

HERITAGE IMPACT ASSESSMENT

(REQUIRED UNDER SECTION 38(8) OF THE NHRA (No. 25 OF 1999))

FOR THE PROPOSED WATERVAL UG1 OPENCAST PROJECT, RUSTENBURG,
NORTH WEST PROVINCE.

Type of development:

Mining

Client:

Alta van Dyk Environmental (AVDE)

Applicant:

Glencore Operations South Africa (Pty) Ltd (Glencore)
Glencore Waterval Mine (Waterval Mine)

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Project Reference:

Project number 2237

Report date:

October 2022

APPROVAL PAGE

| | |
|-----------------------------------|---|
| Project Name | Waterval UG1 opencast project, North West Province |
| Report Title | Heritage Impact Assessment for the Waterval UG1 opencast project, Rustenburg, North West Province |
| Authority Reference Number | SAHRA Case Number 19481 |
| Report Status | Draft Report |
| Applicant Name | Glencore Waterval Mine (Waterval Mine) |

| Responsibility | Name | Qualifications and Certifications | Date |
|--------------------------------|------------------------------------|---|--------------|
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| Fieldwork | Ruan van der Merwe - Archaeologist | BA Hons Archaeology | March 2022 |

DOCUMENT PROGRESS**Distribution List**

| Date | Report Reference Number | Document Distribution | Number of Copies |
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REPORT OUTLINE

Appendix 6 of the GNR 326 Environmental Impact Assessment (EIA) Regulations published on 7 April 2017 provides the requirements for specialist reports undertaken as part of the environmental authorisation process. In line with this, Table 1 provides an overview of Appendix 6 together with information on how these requirements have been met.

Table 1. Specialist Report Requirements.

| Requirement from Appendix 6 of GN 326 EIA Regulation 2017 | Chapter |
|--|---|
| (a) Details of - (i) the specialist who prepared the report; and (ii) the expertise of that specialist to compile a specialist report including a curriculum vitae | Section a |
| (b) Declaration that the specialist is independent in a form as may be specified by the competent authority | <i>Declaration of Independence</i> |
| (c) Indication of the scope of, and the purpose for which, the report was prepared | Section 1 |
| (cA) an indication of the quality and age of base data used for the specialist report | Section 3.4. |
| (cB) a description of existing impacts on the site, cumulative impacts of the proposed development and levels of acceptable change; | Section 9 |
| (d) Duration, Date and season of the site investigation and the relevance of the season to the outcome of the assessment | Section 3.4 |
| (e) Description of the methodology adopted in preparing the report or carrying out the specialised process inclusive of equipment and modelling used | Section 3 |
| (f) details of an assessment of the specific identified sensitivity of the site related to the proposed activity or activities and its associated structures and infrastructure, inclusive of site plan identifying site alternatives; | Section 8 and 9 |
| (g) Identification of any areas to be avoided, including buffers | Section 8 and 9 |
| (h) Map superimposing the activity including the associated structures and infrastructure on the environmental sensitivities of the site including areas to be avoided, including buffers | Section 8 |
| (I) Description of any assumptions made and any uncertainties or gaps in knowledge | Section 3.7 |
| (j) a description of the findings and potential implications of such findings on the impact of the proposed activity including identified alternatives on the environment or activities; | Section 1.3 |
| (k) Mitigation measures for inclusion in the EMPr | Section 10.1 and 10.5 |
| (l) Conditions for inclusion in the environmental authorisation | Section 10. 1 and 10.5 |
| (m) Monitoring requirements for inclusion in the EMPr or environmental authorisation | Section 10. 4. |
| (n) Reasoned opinion - (i) as to whether the proposed activity, activities or portions thereof should be authorised; (iA) regarding the acceptability of the proposed activity or activities; and (ii) if the opinion is that the proposed activity, activities or portions thereof should be authorised, any avoidance, management and mitigation measures that should be included in the EMPr, and where applicable, the closure plan | Section 10.2 |
| (o) Description of any consultation process that was undertaken during the course of preparing the specialist report | Section 5 |
| (p) A summary and copies of any comments received during any consultation process and where applicable all responses thereto; and | Refer to EIA report |
| (q) Any other information requested by the competent authority | No other information requested at this time |

Executive Summary

Alta van Dyk Environmental (AVDE) has been appointed as the independent Environmental Assessment Practitioner (EAP) to apply for environmental authorization for the proposed Waterval UG1 opencast project. Beyond Heritage was appointed to conduct a Heritage Impact Assessment (HIA) for the project and the study area was assessed through a desktop assessment and by a non-intrusive pedestrian field survey. Key findings of the assessment include:


- The study area has been transformed by mining and cultivation activities and is of low heritage potential. This was confirmed during the field survey, and no heritage resources were recorded;
- The paleontological significance of the area is insignificant, and no further paleontological studies are required.

The impact on heritage resources is considered to be low, and the project can be authorised provided that the recommendations in this report are adhered to and based on the South African Heritage Resource Authority (SAHRA) 's approval.

Recommendations:

- The study area should be monitored by the Environmental Control Officer (ECO) during construction to facilitate the implementation of the Chance Find Procedure for the project as outlined under Section 10.2.

Declaration of Independence

| | |
|------------------------------------|---|
| Specialist Name | Jaco van der Walt |
| Declaration of Independence | <p>I declare, as a specialist appointed in terms of the National Environmental Management Act (NEMA) (Act No 107 of 1998) and the associated 2014 Environmental Impact Assessment (EIA) Regulations (as amended), that I:</p> <ul style="list-style-type: none"> • I act as an independent specialist 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 the specialist report relevant to this application, 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 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; • All the particulars furnished by me in this form are true and correct; and • I realise that a false declaration is an offence in terms of regulation 48 and is punishable in terms of section 49 A of the Act. |
| Signature |  |
| Date | 26/10/2022 |

a) Expertise of the specialist

Jaco van der Walt has been practising as a Cultural Resource Management (CRM) archaeologist for 15 years. He obtained an MA degree in Archaeology from the University of the Witwatersrand focussing on the Iron Age in 2012 and is a PhD candidate at the University of Johannesburg focussing on Stone Age Archaeology with specific interest in the Middle Stone Age (MSA) and Later Stone Age (LSA). Jaco is an accredited member of the Association of South African Professional Archaeologists (ASAPA) (#159) and have conducted more than 500 impact assessments in Limpopo, Mpumalanga, North West, Free State, Gauteng, Kwa Zulu Natal (KZN) as well as the Northern and Eastern Cape Provinces in South Africa.

Jaco has worked on various international projects in Zimbabwe, Botswana, Mozambique, Lesotho, Democratic Republic of the Congo (DRC) Zambia, Guinea, Afghanistan, Nigeria and Tanzania. Through this, he has a sound understanding of the International Finance Corporations (IFC) Performance Standard requirements, with specific reference to Performance Standard 8 – Cultural Heritage

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ABBREVIATIONS

| |
|---|
| ASAPA: Association of South African Professional Archaeologists |
| BGG Burial Ground and Graves |
| CFPs: Chance Find Procedures |
| CMP: Conservation Management Plan |
| CRR: Comments and Response Report |
| CRM: Cultural Resource Management |
| DFFE: Department of Fisheries, Forestry and Environment, |
| EA: Environmental Authorisation |
| EAP: Environmental Assessment Practitioner |
| ECO: Environmental Control Officer |
| EIA: Environmental Impact Assessment* |
| EIA: Early Iron Age* |
| EAP Environmental Assessment Practitioner |
| EMPr: Environmental Management Programme |
| ESA: Early Stone Age |
| ESIA: Environmental and Social Impact Assessment |
| GIS Geographical Information System |
| GPS: Global Positioning System |
| GRP Grave Relocation Plan |
| HIA: Heritage Impact Assessment |
| LIA: Late Iron Age |
| LSA: Late Stone Age |
| MEC: Member of the Executive Council |
| MIA: Middle Iron Age |
| MPRDA: Mineral and Petroleum Resources Development Act, 2002 (Act No. 28 of 2002) |
| MSA: Middle Stone Age |
| NEMA National Environmental Management Act, 1998 (Act No. 107 of 1998) |
| NHRA National Heritage Resources Act, 1999 (Act No. 25 of 1999) |
| NID Notification of Intent to Develop |
| NoK Next-of-Kin |
| PRHA: Provincial Heritage Resource Agency |
| SADC: Southern African Development Community |
| SAHRA: South African Heritage Resources Agency |

**Although EIA refers to both Environmental Impact Assessment and the Early Iron Age both are internationally accepted abbreviations and must be read and interpreted in the context it is used.*

GLOSSARY

Archaeological site (remains of human activity over 100 years old)

Early Stone Age (~ 2.6 million to 250 000 years ago)

Middle Stone Age (~ 250 000 to 40-25 000 years ago)

Later Stone Age (~ 40-25 000, to the historic period)

The Iron Age (~ AD 400 to 1840)

Historic (~ AD 1840 to 1950)

Historic building (over 60 years old)

1 Introduction and Terms of Reference:

Beyond Heritage was appointed to conduct an HIA for the proposed UG1 opencast project that will include the opencast mining of the chromite layer on the remaining extent of portion 82 of the farm Waterval 306 JQ (Figure 1.1 to 1.3). The report forms part of the EIA and Environmental Management Programme (EMPr) for the development.

The aim of the study is to survey the proposed development footprint to identify cultural heritage sites, document, and assess their importance within local, provincial, and national context. It serves to assess the impact of the proposed project on non-renewable heritage resources, and to submit appropriate recommendations with regard to the responsible cultural resources management measures that might be required to assist the developer in managing the discovered heritage resources in a responsible manner. It is also conducted to protect, preserve, and develop such resources within the framework provided by the National Heritage Resources Act (NHRA) of 1999 (Act No 25 of 1999). The report outlines the approach and methodology utilized before and during the survey, which includes Phase 1, review of relevant literature; Phase 2, the physical surveying of the area on foot and by vehicle; Phase 3, reporting the outcome of the study.

