APPENDIX H: SPECIALIST STUDIES
HERITAGE ASSESSMENT

Prepared for:

SLR Consulting (Africa) (Pty) Ltd

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Cramerview 2060

A PHASE I HERITAGE IMPACT ASSESSMENT (HIA) STUDY FOR MARULA PLATINUM'S PROPOSED NEW MINE INFRASTRUCTURE IN THE STEELPOORT VALLLEY LIMPOPO PROVINCE

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EXECUTIVE SUMMARY

Marula Mine proposes to construct new Ventilation Shafts, a Product Stockpile, power and water lines and a Solar Plant in the Marula Platinum Mine lease area in the Steelpoort Valley in the Limpopo Province. As the Marula Project may have an influence on any of the types and ranges of heritage resources as outlined in Section 3 of the National Heritage Resources Act (NHRA) (No. 25 of 1999) this Phase I Heritage Impact Assessment (HIA) for the proposed Marula Project Area was conducted in terms of Section 38 of the NHRA (No 25 of 1999).

The aims with the heritage survey and impact assessment for the Marula Project Area were the following:

- To establish whether any of the types and ranges of heritage resources as outlined in Section 38 of the NHRA do occur in the Marula Project Area.
- To establish the significance of the heritage resources in the Marula Project Area and the level of significance of any possible impact on any of these heritage resources.
- To propose mitigation measures for those types and ranges of heritage resources that may be affected by the proposed Marula Project.

Earlier heritage surveys which have been done for Marula have recorded different types and ranges of heritage resources in the Marula mine lease area (Figure 10)**.** The significance of the Tsjate cultural landscape which neighbours on Marula Mine has also been outlined in reports in the past and as is here reaffirmed (see 'Part 12, 'Select Bibliography') including Part 5 of this report, 'Contextualising the Marula Project Area'. The Tsjate Provincial Heritage Site overlaps with the north-western tip of Marula Mines' exploration area. This collates with the some of the highest parts of the Leolo mountains where no mining can take place. This part of the Tsjate Provincial Heritage Site therefore will not be affected by the proposed Marula Project.

Possible impact on the heritage resources

The heritage resources which have a bearing on the Marula Project have been mapped and geo-referenced (Figure 10; Tables 1-3). These include the following, namely (Figure 10):

- A Late Iron Age stone walled site along the base of a kopje.

- Graveyards in the open veldt.

The Marula Project will have no direct or indirect impact on any of the heritage resources which have been mapped (Figure 10 & 20). All heritage resources occur at safe distances from the various developmental components of the Marula Project. There is consequently no reason from a heritage point of view why the Marula Project cannot proceed if the mitigation and management measures outlined below are followed (Part 10, 'Mitigation and management of heritage resources').

The significance of the heritage resources

The Late Iron Age site

The Late Iron Age site along the foot of two kopjes can be rated as of low to medium significance (Table 1). The criteria for this rating are the following:

- The site contains deposits as well as stone walls which when excavated and mapped can reveal more information about this site, e.g. when the sites was occupied; who the occupants of the site were; what subsistence strategies did they follow; how does this site link with others in a cultural or chronological framework, etc.
- The site has been damaged in the past. Subsequently, some information and material has been lost. This diminishes the level of significance of the site.

The graveyards

All the graveyards in the open veld or within the confines of homesteads within the mine lease area can be of high significance and are protected by various laws (Table 2). Legislation regarding graves includes Section 36 of the NHRA in instances where graves are older than sixty years. Other legislation about graves includes those which apply when graves are exhumed and relocated, namely the Ordinance on Exhumations (No 12 of 1980) and the Human Tissues Act (No 65 of 1983 as amended). Municipal laws with regard to graves and graveyards may differ and professionals involved with the exhumation and relocation of graves and graveyards must adhere to these laws.

The Tsjate Provincial Heritage site

The Tsjate Provincial Heritage Site and its heritage resources can be considered to be of high significance and are protected by various sections of the National Heritage Resources Act (No 25 of 1999).

Mitigation of the heritage resources

None of the documented heritage resources will be affected by the proposed Marula Project. Consequently, no mitigation measures are required with regard to the Marula Project.

Management of heritage resources

Guidelines for the mitigation and management of heritage resources which may be affected by any future development project including the Marula Project are outlined.

General (disclaimer)

It is possible that this Phase I HIA study may have missed heritage resources within the Marula Project Area due to various reasons set out in the report. If any heritage resources of significance are exposed during the Marula Project the South African Heritage Resources Authority (SAHRA) should be notified immediately, all development activities must be stopped, and an archaeologist accredited with the Association for Southern African Professional Archaeologist (ASAPA) should be notify in order to determine appropriate mitigation measures for the discovered finds. This may include obtaining the necessary authorisation (permits) from SAHRA to conduct the mitigation measures.

ACRONYMS AND ABBREVIATIONS

ASAPA	Association of South African Professional Archaeologists
BP	Before Present
EA	Environmental Authorisation
EAP	Environmental Assessment Practitioner
EIA	Environmental Impact Assessment
EIA	Early Iron Age
EMPr	Environmental Management Programme
EMPR	Environmental Management Programme Report
ESA	Early Stone Age
GPS	Global Positioning System
GY	Graveyard
HIA	Heritage Impact Assessment
LIA	Late Iron Age
LSA	Late Stone Age
MIA	Middle Iron Age
MPRDA	Mineral and Petroleum Resources Development Act, Act No 28 of 2002
MSA	Middle Stone Age
NEMA	National Environmental Management Act, Act No 107 of 1998
NEM: WA	National Environmental Management: Waste Act, Act No 59 of 2008
NHRA	National Heritage Resources Act, Act No 25 of 1999
No	Number
NWA	National Water Act, Act No 36 of 1998
PHRA	Provincial Heritage Resource Agency
SAHRA	South African Heritage Resources Agency
SAHRIS	South African Heritage Resources Information System
ToR	Terms of Reference
VDDC	Vandyksdrift Central
WUL	Water use licence

TERMINOLOGY

Terms that may be used in this report are briefly outlined below:

- Conservation: The act of maintaining all or part of a resource (whether renewable or non-renewable) in its present condition to provide for its continued or future use. Conservation includes sustainable use, protection, maintenance, rehabilitation, restoration, and enhancement of the natural and cultural environment.

- Cultural resource management: A process that consists of a range of interventions and provides a framework for informed and value-based decision-making. It integrates professional, technical and administrative functions and interventions that impact on cultural resources. Activities include planning, policy development, monitoring and assessment, auditing, implementation, maintenance, communication, and many others. All these activities are (or will be) based on sound research.

- Cultural resources: A broad, generic term covering any physical, natural and spiritual properties and features adapted, used and created by humans in the past and present. Cultural resources are the result of continuing human cultural activity and embody a range of community values and meanings. These resources are non-renewable and finite. Cultural resources include traditional systems of cultural practice, belief or social interaction. They can be, but are not necessarily identified with defined locations.

- Heritage resources: The various natural and cultural assets that collectively form the heritage. These assets are also known as cultural and natural resources. Heritage resources (cultural resources) include all human-made phenomena and intangible products that are the result of the human mind. Natural, technological, or industrial features may also be part of heritage resources, as places that have made an outstanding contribution to the

cultures, traditions and lifestyles of the people or groups of people of South Africa.

- In-Situ Conservation: The conservation and maintenance of ecosystems, natural habitats and cultural resources in their natural and original surroundings.

- Iron Age: Refers to the last two millennia and ‘Early Iron Age’ to the first thousand years AD. ‘Late Iron Age' refers to the period between the 16th century and the 19th century and can therefore include the Historical Period.

- Maintenance: Keeping something in good health or repair.

- Pre-historical: Refers to the time before any historical documents were written or any written language developed in a particular area or region of the world. The historical period and historical remains refer, for the Project Area, to the first appearance or use of ‘modern’ Western writing brought to the Eastern Highveld by the first Colonists who settled here from the 1840’s onwards.

- Preservation: Conservation activities that consolidate and maintain the existing form, material and integrity of a cultural resource.

- Recent past: Refers to the 20th century. Remains from this period are not necessarily older than sixty years and therefore may not qualify as archaeological or historical remains. Some of these remains, however, may be close to sixty years of age and may, in the near future, qualify as heritage resources.

- Protected area: A geographically defined area designated and managed to achieve specific conservation objectives. Protected areas are dedicated primarily to the protection and enjoyment of natural or cultural heritage, to the maintenance of biodiversity, and to the maintenance of life-support systems. Various types of protected areas occur in South Africa.

- Reconstruction: Re-erecting a structure on its original site using original components.

- Replication: The act or process of reproducing by new construction the exact form and detail of a vanished building, structure, object, or a part thereof, as it appeared at a specific period.

- Restoration: Returning the existing fabric of a place to a known earlier state by removing additions or by reassembling existing components.

- Stone Age: Refers to the prehistoric past, although Late Stone Age people lived in South Africa well into the Historical Period. The Stone Age is divided into an Earlier Stone Age (3 million years to 150 000 thousand years ago) the Middle Stone Age (150 000 years to 40 000 years ago) and the Late Stone Age (40 000 years to 200 years ago).

- Sustainability: The ability of an activity to continue indefinitely, at current and projected levels, without depleting social, financial, physical and other resources required to produce the expected benefits.

- Translocation: Dismantling a structure and re-erecting it on a new site using original components.

- Project Area: refers to the area (footprint) where the developer wants to focus its development activities.

- Phase I archaeological studies refer to surveys using various sources of data in order to establish the presence of all possible types and ranges of heritage resources in any given Project Area (excluding paleontological remains as these studies are done by registered and accredited palaeontologists).

- Phase II studies include in-depth cultural heritage studies such as archaeological mapping, excavating and sometimes laboratory work. Phase II work may include the documenting of rock art, engraving or historical sites and dwellings; the sampling of archaeological sites or shipwrecks; extended excavations of archaeological sites; the exhumation of human remains and the relocation of graveyards, etc. Phase II work involves permitting processes, requires the input of different specialists and the co-operation and approval of the SAHRA.

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1 BACKGROUND

1.1 Background and context

Marula Mine proposes to construct new Ventilation Shafts, a Product Stockpile, power and water lines and a solar plant. The infrastructure will be located on the farms Clapham 118KT and Winnaarshoek 250KT (Figure 4).

These developmental activities (referred to as the Marula Project) may affect some of the types and ranges of heritage resources (as outlined in Section 3 of the National Heritage Resources Act, No 25 of 1999) that may occur in the Marula Project Area.

Consequently, SLR Consulting (Africa) (Pty) Ltd who is responsible for compiling the EIA/EMP Amendment report for the Marula Project commissioned the author to undertake a Phase I Heritage Impact Assessment (HIA) study for the proposed new infrastructure.

1.2 Aims with this report

This study comprises a heritage survey and a HIA assessment for the Marula Mine Project. The aims with the heritage survey and impact assessment for the Marula Mine Project Area were the following:

- To establish whether any of the types and ranges of heritage resources as outlined in Section 38 of the NHRA do occur in the Marula Project Area.
- To establish the significance of the heritage resources in the Marula Project Area and the level of significance of any possible impact on any of these heritage resources.
- To propose mitigation measures for those types and ranges of heritage resources that may be affected by the proposed Marula Project.

1.3 Assumptions and limitations

The findings, observations, conclusions, and recommendations reached in this report are based on the author's best scientific and professional knowledge, available information, and his ability to keep up with the physical challenges that the project commanded. The author has a good understanding of the types and ranges of heritage resources that occur in the region as he was involved in several Heritage Impact Assessment studies in the area during the last twenty years (See Part 13, 'Bibliography relating to heritage studies').

The project area was surveyed on several former occasions in the past when heritage surveys were done for Marula Mine. Several heritage surveys were also done over the years for Eskom's power lines which either cross the project area or which were constructed close to the boundaries of the mining area,

The report's findings are based on accepted archaeological survey and assessment techniques and methodologies. However, the author preserves the right to modify aspects of the report including the recommendations if and when new information becomes available particularly if this information may have an influence on the reports final results and recommendations. This in particular applies to the uncovering of graves as these may have been missed during the survey as a result of various reasons.

The heritage survey may also have missed other heritage resources as these may be located below the surface of the earth and may only be exposed once development commences. It is also possible that heritage resources simply may have been missed because of human failure to observe or to recognise them.

