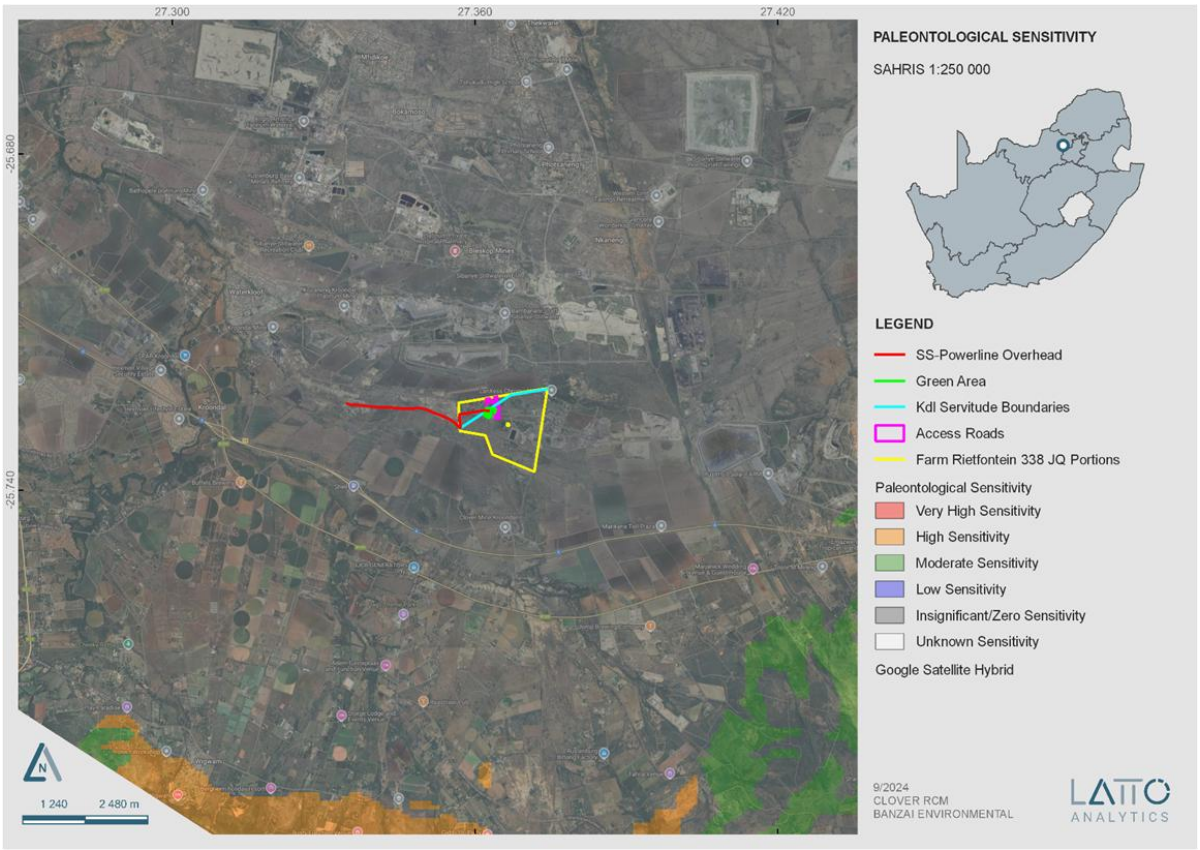


Figure 49: Extract of the 1 in 250 000 SAHRIS PalaeoMap (Council of Geosciences, Pretoria indicting the Zero (grey) Palaeontological Sensitivity of the proposed Glencore Mine Expansion near Rustenburg in the North West Province.

9 ENVIRONMENTAL IMPACT ASSESSMENT

9.1 IMPACTS IDENTIFIED

This Section presents the impacts that have been identified and assessed for the BA. Potential environmental impacts were identified by the EAP, the appointed specialists (where applicable), as well as the preliminary input from the public. The impacts are included in **Table 25**.

When considering cumulative impacts, it is important to bear in mind the scale at which different impacts occur. The identification of impacts is an objective iterative process of considering the project components and activities and how these may interact with the different environmental components. An activity/ environmental component matrix is presented in **Table 24** below. The matrix represents which environmental components are likely to be impacted upon by the project activities. **Table 25** provides a list of the identified impacts associated with each environmental component.

Table 24: Impact identification matrix.

Phase	Activity/Aspect	Environmental Component					
		Geology and soils (G)	Surface water/ wetlands (W)	Terrestrial Biodiversity (TB)	Social (S)	Cultural Heritage (C)	Palaeontology (P)
Planning and Design	None						
Construction (including preconstruction and post construction rehab)	Site Clearing		-	-		-	-
	Job Creation				+		
	Alteration of surface topography and increased hardened surfaces	-	-				
	Release of hazardous substances into the environment		-	-			
Normal Operations	Vehicle and Foot Traffic			-			
	Human (anthropogenic activities)			-			
	Altered surface topography and increased hardened surfaces	-	-				
	Release of hazardous substances into the environment		-	-			
	Job Creation				+		
	Operation of passive wetland associated with Stormwater Management Plan		+				
Decommissioning, Rehabilitation and Closure	Demolition and soil disturbance		-	-			
Post Closure	None						

Table 25: Impacts Identified and Assessed during the BA.

#	Impact	Activity/ Aspect	Phase
TB1	Destruction, further loss and fragmentation of the vegetation community	Site clearing	Construction

#	Impact	Activity/ Aspect	Phase
TB2	Introduction of alien species, especially plants	Site clearing	Construction
TB3	Erosion due to storm water runoff and wind	Site clearing	Construction
TB4	Displacement of faunal community due to habitat loss, direct mortalities and disturbance (road collisions, noise, light, dust, vibration and poaching)	Site clearing	Construction
TB5	Potential leaks, discharges, pollutants from machinery and storage leaching into the surrounding environment	Site clearing	Construction
TB6	Continued encroachment by alien invasive plant species, erosion and environmental pollution	Vehicle and foot traffic	Operational
TB7	Continued displacement and fragmentation of the faunal community due to ongoing anthropogenic disturbances and habitat degradation/loss	Human activities	Operational
TB8	Potential leaks, discharges, pollutants from waste overflows due to infrastructure damage/malfunction spreading into the surrounding environment	Release of hazardous substances into the environment	Operational
TB9	Continued encroachment by alien invasive plant species, erosion and environmental pollution	Demolition and soil disturbance	Decommissioning Rehabilitation and Closure
TB10	Continued displacement and fragmentation of the faunal community due to ongoing anthropogenic disturbances (noise, dust, and vibrations) and habitat degradation/loss (litter, pollution, road mortalities and/or poaching).	Human Activities	Decommissioning Rehabilitation and Closure
W1	Direct and indirect loss, disturbance and degradation of wetlands.	Site Clearing	Construction
W2	Increased bare surfaces, runoff and potential for erosion	Alteration of surface topography and increased hardened surfaces	Construction
W3	Degradation of wetland vegetation and the introduction and spread of alien and invasive vegetation	Site clearing	Construction

#	Impact	Activity/ Aspect	Phase
W4	Increased sediment loads to downstream reaches	Alteration of surface topography and increased hardened surfaces	Construction
W5	Contamination of wetlands with hydrocarbons due to machinery leaks and eutrophication of wetland systems with human sewerage and other waste.	Release of hazardous substances into the environment	Construction
W6	Alteration of hydrological regime	Alteration of surface topography and increased hardened surfaces	Construction
W7	Increased water inputs (clean) to downstream wetlands	Alteration of surface topography and increased hardened surfaces	Operation
W8	Improved ecosystem services, notably water quality enhancement	Operation of passive wetland associated with Stormwater Management Plan	Operation
W9	Degradation of wetland vegetation and proliferation of alien and invasive species	Demolition and soil disturbance	Decommissioning Rehabilitation and Closure
W10	Disruption of wetland soil profile, hydrological regime and increased sediment loads	Demolition and soil disturbance	Decommissioning Rehabilitation and Closure
G1	Soil erosion, compaction and degradation	Alteration of surface topography and increased hardened surfaces	Construction
G2	Decrease in subsurface lateral flow and return flow on the environment	Alteration of surface topography and increased hardened surfaces	Construction
G3	Soil erosion, compaction and degradation	Alteration of surface topography and increased hardened surfaces	Operation

#	Impact	Activity/ Aspect	Phase
G4	Decrease in subsurface lateral flow and return flow on the environment	Alteration of surface topography and increased hardened surfaces	Operation
G5	Soil erosion, compaction and degradation	Alteration of surface topography and increased hardened surfaces	Decommissioning Rehabilitation and Closure
G6	Decrease in subsurface lateral flow and return flow on the environment	Alteration of surface topography and increased hardened surfaces	Decommissioning Rehabilitation and Closure
G7	Loss of land capability; Soil degradation; soil fertility; Soil compaction; Soil contamination	Alteration of surface topography and increased hardened surfaces	Construction
G8	Loss of land capability; Soil degradation; soil fertility; Soil compaction; Soil contamination	Alteration of surface topography and increased hardened surfaces	Operation
G9	Loss of land capability; Soil degradation; soil fertility; Soil compaction; Soil contamination	Demolition and soil disturbance	Decommissioning
G10	Loss of land capability; Soil degradation; soil fertility; Soil compaction; Soil contamination	Demolition and soil disturbance	Rehabilitation and Closure
C1	Destruction or displacement of identified LSA single finds	Site clearing	Construction
C2	Destruction or displacement of identified Iron Age single find	Site Clearing	Construction
P1	Impacts on fossil heritage	Site Clearing	Construction
S1	Job Creation during Construction	Construction of infrastructure	Construction
S2	Job Creation during Operation	Security and housekeeping	Operation

9.2 IMPACT ASSESSMENT METHODOLOGY

The impact significance rating methodology, as presented herein and utilised for all EIMS Impact Assessment Projects, is guided by the requirements of the NEMA EIA Regulations 2014 (as amended). The approach may be altered or substituted on a case-by-case basis if the specific aspect being assessed requires such- such instances require prior EIMS Project Manager approval. The broad approach to the significance rating methodology is to determine the significance (S) of an environmental risk or impact by considering the consequence (C) of each impact (comprising Nature, Extent, Duration, Magnitude, and Reversibility) and relating this to the probability/ likelihood (P) of the impact occurring. The S is determined for the pre- and post-mitigation scenario. In addition, other factors, including cumulative impacts and potential for irreplaceable loss of resources, are used to determine a prioritisation factor (PF) which is applied to the S to determine the overall final significance rating (FS). The impact assessment will be applied to all identified alternatives.

The impact assessment matrix (including pre- and post-mitigation assessment) is included in **Appendix E**. The potential cumulative impacts have been identified, evaluated, and mitigation measures suggested and have been updated during the investigation.

9.2.1 DETERMINATION OF SIGNIFICANCE

The final significance (FS) of an impact or risk is determined by applying a prioritisation factor (PF) to the post-mitigation environmental significance. The significance is dependent on the consequence (C) of the particular impact and the probability (P) of the impact occurring. Consequence is determined through the consideration of the Nature (N), Extent (E), Duration (D), Magnitude (M), and Reversibility (R) applicable to the specific impact.

For the purpose of this methodology the consequence of the impact is represented by:

$$\boldsymbol{C = \frac{(E + D + M + R) * N}{4}}$$

Each individual aspect in the determination of the consequence is represented by a rating scale as defined in **Table 26** below.

Table 26: Criteria for Determining Impact Consequence.

Aspect	Score	Definition
Nature	-1	Likely to result in a negative/ detrimental impact
	+1	Likely to result in a positive/ beneficial impact
Extent	1	Activity (i.e. Highly localised, limited to the area applicable to the specific activity)
	2	Site (i.e. within the development property or site boundary, or the area within a few hundred meters of the site)
	3	Local (i.e. beyond the site boundary within the Local administrative boundary (e.g. Local Municipality) or within consistent local geographical features, or the area within 5 km of the site)
	4	Regional (i.e. Far beyond the site boundary, beyond the Local administrative boundaries within the Regional administrative boundaries (e.g. District Municipality), or extends into different distinct geographical features, or extends between 5 and 50 km from the site).
	5	Provincial / National / International (i.e. extends into numerous distinct geographical features, or extends beyond 50 km from the site).
Duration	1	Immediate (<1 year, quickly reversible)

Aspect	Score	Definition
	2	Short term (1-5 years, less than project lifespan)
	3	Medium term (6-15 years)
	4	Long term (15-65 years, the impact will cease after the operational life span of the project)
	5	Permanent (>65 years, no mitigation measure of natural process will reduce the impact after construction/ operation/ decommissioning).
Magnitude/	1	Minor (where the impact affects the environment in such a way that natural, cultural and social functions and processes are not affected)
Intensity	2	Low (where the impact affects the environment in such a way that natural, cultural and social functions and processes are slightly affected, or affected environmental components are already degraded)
	3	Moderate (where the affected environment is altered but natural, cultural and social functions and processes continue albeit in a modified way; moderate improvement for +ve impacts; or where change affects area of potential conservation or other value, or use of resources).
	4	High (where natural, cultural or social functions or processes are altered to the extent that it will temporarily cease; high improvement for +ve impacts; or where change affects high conservation value areas or species of conservation concern)
	5	Very high / don't know (where natural, cultural or social functions or processes are altered to the extent that it will permanently cease, substantial improvement for +ve impacts; or disturbance to pristine areas of critical conservation value or critically endangered species)
Reversibility	1	Impact is reversible without any time and cost.
	2	Impact is reversible without incurring significant time and cost.
	3	Impact is reversible only by incurring significant time and cost.
	4	Impact is reversible only by incurring very high time and cost.
	5	Irreversible Impact.

Once the C has been determined, the significance is determined in accordance with the standard risk assessment relationship by multiplying the C and the P. Probability is rated/ scored as per **Table 27.**

It is noted that both environmental risks as well as environmental impacts should be identified and assessed. Environmental Risk can be regarded as the potential for something harmful to happen to the environment, and in many instances is not regarded as something that is expected to occur during normal operations or events (e.g. unplanned fuel or oil spills at a construction site). Probability and likelihood are key determinants or variables of environmental risk. Environmental Impact can be regarded as the actual effect or change that happens to the environment because of an activity and is typically an effect that is expected from normal operations or events (e.g. vegetation clearance from site development results in loss of species of concern). Typically, the probability of an unmitigated environmental impact is regarded as highly likely or certain

(management and mitigation measures would ideally aim to reduce this likelihood where possible). In summary, environmental risk is about what could happen, while environmental impact is about what does happen.

Table 27: Probability/ Likelihood Scoring

Probability	1	Improbable (Rare, the event may occur only in exceptional circumstances, the possibility of the impact materialising is very low as a result of design, historic experience, or implementation of adequate corrective actions; <5% chance).
	2	Low probability (Unlikely, impact could occur but not realistically expected; >5% and <20% chance).
	3	Medium probability (Possible, the impact may occur; >20% and <50% chance).
	4	High probability (Likely, it is most probable that the impact will occur- > 50 and <90% chance).
	5	Definite (Almost certain, the impact is expected to, or will, occur, >90% chance).

The result is a qualitative representation of relative significance associated with the impact. Significance is therefore calculated as follows:

$$\boldsymbol{S = C\,x\,P}$$

Table 28: Determination of Significance

Consequence	5- Very High[3]	5	10	15	20	25
	4- High	4	8	12	16	20
	3- Medium	3	6	9	12	15
	2- Low	2	4	6	8	10
	1- Very low	1	2	3	4	5
		1- Improbable	2- Low	3- Medium/ Possible	4- High/ Probable	5- Highly likely/ Definite
	Probability					

The outcome of the significance assessment will result in a range of scores, ranging from 1 through to 25. These significance scores are then grouped into respective classes as described in **Table 29**.

Table 29: Significance Scores

S Score	Description
≤4.25	Low (i.e. where this impact is unlikely to be a significant environmental risk/ reward).
>4,25, ≤8.5	Low-Medium (i.e. where the impact could have a significant environmental risk/ reward).
>8.5, ≤13.75	High-Medium (i.e. where the impact could have a significant environmental risk/ reward).

[3] In the event that an impact or risk has very high or catastrophic consequences, but the likelihood/ probability is low, then the resultant significance would be Low-medium. This does in certain instances detract from the relative important of this impact or risk and must consequently be flagged for further specific consideration, management, mitigation, or contingency planning.

S Score	Description
>13.75	High (i.e. where the impact will have a significant environmental risk/ reward).

The impact significance will be determined for each impact without relevant management and mitigation measures (pre-mitigation significance), as well as post implementation of relevant management and mitigation measures (post-mitigation significance). This allows for a prediction in the degree to which the impact can be managed/mitigated.

9.2.2 IMPACT PRIORITISATION

Further to the assessment criteria presented in the section above, it is necessary to consider each potentially significant impact in terms of:

1. Cumulative impacts; and
2. The degree to which the impact may cause irreplaceable loss of resources.

To ensure that these factors are considered, an impact prioritisation factor (PF) will be applied to each impacts' post-mitigation significance (post-mitigation). This prioritisation factor does not aim to detract from the significance ratings but rather to focus the attention of the decision-making authority on the higher priority/significance issues and impacts. The PF will be applied to the post-mitigation significance based on the assumption that relevant suggested management/mitigation impacts are implemented.

Table 30: Criteria for Determining Prioritisation

Cumulative Impact (CI)	Low (1)	Considering the potential incremental, interactive, sequential, and synergistic cumulative impacts, it is unlikely that the impact will result in spatial and temporal cumulative change.
	Medium (2)	Considering the potential incremental, interactive, sequential, and synergistic cumulative impacts, it is probable that the impact will result in spatial and temporal cumulative change.
	High (3)	Considering the potential incremental, interactive, sequential, and synergistic cumulative impacts, it is highly probable/ definite that the impact will result in spatial and temporal cumulative change.
Irreplaceable Loss of Resources (LR)	Low (1)	Where the impact is unlikely to result in irreplaceable loss of resources.
	Medium (2)	Where the impact may result in the irreplaceable loss (cannot be replaced or substituted) of resources but the value (services and/or functions) of these resources is limited.
	High (3)	Where the impact may result in the irreplaceable loss of resources of high value (services and/or functions).

The value for the final impact priority is represented as a single consolidated priority, determined as the sum of each individual criteria represented in **Table 30**. The impact priority is therefore determined as follows:

$$\boldsymbol{Priority = CI + LR}$$

The result is a priority score which ranges from 2 to 6 and a consequent PF ranging from 1 to 1.5 (Refer to **Table 31**).

Table 31: Determination of Prioritisation Factor

Priority	Prioritisation Factor
2	1
3	1.125
4	1.25
5	1.375
6	1.5

In order to determine the final impact significance (FS), the PF is multiplied by the post-mitigation significance scoring. The ultimate aim of the PF is an attempt to increase the post mitigation environmental risk rating by a factor of 0.5, if all the priority attributes are high (i.e. if an impact comes out with a high medium environmental risk after the conventional impact rating, but there is significant cumulative impact potential and significant potential for irreplaceable loss of resources, then the net result would be to upscale the impact to a higher significance).

Table 32: Final Environmental Significance Rating

Significance Rating	Description
>25	Very High (Impacts in this class are extremely significant and pose a very high environmental risk. In certain instances these may represent a fatal flaw. They are likely to have a major influence on the decision and may be difficult or impossible to mitigate. Offset's may be necessary.
13.75 to 25	High negative (These impacts are significant and must be carefully considered in the decision-making process. They have a high environmental risk or impact and require extensive mitigation measures).
8.5 to 13.75	Medium-High negative (i.e. Impacts in this class are more substantial and could have a significant environmental risk. They may influence the decision to develop in the area and require more robust mitigation measures).
4.25 to 8.5	Medium- Low negative (i.e. These impacts are slightly more significant than low impacts but still do not pose a major environmental risk. They might require some mitigation measures but are generally manageable).
<4.25	Low negative (i.e. Impacts in this class are minor and unlikely to have a significant environmental risk. They do not influence the decision to develop in the area and are typically easily mitigated.
0	No impact
<4.25	Low positive
4.25 to 8.5	Medium-Low positive
8.5 to 13.75	Medium-High positive

Significance Rating	Description
>13.75	High positive

The significance ratings and additional considerations applied to each impact will be used to provide a quantitative comparative assessment of the alternatives being considered. In addition, professional expertise and opinion of the specialists and the environmental consultants will be applied to provide a qualitative comparison of the alternatives under consideration. This process will identify the best alternative for the proposed project.