During the survey, no archaeological sites or artefacts were identified. General site conditions and features on sites were recorded by means of photographs, GPS locations and site descriptions. Possible impacts were identified and mitigation measures are proposed in this report. SAHRA as a commenting authority under section 38(8) of the NHRA require all environmental documents, compiled in support of an Environmental Authorisation application as defined by NEMA EIA Regulations section 40 (1) and (2), to be submitted to SAHRA for commenting. Upon submission to SAHRA the project will be automatically given a case number as reference. As such the EIA report and its appendices must be submitted to the case as well as the EMPr, once it's completed by the EAP.

1.1 Terms of Reference

Field study

Conduct a field study to: (a) locate, identify, record, photograph and describe sites of archaeological, historical or cultural interest; b) record GPS points of sites/areas identified as significant areas; c) determine the levels of significance of the various types of heritage resources affected by the proposed development.

Reporting

Report on the identification of anticipated and cumulative impacts the operational units of the proposed project activity may have on the identified heritage resources for all 3 phases of the project; i.e., construction, operation and decommissioning phases. Consider alternatives, should any significant sites be impacted adversely by the proposed project. Ensure that all studies and results comply with the relevant legislation, SAHRA minimum standards and the code of ethics and guidelines of ASAPA.

To assist the developer in managing the discovered heritage resources in a responsible manner, and to protect, preserve, and develop them within the framework provided by the National Heritage Resources Act of 1999 (Act No 25 of 1999).

1.2 Project Description

Project components and the location of the proposed Waterval UG1 opencast project are outlined under Table 2 and 3.

Table 2: Project Description

| | |
|---|---|
| Farm and Magisterial District | The remaining extent of portion 82 of the farm Waterval 306 JQ. |
| Central co-ordinate of the development | Central co-ordinates for the site are 25°40'37.27"S; 27°16'19.52"E |
| Topographic Map Number | 2527CB |

Table 3: Infrastructure and project activities

| | |
|--------------------------------|---|
| Type of development | Mining Development |
| Project Description | <p>The proposed UG1 opencast project will include the opencast mining of the chromite layer. There is possible 1 million tons of the UG1 chromite layer that can potentially be mined using opencast mining methods. New infrastructure will be constructed in support of the opencast project. The project will take place in three phases: The proposed schedule for the phases is as follows:</p> <ul style="list-style-type: none"> • Construction Phase = ~Two months • Operation Phase = ~3 years • Decommissioning and Closure Phase = ~6 – 12 months |
| Proposed infrastructure | Description |
| Surface infrastructure | |
| Roads | <p><u>Access roads and internal roads</u> Access and internal roads will be gravel compacted and ~10 – 12m wide.</p> <p><u>Haul roads</u> A 12m wide haul road gravel will be constructed from the opencast area to the Waterval West plant. The haul road will be approximately 3km in length.</p> <p><u>In-pit roads</u> Access roads ramps will be built to the different benches within the pit (9m wide).</p> |
| Power | <p><u>Electrical reticulation:</u> Electrical reticulation for the offices and change house area will be installed.</p> <p>A new High Tension (HT) substation will be constructed to feed the Low Tension substation with a 70 x 3 HT cable buried into the ground – 800m long. From LT substation load will be split to different locations ie: change houses – 100 kW, offices – 50 kW.</p> <p>All cables to be buried in the ground in trenches.</p> <p><u>Powerlines:</u> A 1.2 km 11 kV overhead line will be constructed from the planned new HT substation.</p> |
| Pipelines | <p><u>Potable water lines</u> Potable water will be received from the Rustenburg Local Municipality. A 90mm HDPE line x 900m will be installed from Head Quarters manifold to UG1 manifold. From UG1 metering valve station manifold load will be distributed with suitable size HDPE piping to change house</p> |

| | |
|-----------------------|---|
| | <p>– 90mm diameter HDPE; Offices – 60mm diameter HDPE; All pipes will be buried in the ground on designated routes.</p> <p><u>Pollution water pipeline</u> A 100mm diameter pollution water pipeline of ±1 500m will be constructed from the Pollution Control Dam (PCD) to the Waterval West Plant, in order to re-use the water in the plant.</p> <p><u>Sewer lines</u> All offices and change houses main effluent pipes will be of 100mm diameter PVC. These main lines will tie into a 250mm concrete sewer line – 850m long which in turn will tie into the re-routed 600mm Municipal sewer line.</p> |
| Bulk storage for fuel | <p>Fuel will mostly be obtained from the UG2 refuelling facilities at the Waterval West Plant. The following will be stored at the UG1 opencast project:</p> <ul style="list-style-type: none"> • Diesel bowser – 2500L (2.5m³) • Hydraulic oil – 840L (0.84m³) • Transmission oil – 420L (0.42m³) |
| Fencing | <p>The UG1 opencast area will have a razor wire and electric boundary fence.</p> <p>The Pollution Control Dam (PCD) will have a 1.8m high diamond wires security fence.</p> |
| Berms | <p>A 1.8 – 2 m high berm will be established along perimeter of the project area alongside the R24 and D108 roads. The width at the base of the berm will be approximately 10m wide and the slopes of the berm will have an angle of at least 1(V): 2(H).</p> |
| Buildings | <p><u>Offices</u> Two prefabricated site offices will be built with an area of 24m² each. These offices will be built to the southeast of the pits. These facilities will be non-permanent, pre-fabricated structures and will be placed on hard standing.</p> <p><u>Changehouse</u> Prefabricated changehouses will be built with an area of 156m². The change house will be built to the southeast of the pits adjacent to the site offices. These facilities will be non permanent, pre-fabricated structures and will be placed on hard standing.</p> <p><u>Workshops</u> No workshops will be required. The current Waterval East workshops will be utilised.</p> <p><u>Washbays:</u> No washbays will be required. The current Waterval East washbay will be utilised.</p> <p><u>Parking areas</u> A brick-paved carport (1.5 ha) will be constructed within a minimum of 30 carports.</p> <p><u>Explosive storage:</u> No explosive storage areas will be required. Explosives for the UG1 opencast project will be stored at the current magazine at Waterval East.</p> |
| Laydown area | <p>A laydown area will be required during the construction phase. The laydown area will not require earthworks, berms, clean and dirty water separation as it will be refurbished structures for offices and changehouse. The only earthworks that will be required will be for water, electrical and sewage reticulation. The laydown area will be of steel re-</p> |

| | |
|--|--|
| | enforced concrete for placement of refurbished offices and change houses. |
| Stockpiles | |
| Topsoil stockpile | Topsoil will be removed and stockpiled separately from the overburden and used to rehabilitate the area at a later stage. Approximately 80 000m ³ of topsoil will be stockpiled during the Life of Mine. The footprint of the topsoil stockpile will be ±1.5 ha without paddocks and will have a height of ±10m. |
| Overburden stockpile | Overburden material will be removed for roll-over method of mining. The Boxcut area will be used to access the opencast area to the north and south of the boxcut. The first section to be removed will be stockpiled until end of LoM and then backfilled with an option to allow for rehabilitation of the stockpile and not backfill to the open pit. Approximately 620 000m ³ of overburden will be stored on the overburden stockpile. The overburden stockpile will have a footprint of ~10 ha with a height of 20m. Once mining of the bench is completed, the overburden of the next bench will be used to backfilled into the excavation, and covered with topsoil. |
| Waste rock stockpile | The proposed UG1 opencast project does not require a waste rock dump. All blasted material will be excavated and hauled to the operating Waterval West Plant. |
| Run of mine stockpile | A run of mine (ROM) and muck stockpile area will be required, with a capacity of approximately 20 000tonnes. The ROM stockpile will have a footprint area of 0.5 ha with a height of 4m. |
| Waste management facilities | |
| General waste | General waste (including domestic waste, paper, plastic and scrap steel) will be stored in skips to be placed on a concrete bunded area. It is planned to have two 6m ³ skips for general waste. A contracted service provider will remove and empty skips regularly. Skips will be located at the changehouse/offices area. |
| Hazardous waste | Hazardous waste will be temporarily stored in covered skips to be placed on a concreted bunded area. It is planned to have two 6m ³ skips for hazardous waste. A contracted service provider will remove and empty skips regularly. Skips will be located at the changehouse/offices area. |
| Water pollution management facilities | |
| Pollution control dam (PCD) | A pollution control dam (PCD) with a capacity of approximately 18 500 m ³ and an area of ±1.5ha will be constructed to contain dirty water from the UG1 opencast operation and run-off from the ROM/muck stockpile. The PCD will be sized to contain the 24 hour 1:50 year rainfall event. The PCD will be ±4.5m deep. Water from the PCD will be transported to the Waterval West plant to be used in processing. |
| Pollution water trench | A pollution water trench will be constructed to the north east of the opencast pits. The pollution water trench will drain into the PCD. In addition, a pollution water trench will be constructed from the ROM stockpile to the PCD. The pollution water trenches will be concrete or HDPE lined. |
| Sewage treatment plant | No sewage treatment plant will be required. |
| Ablution facilities | Prefabricated ablutions facilities will be constructed at the offices and changehouse. |

| | |
|-------------------------|--|
| In pit storage of water | Water will not be stored in the opencast pits. Any water that accumulates/occurs within the pit will be pumped out to the PCD. No water will be generated by mining activity as all drilling will be done dry. |
|-------------------------|--|

1.3 Alternatives

No alternatives were provided for assessment. The extent of the area assessed allows for siting of the development within this area to minimize impacts to heritage resources.