2 DETAILS OF THE SPECIALIST

Profession: Archaeologist, Museologist (Museum Scientists), Lecturer, Heritage Guide Trainer and Heritage Consultant

Qualifications:

BA (Archaeology, Anthropology and Psychology) (UP, 1976)

BA (Hons) Archaeology (distinction) (UP, 1979)

MA Archaeology (distinction) (UP, 1985)

D Phil Archaeology (UP, 1989)

Post Graduate Diploma in Museology (Museum Sciences) (UP, 1981)

Work experience:

Museum curator and archaeologist for the Rustenburg and Phalaborwa Town Councils (1980-1984)

Head of the Department of Archaeology, National Cultural History Museum in Pretoria (1988-1989)

Lecturer and Senior lecturer Department of Anthropology and Archaeology, University of Pretoria (1990-2003)

Independent Archaeologist and Heritage Consultant (2003-)

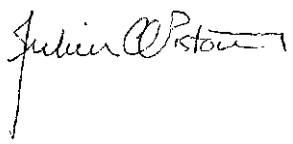
Accreditation: Member of the Association for Southern African Professional Archaeologists. (ASAPA)

Summary: Julius Pistorius is a qualified archaeologist and heritage specialist with extensive experience as a university lecturer, museum scientist, researcher and heritage consultant. His research focussed on the Late Iron Age Tswana and Lowveld-Sotho (particularly the Bamalatji of Phalaborwa). He has published a book on early Tswana settlement in the North-West Province and has completed an unpublished manuscript on the rise of Bamalatji metal workings spheres in Phalaborwa during the last 1 200 years. He has excavated more than twenty LIA settlements in North-West and twelve IA settlements in the Lowveld and has mapped hundreds of stone walled sites in the North-West. He has written a guide for Eskom's field personnel on heritage management. He has published twenty scientific papers in academic journals and several popular articles on archaeology and heritage matters. He collaborated with environmental companies in compiling State of the Environmental Reports for Ekhurhuleni, Hartebeespoort and heritage management plans for the Magaliesberg and Waterberg. Since acting as an independent consultant he has done approximately 800 large to small heritage impact assessment reports. He has a longstanding working relationship with Eskom, Rio Tinto (PMC), Rio Tinto (EXP), Impala Platinum, Angloplats (Rustenburg), Lonmin, Sasol, PMC, Foskor, Kudu and Kelgran Granite, Bafokeng Royal Resources, Pilanesberg Platinum Mine (PPM) etc. as well as with several environmental companies.

3 DECLARATION OF INDEPENDANCE

I, Dr Julius CC Pistorius declare the following:

- 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 result in views and findings that are not favourable for the applicant;
- I declare that there are no circumstances that may compromise my objectivity in performing such work;
- I have expertise in conducting the specialists report relevant to this application, including knowledge of the Act, Regulations and any guidelines that have relevance to the applications;
- I will comply with the Act, Regulations and other applicable legislation;
- I will consider, to the extent possible, the matters listed in Regulation 13;
- I understand to disclose to the applicant and the competent authority all material information in my possession
- All the particulars furnished by me in this form are true and correct 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; 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.



28 November 2021

4 LEGAL FRAMEWORK

South Africa's heritage resources ('national estate') are protected by international, national, provincial and local legislation which provides regulations, policies and guidelines for the protection, management, promotion and utilization of heritage resources. South Africa's 'national estate' includes a wide range of various types of heritage resources as outlined in Section 3 of the NHRA (see Box 1).

At a national level, heritage resources are dealt with by the National Heritage Council Act (Act No 11 of 1999) and the NHRA. According to the NHRA, heritage resources are categorized using a three-tier system, namely Grade I (national), Grade II (provincial) and Grade III (local) heritage resources.

At the provincial level, heritage legislation is implemented by Provincial Heritage Resources Agencies (PHRA's) which apply the NHRA together with provincial government guidelines and strategic frameworks. Metropolitan or Municipal (local) policy regarding the protection of cultural heritage resources is also linked to national and provincial acts and is implemented by the SAHRA and the PHRA's.

4.1 Legislation relevant to heritage resources

Legislation relevant to South Africa's national estate includes the following:

- National Environmental Management Act (NEMA), Act No 107 of 1998
- Minerals and Petroleum Resources Development Act (MPRDA), Act No 28 of 2002
- National Heritage Resources Act (NHRA), Act No 25 of 1999.

Box 1: Types and ranges of heritage resources (the national estate) as outlined in Section 3 of the National Heritage Resources Act, 1999 (No 25 of 1999).

The National Heritage Resources Act (Act No 25 of 1999, Art 3) outlines the following types and ranges of heritage resources that qualify as part of the National Estate, namely:

(a) places, buildings structures and equipment of cultural significance;

(b) places to which oral traditions are attached or which are associated with living heritage;

(c) historical settlements and townscapes;

(d) landscapes and natural features of cultural significance;

(e) geological sites of scientific or cultural importance;

(f) archaeological and palaeontological sites;

(g) graves and burial grounds including-

(i) ancestral graves;

(ii) royal graves and graves of traditional leaders;

(iii) graves of victims of conflict;(iv) graves of individuals designated by the Minister by notice in the Gazette;

(v) historical graves and cemeteries; and

(vi) other human remains which are not covered by in terms of the Human Tissues Act, 1983 (Act No 65 of 1983);

(h) sites of significance relating to the history of slavery in South Africa;

(i) movable objects, including -

(i) objects recovered from the soil or waters of South Africa, including archaeological and palaeontological objects and material, meteorites and rare geological specimens;

(ii) objects to which oral traditions are attached or which are associated with living heritage;

(iii) ethnographic art and objects;

(iv) military objects;

(v) objects of decorative or fine art;

(vi) objects of scientific or technological interest; and

(vii) books, records, documents, photographs, positives and negatives, graphic, film or video material or sound recordings, excluding those that are public records as defined in section 1(xiv) of the National Archives of South Africa Act, 1996 (Act No 43 of 1996).

The National Heritage Resources Act (Act No 25 of 1999, Art 3) also 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 the following:

(a) its importance in the community, or pattern of South Africa's history;

(1) its possession of uncommon, rare or endangered aspects of South Africa's natural or cultural heritage;

(2) its potential to yield information that will contribute to an understanding of South Africa's natural or cultural heritage;

(3) its importance in demonstrating the principal characteristics of a particular class of South Africa's natural or cultural places or objects;

(e) its importance in exhibiting particular aesthetic characteristics valued by a community or cultural group;

(f) its importance in demonstrating a high degree of creative or technical achievement at a particular period;

(g) its strong or special association with a particular community or cultural group for social, cultural or spiritual reasons; (h)

(h) its strong or special association with the life or work of a person, group or organisation of importance in the history of South Africa;

(i) **sites of significance relating to the history of slavery in South Africa**

4.1.1.1 NEMA

The NEMA stipulates under Section 2(4)(a) that sustainable development requires the consideration of all relevant factors including (iii) the disturbance of landscapes and sites that constitute the nation's cultural heritage must be avoided, or where it cannot be altogether avoided, is minimised and remedied. Heritage assessments are implemented in terms of the NEMA Section 24 in order to give effect to the general objectives. Procedures considering heritage resource management in terms of the NEMA are summarised under Section 24(4) as amended in 2008. In addition to the NEMA, the National Environmental Management: Protected Areas Act, 2003 (Act No 57 of 2003) may also be applicable. This act applies to protected areas and world heritage sites, declared as such in terms of the World Heritage Convention Act, 1999 (Act No 49 of 1999).

4.1.1.2 MPRDA

The MPRDA stipulates under Section 5(4) no person may prospect for or remove, mine, conduct technical co-operation operations, reconnaissance operations, explore for and produce any mineral or petroleum or commence with any work incidental thereto on any area without (a) an approved environmental management programme or approved environmental management plan, as the case may be.

4.1.3 NHRA

According to Section 3 of the NHRA the 'national estate' comprises a wide range and various types of heritage resources (see Box 1).

4.1.3.1 Heritage Impact Assessment studies

According to Section 38 of the NHRA, a HIA process must be followed under the following circumstances:

- The construction of a linear development (road, wall, power line, canal etc.) exceeding 300m in length
- The construction of a bridge or similar structure exceeding 50m in length
- Any development or activity that will change the character of a site and which exceeds 5 000m^2 or which involve three or more existing erven or subdivisions thereof
- Re-zoning of a site exceeding 10 000 m^2
- Any other category provided for in the regulations of SAHRA, a provincial or local heritage authority or any other legislation such as NEMA, MPRDA, etc.

4.1.3.2 Section 34 (Buildings and structures)

Section 34 of the NHRA provides for general protection of structures older than 60 years. According to Section 34(1) no person may alter (demolish) any structure or part thereof which is older than 60 years without a permit issued by the relevant provincial heritage resources authority.

A structure means any building, works, device or any other facility made by people and which is fixed to land and which includes fixtures, fittings and equipment associated with such structures.

Alter means any action which affects the structure, appearance or physical properties of a place or object, whether by way of structural or any other works such as painting, plastering, decorating, etc..

Most importantly, Section 34(1) clearly states that no structure or part thereof may be altered or demolished without a permit issued by the relevant PHRA. These permits will not be granted without a HIA being completed. A destruction permit will thus be required before any removal and/or demolition may take place, unless exempted by the PHRA according to Section 34(2) of the NHRA.

4.1.3.3 Section 35 (Archaeological and palaeontological resources and meteorites)

Section 35 of the NHRA provides for the general protection of archaeological and palaeontological resources, and meteorites. In the event that archaeological resources are discovered during the course of development, Section 38(3) specifically requires that the discovery must immediately be reported to the PHRA, or local authority or museum who must notify the PHRA. Furthermore, no person may without permits issued by the responsible heritage resources authority:

- destroy, damage, excavate, alter, deface or otherwise disturb any archaeological or paleontological site or any meteorite
- destroy, damage, excavate, remove from its original position, collect or own any archaeological or paleontological material or object or any meteorite
- trade in, sell for private gain, export or attempt to export from the Republic any category of archaeological or paleontological material or object, or any meteorite; or bring onto or use at an archaeological or paleontological site any excavation equipment or any equipment that assists in the detection or recovery of metals or archaeological and paleontological material or objects, or use such equipment for the recovery of meteorites
- alter or demolish any structure or part of a structure which is older than 60 years.

Heritage resources may only be disturbed or moved by an archaeologist after being issued with a permit received from SAHRA. In order to demolish heritage resources the developer has to acquire a destruction permit by from SAHRA.

4.1.3.4 Section 36 (Burial grounds and graves)

Section 36 of the NHRA allows for the general protection of burial grounds and graves. Should burial grounds or graves be found during the course of

development, Section 36(6) stipulates that such activities must immediately cease and the discovery reported to the responsible heritage resources authority and the South African Police Service (SAPS). Section 36 also stipulates that no person without a permit issued by the relevant heritage resources authority may:

(a) destroy, damage, alter, exhume or remove from its original position or otherwise disturb the grave of a victim of conflict, or any burial ground or part thereof which contains such graves

(b) destroy, damage, alter, exhume or remove from its original position or otherwise disturb any grave or burial ground older than 60 years which is situated outside a formal cemetery administered by a local authority; or

9(c) bring onto or use at a burial ground or grave referred to in paragraph (a) or (b) any excavation, or any equipment which assists in the detection or recovery of metals.

Section 36 of the NHRA divides graves and burial grounds into the following categories:

a. ancestral graves
b. royal graves and graves of traditional leaders
c. graves of victims of conflict
d. graves designated by the Minister
e. historical graves and cemeteries
f. human remains

Human remains less than 60 years old are subject to provisions of the National Health Act, 2003 (Act No 61 of 2003), Ordinance 12 of 1980 (Exhumation Ordinance) and Ordinance No 7 of 1925 (Graves and dead bodies Ordinance, repealed by Mpumalanga). Municipal bylaws with regard to graves and graveyards may differ. Professionals involved with the exhumation and relocation of graves and graveyards must establish whether such bylaws exist and must adhere to these laws.

Unidentified graves are handled as if they are older than 60 years until proven otherwise.

Permission for the exhumation and relocation of graves older than sixty years must also be gained from descendants of the deceased (where known), the National Department of Health, Provincial Department of Health, Premier of the Province and local police. Furthermore, permission must also be gained from the various landowners (i.e. where the graves are located and where they are to be relocated) before exhumation can take place.

Human remains can only be handled by a registered undertaker or an institution declared under the Human Tissues Act (Act No 65 of 1983 as amended).

4.1.3.5 Section 37 (Public monuments and memorials)

Section 37 makes provision for the protection of all public monuments and memorials in the same manner as places which are entered in a heritage register referred to in Section 30 of the NHRA.

4.1.3.6 Section 38 (Heritage Resource Management)

Section 38 (8): The provisions of this section do not apply to a development as described in Section 38 (1) if an evaluation of the impact of such development on heritage resources is required in terms of the Environment Conservation Act, 1989 (Act No 73 of 1989), or the integrated environmental management guidelines issued by the Department of Environment Affairs and Tourism, or the Minerals Act, 1991 (Act No 50 of 1991), or any other legislation. Section 38(8) ensures cooperative governance between all responsible authorities through ensuring that the evaluation fulfils the requirements of the relevant heritage resources authority in terms of Subsection (3), and any comments and recommendations of the

relevant heritage resources authority with regard to such development have been taken into account prior to the granting of the consent.