9.3 DESCRIPTION AND ASSESSMENT OF IMPACTS

This section describes each identified environmental impact in the context of the activity and associated aspect and provides reasons why specific ranking/ rating of the component attributes of the impact assessment are given. Please note that at the time of the specialist report compilation, the updated EIMS impact assessment methodology was not yet available and as such, there may be some minor differences between the specialist reports, however this does not dilute the outcome of this assessment.

9.3.1 GEOLOGY AND SOILS (G)

Soil erosion, sedimentation or overland flows can occur due to increased traffic on the surface during the construction phase which can also result in compaction and surface sealing. Overland flow and potential erosion of terrestrial and wetlands soils can occur which can lead to loss of fertile topsoil. Soil erosion can also contribute to water pollution and siltation of rivers. Surface sealing will also promote head cutting instreams and loss of fertile topsoil. Existing sealed areas can intercept lateral flow paths and remove connectivity between recharge zones and lateral flow zones. Alteration of this flow path will likely change the water regimes negatively, even though the impact should be acceptable. The draw-down effect on the water flows can also occur impacting the water regimes as well. These effects are manageable as the post mitigation has been scored low.

Some of the infrastructure will be removed from the site for decommissioning, this will be done with specialist on the site. Increased traffic will occur on-site during the decommissioning and closure phase, though the effects are expected to be minimal and manageable and mitigation measures will already be implemented. These effects are manageable as the post mitigation has been scored low.

9.3.1.1 SOIL EROSION, COMPACTION AND DEGRADATION (CONSTRUCTION) (G1)

Impact	Phase	Pre-mitigation Impact	Post-mitigation Impact	Final Significance
Soil Erosion, Compaction and Degradation (G1)	Construction	Medium-High negative	Medium- Low negative	Medium- Low negative
Potential cumulative/ confounding effects	• Increased traffic and foot traffic during construction which can also result in compaction and surface sealing. • Overland flow and potential erosion of terrestrial and wetlands soils can occur which can lead to loss of fertile topsoil. • Soil erosion can also contribute to water pollution and siltation of rivers. • Surface sealing will also promote head cutting instreams and loss of fertile topsoil. • Existing sealed areas can intercept lateral flow paths and remove connectivity between recharge zones and lateral flow zones. Alteration of this flow path will likely change the water regimes negatively, even though the impact should be acceptable. The draw-down effect on the water flows can also occur impacting the water regimes as well.			
Alternatives	None.			

Impact	Phase	Pre-mitigation Impact	Post-mitigation Impact	Final Significance
Mitigation Measures				
Subsurface drainage on associated infrastructure like the buildings or offices should be included in the water management plan for stormwater which can minimise overland flow from paved surfaces. This can also allow the roof water from the associated infrastructure like parking lots or offices to percolate and re-infiltrate. Pipe leakages need to be fixed and ensure measures are in place to prevent future leakages. Measures like contacting the responsible authorities immediately for sewage or faecal sludge pipelines associated with sanitation systems and having response guidelines. The following measures can promote infiltration and percolation flows: • Minimise soil compaction and keep the soil covered with mulching residue (plant or gravel) and vegetative cover; • Infiltration basin or trench only where necessary can minimise surface overflows or runoffs and allow water that runs off from roofs to settle and re-infiltrate; • Installation of pre-treatment stormwater practices which remove large sediment and other solids upstream of infiltration practice; and • Adhering to the recommended footprint buffers and wetland buffers (15 m minimal) or wetland rehabilitation measures if encroaching within this buffer as proposed with the wetland specialist for the proposed project area should be sufficient to reduce the deductible water losses in the catchment. • Prevent any discharge of untreated potential wastewater into the catchment as responsive saturated soils (mostly associated with the valley bottoms or along water channels) have a high tendency to promote contaminant (i.e., Bacteria and inorganic elements) migrations towards water resources.				

9.3.1.2 **DECREASE IN SUBSURFACE LATERAL FLOW AND RETURN FLOW ON THE ENVIRONMENT (CONSTRUCTION) (G2)**

Impact	Phase	Pre-mitigation Impact	Post-mitigation Impact	Final Significance
Decrease in Subsurface Lateral Flow and Return Flow on the Environment (G2)	Construction	High negative	Medium- Low negative	Medium- Low negative
Potential cumulative/ confounding effects	• Increased traffic and foot traffic during construction which can also result in compaction and surface sealing. • Overland flow and potential erosion of terrestrial and wetlands soils can occur which can lead to loss of fertile topsoil. • Soil erosion can also contribute to water pollution and siltation of rivers. • Surface sealing will also promote head cutting instreams and loss of fertile topsoil. • Existing sealed areas can intercept lateral flow paths and remove connectivity between recharge zones and lateral flow zones. Alteration of this flow path will likely change the water regimes negatively, even though the impact should be acceptable. The draw-down effect on the water flows can also occur impacting the water regimes as well.			
Alternatives	None.			
Mitigation Measures				

Impact	Phase	Pre-mitigation Impact	Post-mitigation Impact	Final Significance
Subsurface drainage on associated infrastructure like the buildings or offices should be included in the water management plan for stormwater which can minimise overland flow from paved surfaces. This can also allow the roof water from the associated infrastructure like parking lots or offices to percolate and re-infiltrate. Pipe leakages need to be fixed and ensure measures are in place to prevent future leakages. Measures like contacting the responsible authorities immediately for sewage or faecal sludge pipelines associated with sanitation systems and having response guidelines. The following measures can promote infiltration and percolation flows: • Minimise soil compaction and keep the soil covered with mulching residue (plant or gravel) and vegetative cover; • Infiltration basin or trench only where necessary can minimise surface overflows or runoffs and allow water that runs off from roofs to settle and re-infiltrate; • Installation of pre-treatment stormwater practices which remove large sediment and other solids upstream of infiltration practice; and • Adhering to the recommended footprint buffers and wetland buffers (15 m minimal) or wetland rehabilitation measures if encroaching within this buffer as proposed with the wetland specialist for the proposed project area should be sufficient to reduce the deductible water losses in the catchment. • Prevent any discharge of untreated potential wastewater into the catchment as responsive saturated soils (mostly associated with the valley bottoms or along water channels) have a high tendency to promote contaminant (i.e., Bacteria and inorganic elements) migrations towards water resources.				

9.3.1.3 SOIL EROSION, COMPACTION AND DEGRADATION (OPERATION) (G3)

Impact	Phase	Pre-mitigation Impact	Post-mitigation Impact	Final Significance
Soil Erosion, Compaction and Degradation (G3)	Operation	Medium- Low negative	Low negative	Medium- Low negative
Potential cumulative/ confounding effects	• Increased traffic and foot traffic during operation which can also result in compaction and surface sealing. • Overland flow and potential erosion of terrestrial and wetlands soils can occur which can lead to loss of fertile topsoil. • Soil erosion can also contribute to water pollution and siltation of rivers. • Surface sealing will also promote head cutting instreams and loss of fertile topsoil. • Existing sealed areas can intercept lateral flow paths and remove connectivity between recharge zones and lateral flow zones. Alteration of this flow path will likely change the water regimes negatively, even though the impact should be acceptable. The draw-down effect on the water flows can also occur impacting the water regimes as well.			
Alternatives	None.			
Mitigation Measures				
Subsurface drainage on associated infrastructure like the buildings or offices should be included in the water management plan for stormwater which can minimise overland flow from paved surfaces. This can also allow the roof water from the associated infrastructure like parking lots or offices to percolate and re-infiltrate. Pipe leakages need to be fixed and ensure measures are in place to prevent future leakages. Measures like				

Impact	Phase	Pre-mitigation Impact	Post-mitigation Impact	Final Significance
contacting the responsible authorities immediately for sewage or faecal sludge pipelines associated with sanitation systems and having response guidelines. The following measures can promote infiltration and percolation flows: • Minimise soil compaction and keep the soil covered with mulching residue (plant or gravel) and vegetative cover; • Infiltration basin or trench only where necessary can minimise surface overflows or runoffs and allow water that runs off from roofs to settle and re-infiltrate; • Installation of pre-treatment stormwater practices which remove large sediment and other solids upstream of infiltration practice; and • Adhering to the recommended footprint buffers and wetland buffers (15 m minimal) or wetland rehabilitation measures if encroaching within this buffer as proposed with the wetland specialist for the proposed project area should be sufficient to reduce the deductible water losses in the catchment. • Prevent any discharge of untreated potential wastewater into the catchment as responsive saturated soils (mostly associated with the valley bottoms or along water channels) have a high tendency to promote contaminant (i.e., Bacteria and inorganic elements) migrations towards water resources.				

9.3.1.4 DECREASE IN SUBSURFACE LATERAL FLOW AND RETURN FLOW ON THE ENVIRONMENT (OPERATION) (G4)

Impact	Phase	Pre-mitigation Impact	Post-mitigation Impact	Final Significance
Decrease in Subsurface Lateral Flow and Return Flow on the Environment (G4)	Operation	Medium- Low negative	Low negative	Medium- Low negative
Potential cumulative/ confounding effects	• Increased traffic and foot traffic during operation which can also result in compaction and surface sealing. • Overland flow and potential erosion of terrestrial and wetlands soils can occur which can lead to loss of fertile topsoil. • Soil erosion can also contribute to water pollution and siltation of rivers. • Surface sealing will also promote head cutting instreams and loss of fertile topsoil. • Existing sealed areas can intercept lateral flow paths and remove connectivity between recharge zones and lateral flow zones. Alteration of this flow path will likely change the water regimes negatively, even though the impact should be acceptable. The draw-down effect on the water flows can also occur impacting the water regimes as well.			
Alternatives	None.			
Mitigation Measures				
Subsurface drainage on associated infrastructure like the buildings or offices should be included in the water management plan for stormwater which can minimise overland flow from paved surfaces. This can also allow the roof water from the associated infrastructure like parking lots or offices to percolate and re-infiltrate. Pipe leakages need to be fixed and ensure measures are in place to prevent future leakages. Measures like contacting the responsible authorities immediately for sewage or faecal sludge pipelines associated with sanitation systems and having response guidelines.				

Impact	Phase	Pre-mitigation Impact	Post-mitigation Impact	Final Significance
The following measures can promote infiltration and percolation flows: • Minimise soil compaction and keep the soil covered with mulching residue (plant or gravel) and vegetative cover; • Infiltration basin or trench only where necessary can minimise surface overflows or runoffs and allow water that runs off from roofs to settle and re-infiltrate; • Installation of pre-treatment stormwater practices which remove large sediment and other solids upstream of infiltration practice; and • Adhering to the recommended footprint buffers and wetland buffers (15 m minimal) or wetland rehabilitation measures if encroaching within this buffer as proposed with the wetland specialist for the proposed project area should be sufficient to reduce the deductible water losses in the catchment. • Prevent any discharge of untreated potential wastewater into the catchment as responsive saturated soils (mostly associated with the valley bottoms or along water channels) have a high tendency to promote contaminant (i.e., Bacteria and inorganic elements) migrations towards water resources.				

9.3.1.5 SOIL EROSION, COMPACTION AND DEGRADATION (DECOMMISSIONING, REHABILITATION AND CLOSURE) (G5)

Impact	Phase	Pre-mitigation Impact	Post-mitigation Impact	Final Significance
Soil Erosion, Compaction and Degradation (G5)	Decommissioning, Rehabilitation and Closure	Medium- Low negative	Low negative	Low negative
Potential cumulative/ confounding effects	• Increased traffic and foot traffic during decommissioning and closure which can also result in compaction and surface sealing. • Overland flow and potential erosion of terrestrial and wetlands soils can occur which can lead to loss of fertile topsoil. • Soil erosion can also contribute to water pollution and siltation of rivers. • Surface sealing will also promote head cutting instreams and loss of fertile topsoil. • Existing sealed areas can intercept lateral flow paths and remove connectivity between recharge zones and lateral flow zones. Alteration of this flow path will likely change the water regimes negatively, even though the impact should be acceptable. The draw-down effect on the water flows can also occur impacting the water regimes as well.			
Alternatives	None.			
Mitigation Measures				
• Minimise soil compaction and keep the soil covered with mulching residue (plant or gravel) and vegetative cover; • Infiltration basin or trench only where necessary can minimise surface overflows or runoffs and allow water that runs off from roofs to settle and re-infiltrate; • Installation of pre-treatment stormwater practices which remove large sediment and other solids upstream of infiltration practice; and • Adhering to the recommended footprint buffers and wetland buffers (15 m minimal) or wetland rehabilitation measures if encroaching within this buffer as proposed with the wetland specialist for the proposed project area should be sufficient to reduce the deductible water losses in the catchment. • Prevent any discharge of untreated potential wastewater into the catchment as responsive saturated soils (mostly associated with the valley bottoms or along water channels) have a high				

Impact	Phase	Pre-mitigation Impact	Post-mitigation Impact	Final Significance
tendency to promote contaminant (i.e., Bacteria and inorganic elements) migrations towards water resources.				

9.3.1.6 **DECREASE IN SUBSURFACE LATERAL FLOW AND RETURN FLOW ON THE ENVIRONMENT (DECOMMISSIONING, REHABILITATION AND CLOSURE) (G6)**

Impact	Phase	Pre-mitigation Impact	Post-mitigation Impact	Final Significance
Decrease in Subsurface Lateral Flow and Return Flow on the Environment (G6)	Decommissioning , Rehabilitation and Closure	Medium- Low negative	Low negative	Low negative
Potential cumulative/ confounding effects	• Increased traffic and foot traffic during decommissioning and closure which can also result in compaction and surface sealing. • Overland flow and potential erosion of terrestrial and wetlands soils can occur which can lead to loss of fertile topsoil. • Soil erosion can also contribute to water pollution and siltation of rivers. • Surface sealing will also promote head cutting instreams and loss of fertile topsoil. • Existing sealed areas can intercept lateral flow paths and remove connectivity between recharge zones and lateral flow zones. Alteration of this flow path will likely change the water regimes negatively, even though the impact should be acceptable. The draw-down effect on the water flows can also occur impacting the water regimes as well.			
Alternatives	None.			
Mitigation Measures				
• Minimise soil compaction and keep the soil covered with mulching residue (plant or gravel) and vegetative cover; • Infiltration basin or trench only where necessary can minimise surface overflows or runoffs and allow water that runs off from roofs to settle and re-infiltrate; • Installation of pre-treatment stormwater practices which remove large sediment and other solids upstream of infiltration practice; and • Adhering to the recommended footprint buffers and wetland buffers (15 m minimal) or wetland rehabilitation measures if encroaching within this buffer as proposed with the wetland specialist for the proposed project area should be sufficient to reduce the deductible water losses in the catchment. • Prevent any discharge of untreated potential wastewater into the catchment as responsive saturated soils (mostly associated with the valley bottoms or along water channels) have a high tendency to promote contaminant (i.e., Bacteria and inorganic elements) migrations towards water resources.				

9.3.1.7 **LOSS OF LAND CAPABILITY; SOIL DEGRADATION; SOIL FERTILITY; SOIL COMPACTION; SOIL CONTAMINATION (CONSTRUCTION) (G7)**

Impact	Phase	Pre-mitigation Impact	Post-mitigation Impact	Final Significance
Loss of land capability; Soil degradation; soil	Construction	Medium- Low negative	Low negative	Low negative

Impact	Phase	Pre-mitigation Impact	Post-mitigation Impact	Final Significance
fertility; Soil compaction; Soil contamination (G7)				
Potential cumulative/ confounding effects	The quantitative impact of the proposed project in isolation on agriculture is anticipated to be "Low" due to the presences of low agricultural potential soils. The cumulative impact of the proposed project is anticipated to be "Medium". The project area has undergone historic and current modification, like the developmental disturbances associated to the mining activities that the local area has currently. After implementation of the mitigation measures such as implementation of erosion control methods, preventing soil contamination and rehabilitating disturbed and bare surfaces as stipulated above the agricultural productivity of the area is not expected to deteriorate further because of the proposed development and no irreplaceable loss of resources is anticipated.			
Alternatives	None.			
Mitigation Measures				
• Cleared areas must be rehabilitated and stabilised to avoid impacts to adjacent areas. • Restrict the disturbance footprint and the clearing of vegetation for the authorized area only. • Make use of existing access routes as much as possible before new routes are considered. Any selected "new" route must be authorized, minimizing disturbances to the wetland areas. • Promptly remove all alien and invasive plant species that may emerge during construction (i.e. weedy annuals and other alien forbs) must be removed. • Limit soil disturbance. • Keep excavation and soil heaps clear of potential contaminates or waste. • Lightly till any disturbed soil around the development footprint to avoid compaction. • Ensure soil stockpiles sand are sufficiently safeguarded against rain wash. • Minimize unnecessary clearing of vegetation beyond the development footprints. • The use of herbicides is not recommended (opt for mechanical removal). • Make sure all excess consumables are removed from site and deposited at an appropriate waste facility. • Appropriately contain any generator diesel storage tanks, machinery spills (e.g. accidental spills of hydrocarbons oils, diesel etc.) or construction materials on site (e.g. concrete) in such a way as to prevent them leaking and entering wetlands or buffer areas. • Provide appropriate sanitation facilities for workers during construction and service them regularly. • The Contractor should supply sealable and properly marked domestic waste collection bins and all solid waste collected must be disposed of at a licensed disposal facility. • The Contractor must be in possession of an emergency spill kit that must be complete and available at all times on site. • Any possible contamination of topsoil by hydrocarbons must be avoided. Any contaminated soil must be treated in situ or be placed in containers and removed from the site for disposal in a licensed facility. • A stormwater management plan must be development and implement for the purpose of this project to control runoff from the development site.				

9.3.1.8 LOSS OF LAND CAPABILITY; SOIL DEGRADATION; SOIL FERTILITY; SOIL COMPACTION; SOIL CONTAMINATION (OPERATION) (G8)

Impact	Phase	Pre-mitigation Impact	Post-mitigation Impact	Final Significance
Loss of land capability; Soil degradation; soil fertility; Soil compaction; Soil contamination (G7)	Operation	Medium- Low negative	Low negative	Low negative
Potential cumulative/ confounding effects	The quantitative impact of the proposed project in isolation on agriculture is anticipated to be "Low" due to the presences of low agricultural potential soils. The cumulative impact of the proposed project is anticipated to be "Medium". The project area has undergone historic and current modification, like the developmental disturbances associated to the mining activities that the local area has currently. After implementation of the mitigation measures such as implementation of erosion control methods, preventing soil contamination and rehabilitating disturbed and bare surfaces as stipulated above the agricultural productivity of the area is not expected to deteriorate further because of the proposed development and no irreplaceable loss of resources is anticipated.			
Alternatives	None.			
Mitigation Measures				
• Implement erosion control methods like mulching, geotextile sheets, reduce soil compaction, chemical spills which can affect soil fertility. • Ensure successful rehabilitation of areas disturbed during construction and these areas are stabilized to avoid impacts to adjacent areas.				

9.3.1.9 LOSS OF LAND CAPABILITY; SOIL DEGRADATION; SOIL FERTILITY; SOIL COMPACTION; SOIL CONTAMINATION (DECOMMISSIONING) (G9)

Impact	Phase	Pre-mitigation Impact	Post-mitigation Impact	Final Significance
Loss of land capability; Soil degradation; soil fertility; Soil compaction; Soil contamination (G7)	Decommissioning	Medium- Low negative	Low negative	Low negative
Potential cumulative/ confounding effects	The quantitative impact of the proposed project in isolation on agriculture is anticipated to be "Low" due to the presences of low agricultural potential soils. The cumulative impact of the proposed project is anticipated to be "Medium". The project area has undergone historic and current modification, like the developmental disturbances associated to the mining activities that the local area has currently. After implementation of the mitigation measures such as implementation of erosion control methods, preventing soil contamination and rehabilitating disturbed and bare surfaces as stipulated above the agricultural productivity of the area is not expected to deteriorate further because of the proposed development and no irreplaceable loss of resources is anticipated.			