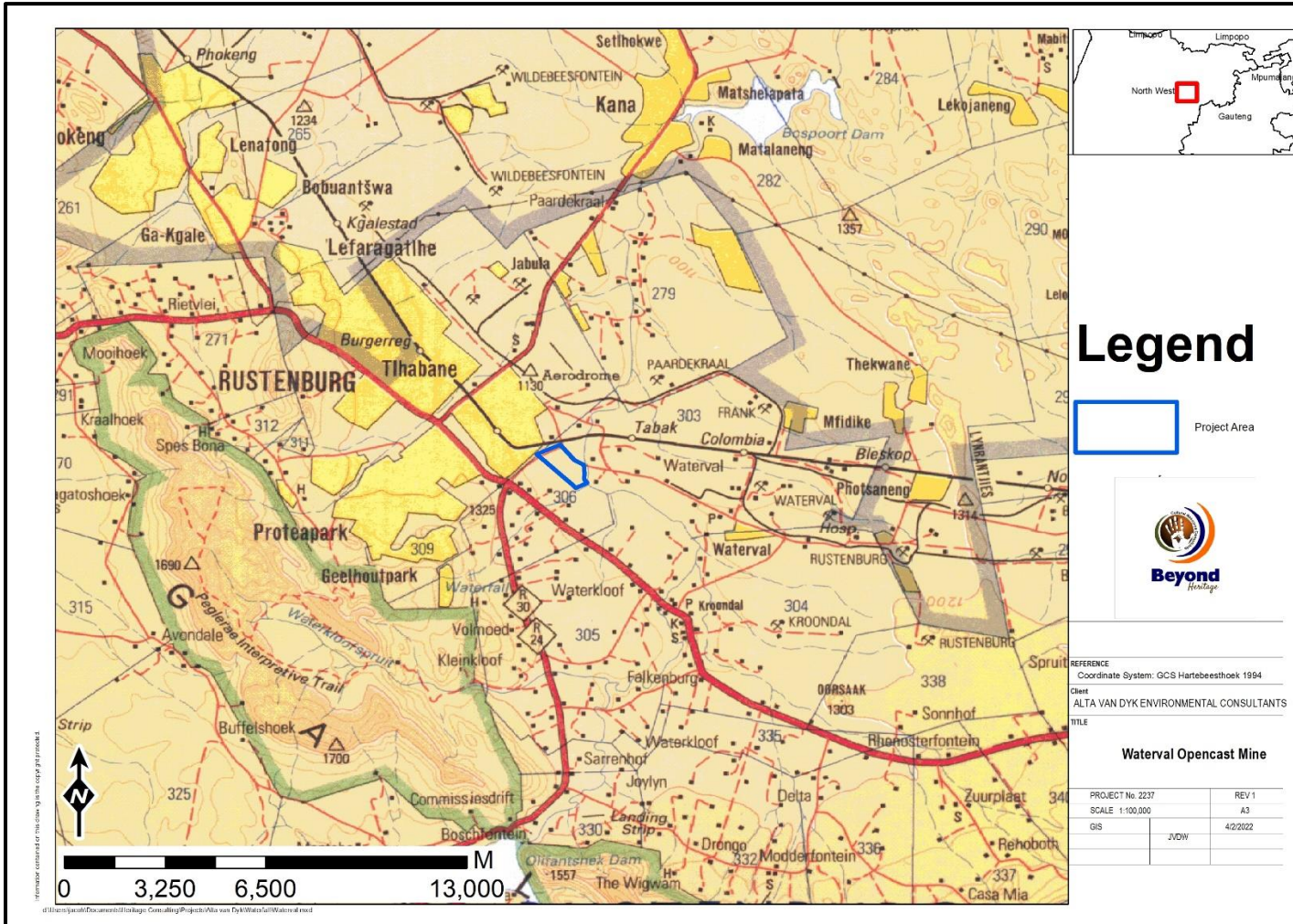


Figure 1.1. Regional setting of the project (1: 250 000 topographical map).

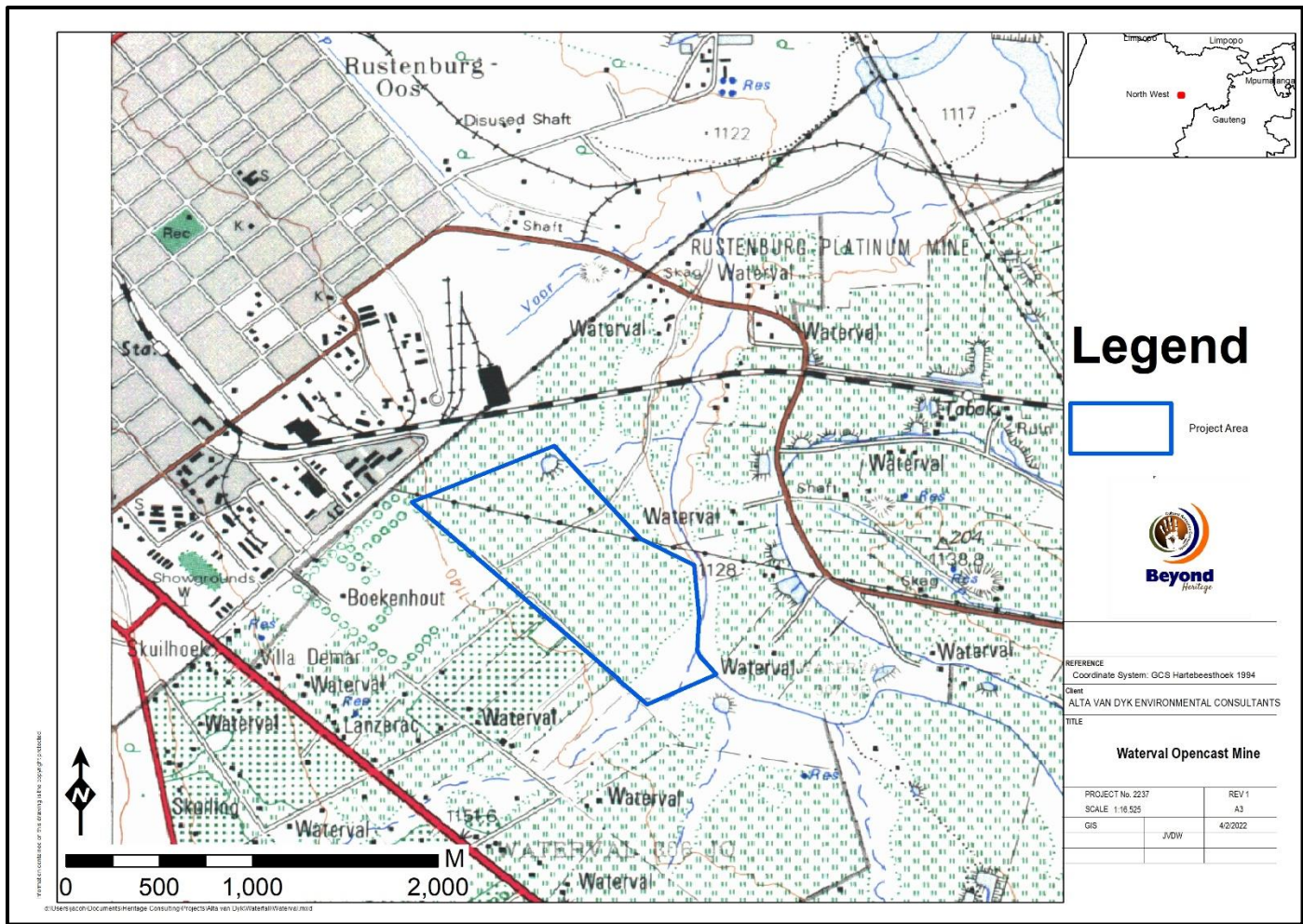


Figure 1.2. Local setting of the project (1: 50 000 topographical map).

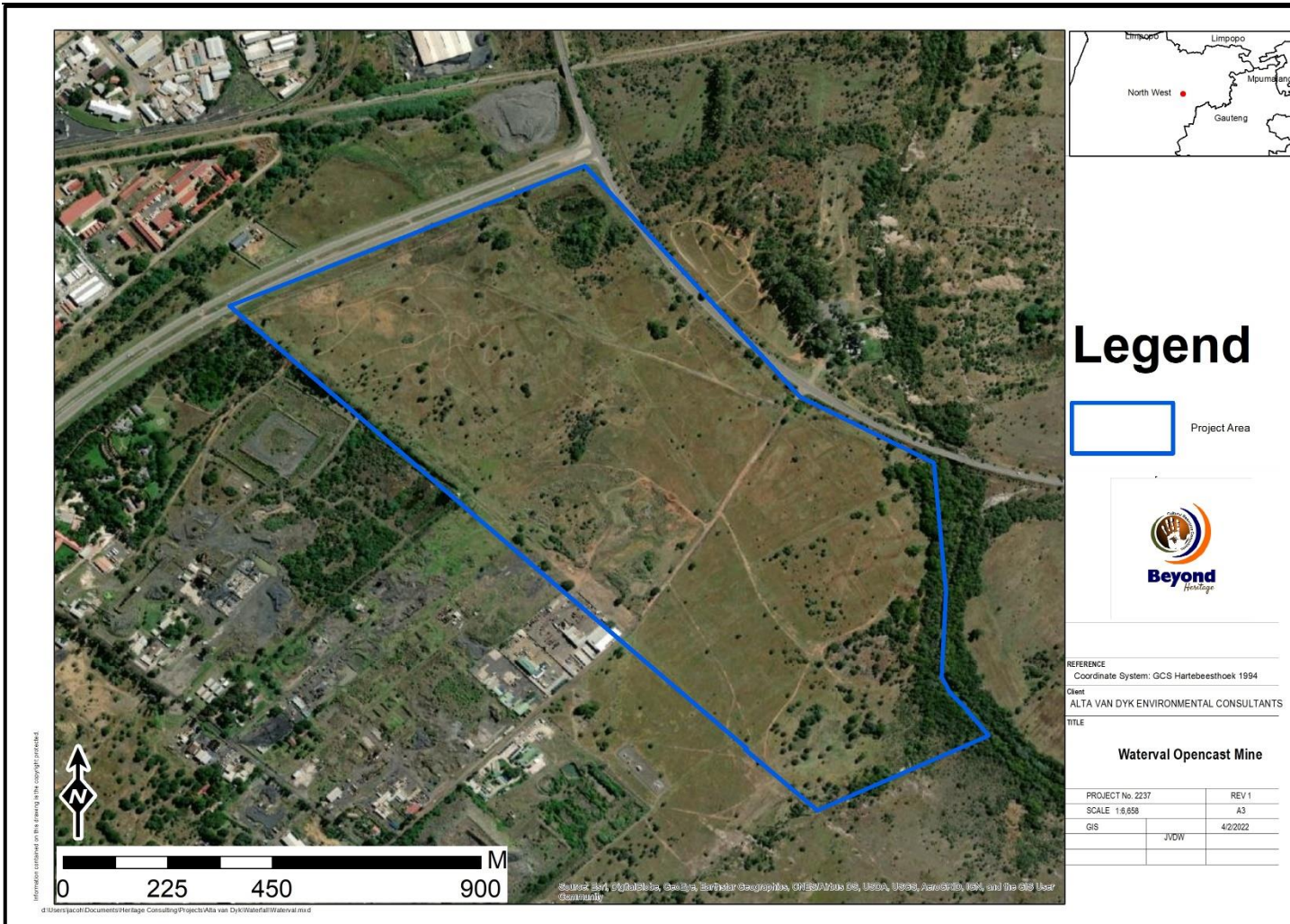


Figure 1.3. Aerial image of the project area.