4.2 NEMA (Appendix Six requirements)

NEMA Regulations, 2014 (as amended 2107) **Appendix 6 Relevant section in report**	
Details of the specialist who prepared the report and the expertise of that person to compile a specialist report including a curriculum vitae	Part 2. Details of the specialist
A declaration that the person is independent in a form as may be specified by the competent authority	Part 3. Declaration of independence
An indication of the scope of, and the purpose for which the report was prepared	Part 1. Introduction Part 1.2. Aims with this report
An indication of the quality and age of base data used for the specialist report	Part 7. Approach and Methodology
The duration, date and season of the site investigation and the relevance of the season to the outcome of the assessment	Part 7. Approach and Methodology Part 7.1. Field survey
A description of the methodology adopted in preparing the report or carrying out the specialised process inclusive of equipment and modelling used	Part 7. Approach and Methodology
Details of an assessment of the specific identified sensitivity of the site related to the proposed activity or activities and its	Part 8. Heritage survey

associated structures and infrastructure, inclusive of a site plan identifying site alternatives	
An identification of any areas to be avoided, including buffers	Part 10.1 Possible impact on heritage resources
A map superimposing the activity including the associated structures and infrastructure on the environmental sensitivities of the site including areas to be avoided, including buffers;	Figure 10, Figure 20
A description of any assumptions made and any uncertainties or gaps in knowledge;	Part 1.3. Assumptions and limitations
A description of the findings and potential implications of such findings on the impact of the proposed activity, including identified alternatives, on the environment	Part 11 Conclusion and recommendations
Any mitigation measures for inclusion in the EMPr	Part 10 Mitigation and management measures for heritage resources
Any conditions for inclusion in the environmental authorisation	Part 10 Mitigation and management measures for heritage resources
Any monitoring requirements for inclusion in the EMPr or environmental authorisation	
A reasoned opinion – • whether the proposed activity, activities or portions thereof should be authorised. • regarding the acceptability of the proposed activity or activities; and if the opinion is that the proposed activity, activities or portions thereof should be authorised, any avoidance, management and	Part 11 Conclusion and recommendations

mitigation measures that should be included in the EMPr.	
A description of any consultation process that was undertaken during preparing the specialist report	Part 7.4 Consultation process undertaken, and comments received from stakeholders
A summary and copies if any comments that were received during any consultation process	Part 7.4 Consultation process undertaken and comments received from stakeholders
Any other information requested by the competent authority.	None

5 THE MARULA MINE PROJECT AREA

5.1 Location

Marula Mine is situated approximately forty-five kilometres to the north-west of Steelpoort in the Steelpoort River Valley. The mine's proposed new development will be focused on the farms Winnaarshoek 250KT and Clapham 118KT in the Steelpoort Valley in the Limpopo Province. Whilst Clapham 118KT and the adjacent Driekop 253KT occur on the valley floor to the east of the Leolo mountain range Winnaarshoek 250KT stretches westwards from the valley floor up the lower foot slope of the Leolo mountain range. Hackney 116KT incorporates part of the Leolo Mountains and stretches westwards across the floor of the Tsjate Valley where the Tsjate Provincial Heritage site is located (2430CA Steelpoort; 1: 50 000 topographic map) (Figures 1 - 8).

The Steelpoort Valley's name is derived from the Steelpoort (Tubatse) River, one of the main geographical features in this valley. The Steelpoort River is a southern tributary of the Olifants River. It flows from an altitude higher than 1 800m on the Highveld near Wonderfontein in the Belfast district northwards and then north-eastwards to join the Olifants River before the latter cuts through the Drakensberg to enter the Lowveld. Other prominent beacons in the wider study area include the Chromite Hills to the north-east and the imposing Leolo Mountain range along the western perimeter of the mining area. The Leolo Mountain range is known as a beacon in the origin history of the Pedi.

Formal and informal villages are scattered throughout the Steelpoort Valley. These communities, some of which are still practising mixed subsistence farming, have occupied the Steelpoort Valley without interruption for centuries. This is definitely the case with the village of Tsjate, situated west of the Leolo Mountain range, which already existed in the late 18th century.

5.2 The Marula Project

Marula Mine proposes to construct new Ventilation Shafts, a Product Stockpile, power and water lines and a Solar Plant. The infrastructure will be located on the farms Clapham 118KT and Winnaarshoek 250KT (see below) (Figure 4).

The construction of the proposed new infrastructure is hereafter referred to as the Marula Project whilst the developmental footprint which is to be affected by the mine infrastructure is referred to as the Marula Project Area. Otherwise, references are also made to the Marula mine lease area which covers a substantial portion of land beyond where the new mine infrastructure will be established.

Proposed components associated with the Ventilation Shafts

To support the proposed project components at the various ventilation shafts the following upgrades to the existing power and water supply infrastructure are required.

RELEVANT SHAFT COMPLEX	PROJECT COMPONENT DETAIL
Driekop Shaft	
Ventilation Shaft 6 (existing)	• Establishment of a new bulk air cooler. • Establishment of a refrigeration plant and condenser cooling towers.
Ventilation Shaft 9 (proposed)	• Establishment of a new ventilation shaft with surface main fans and electrical rooms.
Clapham Shaft	
Ventilation Shaft 5 (existing)	• Downcast • Establishment of a new bulk air cooler.
Ventilation Shaft 7 (Approved but not constructed)	• Upcast • Establishment of surface main fans and electrical rooms.
Ventilation Shaft 8 (proposed)	• Downcast • Establishment of a new bulk air cooler.

	• Establishment of refrigeration plant and condenser cooling towers.

Clapham Ventilation Shafts

- Upcast Shaft (VS 7)
- Downcast Shaft (VS 8)

DriekopP Ventilation Shafts

- Driekop upcast shaft (VS 9)

Surface footprint of proposed shafts are 0.25 Ha each.

Water pipelines and power lines

Water supply

- Raw water required for the proposed project will be sourced from the existing on-site Lebalelo Raw Water Dam (Plant Dam).

Distribution

- The proposed project will require the establishment of pipelines from the Plant Dam to the new ventilation shafts (Driekop Ventilation Shaft 9 and Clapham Ventilation Shaft 8).
- The proposed HDPE pipelines will have a diameter of approximately 150 mm (0.15 cm) and will be below ground.
- The proposed pipeline to the Clapham Ventilation Shaft 8 will be approximately 2.1 km in length with a throughput of 24 l/s.
- The proposed Driekop Ventilation Shaft 9 pipeline will be approximately 5.2 km in length with a throughput of 24 l/s.
- The water supply pipeline will be fed into the plant room and subsequently through to the cooling tower.
- Establishment of the proposed Driekop water supply pipeline - Area of disturbance = 5 250 m^2/ 0.525 Ha.

- Establishment of a proposed Clapham water supply pipeline - Area of disturbance = 13 000 m2 / 1.3 Ha.

Power supply

- Upgrade of Eskom substation by existing Eskom yard capacity will be increased to 120 MVA by the addition of a 40 MVA transformer . The running load will be 54 MVA.
- A new 33 kV overhead transmission line will be established from the on-site Eskom yard to the Clapham Ventilation Shaft 8.
- A new 33 kV overhead transmission line will also be established from the Driekop Shaft Complex to the new Driekop Ventilation Shaft 9, to supply the new ventilation shaft with power.
- The new 33 kV overhead transmission line will then be fed into a new step-down transformer located at the Clapham and Driekop ventilation shafts.
- The 33 kV will be stepped down to 11 kV and then fed into the plant room and ventilation fans.
- Clapham Ventilation Shaft 8- Length is 3.8 km
- Driekop Ventilation Shaft 9 - Length is 3.3 km.

Wastewater

- Wastewater which contains an elevated salt concentration will emanate from the refrigeration process. This wastewater will be pumped into a surface sump (with approximate dimension of 2 m by 2 m).
- A return pipeline of approximately 50 mm will carry this wastewater back to the Concentrator Plant. The return pipeline will be located within the same below ground trench as the water supply pipeline to the ventilation shafts and will thus not result in any additional land clearance.

Product Stockpile

- Low grade ore stockpile (low grade ROM) located within the concentrator plant. See map
- Confirm maximum capacity of product stockpile of 200 000 tons.

5.3 The developed nature of the Marula Project Area in relation to the new mine infrastructure

The Marula Mine lease area is not a pristine piece of land any longer as communities have lived in and beyond the mines' boundaries for a long period of time. The people who occupied the Steelpoort area practised hunting, gathering, cultivating and stock farming for many centuries. Some of the people who occupy the area still depend on agriculture and stock farming for a livelihood. Agricultural plots are still utilized by local communities.

Figure 1- Barren veld with sickle bush where existing Ventilation Shaft 5 has been established and the proposed Ventilation Shafts 7 and 8 will be constructed. Note disturbed nature of the veld stretching to two twin mountains named Diphala and Diphalana (above).

In the past, chiefs allocated pieces of land to the heads of wards. The ward heads then provided plots to married men. The sizes of plots were determined according to the number of wives a man had married. Each plot usually measured 1 to 2 hectares, which was the maximum a woman could cultivate using a hoe. The

introduction of the plough allowed families to cultivate larger areas of land, up to about 4, 5 hectares (Botha 1983).

Staple food comprises crops which included sorghum (*mabele*) and millet (*letsoa*), which were later replaced by maize (*mahea*). Supplementary crops included pumpkins (*marotse*), various varieties of gourd (*maraka*), beans (*dinawa*) and a type of groundnut (*ditloo*). Tobacco and sugarcane were also planted.

Figure 2- Existing Ventilation Shaft 6 with proposed Ventilation Shaft 9 are both situated in former agricultural fields where sickle bush penetration is occurring at a rapid rate. Grazing cattle also contributed to the degradation of the veld and destruction of possible heritage resources as archaeological deposits churned under hoof and low stone foundations are broken and scattered (above).

Although each person usually possessed his own stock, pasturage was used on a communal basis. At a fixed time, the ruler declared the reaped grain fields open for use as winter grazing (Botha 1983).

The uninterrupted occupation of the Steelpoort Valley over centuries with communities practising subsistence strategies based on cattle herding and agriculture is now exacerbated by increasing development and population pressure which all are contributing to the gradual destruction of this extraordinary cultural landscape.

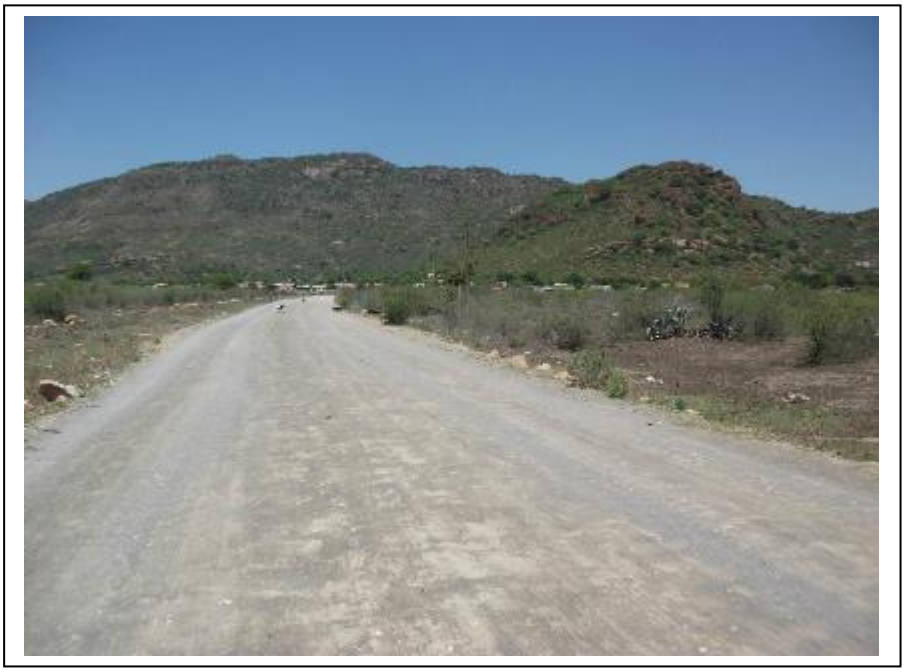


Figure 3- View along one of the dirt roads where water pipelines lines will be constructed. Note the disturbed nature of the shoulders of the road (above).

Since the inception of the Marula Mine, approximately twenty years ago the area around the mine has undergone significant change. Its rural character has largely been altered because of the establishment of hundreds new homes, some on a grandiose scale, upgrading of roads from dirt to tar, the construction of a large Eskom substation and the building of several new mines including an open cast mine with accompanying infrastructure. The sense of the original Tsjate historical landscape has been lost, transformed, and replaced because of inevitable development and modernisation.

Figure 4- View along a stream (now a dry donga) where the proposed new water pipeline would run to the Concentrator Plant (above).

Figure 5- View across old agricultural fields along which a water pipe and power line will run between Ventilation Shafts 6, 9 and Driekop Shaft (above).

Figures 6 & 7- The proposed new Solar Plant is to be established on what seems to be old, abandoned agricultural fields. The footprint of the Solar Plant is covered with sickle bush which in places are dense and impenetrable and in other places open and accessible (above and below).