Impact	Phase	Pre-mitigation Impact	Post-mitigation Impact	Final Significance
Alternatives	None.			
Mitigation Measures				
• Rehabilitation of the Project area will be undertaken, includes the ripping of the compacted soil surfaces and establishment of vegetation. • Ensure successful rehabilitation of areas disturbed during construction to decommissioning and these areas are stabilized to avoid impacts to adjacent areas. • Ensure rehabilitation of contaminated soil by removal of pollutants by implementing methods such as bioremediation and phytoremediation.				

9.3.1.10 LOSS OF LAND CAPABILITY; SOIL DEGRADATION; SOIL FERTILITY; SOIL COMPACTION; SOIL CONTAMINATION (REHABILITATION AND CLOSURE) (G10)

Impact	Phase	Pre-mitigation Impact	Post-mitigation Impact	Final Significance
Loss of land capability; Soil degradation; soil fertility; Soil compaction; Soil contamination (G7)	Rehabilitation and Closure	Low negative	Low negative	Low negative
Potential cumulative/ confounding effects	The quantitative impact of the proposed project in isolation on agriculture is anticipated to be "Low" due to the presences of low agricultural potential soils. The cumulative impact of the proposed project is anticipated to be "Medium". The project area has undergone historic and current modification, like the developmental disturbances associated to the mining activities that the local area has currently. After implementation of the mitigation measures such as implementation of erosion control methods, preventing soil contamination and rehabilitating disturbed and bare surfaces as stipulated above the agricultural productivity of the area is not expected to deteriorate further because of the proposed development and no irreplaceable loss of resources is anticipated.			
Alternatives	None.			
Mitigation Measures				
• Rehabilitation of the Project area will be undertaken, includes the ripping of the compacted soil surfaces and establishment of vegetation. • Ensure successful rehabilitation of areas disturbed during construction to decommissioning and these areas are stabilized to avoid impacts to adjacent areas. • Ensure rehabilitation of contaminated soil by removal of pollutants by implementing methods such as bioremediation and phytoremediation.				

9.3.2 SURFACE WATER/ WETLANDS (W)

The assessed wetlands exhibit impacts at local scale. These impacts result from present and historical land use relating to agricultural practice, impoundments, access roads and to a little degree, mining activities which have transformed the wetland habitats and have altered their natural hydrological regime and vegetation composition. The list below refers to the **present-day local impacts** observed within the assessed wetland areas:

- Wetland disturbance from other agricultural practises, development of dams and foot traffic;

- Altered hydrological inputs resulting from changes to the surrounding landscape;
- Erosion induced from altered hydrodynamics in combination with the loss of wetland vegetation;
- Altered geomorphology from historical agricultural practices and development of dams in close proximity to wetlands;
- Loss of wetland vegetation from continual disturbances, historical land use and the establishment of alien invasive flora species in some approaches of the wetlands; and
- Wetland degradation from agricultural activities and development of dams.

The development of the project will result in indirect disturbance to the adjacent and downstream watercourses. The clearing of topsoil and vegetation will be required for the installation and placement of infrastructure which will reduce infiltration and increase overland flow. The clearance of vegetation and overall disturbance from the proposed project will create ideal conditions for the proliferation of alien invasive species which will lead to ecosystem degradation and reduced functionality. The development of the area in proximity of the watercourses would also create erosion hotspots which could contribute to the sedimentation of any receiving watercourses. Infrastructure in proximity to watercourses and located on a suitable slope could create preferential flow paths, causing increased surface run-off volumes and velocities causing erosion to the area.

Indirect impacts are potential to the natural watercourses, whereas direct impacts are expected for the artificial seep and depression wetlands. Emphasis was therefore placed on minimising impacts by means of mitigation.

HGM 1 is at an indirect and “Low” risk from the proposed development of the Lekgotla Hall which has the potential to affect the vegetation and hydrological functioning of the wetland.

HGM 2 is at indirect risk from the proposed activities as the wetland is located at a lower elevation than the proposed activities which are intended to occur upslope and a considerable distance away. While the proposed site itself is of relatively flat topography, it should be noted that the overall and general topography of the area slopes towards HGM 2. The main impacts to the system will result from potential altered hydrological inputs and consequent potential erosion and sedimentation. The risk rating for these impacts present within the “Low” category and considers that there is an existing road between the wetland and the site which would act as a physical barrier and alleviate majority of the potential impact.

Additionally, whilst no functional and buffer assessments were conducted for the artificial watercourses. These are anticipated to be impacted and have been included in the DWS Risk Assessment due to the establishment of infrastructure (salvage yard) within the artificial depression and the development of a road and fence in proximity to the artificial seep. The risks for these activities have also been determined to present within the “Low” category given that the artificial nature of the watercourses and their reliance on stormwater input in the case of the artificial depression, which if stopped, would cease the wetland conditions. Furthermore, the artificial depression has already been disturbed by clearing for an informal access route to the southern portions of the existing operations.

It should be noted that the project presents an opportunity to rehabilitate the watercourses which would result in a positive impact.

In light of the expected impacts from proposed activities the following mitigation measures have been proposed to lower the intensity of the impacts on the ecological integrity of the wetlands.

The focus of mitigation measures should be to reduce the significance of potential environmental impacts associated with the proposed development and thereby to:

- Prevent the unnecessary destruction and fragmentation of the vegetation community of the wetland areas; and
- Limit the construction area to the defined project areas and only impact those areas where it is unavoidable to do so otherwise.

9.3.2.1 DIRECT AND INDIRECT LOSS, DISTURBANCE AND DEGRADATION OF WETLANDS (W1)

Impact	Phase	Pre-mitigation Impact	Post-mitigation Impact	Final Significance
Direct and indirect loss, disturbance and degradation of wetlands (W1)	Construction	Medium- Low negative	Medium- Low negative	Medium- Low negative
Potential cumulative/ confounding effects	Any activities within proximity to wetland systems have the potential to degrade these systems directly or indirectly either by improper conduct, negligence, or stochastic / uncontrolled / accidental events. The mitigation measures below have therefore been suggested to alleviate the potential for these impacts to occur on the delineated systems.			
Alternatives	AL2 - Moving Lekgotla Hall to avoid impact on HGM1.			
Mitigation Measures				

- Restrict unauthorised and unnecessary activities within the wetlands and their respective buffers. No laydown areas or storage of equipment and material should be allowed within the wetlands and only activities necessary for construction of the relevant infrastructure (within watercourses) must be permitted. Authorised activities within the watercourse must be overseen by an ECO;
- Minimise the disturbance footprint of the development or the proposed infrastructure areas and avoid land clearing outside of these areas to prevent indirect impact to the wetlands;
- Clearly demarcate the construction footprint and restrict all construction activities to within the proposed infrastructure area;
    - The construction servitude must be identified and be clearly demarcated prior to the commencement of any construction activities on site and before the arrival of construction machinery. Vehicles must use a single route to enter and exit the construction site. This will ensure that the compacting of the soils of these areas is kept to a minimum. The compacting of the soil can lead to an increase in runoff that in return will lead to sedimentation of the aquatic ecosystems;
- Educate staff and relevant contractors on the location and importance of the identified wetlands through toolbox talks and by including them in site inductions as well as the making them aware of the overall site plan which should indicate sensitive areas, waste disposal areas and any other relevant project specifics.

The following road construction specific mitigation measures are provided:

- The road should incorporate stormwater management that aims to divert water into the downstream of adjacent watercourse in a manner that does not lead to erosion and sedimentation;
- A combination of step like grassed berms or perforated bricks and silt traps must be incorporated into the stormwater management plan to prevent scouring of the road margins and subsequent sedimentation of the downslope watercourse (particularly the artificial seep); and
- Contamination of the watercourses with unset cement or bitumen should be negated as it is detrimental to aquatic biota. Mixing of materials should not take place within any of the delineated watercourses and spillage of unset materials into watercourse areas must immediately be remedied.

The below measures are applicable to the disturbed wetlands (particularly the artificial depression and seeps):

- The rehabilitation and revegetation should be conducted in accordance with the approved Rehabilitation Plan (including Plant Species Plan) under supervision of a suitably qualified ECO and/or Ecologist;

Impact	Phase	Pre-mitigation Impact	Post-mitigation Impact	Final Significance
• No heavy machinery shall be permitted within unauthorised water resource areas for any purpose, without the prior approval of the ECO (except emergency procedures). Clearing of vegetation shall be conducted by hand. All cleared and trimmed vegetation shall be removed from any watercourse; • Re-vegetation of disturbed areas must be undertaken with site-specific indigenous species in accordance with biome-specific vegetation types. Rehabilitation of the vegetation component should also include resident, indigenous hydrophilic plant species that have established in the local area. This, to ensure survival and proliferation of site-specific vegetation that have already adapted to the current conditions and provide ecosystem services for other terrestrial and aquatic biota; • Dry seeding or hydro-seeding may be used for aquatic resources. If dry seeding is used it must be done at the end of the dry season and/or beginning of the wet season. This will ensure the seeds germinate and will not be washed away during high rainfall events; • All present alien and invasive plant species must be eradicated if the project is approved. Therefore, as part of the rehabilitation plan, regular removal of alien and invasive plant species should take place; • Dedicated implementation of the Environmental Management Programme (EMPr), including compliance monitoring and auditing by an ECO.				

9.3.2.2 **INCREASED BARE SURFACES, RUNOFF AND POTENTIAL FOR EROSION (W2)**

Impact	Phase	Pre-mitigation Impact	Post-mitigation Impact	Final Significance
Increased Bare Surfaces, Runoff and Potential for Erosion (W2)	Construction	Medium- Low negative	Medium- Low negative	Medium- Low negative
Potential cumulative/ confounding effects	During the construction and operational phase, alterations to the topography of the land will alter the surface flow patterns and in turn affect the hydrological dynamics of the wetland systems. Similarly, increased hardened surfaces, will drastically increase the overland flow in the local area of the infrastructure which will subsequently increase the water input to the wetlands. The alteration of surface topography and hydrology for the project infrastructure will inevitably be accompanied by an increase in erosion and sedimentation as rainwater erodes and washes exposed soils (active working and exposed areas) into the downslope watercourse.			
Alternatives	None.			
Mitigation Measures				
• Design and implement an effective stormwater management plan; • Include green spaces in the development and minimise the extent of paved and concreted areas wherever possible; • Re-vegetate denuded areas as soon as possible to increase surface roughness and promote infiltration; and • Regularly clear drains to prevent uncalled for accumulation of surface water and the establishment of concentrated flow paths out of the accumulation areas. • Loose soils are particularly prone to loss due to wind or water. It is therefore preferable that construction takes place during the dry season, where possible, to reduce the erosion potential of the exposed surfaces; • Practice good soil management across the construction footprint; • Avoid the creation of concentrated flow paths wherever possible;				

Impact	Phase	Pre-mitigation Impact	Post-mitigation Impact	Final Significance
• Devise and implement a suitable stormwater management plan for the construction and operation phases; • Install sandbags as a temporary measure around key areas of soil loss (active working areas and soil stockpiles) to prevent soils washing into the local watercourse (siltation); • Signs of erosion must be addressed immediately to prevent further erosion of the area to prevent head cut erosion from forming; • Temporary and permanent erosion control methods may include silt fences, flotation silt curtains, retention basins, detention ponds, interceptor ditches, seeding and sodding, riprap of exposed embankments, erosion mats, and mulching; • Any exposed earth should be rehabilitated promptly by planting suitable vegetation (vigorous indigenous grasses) to protect the exposed soil; • Relandscape to gentler gradients and re-vegetate all cleared areas, which includes the areas adjacent to the proposed infrastructure, as soon as possible to limit erosion potential. Sandbags and geotextiles should be used to assist until vegetation has established in these reworked areas; and • The rehabilitation of watercourse banks must take place following construction. Key areas where erosion has occurred should be rehabilitated through bank reprofiling to gentler gradients and the revegetation of the marginal and riparian areas. **The following road construction specific mitigation measures are provided:** • The road should incorporate stormwater management that aims to divert water into the downstream of adjacent watercourse in a manner that does not lead to erosion and sedimentation. • A combination of step like grassed berms or perforated bricks and silt traps must be incorporated into the stormwater management plan to prevent scouring of the road margins and subsequent sedimentation of the downslope watercourse (particularly the artificial seep). **The below measures are applicable to the disturbed wetlands (particularly the artificial depression and seeps):** • The rehabilitation and revegetation should be conducted in accordance with the approved Rehabilitation Plan (including Plant Species Plan) under supervision of a suitably qualified ECO and/or Ecologist; • No heavy machinery shall be permitted within unauthorised water resource areas for any purpose, without the prior approval of the ECO (except emergency procedures). Clearing of vegetation shall be conducted by hand. All cleared and trimmed vegetation shall be removed from any watercourse; • Re-vegetation of disturbed areas must be undertaken with site-specific indigenous species in accordance with biome-specific vegetation types. Rehabilitation of the vegetation component should also include resident, indigenous hydrophilic plant species that have established in the local area. This, to ensure survival and proliferation of site-specific vegetation that have already adapted to the current conditions and provide ecosystem services for other terrestrial and aquatic biota; • Dry seeding or hydro-seeding may be used for aquatic resources. If dry seeding is used it must be done at the end of the dry season and/or beginning of the wet season. This will ensure the seeds germinate and will not be washed away during high rainfall events; • All present alien and invasive plant species must be eradicated if the project is approved. Therefore, as part of the rehabilitation plan, regular removal of alien and invasive plant species should take place; • Dedicated implementation of the Environmental Management Programme (EMPr), including compliance monitoring and auditing by an ECO.				

9.3.2.3 DEGRADATION OF WETLAND VEGETATION AND THE INTRODUCTION AND SPREAD OF ALIEN AND INVASIVE VEGETATION (W3)

Impact	Phase	Pre-mitigation Impact	Post-mitigation Impact	Final Significance
Degradation of Wetland Vegetation and the Introduction and Spread of Alien Invasive Vegetation (W3)	Construction	Medium- Low negative	Low negative	Low negative
Potential cumulative/ confounding effects	Alien invasive vegetation is particularly opportunistic and has the potential to spread rapidly, especially in disturbed settings. These plants outcompete the natural vegetation and in turn alter the abiotic and biotic components of freshwater ecosystems. The control of such species is considered imperative in consideration of the proposed development and in maintaining the ecological integrity and functioning of such systems.			
Alternatives	None			
Mitigation Measures				
• Revegetate bare or denuded areas as soon as possible; • Once and if detected, control the spread of any existing colonies; • Avoid working in areas with alien vegetation as dispersal into unaffected areas may be aided through vehicular movement; and • The preparation and implementation of an alien invasive management plan is recommended for the project.				

9.3.2.4 INCREASED SEDIMENT LOADS TO DOWNSTREAM REACHES (W4)

Impact	Phase	Pre-mitigation Impact	Post-mitigation Impact	Final Significance
Increased Sediment Loads to Downstream Reaches (W4)	Construction	Medium- Low negative	Low negative	Low negative
Potential cumulative/ confounding effects	The alteration of surface topography and hydrology for the project infrastructure will inevitably be accompanied by an increase in erosion and sedimentation as rainwater erodes and washes exposed soils (active working and exposed areas) into the downslope watercourse.			
Alternatives	None			
Mitigation Measures				
• Loose soils are particularly prone to loss due to wind or water. It is therefore preferable that construction takes place during the dry season, where possible, to reduce the erosion potential of the exposed surfaces; • Practice good soil management across the construction footprint; • Avoid the creation of concentrated flow paths wherever possible; • Devise and implement a suitable stormwater management plan for the construction and operation phases; • Install sandbags as a temporary measure around key areas of soil loss (active working areas and soil stockpiles) to prevent soils washing into the local watercourse (siltation);				

Impact	Phase	Pre-mitigation Impact	Post-mitigation Impact	Final Significance

- Signs of erosion must be addressed immediately to prevent further erosion of the area to prevent head cut erosion from forming;
- Temporary and permanent erosion control methods may include silt fences, flotation silt curtains, retention basins, detention ponds, interceptor ditches, seeding and sodding, riprap of exposed embankments, erosion mats, and mulching;
- Any exposed earth should be rehabilitated promptly by planting suitable vegetation (vigorous indigenous grasses) to protect the exposed soil;
- Relandscape to gentler gradients and re-vegetate all cleared areas, which includes the areas adjacent to the proposed infrastructure, as soon as possible to limit erosion potential. Sandbags and geotextiles should be used to assist until vegetation has established in these reworked areas; and
- The rehabilitation of watercourse banks must take place following construction. Key areas where erosion has occurred should be rehabilitated through bank reprofiling to gentler gradients and the revegetation of the marginal and riparian areas.

The following road construction specific mitigation measures are provided:

- The road should incorporate stormwater management that aims to divert water into the downstream of adjacent watercourse in a manner that does not lead to erosion and sedimentation.
- A combination of step like grassed berms or perforated bricks and silt traps must be incorporated into the stormwater management plan to prevent scouring of the road margins and subsequent sedimentation of the downslope watercourse (particularly the artificial seep).

The below measures are applicable to the disturbed wetlands (particularly the artificial depression and seeps):

- The rehabilitation and revegetation should be conducted in accordance with the approved Rehabilitation Plan (including Plant Species Plan) under supervision of a suitably qualified ECO and/or Ecologist;
- No heavy machinery shall be permitted within unauthorised water resource areas for any purpose, without the prior approval of the ECO (except emergency procedures). Clearing of vegetation shall be conducted by hand. All cleared and trimmed vegetation shall be removed from any watercourse;
- Re-vegetation of disturbed areas must be undertaken with site-specific indigenous species in accordance with biome-specific vegetation types. Rehabilitation of the vegetation component should also include resident, indigenous hydrophilic plant species that have established in the local area. This, to ensure survival and proliferation of site-specific vegetation that have already adapted to the current conditions and provide ecosystem services for other terrestrial and aquatic biota;
- Dry seeding or hydro-seeding may be used for aquatic resources. If dry seeding is used it must be done at the end of the dry season and/or beginning of the wet season. This will ensure the seeds germinate and will not be washed away during high rainfall events;
- All present alien and invasive plant species must be eradicated if the project is approved. Therefore, as part of the rehabilitation plan, regular removal of alien and invasive plant species should take place;
- Dedicated implementation of the Environmental Management Programme (EMPr), including compliance monitoring and auditing by an ECO.

9.3.2.5 CONTAMINATION OF WETLANDS WITH HYDROCARBONS (W5)

Impact	Phase	Pre-mitigation Impact	Post-mitigation Impact	Final Significance
Contamination of Wetlands with Hydrocarbons (W5)	Construction	Medium-High negative	Medium- Low negative	Medium- Low negative

Impact	Phase	Pre-mitigation Impact	Post-mitigation Impact	Final Significance
Potential cumulative/ confounding effects	Impaired water quality can be detrimental to freshwater ecosystems and can be a result of several factors or activities, most commonly related to the use of harmful or hazardous substances such as fuels, oils, pesticides and herbicides. This impact has the potential to adversely affect the biotic component of the freshwater resources and will ultimately result in a degraded ecosystem with reduced functionality.			
Alternatives	None			
Mitigation Measures				
• All chemicals and toxicants to be used for the construction must be stored outside the watercourse areas and their respective buffers, preferably on flat terrain and in a bunded area; • All machinery and equipment should be inspected regularly for faults and possible leaks, these should be out of watercourses and in a designated area that is flat and bunded; • All contractors and employees should undergo induction which is to include a component of environmental awareness. The induction is to include aspects such as the need to avoid littering, the reporting and cleaning of spills and leaks and general good "housekeeping"; • Adequate sanitary facilities and ablutions must be provided for all personnel within the project area. These facilities must be regularly maintained to promote their use; • Have action plans on site, and training for contactors and employees in the event of spills, leaks and other impacts to the aquatic systems; • The contractors used for the project should have spill kits available to ensure that any fuel or oil spills are clean-up and discarded correctly; • No dumping should be permitted on site and within the watercourses. All waste generated on-site during construction must be adequately managed (not remain on site for more than two weeks). Separation and recycling of different waste materials should be supported; and • The stormwater management plan must aim to release only clean water in the environment. **The following road construction specific mitigation measures are provided:** • Contamination of the watercourses with unset cement or bitumen should be negated as it is detrimental to aquatic biota. Mixing of materials should not take place within any of the delineated watercourses and spillage of unset materials into watercourse areas must immediately be remedied.				