2 Legislative Requirements

The HIA, as a specialist sub-section of the EIA, is required under the following legislation:

- National Heritage Resources Act (NHRA), Act No. 25 of 1999)
- National Environmental Management Act (NEMA), (Act No. 107 of 1998 - Section 23(2)(b))

A Phase 1 HIA is a pre-requisite for development in South Africa as prescribed by SAHRA and stipulated by legislation. The overall purpose of heritage specialist input is to:

- Identify any heritage resources, which may be affected;
- Assess the nature and degree of significance of such resources;
- Establish heritage informants/constraints to guide the development process through establishing thresholds of impact significance;
- Assess the negative and positive impact of the development on these resources; and
- Make recommendations for the appropriate heritage management (or avoidance) of these impacts.

The HIA should be submitted, as part of the impact assessment report or EMPr, to the Provincial Heritage Resource Agency (PHRA) or to SAHRA. SAHRA will ultimately be responsible for the evaluation of Phase 1 HIA reports upon which review comments will be issued. 'Best practice' requires Phase 1 HIA reports and additional development information, as per the impact assessment report and/or EMPr, to be submitted in duplicate to SAHRA after completion of the study. SAHRA accepts Phase 1 HIA reports authored by professional archaeologists, accredited with ASAPA or with a proven ability to do archaeological work.

Minimum accreditation requirements include an Honours degree in archaeology or related discipline and 3 years post-university CRM experience (field supervisor level). Minimum standards for reports, site documentation and descriptions are set by ASAPA in collaboration with SAHRA. ASAPA is based in South Africa, representing professional archaeology in the Southern African Development Community (SADC) region. ASAPA is primarily involved in the overseeing of ethical practice and standards regarding the archaeological profession. Membership is based on proposal and secondment by other professional members.

Phase 1 HIA's are primarily concerned with the location and identification of heritage sites situated within a proposed development area. Identified sites should be assessed according to their significance. Relevant conservation or Phase 2 mitigation recommendations should be made. Recommendations are subject to evaluation by SAHRA.

Conservation or Phase 2 mitigation recommendations, as approved by SAHRA, are to be used as guidelines in the developer's decision-making process.

Phase 2 archaeological projects are primarily based on salvage/mitigation excavations preceding development destruction or impact on a site. Phase 2 excavations can only be conducted with a permit, issued by SAHRA to the appointed archaeologist. Permit conditions are prescribed by SAHRA and includes (as minimum requirements) reporting back strategies to SAHRA and deposition of excavated material at an accredited repository.

In the event of a site conservation option being preferred by the developer, a site management plan, prepared by a professional archaeologist and approved by SAHRA, will suffice as minimum requirement.

After mitigation of a site, a destruction permit must be applied for with SAHRA by the applicant before development may proceed.

Human remains older than 60 years are protected by the National Heritage Resources Act, with reference to Section 36 and GNR 548 as well as the SAHRA BGG Policy 2020. Graves older than 60 years, but younger than 100 years fall under Section 36 of Act 25 of 1999 (NHRA), as well as the National Health Act of 2003 and are under the jurisdiction of SAHRA. The procedure for Consultation Regarding Burial Grounds and Graves (Section 36[5]) of Act 25 of 1999 is applicable to graves older than 60 years that are situated outside a formal cemetery administrated by a local authority. Graves in this age category, located inside a formal cemetery administrated by a local authority, require the same authorisation as set out for graves younger than 60 years, in addition to SAHRA authorisation. If the grave is not situated inside a formal cemetery, but is to be relocated to one, permission from the local authority is required and all regulations, laws and by-laws, set by the cemetery authority, must be adhered to.

Human remains that are less than 60 years old are protected under Section 2(1) of the Removal of Graves and Dead Bodies Ordinance (Ordinance No. 7 of 1925) re-instituted by Proclamation 109 of 17 June 1994 and implemented by CoGHSTA as well as the National Health Act of 2003 and are the jurisdiction of the National Department of Health and the relevant Provincial Department of Health and must be submitted for final approval to the office of the relevant Provincial Premier. . Authorisation for exhumation and reinternment must also be obtained from the relevant local or regional council where the grave is situated, as well as the relevant local or regional council to where the grave is being relocated. All local and regional provisions, laws and by-laws must also be adhered to. To handle and transport human remains, the institution conducting the relocation should be authorised under the National Health Act of 2003.

3 METHODOLOGY

3.1 Literature Review

A brief survey of available literature was conducted to extract data and information on the area in question to provide general heritage context into which the development would be set. This literature search included published material, unpublished commercial reports and online material, including reports sourced from the South African Heritage Resources Information System (SAHRIS).

3.2 Genealogical Society and Google Earth Monuments

Google Earth and 1:50 000 maps of the area were utilised to identify possible places where sites of heritage significance might be located; these locations were marked and visited during the fieldwork phase. The database of the Genealogical Society was consulted to collect data on any known graves in the area.

3.3 Public Consultation and Stakeholder Engagement:

Stakeholder engagement is a key component of any EIA process, it involves stakeholders interested in, or affected by the proposed development. Stakeholders are provided with an opportunity to raise issues of concern (for the purposes of this report only heritage related issues will be included). The aim of the public consultation process undertaken by the EAP was to capture and address any issues raised by community members and other stakeholders.

3.4 Site Investigation

The aim of the site visit was to:

- a) survey the proposed project area to understand the heritage character of the area and to record, photograph and describe sites of archaeological, historical or cultural interest;
- b) record GPS points of sites/areas identified as significant areas;
- c) determine the levels of significance of the various types of heritage resources recorded in the project area.

Table 4: Site Investigation Details

| | Site Investigation |
|--------|---|
| Date | 17 March 2022 |
| Season | Summer. The study area was overgrown with knee high grass and was waterlogged after heavy rainfall before the survey that limited archaeological visibility and accessibility. The area was however sufficiently covered to understand the heritage character of the area (Figure 3.1). |

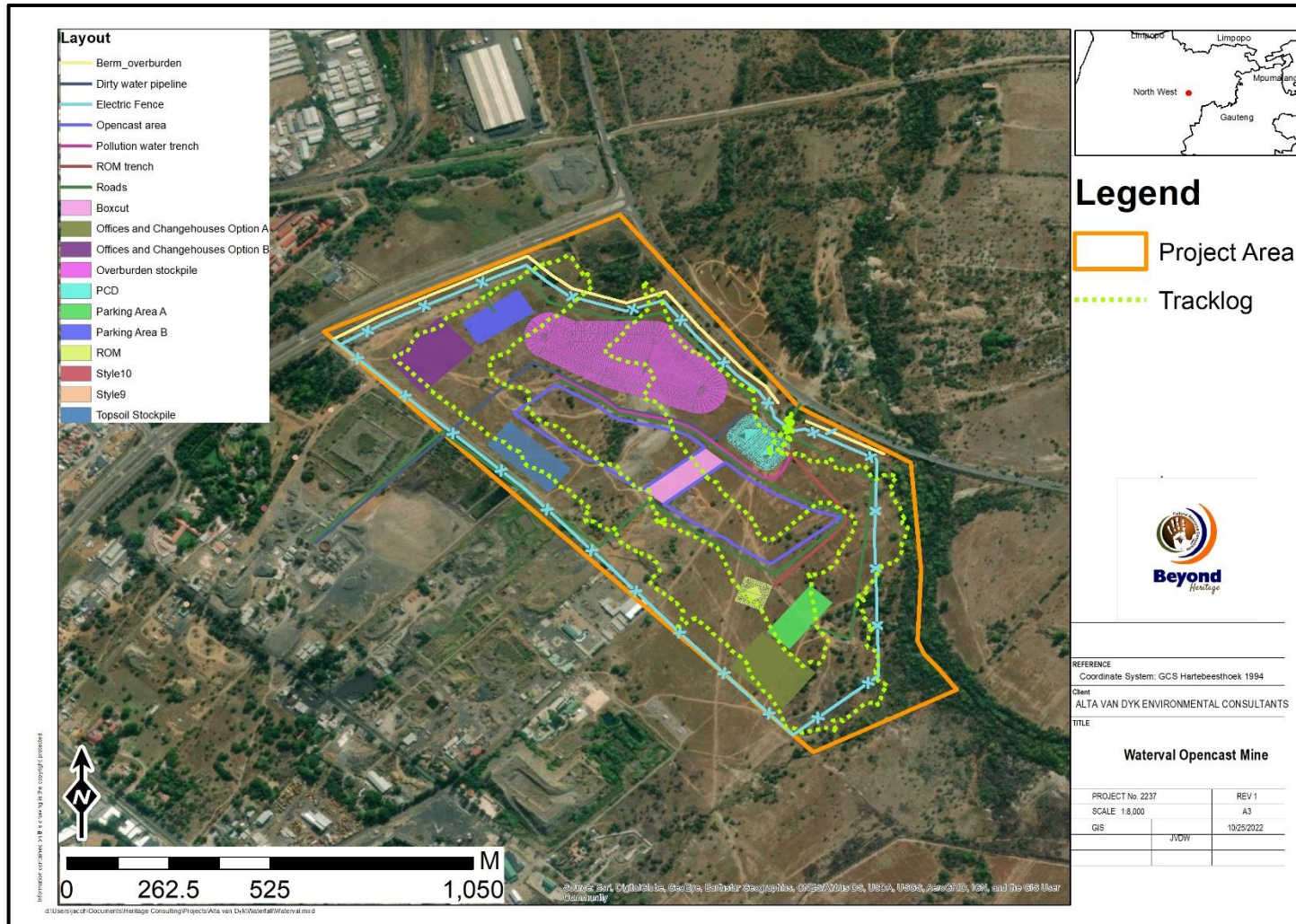


Figure 3.1. Tracklog of the survey path in green showing the proposed layout.