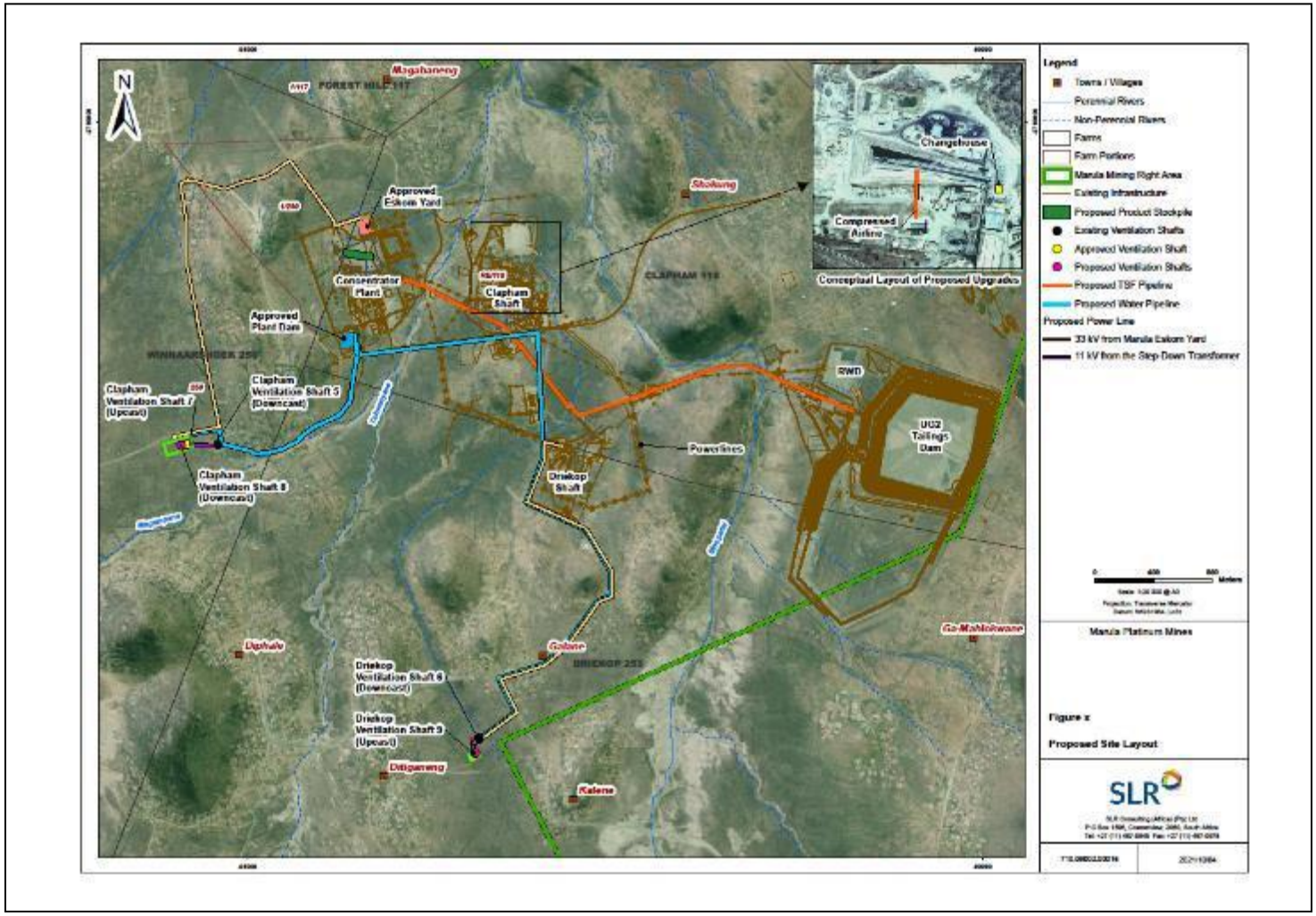


Figure 8- The Marula ventilation project's proposed infrastructure includes Ventilation Shafts, a Product Stockpile, power and water lines, a Solar Plant (not indicated), etc. (above).

5.4 A cultural landscape: the Tsjate Provincial Heritage site

Marula Mine is located along the eastern slopes of the Leolo Mountain range in the northern part of the Steelpoort Valley. This region is the heartland of the pre-historical and the historical Pedi chiefdom and is associated with a wide range of heritage resources a large portion of which have previously been recorded in heritage reports (see Part 13, 'Bibliography relating to heritage studies').

Recognising the importance of these heritage resources the Limpopo Government declared part of the landscape the Tsjate Provincial Heritage Site on 23 February 2007 (Provincial Gazette No. 1333 33). This provincial heritage site borders on the north-western perimeter of Marula Platinum Mine's prospecting area where the heritage site in fact penetrates the prospecting area.

The co-ordinates for the Tsjate Provincial Heritage site are the following:

S 24° 31' 41.5"	E 29° 59' 26"
S 24° 27' 53"	E 29° 59' 30"
S 24° 27' 10"	E 30° 01' 12.5"
S 24° 27' 41"	E 30° 02' 45"
S 24° 30' 06"	E 30° 02' 46"
S 24° 31' 27.5"	E 30° 02' 03"

The archaeological and historical significance of this cultural landscape is outlined in more detail before the results of the heritage survey for Marula Mine is discussed. However, it must be pointed out that the new mine infrastructure required by Marula Mine does not have any direct influence on the Tsjate Provincial Heritage site (see Part 6, 'Contextualising the Project Area').

6 CONTEXTUALISING THE MARULA MINE PROJECT AREA

Marula Platinum Mine is located in the heartland of the Steelpoort Valley which is renowned for its rich and diverse range of heritage resources. The following background information is aimed at contextualising the Project Area with regard to Marula Mine's intention to construct new mine infrastructure within its mine lease boundaries.

The back ground information also refers to earlier heritage studies which have been conducted near the Marula Mine with the intention to characterise the heritage character of this part of the Steelpoort Valley.

6.1 Pre-historical context

Stone Age sites are scattered in the extensive network of dongas which occur across the wide valleys floors between the Leolo and other mountain ranges in the northern part of the Steelpoort Valley.

Some of these sites have been observed by the author on farms such as Hendriksplaats 281, Derde Gelid 278, Onverwacht 292, Winterveld 293, Annex Grootboom 335 and Apiesboomen 295 (Pistorius 1993, 2001, 2005a, 2005b; Van Schalkwyk 2002; Kusel 2008; Van Vollenhoven 2014). These stone tools date from the Early Stone Age (500 000 to 200 000 years ago), the Middle Stone Age (200 000 to 40 000 years ago) and from the Late Stone Age (40 000 to 200 years ago). Stone Age sites dating from all periods of the Stone Age were also recorded on farms such as Twickenham, Hackney, Pachaskraal which border on the Marula Platinum Mine (Huffman and Schoeman 2001; Kruger 2016).

However, no archaeological survey for Stone Age sites as part of any extensive or in-depth Stone Age research project has to the knowledge of this author been done in the Steelpoort River Valley as yet.

6.2 Pre-historical and early Historical Period

The origins of the first Bantu-Negroid farming communities who practised agriculture, live-stock herding and metal working can be traced to the Steelpoort Valley. These Early Iron Age farming communities whose settlements have been recorded on amongst others Hendriksplaats 281 and Derde Gelid 278 (Pistorius 1993) were related to Early Iron Age communities who, contemporaneously, AD500 to AD900 settled further towards the east in the Lydenburg Valley (Evers 1981; 1982). These sites called Doornkop sites in the Steelpoort are widely spread across the Steelpoort Valley and has amongst others been reported on Twickenkam, Hackney and Pachaskraal as well as Tsjate (Huffman & Schoeman 2001; Van Schalkwyk 2002; Kusel 2008).

The Doornkop sites in Steelpoort may have cultural affiliations with settlements belonging to the Early Iron Age in Lydenburg. One of these sites near the Sterkspruit won international acclaim as the Lydenburg clay masks were discovered at this site south of Lydenburg (Evers 1981; 1982).

The early historical period in the Steelpoort Valley is associated with the second millennium AD when a predominantly Northern Sotho-speaking population occupied the Steelpoort. These people are part of a larger Northern Sotho-speaking community who occupy a vast area between the Limpopo River in the north, the Drakensberg in the east and the Sekhukhune Mountains in the west. Numerous divisions and groups or clans therefore occupy this vast region (Makura 2007). Following Monnig (1978) and Delius (1974, 2007) the history of the people of this area can be divided into several periods:

The earliest period of settlement is characterized by small groups of Bantu people who started to drive the San and Khoi Khoi from the area and who are difficult to identify. From approximately AD1700 ancestral groupings of the present

inhabitants of the land began to arrive in the area. Groups that can be distinguished include:

- A large group of Sotho who came from the north-eastern parts of the Lowveld and who settled on the plateau to the north and to the south of the Strydpoortberge.
- Small groups of Kgatla and Huruthshe-Kwena origin moved from the Tswana area (Brits and Rustenburg) into the territory. Amongst them were the present Pedi (or Rota) who moved into what is now Sekhukhuneland, where they subjected the Sotho already living there.
- During these times Sekhukhuneland was also penetrated by Sotho arriving from the south-east.
- After AD1600 the Northern Ndebele arrived from the south-east and settled in what is now the Mokerong district.

It is assumed that during the period from AD1700 to AD1826 the Pedi took political control over the territory previously known as Lebowa, but to the south of the Strydpoortberge. The Pedi chiefdom reached its zenith during the reign of Thulare who died in 1824.

During the disruption of the *difaqane* (AD1822 to AD1828) Mzilikazi attacked the Pedi from the south-east in 1826 and in 1827/1828. This caused large-scale depopulation of the southern part of the Northern-Sotho territory. The Pedi sought refuge in the Soutpansberg in 1822 and only returned in 1828.

After the wars with Mzilikazi there were wars with the Swazi. The Voortrekkers arrived in the Steelpoort area in the late 1840's. Several armed struggles between the Voortrekkers and the Pedi ensued (Mönnig 1978; Delius 1984, 2007):

6.3 The Historical Period

After the British annexed the Transvaal (AD1877 to AD1881) the Pedi was subjugated by the British who were supported by the Swazi during the war of Sekhukhune in 1879 (see more detail below).

In 1842 Andries Hendrik Potgieter wished to move from the British sphere of influence and to establish trade relations with Delagoa Bay. He moved with his followers from Potchefstroom to the Eastern Transvaal and founded Andries Ohrigstad (named after himself and Gergios Gerhardus Ohrig, a merchant from Amsterdam who was well disposed towards the Voortrekkers). The name was later abbreviated to Ohrigstad. The town also served as the seat of the Volksraad.

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During 1848 to 1849 Ohrigstad was abandoned when many people died of malaria. The town of Lydenburg was founded further to the south near the confluence of the Sterkspruit and the Spekboom River. This area was located on higher ground and was therefore healthier than Ohrigstad.

The railway line between Steelpoort and Lydenburg was constructed in 1924 due to an increase in the mining of chrome and magnetite. The name Steelpoort is derived from a hunting expedition that took place either in the late 19th century or the early 20th century. When a group of Voortrekkers from Natal under Frans Joubert had settled there, a man called Scholtz shot an elephant at dusk and on returning next morning found that the tusks had been removed. When the wagons were searched, the tusks were found in the possession of a man called Botha, after which the farm Bothashoek was named. Because an elephant had been killed there, the poort was named Olifantspoort. The river flowing through the poort was called Steelpoort River (‘steel’ meaning steal) (Erasmus 1995).

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The Pedi were governed by Thulware until his death in 1824. His main village was Monganeng on the banks of the Tubatse River. His son, Sekwati, fled to the Soutpansberg in the north during the raids of Mzilikazi in 1822. He returned in 1828

and occupied the mountain fortress Phiring, his capital from where he united the Pedi (Moonig 1978).

The Pedi initially maintained good relations with the Voortrekkers who arrived in Ohrigstad from 1845. However, after a clash with Andries Hendrik Potgieter in 1852 Sekwati moved his capital to Thaba ya Mosego. Border disputes with the Zuid-Afrikaansche Republiek (ZAR) were settled in 1857 with an accord that stated that the Steelpoort River served as the border between Pedi land and the Lydenburg Republic.

Sekwati gave the Berlin Missionary Society permission to establish the Maandagshoek missionary station in Pedi territory. After Sekwati's death in 1861, his son Sekhukhune succeeded his father and established his village at Thaba Mosego. He ordered the Berlin Missionary Society to discontinue their work and the mission station was burn down. Alexander Merensky, one of the missionaries, thereafter, established the well-known Botšabelo missionary station at Middelburg.

The good relationship between the ZAR and the Pedi was gradually weakened. The period from 1876 to 1879 was one of conflict and war, first with the ZAR and then with the British who annexed the Transvaal in 1877. During the First Sekhukhune War in August 1876, the Voortrekkers attacked Thaba Mosego and partly destroyed the settlement (Monnig 1978).

The Second Sekhukhune War followed in November 1879 during which Sekhukhune was captured in the Mamatamageng cave and sent to prison in Pretoria. Two divisions attacked the Pedi. The main division, comprised of 3 000 whites and 2 500 black allies, attacked from the north-east. The Lydenburg division consist of 5 000 to 8 000 Swazi *impi*, 400 other black allies and 400 white soldiers who attacked from Burgersfort in the south. The Second Sekhukhune War is associated with the settlements of Thaba Mosego and Tšate, a new village

established by Sekhukhune close to Thaba Mosego (Mönnig 1978; Delius 1984, 2007).