9.3.2.6 **ALTERATION OF HYDROLOGICAL REGIME (W6)**

Impact	Phase	Pre-mitigation Impact	Post-mitigation Impact	Final Significance
Alteration of Hydrological Regime (W6)	Construction	Medium- Low negative	Low negative	Low negative
Potential cumulative/ confounding effects	During the construction and operational phase, alterations to the topography of the land will alter the surface flow patterns and in turn affect the hydrological dynamics of the wetland systems. Similarly, increased hardened surfaces, will drastically increase the overland flow in the local area of the infrastructure which will subsequently increase the water input to the wetlands.			
Alternatives	None			
Mitigation Measures				

Impact	Phase	Pre-mitigation Impact	Post-mitigation Impact	Final Significance
• Design and implement an effective stormwater management plan; • Include green spaces in the development and minimise the extent of paved and concreted areas wherever possible; • Re-vegetate denuded areas as soon as possible to increase surface roughness and promote infiltration; and • Regularly clear drains to prevent uncalled for accumulation of surface water and the establishment of concentrated flow paths out of the accumulation areas. **The following road construction specific mitigation measures are provided:** • The road should incorporate stormwater management that aims to divert water into the downstream of adjacent watercourse in a manner that does not lead to erosion and sedimentation. • A combination of step like grassed berms or perforated bricks and silt traps must be incorporated into the stormwater management plan to prevent scouring of the road margins and subsequent sedimentation of the downslope watercourse (particularly the artificial seep).				

9.3.2.7 **INCREASED WATER INPUTS (CLEAN) TO DOWNSTREAM WETLANDS (W7)**

Impact	Phase	Pre-mitigation Impact	Post-mitigation Impact	Final Significance
Increased Water Inputs (Clean) to Downstream Wetlands (W7)	Operation	Medium-High negative	Medium- Low negative	Medium- Low negative
Potential cumulative/ confounding effects	During the construction and operational phase, alterations to the topography of the land will alter the surface flow patterns and in turn affect the hydrological dynamics of the wetland systems. Similarly, increased hardened surfaces, will drastically increase the overland flow in the local area of the infrastructure which will subsequently increase the water input to the wetlands.			
Alternatives	None			
Mitigation Measures				
• Design and implement an effective stormwater management plan; • Include green spaces in the development and minimise the extent of paved and concreted areas wherever possible; • Re-vegetate denuded areas as soon as possible to increase surface roughness and promote infiltration; and • Regularly clear drains to prevent uncalled for accumulation of surface water and the establishment of concentrated flow paths out of the accumulation areas.				

9.3.2.8 **IMPROVED ECOSYSTEM SERVICES, NOTABLY WATER QUALITY ENHANCEMENT (W8)**

A constructed passive wetland system delivers notable ecosystem service improvements, particularly enhanced water quality through natural filtration and improved soil saturation that supports wetland vegetation and hydrological function. These conditions promote nutrient cycling, habitat provision, and biodiversity support. The prescribed already mitigation measures enable the system to be effectively constructed and maintained, resulting in a long-term positive operational impact on the local environment.

Impact	Phase	Pre-mitigation Impact	Post-mitigation Impact	Final Significance
Improved Ecosystem Services, Notably Water Quality Enhancement (W8)	Operation	Medium-Low positive	Medium-High positive	Medium-High positive
Potential cumulative/ confounding effects	• Ecosystem service improvements. • Enhanced water quality.			
Alternatives	None			

Passive Wetland Design Considerations

This design consideration outlines the approach to establishing a passive constructed wetland system associated with the clean water dam, intended to enhance water quality, biodiversity, and ecological function.

The wetland will be a **subsurface-flow, passive treatment system** situated downslope of the clean water dam. The system will consist of shallow, vegetated basins, filled with appropriate substrate (sand and gravel) to promote filtration and microbial activity. Flow will be gravity-fed, with retention time maximised to enhance treatment efficiency.

Construction Steps:

1. Site Preparation: Topsoil will be stripped and stockpiled for later use in wetland planting. Earthworks will be limited to shaping shallow depressions and berms to direct and retain water.
2. Lining and Substrate: If required to control infiltration, a clay or HDPE liner will be installed, followed by graded gravel/sand substrate.
3. Inflow/Outflow Structures: Low-flow channels and silt traps will be installed at inlets, with controlled outflows to prevent erosion.
4. Vegetation: Indigenous wetland species (e.g., *Phragmites australis*, *Cyperus* spp., *Typha capensis*) will be planted to establish functionality, biodiversity support, and habitat structure.
5. Buffer Zones: A 15–20 m vegetated buffer will be maintained around the wetland in line with GN 509 and GN 267.

A monitoring plan will be implemented to track vegetation establishment, flow conditions, and water quality improvements. Maintenance will include invasive species control and periodic sediment removal from inflow areas.

9.3.2.9 DEGRADATION OF WETLAND VEGETATION AND PROLIFERATION OF ALIEN AND INVASIVE SPECIES (W9)

Impact	Phase	Pre-mitigation Impact	Post-mitigation Impact	Final Significance
Degradation of Wetland Vegetation and Proliferation of Alien and Invasive Species (W9)	Decommissioning	Medium-High negative	Low negative	Low negative
Potential cumulative/ confounding effects	Alien invasive vegetation is particularly opportunistic and has the potential to spread rapidly, especially in disturbed settings. These plants outcompete the natural vegetation and in turn alter the abiotic and biotic components of			

Impact	Phase	Pre-mitigation Impact	Post-mitigation Impact	Final Significance
	freshwater ecosystems. The control of such species is considered imperative in consideration of the proposed development and in maintaining the ecological integrity and functioning of such systems.			
Alternatives	None.			
Mitigation Measures				
• Revegetate bare or denuded areas as soon as possible; • Once and if detected, control the spread of any existing colonies; • Avoid working in areas with alien vegetation as dispersal into unaffected areas may be aided through vehicular movement; and • The preparation and implementation of an alien invasive management plan is recommended for the project. **The below measures are applicable to the disturbed wetlands (particularly the artificial depression and seeps):** • The rehabilitation and revegetation should be conducted in accordance with the approved Rehabilitation Plan (including Plant Species Plan) under supervision of a suitably qualified ECO and/or Ecologist; • No heavy machinery shall be permitted within unauthorised water resource areas for any purpose, without the prior approval of the ECO (except emergency procedures). Clearing of vegetation shall be conducted by hand. All cleared and trimmed vegetation shall be removed from any watercourse; • Re-vegetation of disturbed areas must be undertaken with site-specific indigenous species in accordance with biome-specific vegetation types. Rehabilitation of the vegetation component should also include resident, indigenous hydrophilic plant species that have established in the local area. This, to ensure survival and proliferation of site-specific vegetation that have already adapted to the current conditions and provide ecosystem services for other terrestrial and aquatic biota; • Dry seeding or hydro-seeding may be used for aquatic resources. If dry seeding is used it must be done at the end of the dry season and/or beginning of the wet season. This will ensure the seeds germinate and will not be washed away during high rainfall events; • All present alien and invasive plant species must be eradicated if the project is approved. Therefore, as part of the rehabilitation plan, regular removal of alien and invasive plant species should take place; • Dedicated implementation of the Environmental Management Programme (EMPr), including compliance monitoring and auditing by an ECO.			

9.3.2.10 **DISRUPTION OF WETLAND SOIL PROFILE, HYDROLOGICAL REGIME AND INCREASED SEDIMENT LOADS (W10)**

Impact	Phase	Pre-mitigation Impact	Post-mitigation Impact	Final Significance
Disruption of Wetland Soil Profile, Hydrological Regime and Increased Sediment Loads (W10)	Decommissioning	Medium- Low negative	Low negative	Medium- Low negative
Potential cumulative/ confounding effects	Any activities within proximity to wetland systems have the potential to degrade these systems directly or indirectly either by improper conduct, negligence, or stochastic / uncontrolled / accidental events. The mitigation measures below have therefore been suggested to alleviate the potential for these impacts to occur on the delineated systems.			

Impact	Phase	Pre-mitigation Impact	Post-mitigation Impact	Final Significance
	The alteration of surface topography and hydrology for the project infrastructure will inevitably be accompanied by an increase in erosion and sedimentation as rainwater erodes and washes exposed soils (active working and exposed areas) into the downslope watercourse.			
Alternatives	None.			

Mitigation Measures

- Restrict unauthorised and unnecessary activities within the wetlands and their respective buffers. No laydown areas or storage of equipment and material should be allowed within the wetlands and only activities necessary for construction of the relevant infrastructure (within watercourses) must be permitted. Authorised activities within the watercourse must be overseen by an ECO;
- Minimise the disturbance footprint of the development or the proposed infrastructure areas and avoid land clearing outside of these areas to prevent indirect impact to the wetlands;
- Clearly demarcate the construction footprint and restrict all construction activities to within the proposed infrastructure area;
- The construction servitude must be identified and be clearly demarcated prior to the commencement of any construction activities on site and before the arrival of construction machinery. Vehicles must use a single route to enter and exit the construction site. This will ensure that the compacting of the soils of these areas is kept to a minimum. The compacting of the soil can lead to an increase in runoff that in return will lead to sedimentation of the aquatic ecosystems;
- Educate staff and relevant contractors on the location and importance of the identified wetlands through toolbox talks and by including them in site inductions as well as the making them aware of the overall site plan which should indicate sensitive areas, waste disposal areas and any other relevant project specifics.
- Loose soils are particularly prone to loss due to wind or water. It is therefore preferable that construction takes place during the dry season, where possible, to reduce the erosion potential of the exposed surfaces;
- Practice good soil management across the construction footprint;
- Avoid the creation of concentrated flow paths wherever possible;
- Develop and implement a suitable stormwater management plan for the construction and operation phases;
- Install sandbags as a temporary measure around key areas of soil loss (active working areas and soil stockpiles) to prevent soils washing into the local watercourse (siltation);
- Signs of erosion must be addressed immediately to prevent further erosion of the area to prevent head cut erosion from forming;
- Temporary and permanent erosion control methods may include silt fences, flotation silt curtains, retention basins, detention ponds, interceptor ditches, seeding and sodding, riprap of exposed embankments, erosion mats, and mulching;
- Any exposed earth should be rehabilitated promptly by planting suitable vegetation (vigorous indigenous grasses) to protect the exposed soil;
- Relandscape to gentler gradients and re-vegetate all cleared areas, which includes the areas adjacent to the proposed infrastructure, as soon as possible to limit erosion potential. Sandbags and geotextiles should be used to assist until vegetation has established in these reworked areas; and
- The rehabilitation of watercourse banks must take place following construction. Key areas where erosion has occurred should be rehabilitated through bank reprofiling to gentler gradients and the revegetation of the marginal and riparian areas.

The below measures are applicable to the disturbed wetlands (particularly the artificial depression and seeps):

Impact	Phase	Pre-mitigation Impact	Post-mitigation Impact	Final Significance
• The rehabilitation and revegetation should be conducted in accordance with the approved Rehabilitation Plan (including Plant Species Plan) under supervision of a suitably qualified ECO and/or Ecologist; • No heavy machinery shall be permitted within unauthorised water resource areas for any purpose, without the prior approval of the ECO (except emergency procedures). Clearing of vegetation shall be conducted by hand. All cleared and trimmed vegetation shall be removed from any watercourse; • Re-vegetation of disturbed areas must be undertaken with site-specific indigenous species in accordance with biome-specific vegetation types. Rehabilitation of the vegetation component should also include resident, indigenous hydrophilic plant species that have established in the local area. This, to ensure survival and proliferation of site-specific vegetation that have already adapted to the current conditions and provide ecosystem services for other terrestrial and aquatic biota; • Dry seeding or hydro-seeding may be used for aquatic resources. If dry seeding is used it must be done at the end of the dry season and/or beginning of the wet season. This will ensure the seeds germinate and will not be washed away during high rainfall events; • All present alien and invasive plant species must be eradicated if the project is approved. Therefore, as part of the rehabilitation plan, regular removal of alien and invasive plant species should take place; • Dedicated implementation of the Environmental Management Programme (EMPr), including compliance monitoring and auditing by an ECO.				

9.3.3 TERRESTRIAL BIODIVERSITY (TB)

The construction phase usually has the largest direct impact on biodiversity. It is anticipated that daily activities associated with the operation phase will lead to further spread of AIP, as well as the deterioration of the habitats due to the increase of traffic, dust and edge effect impacts. Dust reduces the ability of plants to photosynthesise and thus leads to degradation/retrogression of the veld. Moving maintenance vehicles do not only cause sensory disturbances to fauna, affecting their life cycles and movement, but will lead to direct mortalities due to collisions, the roads and fences lead to the barrier effect reducing movement and dispersal. Environmental pollution due to water / mine drainage runoff is also expected during this phase due to vehicular movement, sewage works, and mine operational activities.

9.3.3.1 **DESTRUCTION, FURTHER LOSS & FRAGMENTATION OF THE VEGETATION COMMUNITY (TB1)**

Through site clearing, more of the vegetation communities will be lost. Unmitigated, this will also lead to habitat fragmentation and the establishment of alien invasive species as well as soil erosion.

During construction phase, the activities that will contribute to this impact are:

- Driving/ moving outside of designated areas;
- Physical removal of vegetation;
- Temporary site establishment (laydown, chemical toilets etc.);
- Soil dust precipitation as a result of site establishment;
- Dumping of waste products;
- Hydrocarbon storage and leakages; and
- Random events such as fire (cooking fires or cigarettes).

Impact	Phase	Pre-mitigation Impact	Post-mitigation Impact	Final Significance
Destruction, further loss and fragmentation of the vegetation community (TB1)	Construction	Medium-High negative	Medium-High negative	Medium-High negative
Potential cumulative/ confounding effects	Cumulative impacts: • Loss of habitat for indigenous species; and • Spread of invasive species to surrounding areas. Irreplaceable loss of: • Loss of CBA and ESA habitat.			
Alternatives	None.			
Mitigation Measures				
• A final site walkthrough must be conducted prior to the construction phase by the Environmental Control Officer (ECO) on site to ensure no new flora or faunal concerns have emerged. • Although not noted during the site visit, any observed TOPS (Threatened or Protected Species) of plants must be clearly demarcated prior to the commencement of site clearing. If construction activities are likely to affect any SCC or protected plants these individuals must be relocated as part of a plant rescue and protection plan, and a permit must be obtained before doing so. • All personnel and contractors are to undergo Environmental Awareness Training. A signed register of attendance must be kept for proof. • Discussions are required on sensitive environmental receptors within the PAOI to inform contractors and site staff of the presence of protected species, their identification, conservation status and importance, biology, habitat requirements and management requirements in line with the Environmental Authorisation and within the EMPr. • Contractors and employees must all undergo the induction and must be made aware of any sensitive areas to be avoided. • Laydown and construction preparation activities (such as cement mixing, temporary toilets, etc.) must be limited to already Modified areas and should take up the smallest footprint possible. • It is recommended that areas to be developed/disturbed be specifically demarcated so that during the phase, only the demarcated areas be impacted upon. • Areas of indigenous vegetation, even secondary communities outside of the direct project footprint, should not be fragmented or disturbed further if possible. • A hydrocarbon spill management plan must be put in place to ensure that should there be any chemical spill out or over that it does not run into the surrounding areas. The Contractor shall be in possession of an emergency spill kit that must always be complete and available on site. o Drip trays or any form of oil absorbent material must be placed underneath vehicles/machinery and equipment when not in use. o All servicing and refueling of equipment/vehicles on site to be undertaken in suitably designated areas, unless necessary. o All contaminated soil / yard stone shall be treated in situ or removed and be placed in containers and disposed of at a licenced hazardous waste facility. o Appropriately contain any generator diesel storage tanks, machinery spills (e.g., accidental spills of hydrocarbons oils, diesel etc.) in such a way as to prevent them from leaking and entering the environment. o Construction activities and vehicles could cause spillages of lubricants, fuels and waste material negatively affecting any ecosystem functioning, which must be prevented.			

Impact	Phase	Pre-mitigation Impact	Post-mitigation Impact	Final Significance
• A spill response kit must be available at all times. The incident must be reported on and if necessary, a biodiversity specialist must investigate the extent of the impact and provide rehabilitation recommendations. • A fire management plan needs to be compiled and implemented to restrict the impact fire would have on the surrounding areas. • All vehicles and personnel must make use of existing roads and walking paths as far as possible, especially construction/operational vehicles. • Materials may not be stored for extended periods of time and must be removed from the PAOI once the construction & decommissioning phase has been concluded. No permanent construction phase structures should be permitted. Construction buildings should preferably be prefabricated or constructed of re-usable/recyclable materials. No storage of vehicles or equipment will be allowed outside of the designated laydown areas • All construction waste must be removed from site at the completion of the construction phase and decommissioning phase. • It must be made an offence for any staff member to remove any indigenous plant species from the PAOI or bring any alien species in. This is to prevent the spread of exotic or alien species or the illegal collection of plants. • Dust-reducing mitigation measures must be put in place and must be strictly adhered to. This includes the wetting of exposed soft soil surfaces. No non-environmentally friendly suppressants may be used as this could result in the pollution of water sources.				

9.3.3.2 INTRODUCTION OF ALIEN SPECIES (TB2)

The spread of alien invasive species will result in the loss of habitat and water for indigenous fauna and flora. It can also contribute to the spreading of potentially dangerous diseases due to invasive - and pest species. Overall, the fauna assemblage will be changed. Activities that will contribute to this impact:

- Vegetation removal and disturbance of soil;
- Vehicles potentially spreading seed;
- Unsanitary conditions surrounding infrastructure promoting the establishment of alien and/or invasive; and
- Eating area increasing pest species such as rats and flies.

Impact	Phase	Pre-mitigation Impact	Post-mitigation Impact	Final Significance
Introduction of alien species, especially plants (TB2)	Construction	Medium-High negative	Medium- Low negative	Medium- Low negative
Potential cumulative/ confounding effects	Cumulative impacts: • Loss of habitat for indigenous species; and • Spread of disease to surrounding areas. Irreplaceable loss of: • CBA and ESA habitat.			
Alternatives	None.			
Mitigation Measures				
• All personnel and contractors are to undergo Environmental Awareness Training. A signed register of attendance must be kept for proof.				

Impact	Phase	Pre-mitigation Impact	Post-mitigation Impact	Final Significance
• Discussions are required on sensitive environmental receptors within the PAOI to inform contractors and site staff of the presence of protected species, their identification, conservation status and importance, biology, habitat requirements and management requirements in line with the Environmental Authorisation and within the EMPr. • Contractors and employees must all undergo the induction and must be made aware of any sensitive areas to be avoided. • All construction and maintenance motor vehicle operators should undergo an environmental induction that includes instruction on the need to comply with speed limits, to respect all forms of wildlife. Speed limits of must be enforced to ensure that road killings and erosion is limited. 1. **General Site Roads:** 20 to 40 km/h to ensure safe navigation around the site. 2. **Operational Areas:** 10 to 20 km/h, in areas where heavy machinery and equipment are operating to minimize the risk of accidents. 3. **Pedestrian Zones:** In areas with pedestrian traffic, such as near administrative buildings or worker accommodations, speed limits may be further reduced to 10 km/h (6 mph) or less. 4. **Special Conditions:** During adverse weather conditions, such as fog, rain, or dust storms, speed limits may be temporarily reduced to ensure visibility and control. • The footprint area of the construction should be kept to a minimum. The footprint area must be clearly demarcated to avoid unnecessary disturbances to adjacent areas. Footprints of the roads must be kept to prescribed widths which adhere to regulated requirements and the Mine Health and Safety Act (MHSA). • All vehicles and personnel must make use of existing roads and walking paths as far as possible, especially construction/operational vehicles. • A pest control plan must be put in place and implemented; it is imperative that poisons not be used to control pests. • The clearing of indigenous vegetation must be minimized where possible. Clearing of AIP vegetation, which dominated the PAOI, is advocated. All activities must be restricted to within the authorized areas. • It must be made an offence for any staff member to remove any indigenous plant species from the PAOI or bring any alien species in. This is to prevent the spread of exotic or alien species or the illegal collection of plants.				