3.5 Site Significance and Field Rating

Section 3 of the NHRA distinguishes nine criteria for places and objects to qualify as ‘part of the national estate’ if they have cultural significance or other special value. These criteria are:

- Its importance in/to the community, or pattern of South Africa’s history;
- Its possession of uncommon, rare or endangered aspects of South Africa’s natural or cultural heritage;
- Its potential to yield information that will contribute to an understanding of South Africa’s natural or cultural heritage;
- Its importance in demonstrating the principal characteristics of a particular class of South Africa’s natural or cultural places or objects;
- Its importance in exhibiting particular aesthetic characteristics valued by a community or cultural group;
- Its importance in demonstrating a high degree of creative or technical achievement at a particular period;
- Its strong or special association with a particular community or cultural group for social, cultural or spiritual reasons;
- Its strong or special association with the life or work of a person, group or organisation of importance in the history of South Africa;
- Sites of significance relating to the history of slavery in South Africa.

The presence and distribution of heritage resources define a ‘heritage landscape’. In this landscape, every site is relevant. In addition, because heritage resources are non-renewable, heritage surveys need to investigate an entire project area, or a representative sample, depending on the nature of the project. In the case of the proposed project the local extent of its impact necessitates a representative sample and only the footprint of the areas demarcated for development were surveyed. In all initial investigations, however, the specialists are responsible only for the identification of resources visible on the surface. This section describes the evaluation criteria used for determining the significance of archaeological and heritage sites. The following criteria were used to establish site significance with cognisance of Section 3 of the NHRA:

- The unique nature of a site;
- The integrity of the archaeological/cultural heritage deposits;
- The wider historic, archaeological and geographic context of the site;
- The location of the site in relation to other similar sites or features;
- The depth of the archaeological deposit (when it can be determined/is known);
- The preservation condition of the sites; and
- Potential to answer present research questions.

In addition to this criteria field ratings prescribed by SAHRA (2007), and acknowledged by ASAPA for the SADC region, were used for the purpose of this report. The recommendations for each site should be read in conjunction with section 10 of this report.

Table 5: Heritage significance and field ratings

| FIELD RATING | GRADE | SIGNIFICANCE | RECOMMENDED MITIGATION |
|-------------------------------|--------------|--------------------------|--|
| National Significance (NS) | Grade 1 | - | Conservation; national site nomination |
| Provincial Significance (PS) | Grade 2 | - | Conservation; provincial site nomination |
| Local Significance (LS) | Grade 3A | High significance | Conservation; mitigation not advised |
| Local Significance (LS) | Grade 3B | High significance | Mitigation (part of site should be retained) |
| Generally Protected A (GP. A) | - | High/medium significance | Mitigation before destruction |
| Generally Protected B (GP. B) | - | Medium significance | Recording before destruction |
| Generally Protected C (GP.C) | - | Low significance | Destruction |

3.6 Impact Assessment Methodology

The impact assessment methodology was provided by AVDE. The significance of the identified impacts will be determined using an accepted methodology from the Department of Environmental Affairs and Tourism Guideline document on EIA Regulations, April 1998. As with all impact methodologies, the impact is defined in a semi-quantitative way and will be assessed according to methodology prescribed in the following section.

Table 6. Scale utilised for the evaluation of the Environmental Risk Ratings

| Evaluation Component | Rating | Scale | Description / criteria |
|---|--------|----------------------|---|
| MAGNITUDE of negative impact (at the indicated spatial scale) | 10 | Very high | Bio-physical and/or social functions and/or processes might be <i>severely</i> altered. |
| | 8 | High | Bio-physical and/or social functions and/or processes might be <i>considerably</i> altered. |
| | 6 | Medium | Bio-physical and/or social functions and/or processes might be <i>notably</i> altered. |
| | 4 | Low | Bio-physical and/or social functions and/or processes might be <i>slightly</i> altered. |
| | 2 | Very low | Bio-physical and/or social functions and/or processes might be <i>negligibly</i> altered. |
| | 0 | Zero | Bio-physical and/or social functions and/or processes will remain <i>unaltered</i> . |
| MAGNITUDE of POSITIVE IMPACT (at the indicated spatial scale) | 10 | Very high | Positive: Bio-physical and/or social functions and/or processes might be <i>substantially</i> enhanced. |
| | 8 | High | Positive: Bio-physical and/or social functions and/or processes might be <i>considerably</i> enhanced. |
| | 6 | Medium | Positive: Bio-physical and/or social functions and/or processes might be <i>notably</i> enhanced. |
| | 4 | Low | Positive: Bio-physical and/or social functions and/or processes might be <i>slightly</i> enhanced. |
| | 2 | Very low | Positive: Bio-physical and/or social functions and/or processes might be <i>negligibly</i> enhanced. |
| | 0 | Zero | Positive: Bio-physical and/or social functions and/or processes will remain <i>unaltered</i> . |
| DURATION | 5 | Permanent | Impact in perpetuity. – |
| | 4 | Long term | Impact ceases after operational phase/life of the activity > 60 years. |
| | 3 | Medium term | Impact might occur during the operational phase/life of the activity – 60 years. |
| | 2 | Short term | Impact might occur during the construction phase - < 3 years. |
| | 1 | Immediate | Instant impact. |
| EXTENT | 5 | International | Beyond the National boundaries. |
| | 4 | National | Beyond provincial boundaries, but within National boundaries. |

| | | | |
|---|---|-------------------------------|--|
| (or spatial scale/influence of impact) | 3 | Regional | Beyond 5 km of the site and within the provincial boundaries. |
| | 2 | Local | Within a 5 km radius of the site |
| | 1 | Site-specific | On site or within 100 meters of the site boundaries. |
| | 0 | None | Zero extent. |
| IRREPLACEABLE loss of resources | 5 | Definite | Definite loss of irreplaceable resources. |
| | 4 | High potential | High potential for loss of irreplaceable resources. |
| | 3 | Moderate potential | Moderate potential for loss of irreplaceable resources. |
| | 2 | Low potential | Low potential for loss of irreplaceable resources. |
| | 1 | Very low potential | Very low potential for loss of irreplaceable resources. |
| | 0 | None | Zero potential. |
| REVERSIBILITY of impact | 5 | Irreversible | Impact cannot be reversed. |
| | 4 | Low irreversibility | Low potential that impact might be reversed. |
| | 3 | Moderate reversibility | Moderate potential that impact might be reversed. |
| | 2 | High reversibility | High potential that impact might be reversed. |
| | 1 | Reversible | Impact will be reversible. |
| | 0 | No impact | No impact. |
| PROBABILITY (of occurrence) | 5 | Definite | >95% chance of the potential impact occurring. |
| | 4 | High probability | 75% - 95% chance of the potential impact occurring. |
| | 3 | Medium probability | 25% - 75% chance of the potential impact occurring |
| | 2 | Low probability | 5% - 25% chance of the potential impact occurring. |
| | 1 | Improbable | <5% chance of the potential impact occurring. |
| | 0 | No probability | Zero probability. |
| Evaluation Component | Rating scale and description / criteria | | |
| CUMULATIVE impacts | <p>High: The activity is one of several similar past, present or future activities in the same geographical area, and might contribute to a very significant combined impact on the natural, cultural, and/or socio-economic resources of local, regional or national concern.</p> <p>Medium: The activity is one of a few similar past, present or future activities in the same geographical area, and might have a combined impact of moderate significance on the natural, cultural, and/or socio-economic resources of local, regional or national concern.</p> <p>Low: The activity is localised and might have a negligible cumulative impact.</p> <p>None: No cumulative impact on the environment.</p> | | |

Once the Environmental Risk Ratings have been evaluated for each potential environmental impact, the Significance Score of each potential environmental impact is calculated by using the following formula:

- **SS (Significance Score) = (magnitude + duration + extent + irreplaceable + reversibility) x probability.**

The maximum Significance Score value is 150.

The Significance Score is then used to rate the Environmental Significance of each potential environmental impact as per Table 8.2 below. The Environmental Significance rating process is completed for all identified potential environmental impacts both before and after implementation of the recommended mitigation measures.

Table 7. Scale used for the evaluation of the Environmental Significance Ratings

| Significance Score | Environmental Significance | Description / criteria |
|--------------------|----------------------------|--|
| 125 – 150 | Very high (VH) | An impact of very high significance will mean that the project cannot proceed, and that impacts are irreversible, regardless of available mitigation options. |
| 100 – 124 | High (H) | An impact of high significance which could influence a decision about whether or not to proceed with the proposed project, regardless of available mitigation options. |
| 75 – 99 | Medium-high (MH) | If left unmanaged, an impact of medium-high significance could influence a decision about whether or not to proceed with a proposed project. Mitigation options should be relooked at. |
| 40 – 74 | Medium (M) | If left unmanaged, an impact of moderate significance could influence a decision about whether or not to proceed with a proposed project. |
| <40 | Low (L) | An impact of low is likely to contribute to positive decisions about whether or not to proceed with the project. It will have little real effect and is unlikely to have an influence on project design or alternative motivation. |
| + | Positive impact (+) | A positive impact is likely to result in a positive consequence/effect, and is likely to contribute to positive decisions about whether or not to proceed with the project. |

3.7 Limitations and Constraints of the study

The authors acknowledge that the brief literature review is not exhaustive on the literature of the area. Due to the nature of heritage resources and pedestrian surveys, the possibility exists that some features or artefacts may not have been discovered/recorded and the possible occurrence of graves and other cultural material cannot be excluded. This limitation is successfully mitigated with the implementation of a Chance Find Procedure and monitoring of the study area by the ECO. This report only deals with the footprint area of the proposed development and consisted of non-intrusive surface surveys. This study did not assess the impact on medicinal plants and intangible heritage as it is assumed that these components will be highlighted through the public consultation process if relevant. It is possible that new information could come to light in future, which might change the results of this Impact Assessment.