Very little archaeological work has been done on the early and later historical periods in the Steelpoort Valley. Interest in the last 500 years has resulted in the publication of a synthesis of research which has been done during the last fifty years (Swanepoel et.al. 2008). Regrettably, the region has remained understudied during the last twenty years except for the expansive survey which Kusel (2008) undertook before Tsjate was declared a provincial heritage site.

6.4 Historical beacons near the Project Area

Several outstanding significant historical beacons are located in or near the Leolo Mountain range, in the peripheral area (outside the Project Area) which deserves specific reference, namely:

- The mountain Thaba Mosego is part of the Leolo Mountain range. It was here that the British and their allies subjugated the Pedi of Sekhukhune in 1879 during the Battle of Sekhukhune. The Sekhukhune Wars of 1876 and 1879 were both fought near/on this mountain (and in the Leolo Mountain range) where the Pedi chiefs Sekwati and Sekhukhune also established their mountain fortresses.
- One of the main Pedi villages (*mošate*) during this war, namely Tšatse, is also located along the western foot of the Leolo Mountains range.
- The missionary station known as Maandagshoek (or Ratagou) was established in the middle of the 19th century on Maandagshoek.
- Two mountains in the Leolo Mountain chain are known as 'Modimolle'. The name 'modimolle' implies that these mountains are sacred places. It is possible that Pedi chiefs (and possibly their wives as well) were buried near one or both of these mountains. (These mountains are still sacred places nowadays). The spirits of deceased chiefs (*badimo*) are venerated at these places and sacrifices are made annually at such places (De Beer 1996).

- The mountain Monganeng on Winterveld 293 may be where Thulare one of the greatest Pedi chiefs of all time lived during the early 19th century. The remains of his villages may be located near the Tubatse (Steelpoort) River.
- Names such as 'Badimo' and 'Badimong' are recorded on a mountain close to Monganeng. These names refer to forefathers ('*badimo*') and the place of the forefathers ('*badimong*') and therefore possibly to important settlements and graveyards that have important significance in the origin history of the Pedi (De Beer 1996).

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A large part of the Tsjate Valley between the Leolo mountaiun range in the west and Modimolle and the Leolo mountain range in the east was declared a Provincial Heritage Site on the 23rd February 2007 (Provincial Gazette No 1333 33). This cultural landscape was named the Tsjate Provincial Heritage Site (Kusel 2008).

6.5 The early mining period

Marula Platinum's proposed new expansion activities are located on the eastern limp of the Merensky Reef in the northern part of the Steelpoort Valley. Today it is known that the Merensky Reef is composed of the crescent-shaped Bushveld Complex that stretches across the central part of South Africa. This Reef is known for its wealth of mineral resources, generally referred to as the platinum-group metals (PGM's).

The first discovery of the eastern limb of the Merensky Reef can be traced back to the early decades of the 20th century when the reef was exposed from the Leolo Mountain range in the north to where the Steenkampsberg, west of the Dwars River (Dwars River range), commences as a continuation of the Leolo Mountain range in the south (Lombaard 1945; Viljoen & Reimold 1999).

The norite zone in which the Merensky Reef outcrops is a rugged mountainous terrain, except in the extreme north-western sector. The area is dominated by high,

rough-looking scrub-covered hills and ridges that alternate with flat-bottomed valleys. Four perennial streams, the Olifants, Tubatse, Dwars and Moopetsi Rivers traverse the platinum fields with a number of powerful springs in them (Wilson & Anhausser 1998).

6.6 The discovery of platinum

The first reference to platinum is found in a narrative published in 1748 by Don Antonio de Ullou y Gracia de la Torre, in which he mentioned that a heavy silvery metal occurred together with gold in New Granada (now called Columbia). The metal was described by Sir William Watson, an English physicist, as a semi-metal or metalloid in 1750. Experiments showed that platinum-rich grains consist of a mixture of several metals, namely platinum (Pt), palladium (Pd), iridium (Ir), ruthenium (Ru) and osmium (Os).

The discovery of platinum in South Africa dates to the late 19th century. In 1892, William Bettel identified osmium-iridium alloy particles in concentrate from the Witwatersrand gold mines. Bettel and Hall and Humphrey also recorded the presence of platinum in the chromatite layers of the Bushveld Complex. The presence of sperrylite in the ore bodies at Vlakfontein near the Pilanesberg was reported by Wagner (1973). However, none of these discoveries were considered to be of any economic significance. The first deposits that were economically viable, called the Waterberg Platinum, were found by Adolf Erasmus in the Rooiberg fellsites between Nylstroom and Potgietersrust. These deposits did not prove to be significant. Andries Lombaard's discovery of platinum nuggets in the Moopetsi River on the farm Maandagshoek in the Steelpoort area in 1924 can be considered the initial discovery of the Merenky Reef (Lombaard 1945; Wagner 1973; Wilson & Anhausser 1998).

The Merensky Reef occurs, geographically, in the westerly and the easterly parts of the Bushveld Complex. These two limbs of the Complex are confined to the

North-West Province and to the Northern and the Mpumalanga Provinces of South Africa (Cawthorn 1999).

The Merensky Reef has been traced for a total distance strike extent of 283km, 138 kilometres of which is in the eastern limb and 145 kilometres in the western limb of the Bushveld Complex. Vertical depths of 1 900m have been registered along the Reef, which also indicates its continuity. The eastern limb of the Reef is geologically less well known than the eastern limb, because mining activities in this part of the Reef have been limited (Wilson & Anhausser 1998).

7 APPROACH AND METHODOLOGY

This heritage survey and impact assessment study was conducted by means of the following:

7.1 Field survey

A field survey was conducted for the Marula Project on 13 and 14 November 2020. Earlier surveys for Marula Platinum Mine were also undertaken during 2001 and 2011 when heritage surveys were conducted for various developmental components for Marula Mine. Several heritage assessment studies were also done for Eskom power lines which traverse the area whilst the Tsjate cultural landscape was investigated by Kusel (2008) (see Part 12, 'Bibliography for heritage studies').

Figure 9- The GPS track log which the two surveyors followed (pink route) when covering the project area (above). Several earlier heritage surveys done did not require any track logs to be registered. Consequently, not all tracks are indicated here.

The most recent survey that was done for the Project occurred during the onset of the summer rain fall season for Limpopo. Undisturbed areas were covered with vegetation particularly sickle bush, weeds and other intruder plants which reached a climax this time of the year. This dense vegetation cover is normally not conducive for uncovering all possible heritage resources. This in particular applies to the dense sickle bush encountered at the ventilation shaft positions and the proposed solar plant.

Two individuals partook in the survey and not all the tracks could be logged due to a shortage of logistic equipment. Therefore, only the main track that was followed is indicated (Figure 5).

The fact that a large part of the project area has been developed for residential purposes restricts the possibilities that outstanding significant heritage resources may still occur. However, undecorated graves part of earlier homesteads may have been missed because of the thick vegetation and the fact that such graves may be undecorated and not maintained any longer. Graves may also have been missed because of human failure to recognise them.

Google Earth imagery served as a supplementary source (*prior* and after fieldwork) to establish the presence of heritage resources such as earlier homesteads. Ecological indicators such as alternations in vegetation patterns; open or bald spots in the veld; protrusions of boulders, patches with grass or clusters of sisal bush were searched as these could have harboured former dwellings.

All coordinates for heritage resources recorded by the author were done with a Garmin Etrex hand set Global Positioning System (instrument) with an accuracy of < 15m.

The nature and character of the project area has further been illuminated with descriptions and photographs (see Part 5,3 ‘The developed nature of the Marula Mine Project Area in relation to the new mine infrastructure’).

7.2 Databases, literature surveys and maps

Databases kept and maintained at institutions such as the PHRA, the Archaeological Data Recording Centre at the National Flagship Institute (Museum Africa) in Pretoria and SAHRA’s national archive (referred to as the South African Heritage Resources Information System, (SAHRIS) were consulted by the author to determine whether any heritage resources of significance had been identified during earlier heritage surveys in or near the project area.

The author is acquainted with the Marula Mine Project Area at large as he has done several heritage impact assessment studies near the proposed Marula Mine Project Area (see Part 13, ‘Bibliography relating to heritage studies’).

Literature relating to the pre-historical and the historical unfolding of the region where the Marula Mine Project Area is located was reviewed (see Part 6, ‘Contextualising the Marula Mine Project Area’ and Part 12, ‘Select Bibliography).

In addition, the Marula Mine Project Area was studied by means of maps on which it appears such as the 1:50 000 topographical map (2430CA Steelpoort).

7.3 Consultation process undertaken and comments received from stakeholders

No specific consultation process was undertaken for the purposes of the heritage study as the stakeholder consultation for the project is being done by SLR Consulting (Africa) (Pty) Ltd as part of their Environmental Impact Assessment Process.

7.4 Significance ratings

The significance of possible impacts on the heritage resources was determined using a ranking scale based on the following:

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 *severely* altered.
	8	**High**	Bio-physical and/or social functions and/or processes might be *considerably* altered.
	6	**Medium**	Bio-physical and/or social functions and/or processes might be *notably* altered.
	4	**Low**	Bio-physical and/or social functions and/or processes might be *slightly* altered.
	2	**Very low**	Bio-physical and/or social functions and/or processes might be *negligibly* altered.
	0	**Zero**	Bio-physical and/or social functions and/or processes will remain *unaltered.*
MAGNITUDE of POSITIVE IMPACT (at the indicated spatial scale)	**10**	**Very high**	Positive: Bio-physical and/or social functions and/or processes might be *substantially* enhanced.
	8	**High**	**Positive**: Bio-physical and/or social functions and/or processes might be *considerably* enhanced.
	6	**Medium**	**Positive**: Bio-physical and/or social functions and/or processes might be *notably* enhanced.
	4	**Low**	**Positive**: Bio-physical and/or social functions and/or processes might be *slightly* enhanced.
	2	**Very low**	**Positive**: Bio-physical and/or social functions and/or processes might be *negligibly* enhanced.
	0	**Zero**	**Positive**: Bio-physical and/or social functions and/or processes will remain *unaltered.*
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 (or spatial scale/influence of impact)	**5**	**International**	**Beyond the National boundaries.**
	4	**National**	Beyond provincial boundaries, but within National boundaries.
	3	**Regional**	Beyond 5 km of the prject and within the provincial boundaries.
	2	**Local**	Within a 5 km radius of the project.
	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	**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. ***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. ***Low**:* The activity is localised and might have a negligible cumulative impact. ***None**:* No cumulative impact on the environment.		

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 below. The Environmental Significance rating process is completed for all identified potential environmental impacts both before and after implementation of the recommended mitigation measures.

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.

8 THE PHASE I HERITAGE SURVEY

8.1 Types and ranges of heritage resources

Earlier heritage surveys which have been done for Marula have recorded different types and ranges of heritage resources in the Marula mine lease area (Figure 6)**.** The significance of the Tsjate cultural landscape which neighbours on Marula Mine has also been outlined in reports in the past and as is here reaffirmed (see 'Part 12, 'Select Bibliography') including Part 5 of this report, 'Contextualising the Marula Project Area'.

Heritage surveys done for Marula Mine revealed the following types and ranges of heritage resources as outlined in Section 3 of the National Heritage Resources Act (No 25 of 1999), namely:

- Scatters of stone tools from various periods of the Stone Age in dongas all over the mine lease area and beyond.
- A Late Iron Age stone walled site along the base of a kopje.
- Graveyards in the open veldt and within the confines of homesteads within residential areas.
- Historical homesteads older than sixty years in residential areas and towns in the mine lease area and further afield.
- Remains from the recent past all over the mine lease area and beyond.
- Part of the Tsjate Provincial Heritage Site which coincides with the north-western tip of Marula Platnum's prospecting area on Hackney 116KT.

The heritage resources which have a bearing on the Marula Project have been mapped and geo-referenced (Figure 6; Tables 1-3). This includes a Late Iron Age site and graveyards on the valley floor where the proposed Marula Project will be established. The discoveries are illuminated with photographs. Possible impact on these resources is indicated as well as the significance of the heritage resources.

Mitigation and management measures are outlined for all the heritage resources which may be affected by the proposed Marula Project.