9.3.3.3 EROSION DUE TO STORM WATER RUNOFF AND WIND (TB3)

Erosion will lead to the loss of vegetation, the removal/ relocation of the topsoil and the destruction of habitat. Activities that will contribute to this impact:

- Storm water runoff from roads, and other paved areas;
- Vehicles driving outside demarcated areas;
- Footpaths outside demarcated areas;
- Clearing of vegetation;
- Runoff from areas with bare soil; and
- Compacting of roads.

Impact	Phase	Pre-mitigation Impact	Post-mitigation Impact	Final Significance
Erosion due to Storm Water Runoff and Wind (TB3)	Construction	Medium- Low negative	Medium- Low negative	Medium- Low negative

Impact	Phase	Pre-mitigation Impact	Post-mitigation Impact	Final Significance
Potential cumulative/ confounding effects	Cumulative impacts: • Removal of topsoil; and • Loss of habitat for indigenous species. Irreplaceable loss of: • CBA and ESA areas.			
Alternatives	None.			
Mitigation Measures				
• All personnel and contractors are to undergo Environmental Awareness Training. A signed register of attendance must be kept for proof. • Discussions are required on sensitive environmental receptors within the PAOI to inform contractors and site staff of the presence of protected species, their identification, conservation status and importance, biology, habitat requirements and management requirements in line with the Environmental Authorisation and within the EMPr. • Contractors and employees must all undergo the induction and must be made aware of any sensitive areas to be avoided. • All construction and maintenance motor vehicle operators should undergo an environmental induction that includes instruction on the need to comply with speed limits, to respect all forms of wildlife. Speed limits of must be enforced to ensure that road killings and erosion is limited. 1. **General Site Roads:** 20 to 40 km/h to ensure safe navigation around the site. 2. **Operational Areas:** 10 to 20 km/h, in areas where heavy machinery and equipment are operating to minimize the risk of accidents. 3. **Pedestrian Zones:** In areas with pedestrian traffic, such as near administrative buildings or worker accommodations, speed limits may be further reduced to 10 km/h (6 mph) or less. 4. **Special Conditions:** During adverse weather conditions, such as fog, rain, or dust storms, speed limits may be temporarily reduced to ensure visibility and control. • Only existing access routes and walking paths, or those constructed during this project, may be made use of. Using informal routes through vegetation can reduce ground cover and lead to erosion. • A stormwater management plan must be compiled and implemented if necessary.			

9.3.3.4 DISPLACEMENT OF FAUNAL COMMUNITY, DIRECT MORTALITIES AND DISTURBANCE (TB4)

Faunal community will be influenced in a number of ways, including the loss of habitat, disturbances that will either make them move out of the area if possible or have to adapt and possible deaths due to physical harm or indirect harm. Activities that will contribute to this impact:

- Clearing of vegetation;
- Roadkill due to vehicle collision;
- Pollution of water resources due to dust effects and run-off;
- Intentional killing of fauna for food (hunting) or otherwise (killing of snakes);
- Disease caused by increased dust levels;
- Increase in pest species in the area due to new food source created; and
- Vibrations, noise and rock chips skidding out due to the construction activities.

Impact	Phase	Pre-mitigation Impact	Post-mitigation Impact	Final Significance
Displacement of Faunal Community, Direct Mortalities and Disturbance (TB4)	Construction	Medium-High negative	Medium- Low negative	Medium- Low negative
Potential cumulative/ confounding effects	Cumulative impacts: • Loss of habitat for indigenous species. Potential irreplaceable loss of: • Possible faunal SCCs.			
Alternatives	None.			

Mitigation Measures

- All personnel and contractors are to undergo Environmental Awareness Training. A signed register of attendance must be kept for proof.
  Discussions are required on sensitive environmental receptors within the PAOI to inform contractors and site staff of the presence of protected species, their identification, conservation status and importance, biology, habitat requirements and management requirements in line with the Environmental Authorisation and within the EMPr.
  Contractors and employees must all undergo the induction and must be made aware of any sensitive areas to be avoided.
- All construction and maintenance motor vehicle operators should undergo an environmental induction that includes instruction on the need to comply with speed limits, to respect all forms of wildlife. Speed limits of must be enforced to ensure that road killings and erosion is limited.
  1. **General Site Roads:** 20 to 40 km/h to ensure safe navigation around the site.
  2. **Operational Areas:** 10 to 20 km/h, in areas where heavy machinery and equipment are operating to minimize the risk of accidents.
  3. **Pedestrian Zones:** In areas with pedestrian traffic, such as near administrative buildings or worker accommodations, speed limits may be further reduced to 10 km/h (6 mph) or less.
  4. **Special Conditions:** During adverse weather conditions, such as fog, rain, or dust storms, speed limits may be temporarily reduced to ensure visibility and control.
- A qualified environmental control officer must be on site throughout construction and decommissioning phases, as well as periodically during operation. A site walk through must be performed by a suitably qualified ecologist prior to any activities taking place and any SSC or protected species should be noted.
- In situations where these species are observed and must be removed, the proponent may only do so after the required permission/permits have been obtained in accordance with national and provincial legislation. In the abovementioned situation the development and implementation of a search, rescue and recovery program is suggested for the protection of these species. Should animals not move out of the area on their own, relevant specialists must be contacted to advise on how the species can be relocated.
- Clearing and disturbance activities must be conducted in a progressive manner, always outwards and away from the centre of the PAOI and over several days, so as to provide an easy escape route for all small mammals and herpetofauna.
- The duration of the activities should be minimised to as short a term as possible, to reduce the period of disturbance on fauna.
- Noise must be kept to an absolute minimum during the evenings and at night to minimise all possible disturbances to reptile species and nocturnal mammals.
- No trapping, killing, or poisoning of any wildlife is to be allowed and signs must be put up to enforce this. Monitoring must take place in this regard.
- The areas to be disturbed must be specifically and responsibly demarcated to prevent the movement of staff or any individual into the surrounding environments, signs must be put up to enforce this.

Impact	Phase	Pre-mitigation Impact	Post-mitigation Impact	Final Significance
• Outside lighting should be designed and limited to minimise impacts on fauna. All outside lighting should be directed away from any sensitive areas. Fluorescent and mercury vapor lighting should be avoided, and sodium vapor (green/red) lights should be used wherever possible. • Any holes/deep excavations must be dug in a progressive manner and shouldn't be left open overnight. Should any holes remain open overnight they must be properly covered temporarily to ensure that no small fauna species fall in. Holes must be subsequently inspected for fauna prior to backfilling. • If fencing is required: wildlife-permeable fencing with holes large enough for mongoose and other smaller mammals should be installed, the holes must not be placed in the fence where it is next to a major road as this will increase road killings in the area. • Dust-reducing mitigation measures must be put in place and must be strictly adhered to. This includes the wetting of exposed soft soil surfaces. No non-environmentally friendly suppressants may be used as this could result in the pollution of water sources.				

9.3.3.5 POTENTIAL LEAKS, DISCHARGES, POLLUTANTS FROM MACHINERY AND STORAGE LEACHING INTO THE ENVIRONMENT (TB5)

Hydrocarbons leaching into the surrounding area will result in the loss of usable water resources, the loss of fauna and flora species. This will also result in the contamination of the topsoil and reduce the likelihood of successful rehabilitation of an area.

Activities that will contribute to this impact:

- Loss of vegetation; and
- Loss of topsoil.

Impact	Phase	Pre-mitigation Impact	Post-mitigation Impact	Final Significance
Potential Leaks, Discharges, Pollutants from Machinery and Storage Leaching into the Surrounding Environment (TB5)	Construction	Medium-High negative	Low negative	Medium- Low negative
Potential cumulative/ confounding effects	Cumulative impacts: • Loss of usable water resources for fauna species; and • Loss of viable habitat. Irreplaceable loss of: • Usable water resources for fauna species resulting in loss of possible SCC and other species.			
Alternatives	None.			
Mitigation Measures				
• All personnel and contractors are to undergo Environmental Awareness Training. A signed register of attendance must be kept for proof. • Discussions are required on sensitive environmental receptors within the PAOI to inform contractors and site staff of the presence of protected species, their identification, conservation status and importance, biology, habitat requirements and management requirements in line with the Environmental Authorisation and within the EMPr. • Contractors and employees must all undergo the induction and must be made aware of any sensitive areas to be avoided.				

Impact	Phase	Pre-mitigation Impact	Post-mitigation Impact	Final Significance
• Waste management must be a priority and all waste must be collected and stored effectively and responsibly according to a site-specific waste management plan. Dangerous waste such as metal wires and glass must only be stored in fully sealed and secure containers, before being moved off site as soon as possible. • Litter, spills, fuels, chemical and human waste in and around the PAOI must be minimised and controlled according to the waste management plan. • Cement mixing may not be performed on the ground. It is recommended that only closed side drum or pan-type concrete mixers be utilised. Any spills must be immediately contained and isolated from the natural environment, before being removed from site and treated in situ or removed, placed in containers, and disposed of at a licenced hazardous waste facility. • Toilets at the recommended Health and Safety standards must be provided. These should be emptied regularly and once no longer required, they must be pumped dry to prevent leakage into the surrounding environment and removed from site. • The Contractor should supply sealable and properly marked domestic waste collection bins and all solid waste collected shall be disposed of at a licensed disposal facility within every 10 days at least. • Where a registered disposal facility is not available close to the PAOI, the Contractor shall provide a method statement with regards to waste management. Under no circumstances may domestic waste be burned on site or buried in open pits. • Refuse bins will be responsibly emptied and secured. Temporary storage of domestic waste shall be in covered and secured waste skips. Maximum domestic waste storage period will be 10 days.				

9.3.3.6 CONTINUED ENCROACHMENT BY ALIEN INVASIVE PLANT SPECIES, EROSION AND ENVIRONMENTAL POLLUTION (TB6)

The spread of alien invasive species will result in the loss of habitat and water for indigenous fauna and flora. Overall, the fauna assemblage will be changed. Erosion will also disrupt the vegetation in the surrounding areas and result in habitat loss. Activities that will contribute to this impact:

- Vehicles potentially spreading seed;
- Storm water runoff from roads and other bare areas;
- Vehicles driving outside demarcated areas; and
- Footpaths outside demarcated areas.

Impact	Phase	Pre-mitigation Impact	Post-mitigation Impact	Final Significance
Continued Encroachment by Alien Invasive Plant Species, Erosion and Environmental Pollution (TB6)	Operation	High negative	Medium- Low negative	Medium-High negative
Potential cumulative/ confounding effects	Cumulative impacts: • Loss of habitat; and • Loss of indigenous flora species due to competition. Irreplaceable loss of: • Habitat and food sources for fauna SCCs.			
Alternatives	None.			
Mitigation Measures				

Impact	Phase	Pre-mitigation Impact	Post-mitigation Impact	Final Significance

- All personnel and contractors are to undergo Environmental Awareness Training. A signed register of attendance must be kept for proof.
- Discussions are required on sensitive environmental receptors within the PAOI to inform contractors and site staff of the presence of protected species, their identification, conservation status and importance, biology, habitat requirements and management requirements in line with the Environmental Authorisation and within the EMPr.
- Contractors and employees must all undergo the induction and must be made aware of any sensitive areas to be avoided.
- All construction and maintenance motor vehicle operators should undergo an environmental induction that includes instruction on the need to comply with speed limits, to respect all forms of wildlife. Speed limits of must be enforced to ensure that road killings and erosion is limited.
    1. **General Site Roads:** 20 to 40 km/h to ensure safe navigation around the site.
    2. **Operational Areas:** 10 to 20 km/h, in areas where heavy machinery and equipment are operating to minimize the risk of accidents.
    3. **Pedestrian Zones:** In areas with pedestrian traffic, such as near administrative buildings or worker accommodations, speed limits may be further reduced to 10 km/h (6 mph) or less.
    4. **Special Conditions:** During adverse weather conditions, such as fog, rain, or dust storms, speed limits may be temporarily reduced to ensure visibility and control.
- An Alien Invasive Plant (AIP) Management Plan must be compiled and implemented. This should regularly be updated to reflect the annual changed in AIP composition.
- The footprint area of the construction should be kept to a minimum. The footprint area must be clearly demarcated to avoid unnecessary disturbances to adjacent areas. Footprints of the roads must be kept to prescribed widths which adhere to regulated requirements and the Mine Health and Safety Act (MHSA).
- A pest control plan must be put in place and implemented; it is imperative that poisons not be used to control pests.
- Speed limits must be put in place to reduce erosion. Soil surfaces must be wetted as necessary to reduce the dust generated by the project activities. Speed bumps and signs must be erected to enforce slow speeds.
- Only existing access routes and walking paths, or those constructed during this project, may be made use of. Using informal routes through vegetation can reduce ground cover and lead to erosion.
- Areas that are denuded during construction need to be re-vegetated with indigenous vegetation according to a habitat rehabilitation plan, to prevent erosion during flood and wind events and to promote the regeneration of functional habitat. This will also reduce the likelihood of encroachment by alien invasive plant species. All grazing mammals must be kept out of the areas that have recently been re-planted.
- Areas that are denuded during construction need to be re-vegetated with indigenous vegetation to prevent erosion during flood events etc.
- A stormwater management plan must be compiled and implemented if necessary.
- All vehicles and personnel must make use of existing roads and walking paths as far as possible, especially construction/operational vehicles.
- The clearing of indigenous vegetation must be minimized where possible. Clearing of AIP vegetation, which dominated the PAOI, is advocated. All activities must be restricted to within the authorized areas.
- Materials may not be stored for extended periods of time and must be removed from the PAOI once the construction & decommissioning phase has been concluded. No permanent construction phase structures should be permitted. Construction buildings should preferably be prefabricated or constructed of re-usable/recyclable materials. No storage of vehicles or equipment will be allowed outside of the designated laydown areas.
- A habitat rehabilitation plan must be implemented, and areas of bare ground must be revegetated with species indigenous to the region.

Impact	Phase	Pre-mitigation Impact	Post-mitigation Impact	Final Significance
• A hydrocarbon spill management plan must be put in place to ensure that should there be any chemical spill out or over that it does not run into the surrounding areas. The Contractor shall be in possession of an emergency spill kit that must always be complete and available on site. o Drip trays or any form of oil absorbent material must be placed underneath vehicles/machinery and equipment when not in use. o All servicing and refueling of equipment/vehicles on site to be undertaken in suitably designated areas, unless necessary. o All contaminated soil / yard stone shall be treated in situ or removed and be placed in containers and disposed of at a licenced hazardous waste facility. o Appropriately contain any generator diesel storage tanks, machinery spills (e.g., accidental spills of hydrocarbons oils, diesel etc.) in such a way as to prevent them from leaking and entering the environment. o Construction activities and vehicles could cause spillages of lubricants, fuels and waste material negatively affecting any ecosystem functioning, which must be prevented. • It must be made an offence for any staff member to remove any indigenous plant species from the PAOI or bring any alien species in. This is to prevent the spread of exotic or alien species or the illegal collection of plants. • A fire management plan needs to be compiled and implemented to restrict the impact fire would have on the surrounding areas. • All construction waste must be removed from site at the completion of the construction phase and decommissioning phase. • Speed limits must be put in place to reduce erosion. Soil surfaces must be wetted as necessary to reduce the dust generated by the project activities. Speed bumps and signs must be erected to enforce slow speeds. • Only existing access routes and walking paths, or those constructed during this project, may be made use of. Using informal routes through vegetation can reduce ground cover and lead to erosion. • Areas that are denuded during construction need to be re-vegetated with indigenous vegetation to prevent erosion during flood events etc. • A stormwater management plan must be compiled and implemented if necessary.				

9.3.3.7 CONTINUED DISPLACEMENT AND FRAGMENTATION OF THE FAUNAL COMMUNITY DUE TO ONGOING ANTHROPOGENIC DISTURBANCES AND HABITAT DEGRADATION/LOSS (TB7)

The operation and maintenance of the proposed development may lead to disturbance or persecution of fauna in the vicinity of the development through;

- Increased anthropogenic disturbances (noise, human presence, litter and poaching/snaring);
- Intentional killing of fauna for food (hunting) or otherwise (killing of snakes);
- The disruption of natural faunal movement corridors.

Impact	Phase	Pre-mitigation Impact	Post-mitigation Impact	Final Significance
Continued Displacement and Fragmentation of the Faunal Community due to Ongoing Anthropogenic Disturbances and Habitat	Operation	Medium-High negative	Medium- Low negative	Medium- Low negative

Impact	Phase	Pre-mitigation Impact	Post-mitigation Impact	Final Significance
Degradation/Loss (TB7)				
Potential cumulative/ confounding effects	Cumulative impacts: • Loss of suitable habitat. Irreplaceable loss: • Potential loss of fauna SCCs.			
Alternatives	None.			

Mitigation Measures

- All personnel and contractors are to undergo Environmental Awareness Training. A signed register of attendance must be kept for proof.
- Discussions are required on sensitive environmental receptors within the PAOI to inform contractors and site staff of the presence of protected species, their identification, conservation status and importance, biology, habitat requirements and management requirements in line with the Environmental Authorisation and within the EMPr.
- Contractors and employees must all undergo the induction and must be made aware of any sensitive areas to be avoided.
- All construction and maintenance motor vehicle operators should undergo an environmental induction that includes instruction on the need to comply with speed limits, to respect all forms of wildlife. Speed limits of must be enforced to ensure that road killings and erosion is limited.
    1. **General Site Roads:** 20 to 40 km/h to ensure safe navigation around the site.
    2. **Operational Areas:** 10 to 20 km/h, in areas where heavy machinery and equipment are operating to minimize the risk of accidents.
    3. **Pedestrian Zones:** In areas with pedestrian traffic, such as near administrative buildings or worker accommodations, speed limits may be further reduced to 10 km/h (6 mph) or less.
    4. **Special Conditions:** During adverse weather conditions, such as fog, rain, or dust storms, speed limits may be temporarily reduced to ensure visibility and control.
- A qualified environmental control officer must be on site throughout construction and decommissioning phases, as well as periodically during operation. A site walk through must be performed by a suitably qualified ecologist prior to any activities taking place and any SSC or protected species should be noted.
- In situations where these species are observed and must be removed, the proponent may only do so after the required permission/permits have been obtained in accordance with national and provincial legislation. In the abovementioned situation the development and implementation of a search, rescue and recovery program is suggested for the protection of these species. Should animals not move out of the area on their own, relevant specialists must be contacted to advise on how the species can be relocated.
- The areas to be disturbed must be specifically and responsibly demarcated to prevent the movement of staff or any individual into the surrounding environments, signs must be put up to enforce this.
- Noise must be kept to an absolute minimum during the evenings and at night to minimise all possible disturbances to reptile species and nocturnal mammals.
- Schedule activities and operations during least sensitive periods, to avoid migration, nesting, and breeding seasons. In this case, activities should take place during the day.
- No trapping, killing, or poisoning of any wildlife is to be allowed and signs must be put up to enforce this. Monitoring must take place in this regard.
- Outside lighting should be designed and limited to minimise impacts on fauna. All outside lighting should be directed away from any sensitive areas. Fluorescent and mercury vapor lighting should be avoided, and sodium vapor (green/red) lights should be used wherever possible.
- Dust-reducing mitigation measures must be put in place and must be strictly adhered to. This includes the wetting of exposed soft soil surfaces. No non-environmentally friendly suppressants may be used as this could result in the pollution of water sources.