4 Description of Socio-Economic Environment

According to Census 2011, Rustenburg Local Municipality has a total population of 549 575 people, of whom 88,5% are black African, 9,4% are white, with the other population groups make up the remaining 2,1%. Of those aged 20 years and older, 5,4% have completed primary school, 36,2% have some secondary education, 31,1% have completed matric, and 8,9% have some form of higher education, while 5,4% of those aged 20 years and older have no form of schooling. 266 471 people are economically active (employed or unemployed but looking for work), and of these, 26,4% are unemployed. 34,7% of the 142 219 economically active youth (15 – 34 years) in the municipality are unemployed.

5 Results of Public Consultation and Stakeholder Engagement:

5.1.1 Stakeholder Identification

Adjacent landowners and the public at large were informed of the proposed activity as part of the EIA process by the EAP. Site notices and advertisements notifying interested and affected parties were placed at strategic points and in local newspapers as part of the process. No heritage concerns have been raised thus far.

6 Literature / Background Study:

6.1 Literature Review (SAHRIS)

The area under investigation was not previously assessed and few HIA's was conducted in the immediate area. Studies conducted in the general area that were consulted is listed in Table 8.

Table 8. Studies conducted in the greater area.

| Author | Year | Project | Findings |
|----------------------------------|------|--|--|
| Kruger, N. | 2015 | Delron Environmental: Proposed Rustenburg Extension 30 Township Establishment on The Remaining Extent of Portion 1 Of The Farm Town And Townlands Of Rustenburg 272-Jq, Rustenburg Local Municipality, North West Province | No Sites |
| Pelser, A.J. | 2012 | A Report on A Heritage Impact Assessment For The Proposed Strumosa Solid Waste Transfer Station Near Rustenburg In The Northwest Province | No sites |
| Huffman, T.N. | 2005 | The Archaeology of the Anglo Platinum Lease Area. | Stone Age occurrences and Iron Age sites, structures and graves. |
| Huffman, T.N. and Murimbika T.M. | 2002 | Archaeological study of the Boschfontein East Options, Rustenburg | MSA artefacts, Iron Age scatters |

6.1.1 Google Earth and The Genealogical Society of South Africa (Graves and burial sites)

Google Earth and 1:50 000 maps of the area were utilised to identify possible places where archaeological and historical sites might be located. The database of the Genealogical Society of South Africa indicated no known grave sites within the study area

6.2 Archaeological Background

The archaeological record for the greater study area consists of the Stone Age and Iron Age.

6.2.1 Stone Age

South Africa has a long and complex Stone Age sequence of more than 2 million years. The broad sequence includes the Later Stone Age, the Middle Stone Age and the Earlier Stone Age. Each of these phases contain sub-phases or industrial complexes, and within these we can expect regional variation regarding characteristics and time ranges. The three main phases can be divided as follows;

- * Later Stone Age; associated with Khoi and San societies and their immediate predecessors. Recently to ~30 thousand years ago
- * Middle Stone Age; associated with Homo sapiens and archaic modern humans. 30-300 thousand years ago.
- * Earlier Stone Age (ESA); associated with early Homo groups such as Homo habilis and Homo erectus. 400 000-> 2 million years ago.

The ESA is represented in the area by the Wonderboom site on the southern slopes of the Magaliesberg north of Pretoria. This site is characterised by numerous cleavers, hand axes, cores and flakes (Mason, 1958). The nearby Jubilee shelter has been excavated and provides a record from the Late Pleistocene to the 7th Century AD (Turner, 1986), an extended cultural sequence with assemblages' characteristic of the Middle Stone Age, Early Later Stone Age and Later Stone Age including assemblages from the Oakhurst and Wilton industries (Wadley, 1986). The Jubilee shelter provides evidence of hunter–gatherer occupation during three phases of agro pastoralist contact, beginning in 225 AD and characterised by cooperative contact, prior to the hunter-gatherers being either assimilated or dispersed to other areas (Wadley, 1996).

6.2.2 The Iron Age

The Iron Age represents the spread of Bantu speaking people and includes both the pre-Historic and Historic periods. It can be divided into three distinct periods:

- The Early Iron Age: Most of the first millennium AD.
- The Middle Iron Age: 10th to 13th centuries AD
- The Late Iron Age: 14th century to colonial period.

There are no signs of Early Iron Age remains in the immediate vicinity of the study area (Bergh 1999: 4-6). There are however signs that the present-day Rustenburg is located in an area that used to be a large Late Iron Age (1000-1800) terrain. (Bergh 1999: 7)

Since the beginning of the 19th century, there was a presence of Fokeng, Kwena and Tuang settlements in the present-day Rustenburg area. The Fokeng tribe had its settlement at Phokeng, to the northwest of Rustenburg, and were able to live there up until the time of the Difaqane, when Mzilikazi's Khumalo-Ndebeles drove all other black communities from the area. The Fokeng, under the authority of Nôgê, was one of the few groups that resisted Mzilikazi, and without success. (Bergh 1999: 10-11; 110-111) The Difaqane (Sotho), or Mfekane ("the crushing" in Nguni) was a time of bloody upheavals in Natal and on the Highveld, which occurred around the early 1820's until the late 1830's. (Bergh 1999: 10) It came about in response to heightened competition for land and trade and caused population groups like gun-carrying Griquas and Shaka's Zulus to attack other tribes. (Bergh 1999: 14; 116-119)

6.2.3 Anglo-Boer War

The Anglo-Boer War, which took place between 1899 and 1902 in South Africa, was one of the most turbulent times in South Africa's history. Even before the outbreak of war in October 1899 British politicians, including Sir Alfred Milner and Mr. Chamberlain, had declared that should Britain's differences with the Z.A.R. result in violence, it would mean the end of republican independence. This decision was not immediately publicized, and subsequently republican leaders based their assessment of British intentions on the more moderate public utterances of British leaders. Consequently, in March 1900, they asked Lord Salisbury to agree to peace on the basis of the status quo ante bellum. Salisbury's reply was; however, a clear statement of British war aims. (Du Preez 1977).

One battalion of British troops moved through Rustenburg between February and September 1900. This was the regiment of General Major R. S. S. Baden-Powell. The Boer war-hero General Jacobus Herculaas de la Rey (more commonly known as Koos de la Rey) also moved past Rustenburg on his route between Barberton and Lichtenburg. (Bergh 1999: 51).

Rustenburg was under siege on 14 June 1900, when Colonel Herbert Plumer accepted the surrender of the Rustenburg Field Cornet Piet Kruger. Kruger, on his part, had been unable to get the Burghers to put up any resistance against the British forces. The British camped near the old goal, but on strict order from General Baden-Powell that there were no demonstrations. On the same day, the demoralized Burghers handed 1000 rifles to the British authorities, and it is perhaps safe to assume that an equivalent number signed the oath of neutrality. (Wulfsohn 1992: 50-51)

7 Description of the Physical Environment

The proposed UG1 opencast project is situated in the Waterval-East suburb of Rustenburg about 3km east of the N4 highway. The site is located on a fallow portion of land at the corner of the R24. The site is characterized by dense grass cover and pioneer invasive plants with thickets of trees on both the western and eastern edges of the area. The proposed area is highly disturbed due to various activities such as historical cultivation of the entire area, road construction, excavations, mining related activities and illegal dumping. General site conditions are presented in Figure 7.1 to 7.4.



Figure 7.1. General site conditions showing the existing site office.



Figure 7.2. Main access road into the proposed project area.



Figure 7.3. Dense vegetation in the study area.



Figure 7.4. Earth moving activities evident throughout the area.

8 Findings of the Survey

8.1 Heritage Resources

The study area is without any major topographical features like pans or rocky outcrops that would be focal points for archaeological sites. Existing infrastructure includes a small site office towards the northern entrance to the area for the current drilling operations and a large pipeline. The study area has been transformed through these activities and historical cultivation from the 1980's onwards, that would also have destroyed surface indicators of heritage sites and the project area is considered to be of low heritage potential. This was confirmed during the survey and no heritage resources of significance were recorded.

8.2 Cultural Landscape

The study area used to be rural in character but is now located in an urban setting with industrial elements related to mining activities in the surrounding area (Figure 8.1 to 8.3).

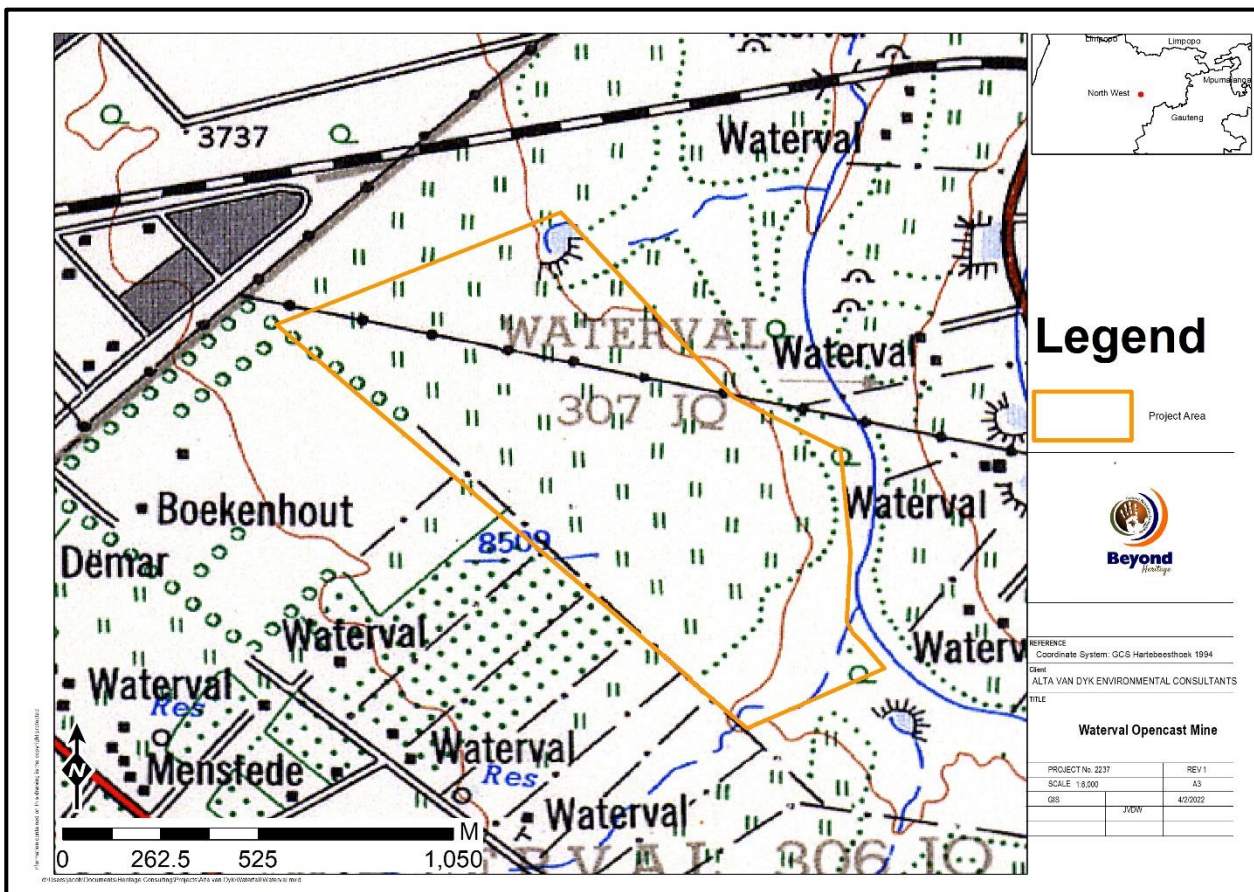


Figure 8.1. 1968 Topographic map of the area showing the area to be cultivated.