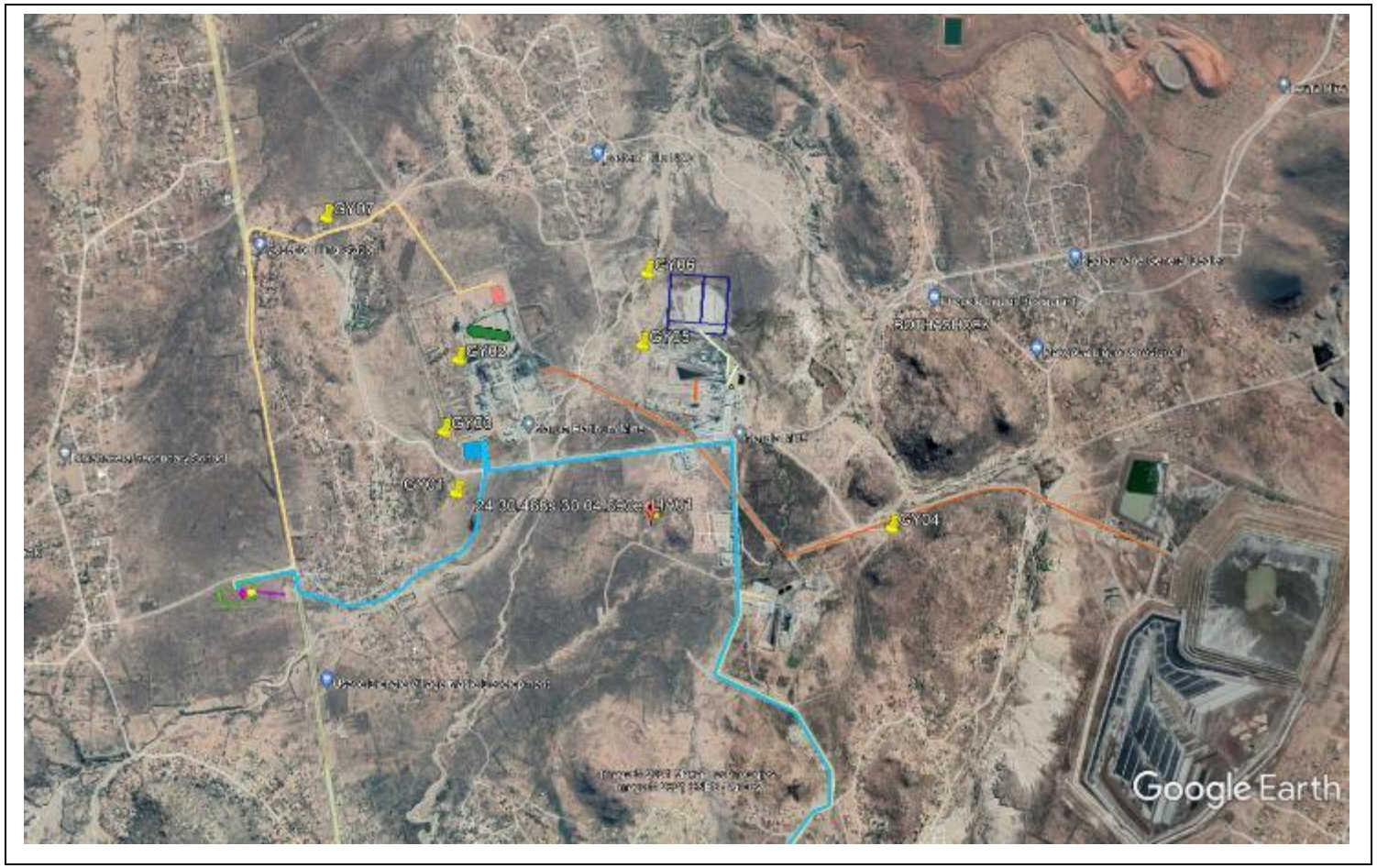


Figure 10- Heritage resources in the Marula Project Area include a Late Iron Age site and several graveyards. None of these remains will be affected by the infrastructure for the proposed Marula Project (above).

8.1.1 Scattered stone tools in dongas

Single, isolated and scattered stone tools occur in most of the dongas that occur in the mine lease area. Similar dongas are common elsewhere in the Steelpoort Valley and also hold stone tools dating from various periods of the Stone Age. References have been made to earlier discoveries of stone tools during heritage impact assessment studies (Part 6, 'Pre-historical context').

The stone tools in the dongas in the mine lease area were not documented due to their numbers; wide spatial distribution; the fact that they 'appear and disappear' when dongas are flooded by rain and since these artefacts occur out of an archaeological context. This diminishes the significance of isolated stone tools.

Most importantly, however, is that none of the stone tools will be affected by the proposed developmental project which does not allow for the mine infrastructure to be established in any of these dongas and potential streams.

8.1.2 The Late Iron Age site

The remains of a Late Iron Age stone walled site occur along the foot of the two linked kopjes which occur in the central part of the project area. This site (Site LIA01) covers a considerable area as it is stretched from the northern tip of the kopje along its western foot to near the southern end of the kopjes.

This site was damaged in the past when a store for equipment (east) and a destruction site, currently used for incinerating waste material (west), were established along the base of the kopje. More recently a soccer field was established near the perimeter of the site.

Figure 11- Stone walls belonging to a Late Iron Age site (LIA01) along the foot of kopjes in the central part of the Project Area (above).

8.1.3 Graveyards

Graveyards occur in the open veldt as well as within the confines of homesteads in the mine lease area.

All the graveyards in the open veldt were documented.

Only some of the graveyards within the confines of homesteads in the mine lease area were documented. The proposed developmental project does not impact on the residential areas. Consequently, these graveyards have not been mapped. However, some of these graveyards are discussed and their coordinates have been tabulated.

The graveyards in the open veldt and in the homesteads are the following:

8.1.3.1 Graveyards in the open veldt

8.1.3.1.1 Graveyard 01

This graveyard is part of remains (homesteads) from the recent past which occur along the foot of a low ridge. GY01 contains at least 11 graves, seven of which are covered with stones while four are fitted with granite tombstones. The graveyard has recently been demarcated with a steel palisade fence.

Figure 12- GY01 with eleven graves along the foot of a low ridge (above).

8.1.3.1.2 Graveyard 02

This graveyard is located near Marula Mine's concentrator Plant and in proximity of GY03 and GY01. It holds approximately 7 graves, five of which are covered with stones, one with a cement slab and one fitted with a granite tombstone with the following inscription:

- ‘Mabilo Manyane Gabriel, *1947-04-03 †1999-06-30, Rhobala ka khutso Phaala A Gosebo ka, Psalm 23.’

8.1.3.1.3 Graveyard 03

GY03 is located near GY01 and GY02 along the broad shoulder of a dirt road. It is also associated with remains (homesteads) from the recent past. It contains at least 10 graves, eight of which are covered with stones.

Two of the graves are fitted with granite trimmings and headstones with the following inscriptions:

- ‘Johannes Segopotse Boshego, *1912-04-28 †1991-11-03, Rhobala ka khutso’.
- ‘Boshigo Thunyane David, *27-07-1930 †13-02-2002, Robala ka khutso’.

Figure 13- GY03 with ten graves is located near GY01 and GY02. The latter two graveyards are also associated with remains from the recent past (above).

8.1.3.1.4 Graveyard 04

This graveyard is situated near a booster pump and near a Late Iron Age site which was destroyed in the distant past.

GY04 holds at least eleven graves of which the majority are fitted with granite headstones.

Inscriptions on some of the headstones read as follow:

- ‘Mputlana Naatshehle Robala ka khutso phuti’
- ‘Mosoma Moropa’
- ‘Mosoma Mosebu’
- ‘Molokane Mlamanye’
- ‘Ntagane Maggie Magale’

Figure 14- GY04 hold eleven graves and is located near a booster pump and Marula Platinum’ existing infrastructure (above).

8.1.3.1.5 Graveyard 05

GY05 is in open veldt and holds as many as twenty graves, most of which are covered with piles of stone.

Three of the graves are fitted with granite headstones which are covered with plastic sheeting. The inscriptions on the headstones therefore are not visible,

8.1.3.1.6 Graveyard 06

This graveyard is located on the banks of a stream and holds three graves one of which is fenced in a steel cage. The remaining two graves are demarcated with upright stones. The grave in the steel cage is fitted with a granite headstone which bears the following inscription:

- 'Phule Malikane Philip †1880-92-13 *1931-05-21 Robala ka khutso Mahlatjie a boledi le mphel'

Figure 15- GY07 is located on the banks of the Moopetsi River and holds three graves (above).

8.1.3.1.7 Graveyard 07

GY07 is a large graveyard which holds more than fifty graves. It is located on the outskirts of a village and near a kopje. Many of the graves are decorated and fitted with granite headstones with inscriptions such as the following:

- 'Sebopela Mabu Johanna 16-4-1913, 28-02-1998 Robala ka khutso mologadi'

Figure 16- A large graveyard (GY07) on the outskirts of a village holds many graves most of which are decorated (above).

8.1.3.2 Graveyards within the confines of homesteads

A considerable number of graves and graveyards occur within the confines of homesteads in the mine lease area. However, none of these graves or graveyards will be affected by the proposed Marula Project. Nevertheless, a few have been geo-referenced and are discussed in this report. Due to the fact that they fall outside the Marula Project Area they were not mapped.

8.1.3.2.1 Graveyard 08

This graveyard holds three graves with similar headstones with no inscriptions.

GY08 is situated along a dirt road running through the village of Seuwe.

Figure 17- GY04 with three graves in the village of Seuwe. Note magnificent twin mountains Diphale and Diphalana in the background (above).

8.1.3.2.2 Graveyard 09

This graveyard is in an open space next to a dirt road in the village of Seuwe.

The graves are neglected and barely recognisable as graves as no decorations with inscriptions occur on any of the graves.

All the graves are all edged with rows of stones.

Figure 18- A few graves (GY09) which are edged with stones in an open space in the village of Seawu (above).

8.1.3.2.3 Graveyard 10 and other graveyards

GY10, GY11 and GY12 were geo-referenced and mapped.

They all occur within the confines of homesteads or along the shoulders of roads in the village of Seuwe. Although they were geo-referenced, they are not discussed in this report as they merely represent a faction of a considerable number of graves and graveyards which occur in towns within the mine lease area.

8.1.3 Historical Houses

The mine lease area incorporates several villages. Most of the villages in Steelpoort hug the lower contours of mountains and a considerable number of houses are straggle along the lower foot slopes of the Leolo Mountains as is the case in the

village of Seuwe along the mine's western boundary. Houses also occur along the lower foot slopes of the Diphale and Diphalana mountains in the west and in the village of Manyaka.

It is highly likely that some of these houses will qualify as historical houses as they are older than sixty years.

These homesteads were not recorded and documented as this is not the scope of this study. Historical houses are also part of the build environment and cannot be accessed directly as privacy and tradition does not allow random access to private households for the purposes of recording and documentation.

However, more importantly none of the residential houses in the mine lease area will be affected by the proposed new developmental project.

8.1.4 Remains from the recent past

Remains from the more recent past consisting of stone walls and sisal hedges occur in parts across the mine lease area. Similar remains have already been destroyed as a result of residential development and agricultural activities. These remains mainly comprise evidence for low, dilapidated clay walls and hedges comprising sisal plants which demarcated various households (*malapa*) from each other. These remains can primarily be seen along the foot of mountains and kopjes as well as on the flat plains towards the central part of the project area.

Remains from the recent past were not documented as it holds no historical significance.

8.1.5 The Tsjate Provincial Heritage Site

The Tsjate Provincial Heritage site that coincides with Marula's prospecting area on Hackney 116KT includes the following heritage resources:

- The mountain Modimolle which is regarded as a holy or sacred mountain which people may not ascend as it is believed that it roars when people desecrate it.

Figure 19- The mountain Modimolle (behind Mosega in the foreground) is a holy mountain. It falls within Marula Mine's prospecting area on Hackney 116KT (above).

- The passage Sefateng between Modimolle and Tsjate Mountain was used by Merensky and his Christian followers when they fled Sekhukhune. This area is also an archaeological site as it holds a communal grinding stone and a stone cairn (*seotlo* or *isivivani*) which is associated with major routes or footpaths. A traveller would pick up a stone and some grass or leaves and puts them on top of the heap. This act will ensure a safe passage.

- An Early Iron Age (EIA) site lies near a dry riverbed. The pottery found on the site is typical of the so-called Doornkop phase (AD750-AD1000) of the EIA.

The Tsjate Provincial Heritage Site overlaps with the north-western tip of Marula Mines' exploration area. This collates with the some of the highest parts of the Leolo mountains where no mining can take place. This part of the provincial heritage site therefore will not be affected by the proposed Marula Project.

8.2 Tables

	LATE IRON AGE SITE	**COORDINATES**	**SIGNIFICANCE**
LIA01	Stone walled site along foot of kopjes	24º 30.468'S 30º 04.690'E	**Low –Med**

Table 1- Coordinate for a Late Iron Age site along the base of a kopje (above).

	GRAVEYARDS	**COORDINATES**	**SIGNIFICANCE**
In open veldt in the mine lease area			
GY01	11 graves against foot of ridge	24º 30.408'S 30º 04.109'E	**HIGH**
GY02	7 graves against foot of ridge	24º 30.058'S 30º 04.116'E	**HIGH**
GY03	10 graves against foot of ridge	24º 30.252'S 30º 04.074'E	**HIGH**
GY04	11 graves near booster pump	24º 30.504'S 30º 05.399'E	**HIGH**
GY05	More than 20 graves in open veldt	24º 30.016'S 30º 04.658'E	**HIGH**
GY06	Three graves on the bank of the river	24º 29.824'S 30º 04.671'E	**HIGH**
GY07	Large graveyard on outskirts of village	24º 29.678'S 30º 03.726'E	**HIGH**
Within the confines of homesteads (not mapped, outside developmental area)			
GY08	3 graves in a homestead	24º 30.945'S	**HIGH**

		30º 02.754'E	
GY09	A few graves in an open space	24º 30.977'S 30º 02.733'E	**HIGH**
GY10	14 graves on 'pavement'	24º 31.138'S 30º 02.659'E	**HIGH**
GY11	9 graves in homestead	24º 31.150'S 30º 02.620'E	**HIGH**
GY12	Large cemetery on northern border of corridor	24º 30.887 S 30º 02.629'E	**HIGH**

Table 2- Coordinates for graveyards in the open veldt and within the confines of homesteads in the Project Area (above).