9.3.3.8 POTENTIAL LEAKS, DISCHARGES, POLLUTANTS FROM WASTE OVERFLOWS DUE TO INFRASTRUCTURE DAMAGE/MALFUNCTION SPREADING INTO THE ENVIRONMENT (TB8)

Sewage and other contaminants leaking into the surrounding area will result in the loss of usable water resources, the loss of fauna and flora species and the associated habitat.

Activities that will contribute to this impact:

- Damage to/or leaking of sewage plant and infrastructure containing/transporting pollutants including vehicles.

Impact	Phase	Pre-mitigation Impact	Post-mitigation Impact	Final Significance
Potential leaks, discharges, pollutants from waste overflows due to infrastructure damage/malfunction spreading into the surrounding environment (TB8)	Operation	Medium-High negative	Medium- Low negative	Medium-High negative
Potential cumulative/ confounding effects	Cumulative impacts: • Loss of usable water resources for fauna species; and • Loss of viable habitat. Irreplaceable loss of: • usable water resources for fauna species resulting in loss of possible SCC and other species.			
Alternatives	None.			
Mitigation Measures				
• All personnel and contractors are to undergo Environmental Awareness Training. A signed register of attendance must be kept for proof. • Discussions are required on sensitive environmental receptors within the PAOI to inform contractors and site staff of the presence of protected species, their identification, conservation status and importance, biology, habitat requirements and management requirements in line with the Environmental Authorisation and within the EMPr. • Contractors and employees must all undergo the induction and must be made aware of any sensitive areas to be avoided. • Waste management must be a priority and all waste must be collected and stored effectively and responsibly according to a site-specific waste management plan. Dangerous waste such as metal wires and glass must only be stored in fully sealed and secure containers, before being moved off site as soon as possible. • Litter, spills, fuels, chemical and human waste in and around the PAOI must be minimised and controlled according to the waste management plan. • Cement mixing may not be performed on the ground. It is recommended that only closed side drum or pan-type concrete mixers be utilised. Any spills must be immediately contained and isolated from the natural environment, before being removed from site and treated in situ or removed, placed in containers, and disposed of at a licenced hazardous waste facility. • Toilets at the recommended Health and Safety standards must be provided. These should be emptied regularly and once no longer required, they must be pumped dry to prevent leakage into the surrounding environment and removed from site. • The Contractor should supply sealable and properly marked domestic waste collection bins and all solid waste collected shall be disposed of at a licensed disposal facility within every 10 days at least.			

Impact	Phase	Pre-mitigation Impact	Post-mitigation Impact	Final Significance
• Where a registered disposal facility is not available close to the PAOI, the Contractor shall provide a method statement with regards to waste management. Under no circumstances may domestic waste be burned on site or buried in open pits. • Refuse bins will be responsibly emptied and secured. Temporary storage of domestic waste shall be in covered and secured waste skips. Maximum domestic waste storage period will be 10 days.				

9.3.3.9 CONTINUED ENCROACHMENT BY ALIEN INVASIVE PLANT SPECIES, EROSION AND ENVIRONMENTAL POLLUTION (TB9)

The spread of alien invasive species will result in the loss of habitat and water for indigenous fauna and flora. Overall, the fauna assemblage will be changed. Erosion will also disrupt the vegetation in the surrounding areas and result in habitat loss. Activities that will contribute to this impact:

- Vehicles potentially spreading seed.

Impact	Phase	Pre-mitigation Impact	Post-mitigation Impact	Final Significance
Continued encroachment by alien invasive plant species, erosion and environmental pollution (TB9)	Decommissioning	Medium-High negative	Medium- Low negative	Medium- Low negative
Potential cumulative/ confounding effects	Cumulative impacts: • Loss of habitat; and • Loss of indigenous flora species due to competition. Irreplaceable loss: • Loss of habitat and food sources for Fauna SCCs.			
Alternatives	None.			
Mitigation Measures				
• All personnel and contractors are to undergo Environmental Awareness Training. A signed register of attendance must be kept for proof. • Discussions are required on sensitive environmental receptors within the PAOI to inform contractors and site staff of the presence of protected species, their identification, conservation status and importance, biology, habitat requirements and management requirements in line with the Environmental Authorisation and within the EMPr. • Contractors and employees must all undergo the induction and must be made aware of any sensitive areas to be avoided. • All construction and maintenance motor vehicle operators should undergo an environmental induction that includes instruction on the need to comply with speed limits, to respect all forms of wildlife. Speed limits of must be enforced to ensure that road killings and erosion is limited. 1. **General Site Roads:** 20 to 40 km/h to ensure safe navigation around the site. 2. **Operational Areas:** 10 to 20 km/h, in areas where heavy machinery and equipment are operating to minimize the risk of accidents. 3. **Pedestrian Zones:** In areas with pedestrian traffic, such as near administrative buildings or worker accommodations, speed limits may be further reduced to 10 km/h (6 mph) or less. 4. **Special Conditions:** During adverse weather conditions, such as fog, rain, or dust storms, speed limits may be temporarily reduced to ensure visibility and control. • An Alien Invasive Plant (AIP) Management Plan must be compiled and implemented. This should regularly be updated to reflect the annual changed in AIP composition.				

Impact	Phase	Pre-mitigation Impact	Post-mitigation Impact	Final Significance
• Materials may not be stored for extended periods of time and must be removed from the PAOI once the construction & decommissioning phase has been concluded. No permanent construction phase structures should be permitted. Construction buildings should preferably be prefabricated or constructed of re-usable/recyclable materials. No storage of vehicles or equipment will be allowed outside of the designated laydown areas. • Areas that are denuded during construction need to be re-vegetated with indigenous vegetation according to a habitat rehabilitation plan, to prevent erosion during flood and wind events and to promote the regeneration of functional habitat. This will also reduce the likelihood of encroachment by alien invasive plant species. All grazing mammals must be kept out of the areas that have recently been re-planted. • A habitat rehabilitation plan must be implemented, and areas of bare ground must be revegetated with species indigenous to the region. • A hydrocarbon spill management plan must be put in place to ensure that should there be any chemical spill out or over that it does not run into the surrounding areas. The Contractor shall be in possession of an emergency spill kit that must always be complete and available on site. o Drip trays or any form of oil absorbent material must be placed underneath vehicles/machinery and equipment when not in use. o All servicing and refueling of equipment/vehicles on site to be undertaken in suitably designated areas, unless necessary. o All contaminated soil / yard stone shall be treated in situ or removed and be placed in containers and disposed of at a licenced hazardous waste facility. o Appropriately contain any generator diesel storage tanks, machinery spills (e.g., accidental spills of hydrocarbons oils, diesel etc.) in such a way as to prevent them from leaking and entering the environment. o Construction activities and vehicles could cause spillages of lubricants, fuels and waste material negatively affecting any ecosystem functioning, which must be prevented. • A fire management plan needs to be compiled and implemented to restrict the impact fire would have on the surrounding areas. • All construction waste must be removed from site at the completion of the construction phase and decommissioning phase.				

9.3.3.10 CONTINUED DISPLACEMENT AND FRAGMENTATION OF THE FAUNAL COMMUNITY (TB10)

Continued displacement and fragmentation of the faunal community (including threatened or protected species) due to ongoing anthropogenic disturbances (noise, dust and vibrations) and habitat degradation/loss (litter, road mortalities and/or poaching) during the decommissioning phase could result in:

- Habitat loss; and
- The disruption of natural faunal movement corridors.

Impact	Phase	Pre-mitigation Impact	Post-mitigation Impact	Final Significance
Continued displacement and fragmentation of the faunal community (TB10)	Decommissioning	Medium-High negative	Medium- Low negative	Medium- Low negative
Potential cumulative/ confounding effects	Cumulative impacts: • Loss of suitable habitat. Irreplaceable loss: • Loss of fauna and suitable habitat.			

Impact	Phase	Pre-mitigation Impact	Post-mitigation Impact	Final Significance
Alternatives	None.			
Mitigation Measures				
• All personnel and contractors are to undergo Environmental Awareness Training. A signed register of attendance must be kept for proof. • Discussions are required on sensitive environmental receptors within the PAOI to inform contractors and site staff of the presence of protected species, their identification, conservation status and importance, biology, habitat requirements and management requirements in line with the Environmental Authorisation and within the EMPr. • Contractors and employees must all undergo the induction and must be made aware of any sensitive areas to be avoided. • All construction and maintenance motor vehicle operators should undergo an environmental induction that includes instruction on the need to comply with speed limits, to respect all forms of wildlife. Speed limits of must be enforced to ensure that road killings and erosion is limited. 1. **General Site Roads:** 20 to 40 km/h to ensure safe navigation around the site. 2. **Operational Areas:** 10 to 20 km/h, in areas where heavy machinery and equipment are operating to minimize the risk of accidents. 3. **Pedestrian Zones:** In areas with pedestrian traffic, such as near administrative buildings or worker accommodations, speed limits may be further reduced to 10 km/h (6 mph) or less. 4. **Special Conditions:** During adverse weather conditions, such as fog, rain, or dust storms, speed limits may be temporarily reduced to ensure visibility and control. • The areas to be disturbed must be specifically and responsibly demarcated to prevent the movement of staff or any individual into the surrounding environments, signs must be put up to enforce this. • Noise must be kept to a minimum during the evenings and at night to minimise all possible disturbances to reptile species and nocturnal mammals. • No trapping, killing, or poisoning of any wildlife is to be allowed and signs must be put up to enforce this. Monitoring must take place in this regard. • Schedule activities and operations during least sensitive periods, to avoid migration, nesting, and breeding seasons. In this case, activities should take place during the day. • Dust-reducing mitigation measures must be put in place and must be strictly adhered to. This includes the wetting of exposed soft soil surfaces. No non-environmentally friendly suppressants may be used as this could result in the pollution of water sources.				

9.3.4 SOCIAL (S)

Temporary jobs will be created during the construction phase of the project. The existing contractors will need to hire additional people for the construction. Approximately 20 new un-skilled employment opportunities will be created during the construction phase.

The existing employees of Kroondal will be moved to the new location of the development. Additional contracted security and housekeeping personnel will be required during the operation phase.

9.3.4.1 **JOB CREATION DURING CONSTRUCTION PHASE (S1)**

Impact	Phase	Pre-mitigation Impact	Post-mitigation Impact	Final Significance
Job creation during Construction Phase (S1)	Construction	Low positive	Low positive	Low positive

Impact	Phase	Pre-mitigation Impact	Post-mitigation Impact	Final Significance
Potential cumulative/ confounding effects	Cumulative impacts are limited as approximately 20 new un-skilled employment opportunities will temporarily be created during the construction phase			
Alternatives	None.			
Mitigation Measures				
• None.				

9.3.4.2 JOB CREATION DURING OPERATION PHASE (S2)

Impact	Phase	Pre-mitigation Impact	Post-mitigation Impact	Final Significance
Job creation during Operation Phase (S2)	Operation	Medium-low positive	Medium-low positive	Medium-low positive
Potential cumulative/ confounding effects	Cumulative impacts are limited as existing employees of Kroondal will be moved to the new location of the development. Additional contracted security and housekeeping personnel will be required during the operation phase. This will ensure long-term jobs associated with the lifetime of the operation.			
Alternatives	None.			
Mitigation Measures				
• None.				

9.3.5 CULTURAL HERITAGE (C)

The heritage impacts include the Later Stone Age (LSA) single finds as well as Iron Age single find. None of these finds constitute a site as they were scattered across far distances around the development area.

Given that these finds are located in the area of the proposed parking lot, these finds will definitely be affected by construction activities. If not found or collected, these finds may be permanently displaced or damaged. Bearing in mind the nature of the finds which have been documented and analysed, their heritage value is not critically significant. In fact, these finds do not add anything new to our understandings of the past and South African heritage as presented in the literature review of this report. Documenting these finds should be sufficient, with no mitigation put in place to preserve them.

It is the understanding of the Archaeologist that these finds represent pieces from sites further away from the development area or finds which have been removed from context due to the extensive mining activities which take place in the surrounding area. Given that these finds were identified together with modern debris, this would indicate that the proposed site for development has been extensively disturbed and does not carry intrinsic heritage value. It is possible that the finds were initially displaced and deposited at the locations they were found through alluvial, erosional, and anthropogenic processes associated with development.

While these individual finds do not represent markers of heritage significance, they may be indicators of below-ground heritage finds and sights. For this reason, as a mitigation measure proposed, a Heritage Finds or Chance Find Procedure for addressing heritage finds must be adopted as part of construction processes. Should finds of an alarming significance, for example, grave or high density of small finds be discovered during construction, this procedure will inform the next steps taken to ensure the documentation of these finds, and further action to be taken should a heritage professional deem necessary.

It is on this premise that post-mitigation of the identified heritage impacts is rated a Low Negative, given the potential for a heritage procedure to allow for the documentation, recording, and further assessment of undiscovered finds and sites. A heritage procedure can present opportunity to limit the impact of development on heritage finds to construction activities, with the potential to document and further assess finds should they be related to broader sites. This ultimately presents opportunity to reverse the adverse effects of development of heritage finds, given that their value can be evaluated through documentation. This also presents opportunity to better understand the heritage significance of the area to be developed.

9.3.5.1 DESTRUCTION OR DISPLACEMENT OF IDENTIFIED LSA SINGLE FINDS (C1)

Impact	Phase	Pre-mitigation Impact	Post-mitigation Impact	Final Significance
Destruction or Displacement of Identified LSA Single Finds (C1)	Construction	High negative	Medium- Low negative	Medium- Low negative
Potential cumulative/ confounding effects	• Destruction or displacement of identified LSA single finds.			
Alternatives	None.			
Mitigation Measures				
• No further mitigation or action is recommended. However, a Heritage Procedure is advised to be followed should additional heritage finds or sites be encountered.				

9.3.5.2 DESTRUCTION OR DISPLACEMENT OF IDENTIFIED IRON AGE SINGLE FIND (C2)

Impact	Phase	Pre-mitigation Impact	Post-mitigation Impact	Final Significance
Destruction or Displacement of Identified Iron Age Single Find (C2)	Construction	High negative	Medium- Low negative	Medium- Low negative
Potential cumulative/ confounding effects	• Destruction or displacement of identified Iron Age single find.			
Alternatives	None.			
Mitigation Measures				
• No further mitigation or action is recommended. However, a Heritage Procedure is advised to be followed should additional heritage finds or sites be encountered.				

9.3.6 PALAEONTOLOGY (P)

The entire study area is underlain by Mathlagame Norite-Anorthosite of the Rustenburg Layered Suite (Bushveld Complex), which is unfossiliferous. According to the PalaeoMap of the South African Heritage Resources Information System (SAHRIS) the Palaeontological Sensitivity of the Rustenburg Layered Suite (Bushveld Complex) is Zero (grey) (Almond and Pether, 2009; Almond *et al*., 2013, Groenewald *et al* 2014).

A Low Palaeontological Significance has been allocated for impacts associated with the construction phase of the project pre-mitigation and post-mitigation. The construction phase will be the only development phase with the potential of impacting Palaeontological Heritage, and no significant impacts are expected to impact the

Decommissioning phase. As the No-Go Alternative considers the option of 'do nothing' and maintaining the status quo, it will have a Neutral impact on the Palaeontological Heritage of the development. The Cumulative impacts of the project is considered to be Low (as the area is not highly fossiliferous), and falls within the acceptable limits for the project. It is therefore considered that the proposed project will not lead to damaging impacts on the palaeontological resources of the area. The project may thus be permitted in its whole extent, as the development footprint is not considered sensitive in terms of palaeontological resources. It is consequently recommended that no further palaeontological heritage studies, ground truthing and/or specialist mitigation are required, pending the discovery of newly discovered fossils.

9.3.6.1 IMPACTS ON FOSSIL HERITAGE (P1)

The excavations and site clearance of the Glencore Western Chrome Mine Project near Rustenburg, North-West Province will involve considerable excavations into the superficial sediments and also into the underlying bedrock. Existing topography will be modified while fossils may be destroyed or sealed-in, at the surface or below ground surface. Impacts on fossil heritage will only occur during the construction phase of the development. The extent of the area of potential impact is thus limited to the project site.

The expected duration of the impact is potentially permanent to long term. In the absence of mitigation procedures (and if fossils are present in the development area) the harm or destruction of palaeontological heritage will be permanent. No significant impact will occur as the site is underlain by unfossiliferous Mathlagame Norite-Anorthosite of the Rustenburg Layered Suite (Bushveld Complex). Probable significant impacts on palaeontological heritage during the construction phase are Low/Zero. According to the Geology of the proposed development, fossil heritage is scarce in the development footprint. The probability of significant impacts on palaeontological heritage during the construction phase are thus Low to Zero.

Impact	Phase	Pre-mitigation Impact	Post-mitigation Impact	Final Significance
Impacts on Fossil Heritage (P1)	Construction	Low negative	Low negative	Low negative
Potential cumulative/ confounding effects	**Degree of irreversible loss:** Impacts on fossil heritage are generally irreversible. Scientifically all well-documented records and palaeontological studies of any fossils exposed during construction would represent a positive impact. The possibility of a negative impact on the palaeontological heritage of the area can be reduced by the implementation of adequate mitigation procedures. If mitigation is undertaken the benefit scale for the project will be beneficial. **Irreplaceable loss:** Fossil heritage is scarce/absent in the Mathlagame Norite-Anorthosite of the Rustenburg Layered Suite (Bushveld Complex) underlaying the development. Significant loss of fossil heritage may be limited by taking a precautionary approach.			
Alternatives	None.			
Mitigation Measures				
• If fossil heritage is present in the development footprint any negative or detrimental impact on these fossils can be mitigated by describing and collecting of the well-preserved fossils (by a professional palaeontologist). Mitigation should take place after vegetation clearance and before the ground is levelled for construction. A SAHRA permit will be required for fossil collection and the fossil heritage must be housed in an accredited institution (university or museum). If fossil heritage cannot be excavated a buffer could be placed around the fossil heritage thus protecting the fossils and fossil locality.				

10 CONCLUSIONS AND RECOMMENDATIONS

The BA process identified potential issues and impacts associated with the proposed project. The BA addresses those identified potential environmental impacts and benefits (direct, indirect and cumulative impacts) associated with applicable phases and activities of the project and recommends appropriate mitigation measures for potentially significant environmental impacts. The BA report provides sufficient information regarding the potential impacts and the acceptability of these impacts in order for the Competent Authority to make an informed decision regarding the proposed project. The release of a draft BA Report for public review and comment provides stakeholders with an opportunity to verify that the issues they have raised throughout the process to date has been captured and adequately considered. All issues raised throughout the public participation process have been captured and responded to as far as possible.

The BA report aims to achieve the following:

- Provide an overall assessment of the social and biophysical environments affected by the proposed project.
- Assess potentially significant impacts (direct, indirect and cumulative, where required) associated with the proposed project.
- Identify and recommend appropriate mitigation measures for potentially significant environmental impacts; and
- Undertake a fully inclusive public involvement process to ensure that I&APs are afforded the opportunity to participate, and that their issues and concerns are recorded.

10.1 CONCLUSIONS FROM SPECIALIST STUDIES

The conclusions and recommendations of this BA are the result of the assessment of identified impacts by specialists where applicable, and the parallel process of public participation. The main conclusions from each of the specialist studies are presented below.

10.1.1 HYDROPEDOLOGY

The four hillslope types which were identified, includes the presence of recharge (shallow and deep), interflow (A/B) and responsive saturated hydropedological types. The Glencore Kroondal Project and associated infrastructure will have an acceptable effect on the hillslope hydrology due to the extent of the underground mining tunnels, building concrete foundations, or associated water and drainage pipelines and other infrastructures. Most of the hillslopes with recharge (deep) dominating throughout as well as the size of the greater catchment have minimal impacts. Lateral flow from interflow (A/B) changes can occur in the hillslopes which may increase surface run-offs, surface return flows and overland flows or drawbacks into the mine tunnels. However, their effects will have acceptable impacts on the total streamflow or total deductible water regime losses of watercourses in the larger catchment as both lateral and vertical flow paths will occur in response to the flow impediment.