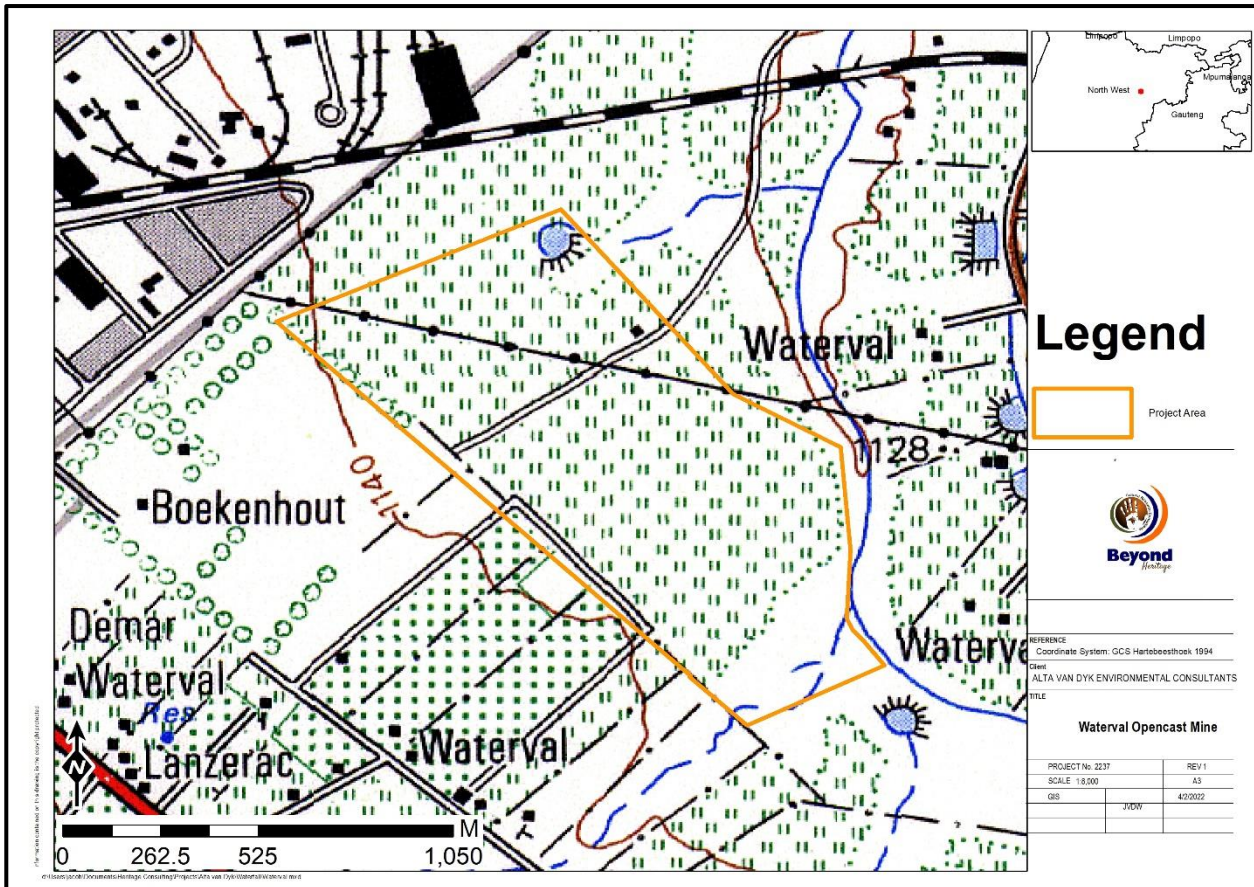


Figure 8.2. 1986 Topographic map showing the area to be cultivated with a water body in the northern portion.

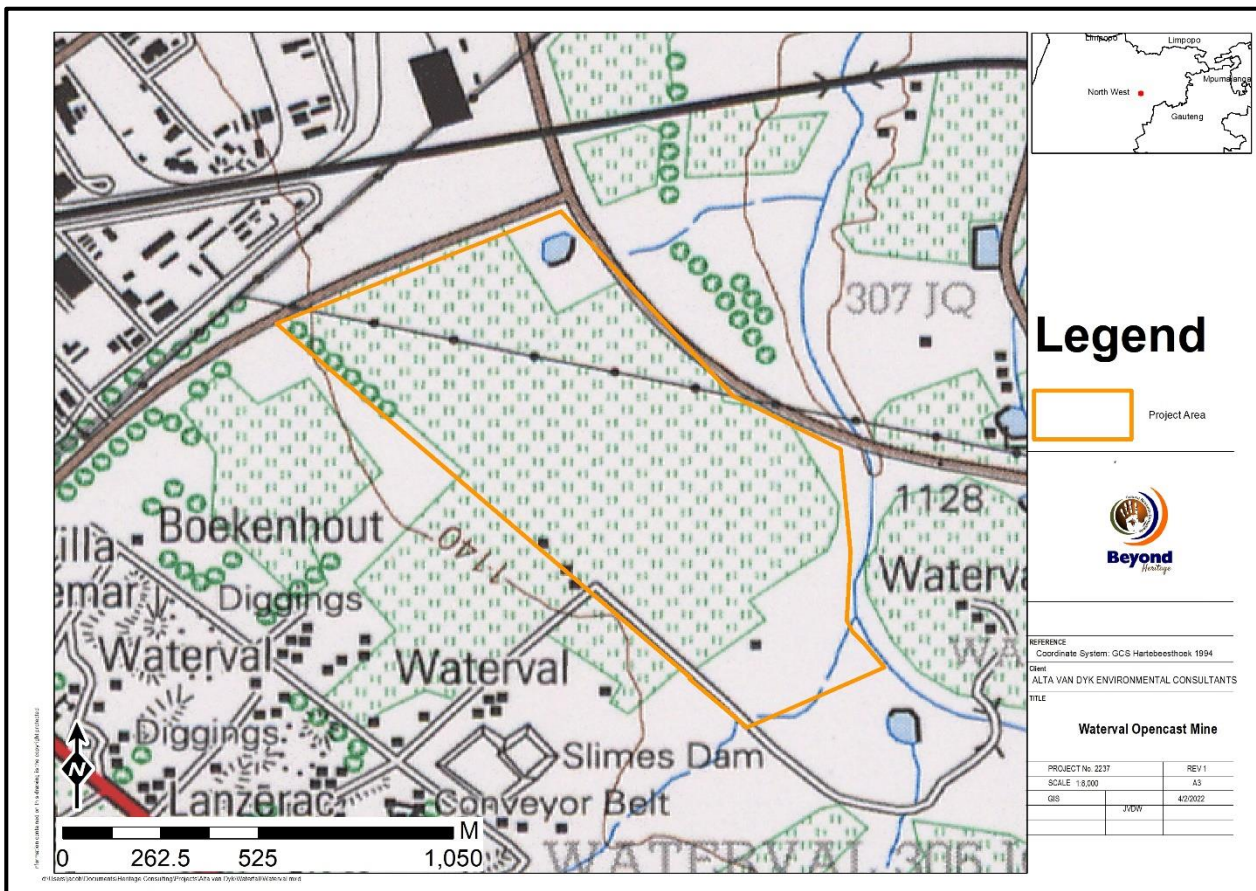
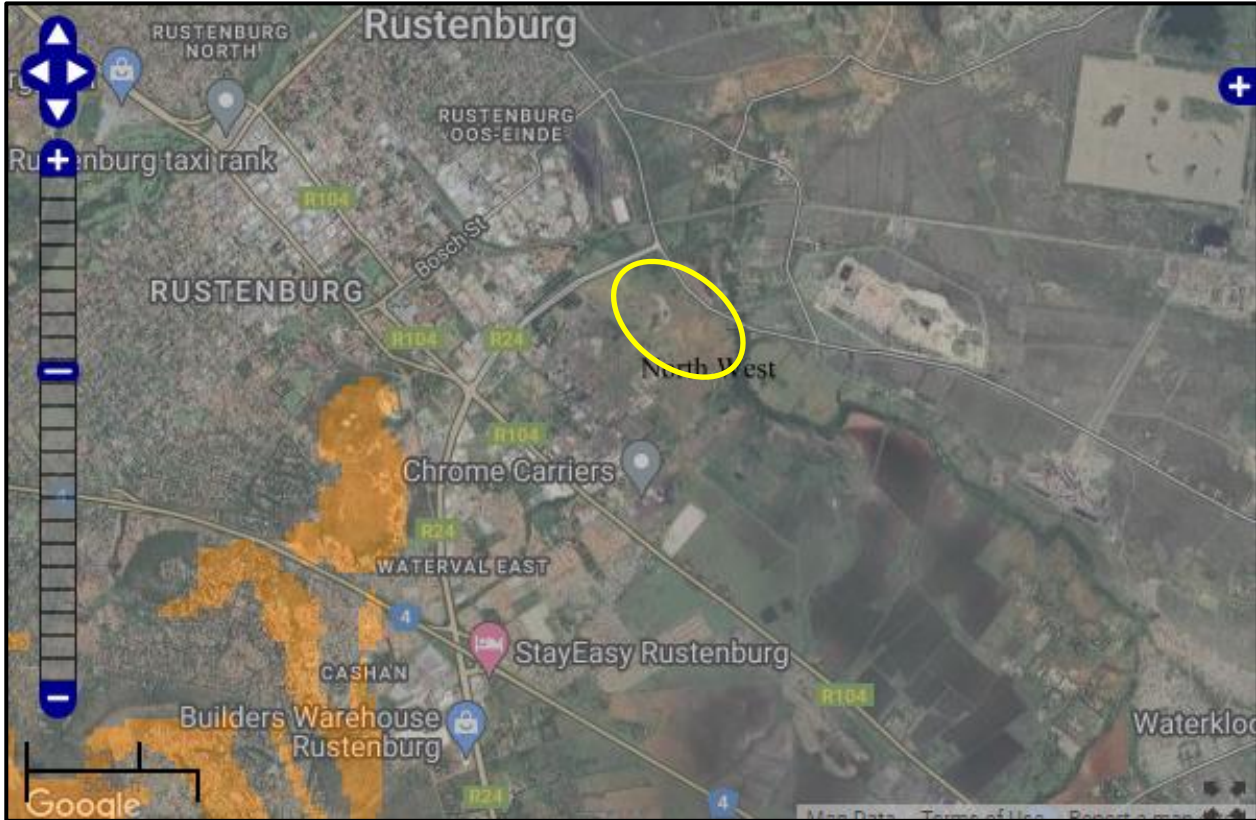