PART OF TSJATE PROVINCIAL HERITAGE SITE WHICH COINCIDES WITH MARULAS PROSPECTING AREA	**COORDINATES**	**SIGNIFICANCE**
Modimolle, holy or sacred mountain	24° 28' 52.0" 30° 02' 40.0"	**HIGH**
Sefateng poort with communal grinding stone and isivivani	24° 29' 13.1" 30° 02' 39.8"	**HIGH**
Early Iron Age site	24° 29' 45.5" 30° 02'05.4".	**HIGH**

Table 3- Coordinates for heritage resources in the Tsjate Provincial Heritage site which coincides with the Marula Mine Project Area (above).

9 POSSIBLE IMPACT, SIGNIFICANCE AND MITIGATION OF THE HERITAGE RESOURCES

9.1 Possible impact on the heritage resources

The heritage resources which have a bearing on the Marula Project have been mapped and geo-referenced (Figure 10; Tables 1-3). These include the following, namely (Figure 10):

- A Late Iron Age stone walled site along the base of a kopje.
- Graveyards in the open veldt,

The Marula Project will have no direct or indirect impact on any of the heritage resources which have been mapped (Figure 10 & 20). All heritage resources occur at safe distances from the various developmental components of the Marula Project. There is consequently no reason from a heritage point of view why the Marula Project cannot proceed if the mitigation and management measures outlined below are followed (Part 10, 'Mitigation and management of heritage resources').

Even though no heritage resources are likely to be impacted upon due to the proposed project, for completeness purposes mitigation measures relevant to heritage resources located within the Marula Mining Right Area are provided below.

9.2 The significance of the heritage resources

9.2.1 The Late Iron Age site

The Late Iron Age site along the foot of two kopjes can be rated as of low to medium significance (Table 1). The criteria for this rating are the following:

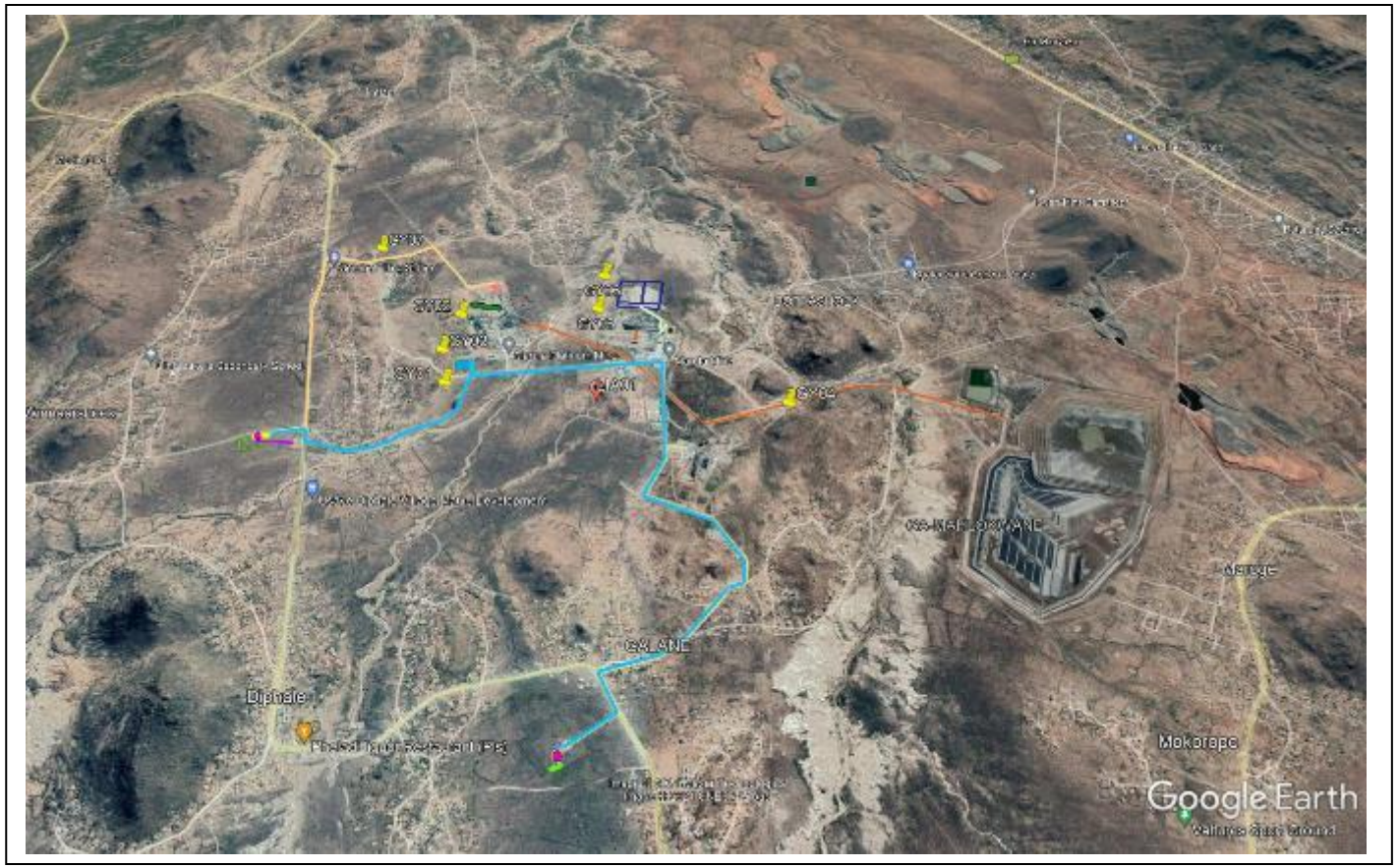


Figure 20- None of the heritage resources recorded in the Marula Project Area will be affected by the proposed Marula project (above).

- The site contains deposits as well as stone walls which when excavated and mapped can reveal more information about this site, e.g., when the sites was occupied; who the occupants of the site were; what subsistence strategies did they follow; how does this site link with others in a cultural or chronological framework, etc.
- The site has been damaged in the past. Subsequently, some information and material has been lost. This diminishes the level of significance of the site.

9.2.2 The graveyards

All the graveyards in the open veld or within the confines of homesteads within the mine lease area can be of high significance and are protected by various laws (Table 2). Legislation about graves includes Section 36 of the NHRA in instances where graves are older than sixty years. Other legislation about graves includes those which apply when graves are exhumed and relocated, namely the Ordinance on Exhumations (No 12 of 1980) and the Human Tissues Act (No 65 of 1983 as amended). Municipal laws about graves and graveyards may differ and professionals involved with the exhumation and relocation of graves and graveyards must adhere to these laws.

9.2.3 The Tsjate Provincial Heritage site

The Tsjate Provincial Heritage site and its heritage resources can be of high significance and are protected by various sections of the National Heritage Resources Act (No 25 of 1999).

9.3 Mitigation of the heritage resources

None of the documented heritage resources will be affected by the proposed Marula Project. Consequently, no mitigation measures are required with regard to the Marula Project.

10 MITIGATION AND MANAGEMENT OF HERITAGE RESOURCES

The following guidelines for the mitigation and management of heritage resources which may be affected by any future development project including the Marula Project are the following, namely:

10.1 The stone tools

Stone tools which may be affected by future developmental activities must be collected from the surface of the dongas before any development project commences. These stone tools can be donated to museums (preferably closest to the Project Area) or to an accredited institution such as a national museum or a university. Here, the stone artefacts can be safe-kept and be used in displays or in educational programmes.

Phase II investigations for Stone Age sites can only be conducted by archaeologists accredited with the Association for Southern African Professional Archaeologists (ASAPA). The archaeologist has to obtain a permit from the South African Heritage Resources Authority (SAHRA) which will authorise the collection of the stone artefacts *prior* to the commencement of the development project.

10.2 The Late Iron Age site

The stone walled site may not be affected (altered, removed or demolished) by any development project *prior* to a permit being issued by the South African Heritage Resources Authority (SAHRA) authorising such an impact on these remains. This impact, although authorised, can also only occur after the stone walled site has been subjected to a Phase II archaeological investigation.

A Phase II archaeological investigation implies that the stone walled site be subjected to an investigation which provides for the documenting of the site. This investigation would entail the mapping of the stone walls of the site and test excavations in some of the deposits which are associated with the site.

The results of this Phase II investigation must be published in a report which will be kept in the South African Heritage Resources Information System (SAHRIS).

10.3 The graveyards

The graveyards on the level plains outside the confines of homesteads in the Project Area must be mitigated by following one of the following strategies, namely:

- Graveyards can be demarcated with brick walls or with fences. Conserving graveyards *in situ* in mining areas create the risk and responsibility that they may be damaged, accidentally, that the mine remains responsible for their future unaffected existence, maintenance and that controlled access must exist for any relatives or friends who wish to visit the deceased.
- Graveyards can also be exhumed and relocated. The exhumation of human remains, and the relocation of graveyards are regulated by various laws, regulations, and administrative procedures. This task is undertaken by forensic archaeologists or by reputed undertakers who are acquainted with all the administrative procedures and relevant legislation that must be adhered to whenever human remains are exhumed and relocated. This process also includes social consultation with a 60-day statutory notice period for graves older than sixty years. Permission for the exhumation and relocation of human remains must be obtained from the descendants of the deceased (if known), the National Department of Health, the Provincial Department of Health, the Premier of the Province, and the local police.

The graveyards within the confines of towns and homesteads must be left untouched and *in situ.* These graves and graveyards are under the ‘protection’ of custodians such as family and friends. However, if any of these graves or graveyards is to be affected by any mining related development project, the mitigation measures outlined above must be followed.

10.4 The Historical Houses

Historical structures may not be affected (demolish, renovate, alter) by any development project *prior* to their investigation by a historical architect in good standing with the South African Heritage Resources Agency (SAHRA). The historical architect has to acquire a permit from the South African Heritage Resources Authority (SAHRA) *prio*r to any of these structures and features being affected or altered as a result of any development project.

10.5 The remains from the recent past

The remains from the recent past are insignificant and can be destroyed without acquiring any permit from the South African Heritage Resources Agency.

10.6 The Tsjate Provincial Heritage Site

No developmental activities may be conducted in the prospecting area on Hackney 116KT which coincides with the Tsjate Provincial Heritage site without *prior* consultation with the Limpopo Heritage Resources Authority (LIHRA). This restriction applies although prospecting rights have been granted for this area. It is highly likely that the heritage authorities may require that an archaeologist must undertake a survey before any activities (e.g. drilling) commences or that certain activities (e.g. drilling, road building for exploration vehicles, etc) must be before monitored whilst being implemented.

Marula can do underground mining on Hackney 116KT (or even under the heritage site). However, when Marula do any work, e.g., exploration on the surface in the heritage site, the mine must consult with SAHRA beforehand safeguarding them from any accidental damage which may occur as a result of any activities taking place within the boundaries of the heritage site. SAHRA will normally request that an archaeologist accompany contractors to site.

Best practise would be - in all instances - to consult with SAHRA or an archaeologist before anything is done in the heritage site.

11 CONCLUSION AND RECOMMENDATIONS

Earlier heritage surveys which have been done for Marula have recorded different types and ranges of heritage resources in the Marula mine lease area (Figure 10)**.** The significance of the Tsjate cultural landscape which neighbours on Marula Mine has also been outlined in reports in the past and as is here reaffirmed (see 'Part 12, 'Select Bibliography') including Part 5 of this report, 'Contextualising the Marula Project Area'. The Tsjate Provincial Heritage Site overlaps with the north-western tip of Marula Mines' exploration area. This collates with the some of the highest parts of the Leolo mountains where no mining can take place. This part of the Tsjate Provincial Heritage Site therefore will not be affected by the proposed Marula Project.

Possible impact on the heritage resources

The heritage resources which have a bearing on the Marula Project have been mapped and geo-referenced (Figure 10; Tables 1-3). These include the following, namely (Figure 10):

- A Late Iron Age stone walled site along the base of a kopje.
- Graveyards in the open veldt,

The Marula Project will have no direct or indirect impact on any of the heritage resources which have been mapped (Figure 10 & 20). All heritage resources occur at safe distances from the various developmental components of the Marula Project. There is consequently no reason from a heritage point of view why the Marula Project cannot proceed if the mitigation and management measures outlined below are followed (Part 10, 'Mitigation and management of heritage resources').