The Glencore Kroondal Project and associated infrastructure activities will require some mitigation measures being implemented due to impacts expected on some of the identified hillslopes in the assessment area (refer to **Section 9.3.1**). Measures can be set on soils which experienced some changes in flow paths following the development and associated infrastructure construction. Flow impediment can be managed well to minimise saturation conditions and surface return flows to promote subsurface groundwater recharge and storage. Valley bottom soils are responsive hydromorphic soils due to long periods of saturation. Usually, development should avoid areas with responsive (saturated) hydropedological soil types mostly associated with and found in areas like wetlands which act as water regime receptors for the water balance in the hillslopes' catchment. These soils also have a high tendency to promote migration of inorganic (chemical elements) and organic (faecal bacteria) from a pollution source towards water resources.

Impact Statement:

The project has an overall low residual impact, and this is acceptable. The following aspects must be considered for the development to reduce overland flows and surface return flows:

- Prevent flood damage or concentration of run-off;
- Divert stormwater and surface run-off from buildings, roads and parking areas into an attenuation pond;
- Preserve the natural and beneficial functions of the natural drainage system downstream;
- Preserve and enhance stormwater quality;
- Attenuate the difference between pre and post-development flows; and
- Prevent disposal of untreated wastewater into the catchment system or surrounding areas.

Such measures for these systems will ensure that adequate water deducted from the catchment as run-off will be re-applied into the system which can minimise losses from the total deductible regimes as most of the hillslopes have recharge soils. Application of good quality water will promote lateral flows associated with these hydropedological groups. Improved water quality in the area is important to minimise pollutes migrations. From a hydropedological perspective, the proposed monitoring will be sufficient for water flows and groundwater recharge receptors.

Specialist Opinion:

From a hydropedological perspective, the impact of the development on hydropedological flow paths would be acceptable and the impacts can be managed sustainably.

Layout Approval (inclusion of Artificial Wetland in the Stormwater Management Plan):

The siting, design, and scale of this dam have been informed by specialist findings, ecological sensitivities, and site conditions. This change does not represent a significant deviation from the original project scope; rather, it results in a net improvement in environmental outcomes introducing a multifunctional, ecologically beneficial wetland system.

These updates are detailed in the stormwater management plan drawing (Drawing No. P2501017-SW-ST2-710). Minor adjustments to infrastructure layout, are considered acceptable and do not affect the conclusions of the original specialist assessment. The revised design is supported by the specialist and is regarded as favourable for environmental authorisation.

From a hydropedological standpoint, the integration of a constructed wetland within the clean water dam system, enhances the hydrological integrity of the site. The wetland system promotes passive recharge and preserves subsurface lateral flow patterns, which is favourable for maintaining hillslope hydrological processes. The inclusion of a clean water dam (functioning as an artificial wetland) remain within the scope of previously assessed flow regimes and do not introduce additional hydropedological risks.

10.1.2 SOILS AND LAND CAPABILITY

The proposed project area is dominated by low potential soils including Mispah, Rustenburg, Rensburg and Arcadia soil forms. Active crop fields were confirmed within the proposed 50 m buffer of the project area on soils characterised by low and very restricted agricultural potential with regular to severe limitations. This is due to the soil morphological properties such as high clay content of vertic soils, impermeable underlying horizons of Mispah soil and slope.

The land capability sensitivity (DAFF, 2017) is dominated by land capabilities with “Low-Moderate to Moderate” sensitivity. Furthermore, highly sensitive crop field boundaries were also identified using the DFFE Screening Tool Report - DFFE (2024). The verified baseline findings, current land uses and the calculated land potential level dispute with the agricultural theme in areas associated with Low-Moderate to Moderate land capability sensitivity and further confirms marginal active cropping on low potential soils within the 50 m regulated area

It is the specialist's opinion that the proposed Glencore WCM mine infrastructure project and the associated powerline connection will have an overall low residual impact on the agricultural production ability of the land. The proposed project and associate infrastructure may be favourably considered for development, provided mitigation measures are implemented.

Specialist Statement:

The proposed development area will have an overall low residual impact on the agricultural production capability of the area. The proposed development can be favourably considered for authorisation. The following serves to substantiate this statement:

- The site verified land capability of the proposed project area ranges from low to medium;
- The agricultural potential of the area is low;
- There was active crop farming within the 50 m buffer of the project area; and
- The overall agricultural sensitivity for the project area ranges from low to medium.

Statement Conditions:

The project may be favourably considered for authorisation and is not subject to any conditions which can include obtaining consent for high sensitive areas from the respective land owners or any proposed no go areas as land segregation is expected to be minimal following the development.

Layout Approval (inclusion of Artificial Wetland in the Stormwater Management Plan):

The siting, design, and scale of this dam have been informed by specialist findings, ecological sensitivities, and site conditions. This change does not represent a significant deviation from the original project scope; rather, it results in a net improvement in environmental outcomes introducing a multifunctional, ecologically beneficial wetland system.

These updates are detailed in the stormwater management plan drawing (Drawing No. P2501017-SW-ST2-710). Minor adjustments to infrastructure layout, are considered acceptable and do not affect the conclusions of the original specialist assessment. The revised design is supported by the specialist and is regarded as favourable for environmental authorisation.

The proposed project and assessment footprint do not result in the loss of any high-potential agricultural soils. The changes are limited to previously disturbed areas and remain within the zones already assessed as having low to marginal sensitivity. As such, the inclusion of a clean water dam (functioning as an artificial wetland) are considered acceptable from a soil and agricultural perspective and do not compromise land capability or long-term agricultural use potential.

10.1.3 TERRESTRIAL BIODIVERSITY

The PAOI exists in a predominantly modified and disturbed state having been subjected to various anthropogenic impacts such as human ingress, brush cutting and vegetation clearing, dumping of rubble, high numbers of alien and invasive plants, mining activities, and edge effects from agriculture. The modified and disturbed habitats are unlikely to recover without human intervention and will continue to degrade further without active rehabilitation. No fauna or flora SCC found nor expected throughout the PAOI.

- Completion of the terrestrial biodiversity assessment led to the dispute of the 'Very High' classification for the terrestrial biodiversity theme sensitivity as allocated by the National Environmental Screening Tool. The PAOI is instead assigned an overall terrestrial sensitivity ranging from 'Very Low' to 'Medium' (with 'High' for water resources within the site – which includes artificial water features and a small HGM 1 depression – please refer to the accompanying wetland report (**Appendix D**) for detailed sensitivity information (TBC, 2025)).

According to the Mining Guide dataset for Biodiversity Risk & Importance (SANBI, 2013), the PAOI is overlapped by 'C - High Risk for Mining' which translated to 'High biodiversity importance'.

- The site inspection results, and screening tool comparison highlighted a variety of factors that indicate the PAOI is no longer characteristic of biodiversity category C;
- As this PAOI occurs in a predominately modified and disturbed area, expected impacts from the undertaking of this project do not carry the same risk were these to take place in a site with intact ecosystems confirmed as priority biodiversity areas; and
- The majority of the PAOI is impacted by several anthropogenic activities past and present, where physical evidence on-site suggests the biodiversity importance of the area is now lower than indicated by the above SANBI Mining guide dataset, which was released over a decade ago.

Impact Statement:

The location, state and size of the ecosystem suggests that it is unlikely that any functional habitat or SCCs will be lost as a result of the impacts arising from the proposed activities.

Specialist Opinion:

It is the opinion of the specialist that the proposed development is favourable only if all mitigation measures provided in the Terrestrial Biodiversity report and other specialist reports are implemented.

Both surveys were conducted during dry season conditions and substantial portions of the site were recently burned, limiting accurate biodiversity representation. These factors constitute limitations. Due to the modified condition of the PAOI and the limited observable indigenous biodiversity this project only necessitates a compliance statement, and the seasonality would unlikely affect the outcome of this study in a substantial way. Additionally, most of the high-impact construction for the project development is planned for the already 'Modified' areas. A final site walkthrough must be conducted prior to the construction phase by the Environmental Control Officer (ECO) on site to ensure no new flora or faunal concerns have emerged.

Layout Approval (inclusion of Artificial Wetland in the Stormwater Management Plan):

The siting, design, and scale of this dam have been informed by specialist findings, ecological sensitivities, and site conditions. This change does not represent a significant deviation from the original project scope; rather, it results in a net improvement in environmental outcomes introducing a multifunctional, ecologically beneficial wetland system.

These updates are detailed in the stormwater management plan drawing (Drawing No. P2501017-SW-ST2-710). Minor adjustments to infrastructure layout, are considered acceptable and do not affect the conclusions of the original specialist assessment. The revised design is supported by the specialist and is regarded as favourable for environmental authorisation.

The updated layout, within the originally assessed area, remains within already modified and low-sensitivity zones. These adjustments are therefore considered acceptable. The introduction of a constructed wetland system is favourable, offering new habitat heterogeneity, foraging potential, and faunal movement corridors, without negatively affecting the conservation importance or functional integrity of terrestrial habitats.

10.1.4 WETLAND AND AQUATIC ECOLOGY

During the site assessment, two HGM types were identified within the PAOI, which were classified as depression (HGM 1) and unchanneled valley-bottom (HGM 2) wetlands. Several artificial watercourses (artificial wetlands and dams) were identified within the footprint and PAOI. In addition to these features, a non-perennial drainage feature was identified within the PAOI.

The ecological characteristics of the identified natural watercourses are described in **Table 33**. The artificial features were identified to be at risk and were included in the DWS impact assessment, however no functional assessments were conducted for these features due to their nature and dependence on human induced hydrological inputs which if stopped will prevent wetland conditions in these features from persisting.

Table 33: Ecological characteristics and buffer requirements of the freshwater features

Aspect	Present Ecological State	Ecological Importance and Sensitivity (EIS)	Buffer Requirement
Depression (HGM 1)	C – Moderately Modified	Low	15 m
Unchanneled Valley-Bottom	D – Largely Modified	High	15 m

Risk and Impact Statement:

The overall post-mitigation residual risk of the proposed development was calculated to be "Low" given that the proposed areas for development intersect artificial and natural features of low sensitivity. The impacts are deemed acceptable as small portions of the watercourse will be affected and as the post-construction rehabilitation of the watercourse may result in an overall positive effect.

Specialist Opinion:

Considering the assessment findings, no fatal flaws are evident for the proposed project. It is the opinion of the specialists that the project can be considered for authorisation by the Competent Authority. Any affected watercourse should be rehabilitated post-construction. Post-construction rehabilitation of the watercourses is perceived to result in positive impacts and will be an effort to compensate for the minor loss and disturbance of the artificial wetlands as result of the salvage yard, fence and road.

Layout Approval (inclusion of Artificial Wetland in the Stormwater Management Plan):

Following refinement and further specialist input a SWMP was developed after the completion of the specialist report and therefore this section aims to provide consideration by the specialist of the new clean water dam infrastructure in the context of the overall study. The remaining clean water dam will now incorporate a constructed wetland system, designed to enhance passive treatment, water quality improvement, and ecological function.

The siting, design, and scale of this dam have been informed by specialist findings, ecological sensitivities, and site conditions. This change does not represent a significant deviation from the original project scope; rather, it results in a net improvement in environmental outcomes introducing a multifunctional, ecologically beneficial wetland system.

These updates are detailed in the stormwater management plan drawing (Drawing No. P2501017-SW-ST2-710). Minor adjustments to infrastructure layout, are considered acceptable and do not affect the conclusions of the original specialist assessment. The revised design is supported by the specialist and is regarded as favourable for environmental authorisation.

The updated layout that integrates a passive wetland system is deemed acceptable and beneficial from a wetland ecological perspective. This update reduces the risk of pollution, improves the potential for water quality enhancement, and introduces a more ecologically functional and hydrologically compatible feature. The constructed wetland system supports passive treatment, enhances biodiversity, and maintains interflow pathways, aligning with the low-risk classification under the General Authorisation (GN4167) and improving the overall ecological resilience of the site.

10.1.5 HERITAGE

The Heritage Impact Assessment report was prepared as part of a Phase 1 Heritage Impact Assessment for the proposed project. A desktop as well as on-site evaluation of Heritage impacts was conducted. Through the methodology adopted as part of the assessment, no significant heritage impacts were identified. While some archaeological finds will be impacted, mitigation measures proposed accounts for any further discoveries and the potential to impact undiscovered heritage finds. Therefore, from an Archaeological perspective, the development will not have significant foreseeable impacts.

Layout Approval (inclusion of Artificial Wetland in the Stormwater Management Plan):

An attenuation pond (artificial wetland) was included to the south of the overall layout design following this heritage assessment. Although not initially considered, the area where the attenuation pond is proposed was traversed and surveyed. No additional impacts or findings were identified and hence, the addition will not change the conclusions made in the HIA report.

10.1.6 PALAEONTOLOGY

The proposed Glencore Western Chrome Mine Project near Rustenburg in North West Province is underlain by Mathlagame Norite-Anorthosite and Bronzitite, Harzburgite and Norite of the Rustenburg Layered Suite (Bushveld Complex). According to the PalaeoMap of the South African Heritage Resources Information System (SAHRIS) the Palaeontological Sensitivity of the Rustenburg Layered Suite (Bushveld Complex) is Zero (Almond and Pether, 2009; Almond *et al*., 2013, Groenewald *et al* 2014). The suggested location is classified as having a Medium Palaeontology Theme Sensitivity in the DFFE Screening Report (**Appendix B**). Updated Geology (Council of Geosciences) refined the geological map and indicate that the proposed development is underlain by the Schilpadnest and Vlakfontein Subsuite (Rustenburg Layered Subsuite of the Bushveld Complex).

Desktop research (National Database and published data) concluded that fossil heritage of scientific and conservational interest in the development area is rare. A low significance has thus been allocated to the development footprint. This is in agreement with the Zero Palaeontological Sensitivity allocated to the development area by the SAHRIS Palaeontological Sensitivity Map.

A Low Palaeontological Significance has been allocated for impacts associated with the construction phase of the project pre-mitigation and post-mitigation. The construction phase will be the only development phase with the potential of impacting Palaeontological Heritage, and no significant impacts are expected to impact the Decommissioning phase. As the No-Go Alternative considers the option of 'do nothing' and maintaining the status quo, it will have a Neutral impact on the Palaeontological Heritage of the development. The Cumulative impacts of the project is considered to be Low (as the area is not highly fossiliferous), and falls within the acceptable limits for the project. It is therefore considered that the proposed project will not lead to damaging impacts on the palaeontological resources of the area. The project may thus be permitted in its whole extent, as the development footprint is not considered sensitive in terms of palaeontological resources. It is consequently recommended that no further palaeontological heritage studies, ground truthing and/or specialist mitigation are required, pending the discovery of newly discovered fossils.

10.2 SENSITIVITY MAP

Environmental sensitivity mapping provides a strategic overview of the environmental, cultural and social assets in a region. The sensitivity mapping technique integrates numerous datasets (base maps and shapefiles) into a single consolidated layer making use of Geographic Information System (GIS) software and analysis tools. Environmental sensitivity mapping is a rapid and objective method applied to identify areas which may be particularly sensitive to development based on environmental, cultural and social sensitivity weightings – which is refined by specialists' input within each respective specialist field based on aerial or ground-surveys. Therefore, the sensitivity mapping exercise assists in the identification of sensitive areas within and surrounding the proposed application area. **Figure 50** represents the combined sensitivities identified by the various specialists, indicating the highest (maximum) sensitivities identified overall, including the buffer areas, that should be avoided.

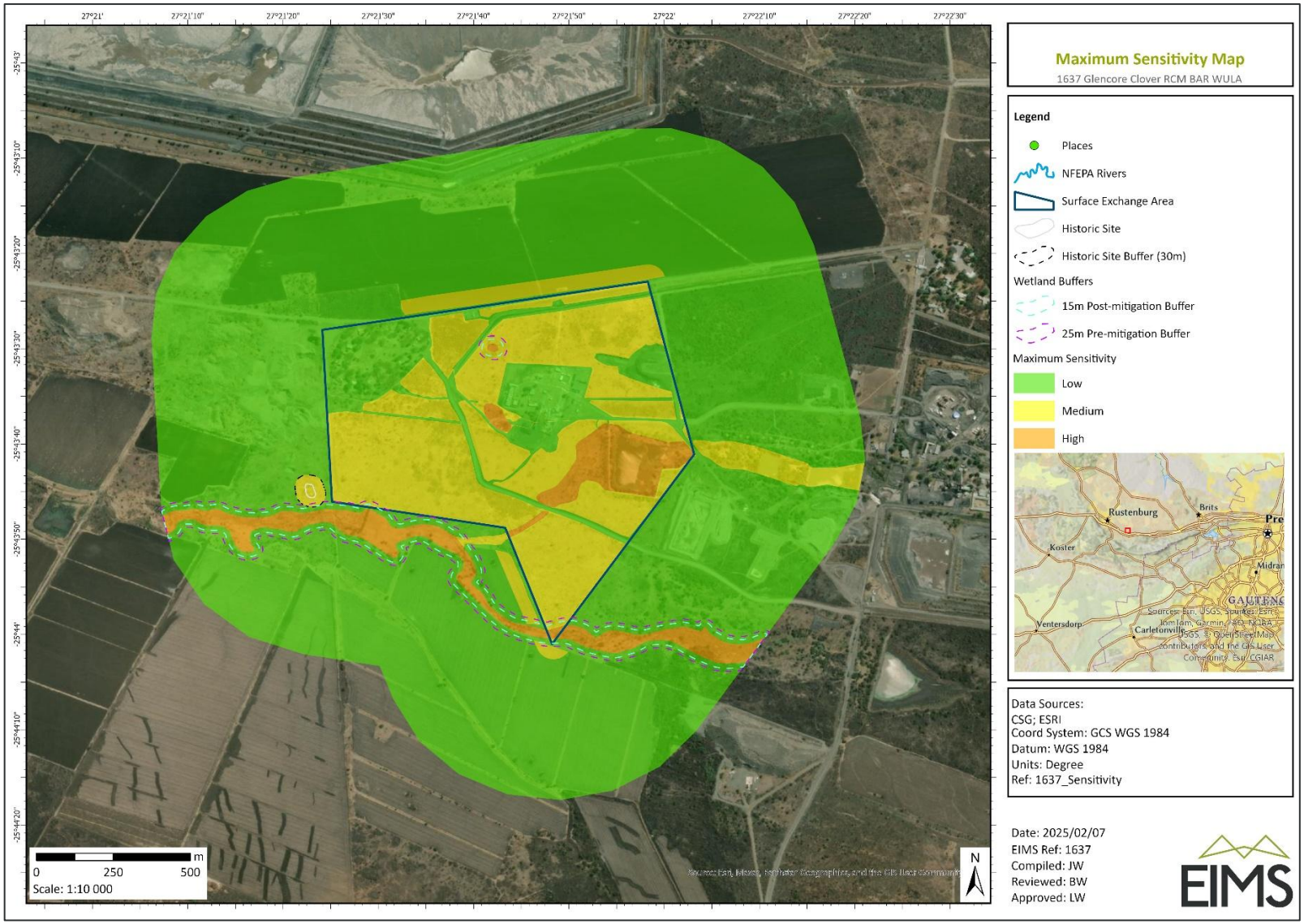


Figure 50: Maximum Sensitivity Map.

10.3 ASSESSMENT OF ALTERNATIVES

The preferred alternatives identified in **Section 6** are discussed and comparatively assessed in this section. The Wetlands and Aquatic Specialist study identified that the initial proposed location of the Lekgotla Hall (hereafter referred to as Alternative Layout 1 or "AL1") would overlap with a small non-perennial pan/wetland (identified as HGM1 by the specialist). Therefore, an alternative location for the Lekgotla Hall (hereafter referred to as Alternative Layout 2 or "AL2") has been identified so as to avoid the loss of and reduce the impact of the hall on the wetland (Refer to **Figure 2** for the original location and alternative location of the Lekgotla Hall and **Figure 35** for the delineated wetlands).**Table 34** below describes the advantages and disadvantages of the alternatives identified in this BA process. The alternatives are compared to each other as well as with the No-Go alternative. AL2 has been identified as the preferred and recommended layout alternative moving forward.