Figure 8.3. 1996 Topographic map showing the area to be cultivated with a water body in the northern portion.

8.3 Paleontological Heritage

Based on the SAHRA sensitivity map the area is of insignificant paleontological sensitivity (Figure 8.4). No further palaeontological studies are required and as far as the palaeontology is concerned, the project can go ahead without further investigations.



| Colour | Sensitivity | Required Action |
|---------------|--------------------|---|
| RED | VERY HIGH | Field assessment and protocol for finds is required |
| ORANGE/YELLOW | HIGH | Desktop study is required and based on the outcome of the desktop study; a field assessment is likely |
| GREEN | MODERATE | Desktop study is required |
| BLUE | LOW | No palaeontological studies are required however a protocol for finds is required |
| GREY | INSIGNIFICANT/ZERO | No palaeontological studies are required |
| WHITE/CLEAR | UNKNOWN | These areas will require a minimum of a desktop study. As more information comes to light, SAHRA will continue to populate the map. |

Figure 8.4. Paleontological sensitivity for the approximate study area (yellow polygon) as indicated by SAHRA.

9 Potential Impact

Due to the lack of any heritage finds, the impact to the heritage record of the area is low. Any additional effects to subsurface heritage resources can be successfully mitigated by implementing a chance find procedure. Monitoring procedures and management guidelines outlined in Table 9 will ensure adequate handling of chance finds.

Cumulative impacts considered as an effect caused by the proposed action that results from the incremental impact of an action when added to other past, present, or reasonably foreseeable future actions. (Cornell Law School Information Institute, 2020). Cumulative impacts occur from the combination of effects of various impacts on heritage resources. The importance of identifying and assessing cumulative impacts is that the whole is greater than the sum of its parts. In the case of this project, impacts can be mitigated to an acceptable level. However, this and other projects in the area can have a negative impact on heritage sites in the area where these sites have been destroyed unknowingly.

9.1.1 Pre-Construction phase

It is assumed that the pre-construction phase involves the removal of topsoil and vegetation as well as the establishment of infrastructure. These activities can have a negative and irreversible impact on heritage features if any occur. Impacts include destruction or partial destruction of non-renewable heritage resources.

9.1.2 Construction Phase

During this phase, the impacts and effects are similar in nature but more extensive than the pre-construction phase. Potential impacts include destruction or partial destruction of non-renewable heritage resources.

9.1.3 Operation Phase

No impacts are expected during the operation phase.

9.1.1 Impact Assessment for the Project

Table 9. Impact assessment for the proposed project.

| POTENTIAL ENVIRONMENTAL IMPACT | ACTIVITY | ENVIRONMENTAL SIGNIFICANCE BEFORE MITIGATION | | | | | | | | Cumulative | Status | RECOMMENDED MITIGATION MEASURES/REMARKS | ENVIRONMENTAL SIGNIFICANCE AFTER MITIGATION | | | | | | | |
|--|--|--|---|---|---|---|---|-------|----|------------|----------|---|---|---|---|---|---|---|-------|----|
| | | M | D | S | I | R | P | TOTAL | SP | | | | M | D | S | I | R | P | TOTAL | SP |
| Cultural Heritage Impact Assessment | | | | | | | | | | | | | | | | | | | | |
| Heritage Resources | Waterval Open Cast Mine – Mining activities and construction of infrastructure | 2 | 5 | 3 | 5 | 5 | 2 | 40 | L | Low | Negative | Implementation of a chance find procedure for the project | 2 | 5 | 3 | 0 | 0 | 2 | 20 | L |

10 Conclusion and recommendations

The study area is a disturbed piece of land that has been fallow for several years. Historical cultivation of the site, illegal dumping of building rubble and refuse material and earthmoving activities altered the site and no standing structures older than 60 years or heritage resources were noted during the site visit. According to the SAHRA Paleontological sensitivity map the study area is of insignificant/zero paleontological significance and no further studies are required for this aspect

The impact on heritage resources is considered to be low and the project can be authorised provided that the recommendations in this report are adhered to and based on the South African Heritage Resource Authority (SAHRA) 's approval.

10.1 Recommendations for condition of authorisation

The following recommendations for Environmental Authorisation apply and the project may only proceed based on approval from SAHRA:

Recommendations:

- The study area should be monitored by the ECO during construction to facilitate the implementation of the Chance Find Procedure for the project as outlined under Section 10.2.

10.2 Chance Find Procedures

10.2.1 Heritage Resources

The possibility of the occurrence of subsurface finds cannot be excluded. Therefore, if during construction any possible finds such as stone tool scatters, artefacts or bone and fossil remains are made, the operations must be stopped, and a qualified archaeologist must be contacted for an assessment of the find and therefore chance find procedures should be put in place as part of the EMP. A short summary of chance find procedures is discussed below and monitoring guidelines for this procedure are provided in Section 10.5. This procedure applies to the developer's permanent employees, its subsidiaries, contractors and subcontractors, and service providers. The aim of this procedure is to establish monitoring and reporting procedures to ensure compliance with this policy and its associated procedures. Construction crews must be properly inducted to ensure they are fully aware of the procedures regarding chance finds as discussed below.

- If during the pre-construction phase, construction, operations or closure phases of this project, any person employed by the developer, one of its subsidiaries, contractors and subcontractors, or service provider, finds any artefact of cultural significance or heritage site, this person must cease work at the site of the find and report this find to their immediate supervisor, and through their supervisor to the senior on-site manager.
- It is the responsibility of the senior on-site Manager to make an initial assessment of the extent of the find and confirm the extent of the work stoppage in that area.
- The senior on-site Manager will inform the ECO of the chance find and its immediate impact on operations. The ECO will then contact the Glencore Environmental Officers and a professional archaeologist for an assessment of the finds who will notify the SAHRA.

10.3 Reasoned Opinion

The overall impact of the project is considered to be low and residual impacts can be managed to an acceptable level through implementation of the recommendations made in this report. The socio-economic benefits also outweigh the possible impacts of the development if the correct mitigation measures are implemented for the project.

10.4 Potential risk

Potential risks to the proposed project are the occurrence of intangible features and unrecorded cultural resources (of which graves and subsurface cultural material are the highest risk). This can cause delays during construction, as well as additional costs involved in mitigation and possible layout changes.

10.5 Monitoring Requirements

Day to day monitoring can be conducted by the Environmental Control Officers (ECO). The ECO or other responsible persons should be trained along the following lines:

- *Induction training:* Responsible staff identified by the developer should attend a short course on heritage management and identification of heritage resources.
- *Site monitoring and watching brief:* As most heritage resources occur below surface, all earth-moving activities need to be routinely monitored in case of accidental discoveries. The greatest potential impacts are from pre-construction and construction activities. The ECO should monitor all such activities. If any heritage resources are found, the chance finds procedure must be followed as outlined above.

Table 10. Monitoring requirements for the project

| Heritage Monitoring | | | | | |
|--|---------------------|--|--|-----------------------------------|---|
| Aspect | Area | Responsible for monitoring and measuring | Frequency | Proactive or reactive measurement | Method |
| Cultural Heritage Resources chance finds | Entire project area | EO & ECO | Weekly (Pre construction and construction phase) | Proactively | <ul style="list-style-type: none"> • If risks are manifested (accidental discovery of heritage resources) the chance find procedure should be implemented: <ol style="list-style-type: none"> 1. Cease all works immediately; 2. Report incident to Site Manager 3. The Glencore Western Chrome Mines (WCM) Environmental Department must contact an archaeologist/ palaeontologist to inspect the site; 4. Report incident to SAHRA; as advised by specialist and 5. Employ site specific mitigation measures recommended by the specialist after assessment in accordance with the requirements of the relevant authorities. • Only recommence operations once impacts have been mitigated. |

10.6 Management Measures for inclusion in the EMPr

Table 11. Heritage Management Plan for EMPr implementation

| Area | Mitigation measures | Phase | Timeframe | Responsible party for implementation | Target | Performance indicators (Monitoring tool) |
|----------------------|--|--------------|------------------------|--------------------------------------|--|--|
| General project area | Implement chance find procedures in case possible heritage finds are uncovered | Construction | Throughout the project | Applicant EPC Contractor | Ensure compliance with relevant legislation and recommendations from SAHRA under Section 35, 36 and 38 of NHRA | ECO Checklist/Report |

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