Table 34: Comparative assessment of alternatives.

Alternative Category	Alternative	Alternative Description	Advantages	Disadvantages	Assessed in this BAR
Development Location Alternatives	The proposed development location was identified to reduce the miners' underground travel time to the face at Kroondal Mine by gaining access to the chairlift on the property. Therefore, no location alternatives have been considered.				No
Layout Alternatives	**AL1**	Initial proposed location of Lekgotla Hall.	Aligns with the original proposed development.	Loss of HGM1 wetland.	Yes
	AL2	Alternative Location for Lekgotla Hall.	Does not result in the loss of HGM1 wetland.	No material disadvantages are expected with the proposed alternative.	**Yes**
Scheduling Alternatives	No specific scheduling alternatives have been assessed as discrete alternatives, however various mitigation measures contain scheduling requirements to reduce the overall impacts of the development.				No
Process Alternatives	Process alternatives will be defined and implemented as incremental alternatives during the assessment and incorporated into the EMPr. No process alternatives are considered reasonable and/or feasible and therefore have not been considered.				No
Technology Alternatives	No technology alternatives are considered reasonable and/or feasible and therefore have not been considered.				No
Activity Alternatives	No activity alternatives are considered reasonable and/or feasible and therefore have not been considered.				No

Alternative Category	Alternative	Alternative Description	Advantages	Disadvantages	Assessed in this BAR
No Go Alternative	**No-Go**	The proposed activity will not take place.	No environmental impacts as a result of the proposed project.	• No benefits with regards to job creation and no indirect socio-economic benefits will be created. • The applicant will not gain access to the shaft, foregoing the benefit of increased productivity as a result of increased mining facetime. • Miners will continue to travel far distances to reach the face.	Yes

10.4 ENVIRONMENTAL IMPACT STATEMENT

The findings of the assessment and associated specialist studies conclude that there are no environmental fatal flaws that should prevent the proposed project from proceeding, provided that the recommended mitigation and management measures are implemented. Based on the nature and extent of the proposed project, the local level of disturbance predicted as a result of the proposed development activities, the findings of the specialist studies, and the understanding of the significance level of potential environmental impacts, it is the opinion of the project team and the EAP that the significance levels of the majority of identified negative impacts can generally be reduced to an acceptable level by implementing the recommended mitigation measures and the project should be authorized.

The following three impacts resulted in the highest overall negative significance scores of all impacts that were assessed and were determined to have a potentially medium to high negative final significance after mitigation. However these impacts and the significance thereof does not pose an unacceptable risk to the environment or on the EAPs opinion that the project should be authorised:

- Destruction, further loss and fragmentation of the vegetation community;
- Continued encroachment of an indigenous vegetation community by alien invasive plant species as well as erosion due to disturbed soils and environmental pollution due to water/ mine drainage runoff;
- Potential leaks, discharges, pollutant from sewage pipeline overflowing or leak due to damage spreading into the surrounding environment.

Further, the incorporation of a constructed passive wetland in the proposed Stormwater Management Plan is expected to have a medium to high positive significance. The passive wetland system is considered favourable by the EAP and specialist team as it supports passive treatment of stormwater as well as enhances biodiversity and maintains interflow pathways.

The potential impact on HGM 1 as a result of the Lekgotla Hall has been adequately reduced through the selection of an alternative site location for the hall.

10.5 RECOMMENDATIONS FOR INCLUSION IN ENVIRONMENTAL AUTHORIZATION

This section contains recommendations from the EAP and various specialist's for inclusion in the EA.

10.5.1 EAP

In addition to the standard conditions of an integrated Environmental Authorisation, the following specific conditions must be included in the EA. This section will be expanded upon to include any additional conditions identified during the BAR comment period.

- All mitigation measures included in the Basic Assessment Report, EMPr and associated specialist studies must be adhered to.
- The proposed infrastructure and powerline route must avoid all high environmental sensitivities and buffers identified in this BAR and associated specialist studies.
- A suitably qualified and independent Environmental Control Officer (ECO) must be appointed for the proposed project to monitor compliance with the conditions of the Environmental Authorisation and EMPr. The Applicant shall provide the ECO with the necessary support to ensure that the environmental aspects relating to the development is adhered to. The ECO must monitor all construction activities and ensure the demarcation of all applicable areas and approve the locations of all infrastructure prior to construction.
- The EMPr must be made binding on all sub-contractors (if utilised) operating on behalf of Glencore.

- The Contractor shall inform all adjacent landowners of the commencement of construction activities at least 30 days prior to commencement of construction.
- Regular monitoring and maintenance of the sewage treatment plant must take place to prevent contamination of the environment by potential leaks.
- An Explosives Procedure must be used to guide the construction and operation of the Explosives Delivery Bay and the handling of explosives.
- Where possible, rubble material generated from the demolition of old infrastructure must be repurposed/re-used as far as possible for use in foundations.
- No unnecessary cutting down of trees or shrubs is to be permitted.
- Rehabilitation of the disturbed areas must be made a priority, especially wetlands.
- The applicant must incorporate a Stormwater Management Plan. The passive wetland system design must be guided by a suitably qualified specialist.

10.5.2 HYDROPEDOLOGY

The project has an overall low residual impact, and this is acceptable. The following aspects must be considered for the development to reduce overland flows and surface return flows:

- Prevent flood damage or concentration of run-off;
- Divert stormwater and surface run-off from buildings, roads and parking areas into an attenuation pond;
- Preserve the natural and beneficial functions of the natural drainage system downstream;
- Preserve and enhance stormwater quality;
- Attenuate the difference between pre- and post-development flows; and
- Prevent disposal of untreated wastewater into the catchment system or surrounding areas.

Such measures for these systems will ensure that adequate water deducted from the catchment as run-off will be re-applied into the system which can minimise losses from the total deductible regimes as most of the hillslopes have recharge soils. Application of good quality water will promote lateral flows associated with these hydropedological groups. Improved water quality in the area is important to minimise pollutant migration.

10.5.3 SOILS AND LAND CAPABILITY

The project may be favourably considered for authorisation and is not subject to any specific conditions for EA.

10.5.4 WETLAND AND AQUATIC ECOLOGY

Considering the assessment findings, no fatal flaws are evident for the proposed project. It is the opinion of the specialists that the project can be considered for authorisation by the Competent Authority. Any affected watercourse should be rehabilitated post-construction. Post-construction rehabilitation of the watercourses is perceived to result in positive impacts and will be an effort to compensate for the minor loss and disturbance of the artificial wetlands as result of the salvage yard, fence and road. The post-mitigation buffer requirement for the wetland features (Depression (HGM 1) and Unchanneled Valley-Bottom) is 15 metres.

10.5.5 TERRESTRIAL BIODIVERSITY

Both surveys were conducted during dry season conditions and substantial portions of the site were recently burned, limiting accurate biodiversity representation. These factors constitute limitations. Due to the modified condition of the PAOI and the limited observable indigenous biodiversity this project only necessitates a compliance statement, and the seasonality would unlikely affect the outcome of this study in a substantial way.

Additionally, most of the high-impact construction for the project development is planned for the already 'Modified' areas.

A final site walkthrough must be conducted prior to the construction phase by the Environmental Control Officer (ECO) on site to ensure no new flora or faunal concerns have emerged.

10.5.6 HERITAGE

The mitigations addressed in **Section 9.3.5** are associated with construction phase which may involve clearing of vegetation and removal of topsoil for development. Although identified above-ground finds will be affected by these activities regardless of mitigation, the mitigation measures recommended serves to address the potential of further discoveries.

As a key overall recommendation, the developer is reminded to remain cognizant of the potential to discover unidentified above-ground and below-ground finds and sites. Upon discovery of any additional heritage finds of an alarming significance, example, grave or high density of small finds, a Heritage Finds or Chance Find Procedure should be followed.

10.5.6.1 HERITAGE FINDS PROCEDURE AND CHANCE FINDS

A heritage procedure is applicable where finds are identified during the proposed activities. This procedure is guided by the NHRA but should correspond with the overall EMPr drafted for the development. The following is a guideline on how a Heritage or Chance Find Procedure can be structured:

- In the event of a chance find which appears of significant value to the lay person, all development activities must be temporarily halted.
- Finds should not be displaced. Instead, their location should be recorded, and a short description prepared for further evaluation to follow.
- A qualified Archaeologist must be consulted to, firstly, record the find and evaluate its heritage significance. The Archaeologist should provide recommendations on how to approach the finds moving forward. This may include recommendations for the mitigation of impacts on the heritage resources in question.
- Should the Archaeologist recommend, development can resume following the application of recommendations and mitigation measures.

The above should act as a brief guideline which should form an intrinsic element of current or future Heritage Procedures or Protocols adopted by the developer of the project in question.

10.5.7 PALAEONTOLOGY

The following recommendations should be incorporated into the Environmental Management Programme (EMPr) for the Glencore Western Chrome Mine Project near Rustenburg in the North-West Province:

- In the unlikely event that, Palaeontological Heritage is uncovered during surface clearing and excavations, the ECO/site manager must report the find to the South African Heritage Resources Agency (SAHRA) (Contact details: Heritage Western Cape, 111 Harrington Street, Cape Town. PO Box 4637, Cape Town 8000, South Africa. 3rd floor Protea Assurance Building, 142 Longmarket St, Cape Town City Centre, Cape Town, 8000; Private Bag X9067, Cape Town, 8000 Tel: 021 483 9598. Fax: +27 (0) 21 483 9845. Web: www.hwc.org.za) so that mitigation (recording and collection) can be carried out.
- Before any fossil material can be collected from the development site, the specialist involved would need to apply for a collection permit from SAHRA. Fossil material must be housed in an official collection (museum or university), while all reports and fieldwork should meet the minimum standards for palaeontological impact studies proposed by SAHRA (2012).

11 ASSUMPTIONS AND LIMITATIONS

The following assumptions and limitations relating to this assessment should be considered in evaluating and decision-making on this assessment:

- Unless specifically noted, the environmental attributes for the receiving environment have been obtained from best available spatial and scientific data sources. Whilst reasonable effort has been taken to obtain the most recent and relevant data, there may be gaps in baseline data, leading to uncertainties in impact predictions. Where uncertainty exists, efforts are made to indicate this in the assessment.
- This study is based on activity information provided by the applicant (including engineering designs, specifications, services reports, etc). The accuracy of this information has not been verified, and it is assumed that no significant changes or deviations to the final designs will occur. Should such occur the significance of the potential impacts may require reassessment and where relevant formal amendment processes.
- The information presented in this report is based on the information available at the time of compilation of the report.
- Whilst reasonable effort has been made to identify all potential environmental impacts, some impacts may not be reasonably foreseeable or may emerge only after project implementation.
- In determining the significance of impacts, with mitigation, it is assumed that mitigation measures proposed in the report will be correctly and effectively implemented and managed throughout the life of the project.

The remaining sub-sections present the assumptions and limitations applicable to the respective specialist assessments.

11.1 SOILS AND LAND CAPABILITY

- No heavy metals were assessed nor fertility analysed for the relevant classified soils.

11.2 WETLAND AND AQUATIC ECOLOGY

- Areas characterised by external wetland indicators have been the focus for this assessment. Areas lacking these characteristics have not been focussed on.
- Majority of the area was burnt during the first field assessment, which could have resulted in some wetland vegetation species being omitted from the findings. The second survey was intended to cover additional areas for the proposed powerline and no new wetlands were identified during the second survey.

11.3 TERRESTRIAL BIODIVERSITY

- Two field surveys were conducted:
    - The first survey took place on the 2nd of August 2024 during the dry season and furthermore, substantial portions of the site were recently burned prior to the survey.
    - The second survey was conducted on the 11th of November 2024, during the late dry season / early wet season which is the correct season for the biome. The assessment is deemed sufficient.
    - These factors constitute limitations. Due to the modified condition of the PAOI and the limited observable indigenous biodiversity this project only necessitates a compliance statement, and the seasonality would unlikely affect the outcome of this study in a substantial way.

Additionally, most of the high-impact construction for the project development is planned for the already 'Modified' areas.

- A final site walkthrough must be conducted prior to the construction phase by the Environmental Control Officer (ECO) on site to ensure no new flora or faunal concerns have emerged.

- Whilst every effort was made to cover as much of the PAOI as possible, representative sampling was completed, and by its nature it is possible that some plant and animal species that are present within the PAOI were not recorded during the field investigations.

11.4 HERITAGE

General Limitations:

Certain limitations were expected and encountered while implementing the heritage study methodology. Some of these limitations relate to the project itself, while some are more general, relating to the implementation of the methodology itself.

Firstly, such investigations are limited to desktop and field surveys from which findings are drawn. In this regard, the findings presented here are limited to surface observations. Below-ground archaeological contexts would only apply in cases where the methodology includes components involving excavations and test pits. To mitigate this limitation, this report advises the application of heritage procedures adopted by the developer in cases where construction activities lead to the identification of unexpected finds.

The field survey conducted for this report does not account for any finds on surrounding areas which are not affected by the proposed development. To mitigate this, the initial desktop assessment considers surrounding pre-identified heritage resources and prior heritage studies done in the area.

Project-Specific Limitations:

As a key limitation noted during the field survey, some areas surveyed were densely vegetated. These areas were circumvented and assessed from other vantage points.

11.5 PALAEONTOLOGY

The geology of the area is the focal point of geological maps, and the sheet explanations of the Geological Maps were not intended to focus on palaeontological heritage. Many inaccessible areas of South Africa have never been examined by palaeontologists, and data is typically dependent solely on aerial pictures. Locality and geological information in museums and university databases is out of date, and data acquired in the past is not always adequately documented.

Comparable Assemblage Zones in other places are also used to provide information on the existence of fossils in areas that have not before been recorded. When similar Assemblage Zones and geological formations are used for Desktop studies, it is commonly assumed that exposed fossil exists within the footprint.

12 AFFIRMATION REGARDING CORRECTNESS OF INFORMATION

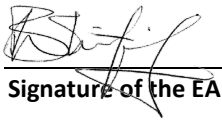
I Brian Whitfield declare that:

General declaration:

- I act as the independent environmental practitioner in this application
- I will perform the work relating to the application in an objective manner, even if this results in views and findings that are not favourable to the applicant;
- I declare that there are no circumstances that may compromise my objectivity in performing such work;
- I have expertise in conducting environmental impact assessments, including knowledge of the Act, regulations and any guidelines that have relevance to the proposed activity;
- I will comply with the Act, regulations and all other applicable legislation;
- I will take into account, to the extent possible, the matters listed in regulation 8 of the regulations when preparing the application and any report relating to the application;
- I have no, and will not engage in, conflicting interests in the undertaking of the activity;
- I undertake to disclose to the applicant and the competent authority all material information in my possession that reasonably has or may have the potential of influencing - any decision to be taken with respect to the application by the competent authority; and - the objectivity of any report, plan or document to be prepared by myself for submission to the competent authority;
- I will ensure that information containing all relevant facts in respect of the application is distributed or made available to interested and affected parties and the public and that participation by interested and affected parties is facilitated in such a manner that all interested and affected parties will be provided with a reasonable opportunity to participate and to provide comments on documents that are produced to support the application;
- I will ensure that the comments of all interested and affected parties are considered and recorded in reports that are submitted to the competent authority in respect of the application, provided that comments that are made by interested and affected parties in respect of a final report that will be submitted to the competent authority may be attached to the report without further amendment to the report;
- I will keep a register of all interested and affected parties that participated in a public participation process; and I will provide the competent authority with access to all information at my disposal regarding the application, whether such information is favourable to the applicant or not all the particulars furnished by me in this form are true and correct;
- I will perform all other obligations as expected from an environmental assessment practitioner in terms of the Regulations; and
- I realise that a false declaration is an offence in terms of regulation 48 and is punishable in terms of section 24F of the Act.

Disclosure of Vested Interest

I do not have any vested interest (either business, financial, personal or other) in the proposed activity proceeding other than remuneration for work performed in terms of the Environmental Impact Assessment Regulations, 2014.



Signature of the EAP

Environmental Impact Management Services (Pty) Ltd

Name of company:

2025/07/23

Date:

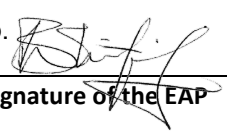
I Jolene Webber declare that:

General declaration:

- I act as the independent environmental practitioner in this application
- I will perform the work relating to the application in an objective manner, even if this results in views and findings that are not favourable to the applicant;
- I declare that there are no circumstances that may compromise my objectivity in performing such work;
- I have expertise in conducting environmental impact assessments, including knowledge of the Act, regulations and any guidelines that have relevance to the proposed activity;
- I will comply with the Act, regulations and all other applicable legislation;
- I will take into account, to the extent possible, the matters listed in regulation 8 of the regulations when preparing the application and any report relating to the application;
- I have no, and will not engage in, conflicting interests in the undertaking of the activity;
- I undertake to disclose to the applicant and the competent authority all material information in my possession that reasonably has or may have the potential of influencing - any decision to be taken with respect to the application by the competent authority; and - the objectivity of any report, plan or document to be prepared by myself for submission to the competent authority;
- I will ensure that information containing all relevant facts in respect of the application is distributed or made available to interested and affected parties and the public and that participation by interested and affected parties is facilitated in such a manner that all interested and affected parties will be provided with a reasonable opportunity to participate and to provide comments on documents that are produced to support the application;
- I will ensure that the comments of all interested and affected parties are considered and recorded in reports that are submitted to the competent authority in respect of the application, provided that comments that are made by interested and affected parties in respect of a final report that will be submitted to the competent authority may be attached to the report without further amendment to the report;
- I will keep a register of all interested and affected parties that participated in a public participation process; and I will provide the competent authority with access to all information at my disposal regarding the application, whether such information is favourable to the applicant or not all the particulars furnished by me in this form are true and correct;
- I will perform all other obligations as expected from an environmental assessment practitioner in terms of the Regulations; and
- I realise that a false declaration is an offence in terms of regulation 48 and is punishable in terms of section 24F of the Act.

Disclosure of Vested Interest

I do not have any vested interest (either business, financial, personal or other) in the proposed activity proceeding other than remuneration for work performed in terms of the Environmental Impact Assessment Regulations, 2014.

pp. 

Signature of the EAP

Name of company:

2025/07/23

Date:

13 REFERENCES

(2011). Retrieved October 15, 2024, from Stats SA: https://www.statssa.gov.za/?page_id=993&id=rustenburg-municipality

(2022). Retrieved October 15, 2024, from Stats SA: https://census.statssa.gov.za/#/

(2018). *Bojonala Platinum District Municipality EMF: Status Quo report (Final Rev13).*

(n.d.). *BPDM - 2024/2025 Reviewed IDP.* Bojanala Platinum District Municipality.

DWS. (2022). *Business Case for the Limpopo-Olifants Catchment Management Agency.* Department of Water & Sanitation.

(2024). *Limpopo-Olifants CMA Annual Performance Plan: 2024/25 to 2026/27.* Limpopo-Olifants CMA.

(2011). *Magaliesberg Biosphere Management Plan - Annexure 1 - Land Use Guidelines for the Magaliesberg Biosphere.* The Department of Economic Development, Environment, Conservation and Tourism.

(2024). *Rustenburg Local Municipality IDP Review 2024/2025.*

(2023). *Rustenburg Spatial Development Framework, Part One, Second Draft: Status Quo Analysis, Vesion 1.* Rustenburg Local Municipality.

Simulated historical climate & weather data for Rustenburg. (2024). Retrieved October 8, 2024, from meteoblue: https://www.meteoblue.com/en/weather/historyclimate/climatemodelled/rustenburg_south-africa_958724

van Tol, J., le Roux, P., & Lorentz, S. (2017). The science of hydropedology – linking soil morphology with. *Water Wheel, 16*(3).

Weather Spark. (2024). Retrieved October 8, 2024, from Weather Spark: https://weatherspark.com/y/150048/Average-Weather-at-Rustenburg-North-West-South-Africa-Year-Round

14 APPENDICES

pp.

Appendix A: EAP CV

Appendix E: Impact Assessment Matrix