The significance of the heritage resources

The Late Iron Age site

The Late Iron Age site along the foot of two kopjes can be rated as of low to medium significance (Table 1). The criteria for this rating are the following:

- The site contains deposits as well as stone walls which when excavated and mapped can reveal more information about this site, e.g. when the sites was occupied; who the occupants of the site were; what subsistence strategies did

they follow; how does this site link with others in a cultural or chronological framework, etc.

- The site has been damaged in the past. Subsequently, some information and material has been lost. This diminishes the level of significance of the site.

The graveyards

All the graveyards in the open veld or within the confines of homesteads within the mine lease area can be of high significance and are protected by various laws (Table 2). Legislation about graves includes Section 36 of the NHRA in instances where graves are older than sixty years. Other legislation about graves includes those which apply when graves are exhumed and relocated, namely the Ordinance on Exhumations (No 12 of 1980) and the Human Tissues Act (No 65 of 1983 as amended). Municipal laws about graves and graveyards may differ and professionals involved with the exhumation and relocation of graves and graveyards must adhere to these laws.

The Tsjate Provincial Heritage site

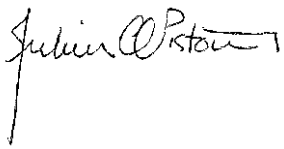
The Tsjate Provincial Heritage Site and its heritage resources can be considered to be of high significance and are protected by various sections of the National Heritage Resources Act (No 25 of 1999).

Mitigation of the heritage resources

None of the documented heritage resources will be affected by the proposed Marula Project. Consequently, no mitigation measures are required with regard to the Marula Project.

Management of heritage resources

Guidelines for the mitigation and management of heritage resources which may be affected by any future development project including the Marula Project are outlined.



DR JULIUS CC PISTORIUS

Archaeologist and Heritage Consultant. Member ASAPA

12 SELECT BIBLIOGRAPHY

Berg, J.S. 1989. *Geskiedenisatlas van Suid Afrika. Die vier noordelike provinsies*. Van Schaik: Pretoria.

Botha, S.J. 1983. *'n Voorgestelde nasionale ontwikkelingsplan vir Lebowa*. Universiteit van Pretoria: Pretoria.

Bothma, C.V. 1969. *Pedi origins*. Ethnological publications no 52. Government Printer: Pretoria.

Bothma, C. V. 1976. *The political structure of the Pedi of Sekhukhuneland*. African Studies. 35(3).

Cawthorn, R.G. 1999. The discovery of the platiniferous Merensky Reef in 1924. *South African Journal of Geology*. 10 (3): 178-183.

De Beer, F.C. 1996. *Berge is nie net berge nie: Swart mense se persepsies oor Modimolle*. South African Journal of Ethnology. 19(1).

Delius, P. 1984. The land belongs to us. Raven Press: Johannesburg.

Delius, P. 2007. Mpumalanga. History and Heritage. C.T.P. Book Printers: Cape Town.

Erasmus, B.P.J. 1995. *Oppad in Suid-Afrika*. Jonathan Ball: Johannesburg.

Evers, T.M. 1981. The Iron Age in the Eastern Transvaal, South Africa. In Voight, E.A. (ed). *Guide to archaeological sites in Northern and Eastern Transvaal.* Pretoria: South African Association of Archaeologists, 64-109.

Evers, T.M. 1982. Excavations at the Lydenburg Heads site, eastern Transvaal, South Africa. *South African Archaeological Bulletin*. 37:16-33.

Leroux, V. 1992. *Reader's Digest Book of the Great South African Outdoors*. Cape Town: Reader's Digest Association South Africa.

Lombaard, B. V. 1945. Die ontdekkers van platina in die Transvaal. *Historical Studies*. University of Pretoria, South Africa. 6(1):32-40.

Makura, T. 2007. The pre-colonial histories of Mpumalanga communities. In Delius, P (ed). *Mpumalanga History and Heritage*. 91-136. Pietermaritzburg Kwa Zulu/Natal University Press.

Mayhew, V. (ed.). 1982. *Reader's Digest illustrated guide to Southern Africa*. Cape Town: Reader's Digest Association South Africa.

Mönnig, H.O. 1978. *The Pedi*. National Book Printers: Cape Town.

O Hagan, T. (ed.) 1995. *Places to visit in Southern Africa*. Cape Town: AA The Motorist Publications.

Standard Encyclopaedia of Southern Africa. Volumes 8-10. 1970. Nasionale Opvoedkundige Uitgewery Ltd, Bpk: Kaapstad.

Swanepoel, N. (et. Al.) 2008. *Five hundred years rediscovered*. Johannesburg. Wits Univesrity Press.

Viljoen, M.J. & Reimold, W.U. 1999. *An introduction to South Africa's geological and mining heritage*. The Geological Society of South Africa. Mintek. Randburg.

Wagner, P.A. 1973. *The platinum deposits and mines of South Africa*. Struik: Cape Town.

Wilson, M.G.C. & Anhausser, C.R. 1998 (eds). *The Mineral Resources of South Africa*. Council for Geoscience 16: Silverton, South Africa.

13 BIBLIOGRAPHY RELATING TO HERITAGE STUDIES

Huffman, T. & Schoeman, A. 2001. *Scoping study for the proposed water supply pipeline to the planned Twickenham Hackney Pachaskraal Platinum Mine* Unpublished report Archaeological Resources Management.

Kruger, N. 2016. Archaeological Impact Assessment for the proposed Twickenham Roads Upgrade Project in the Steelpoort area, Greater Tubatse Local Municipality. Unpublished Report for Dex Consulting Engineers.

Kusel, U. 2008. *Assessment of the Cultural Heritage Resources on the provincial heritage site of Tsjate on the farm Djate 249KT in Sekhukhune Limpopo Province*. Unpublished report. African Heritage Consultants.

Pistorius, J.C.C. 1993. *'n Ondersoek van Historiese en Argeologiese Oorblyfsels op die plase Hendriksplaats (281KT) en Derde Gelid (278KT) in die Steelpoortdistrik van Mpumalanga*. (Mede-outeur H. P. Prinsloo). Verslag voorberei vir Samancor, Eastern Chrome Mines: Steelpoort.

Pistorius, J.C.C. 2001. *An Archaeological impact assessment report for the proposed Impala Platinum Mine at Steelpoort in the Northern Province of South Africa*. Unpublished report prepared for Pulles, Howard and De Lange Incorporated.

Pistorius, J.C.C. 2005a. *A Heritage Impact Assessment (HIA) study for a proposed new power line between the Merensky Substation and the Burgersfort Substation in the Limpopo (Northern) Province of South Africa*. Unpublished report prepared for PBA International and Eskom.

Pistorius, J.C.C. 2005b. *Results of a Phase II Heritage Impact Assessment Study: An investigation of Late Iron Age (including initiation cairns) and mining heritage remains on the farm Onverwacht 292KT in the Mpumalanga and Limpopo Provinces of South Africa.* Unpublished report for SAHRA and Modikwa Platinum.

Pistorius, J.C.C. 2006. *A Phase I Heritage Impact Assessment (HIA) study for Modikwa Platinum's South Shaft 3 Project in the Mpumalanga and Limpopo Provinces of South Africa.* Unpublished report prepared for Modikwa Platinum.

Pistorius, J.C.C. 2007. *A Phase I Heritage Impact Assessment (HIA) study for the proposed Route D for the 400kV Duvha-Leseding power line running across the Tsjate Valley in the Steelpoort in the Limpopo Province.* Unpublished report prepared for Eskom Megawatt Park.

Pistorius, J.C.C. 2010. *A Management plan for Marula Platinum in the Steelpoort Valley in the Limpopo Province.* Unpublished report prepared for SRK Consulting.

Pistorius, J.C.C. 2011. *A Phase I Heritage Impact Assessment (HIA) study for Marula Platinum (Pty) Ltd's (Marula) proposed new mine infrastructure, repositioning of the Merensky Shafts and incorporating of exploration areas into the mining rights area in the Steelpoort Valley in the Limpopo Province of South Africa.* Unpublished report prepared for Metago Environmental Engineers.

Van Schalckwyk, J.A. 2002. *A survey of cultural resources for the proposed new Twickenham Pachaskraal Hackney mining development Sekhukhuneland District, Northern Province.* Unpublished Report National Cultural History Museum.

Van Schalkwyk, J.A. 2003. *Documentation of historical sites in the Twickenham Platinum Mine development. Sekhukhuneland District, Limpopo Province.* Unpublished report for the National Cultural History Museum.

Van Vollenhoven, A.C. 2014. *A report on a Cultural Heritage Impact Assessment done for the Anglo-American Platinum Mine and African Rainbow Minerals Modikwa Platinum Mine South Shaft 2 Project close to Burgersfort, Limpopo Province.* Unpublished report Archaetnos.

APPENDIX H: SPECIALIST STUDIES
PALEONTOLOGICAL ASSESSMENT

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Marion.bamford@wits.ac.za
30 October 2020

Dr Ragna Redelstorff
Heritage Officer Archaeology, Palaeontology & Meteorites Unit
South African Heritage Resources Agency
111 Harrington Street
Cape Town 8001

Dear Dr Redelstorff

RE: Request for Exemption of any Palaeontological Impact Assessment for the proposed construction of three ventilation shafts for Marula Mine, Limpopo Province

In my capacity as a professional palaeontologist, I am requesting exemption for palaeontological impact assessment in terms of the National Heritage Resources Act (Act 25 of 1999) and the National Environmental Management Act (Act 107 of 1998) which requires that the proposed development must be preceded by the relevant impact assessment, in this case for palaeontology.

The owners of Marula Mine in Limpopo (about 100km southeast of Polokwane) proposed to construct three ventilation shafts for the underground operations of the mine (Fig 1) together with the relevant servitudes such as water pipelines and power.

The whole area lies on non-fossiliferous rocks of the Rustenburg Layered Suite, Bushveld Complex that has intruded through the Transvaal Supergroup rocks. The formations affected (Fig 2) are the Dwars River Subsuite, comprising norite and anorthosite, and the Croyden subsuite comprising pyroxenite and feldspathic pyroxenite. These ancient rocks are highly metamorphosed (Cawthorn et al., 2006) and there is no chance of fossils being preserved within them. The overlying Quaternary alluvium and soils are a product of weathering and no not preserve fossils. There is no chance of any impact on the South African fossil heritage from this project. This is confirmed by the blue and grey colours on the SAHRIS palaeosensitivity map (Fig 3).

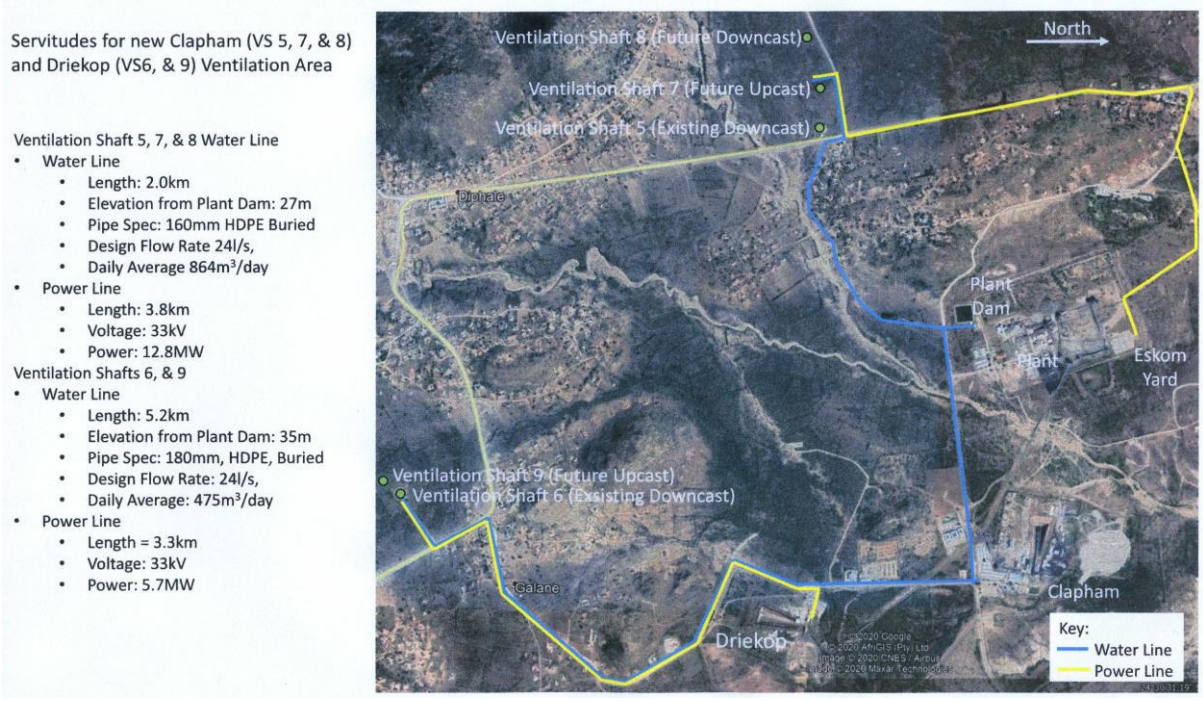

Figure 1: Annotated google map showing the planned servitudes and shafts for Marula Mine.

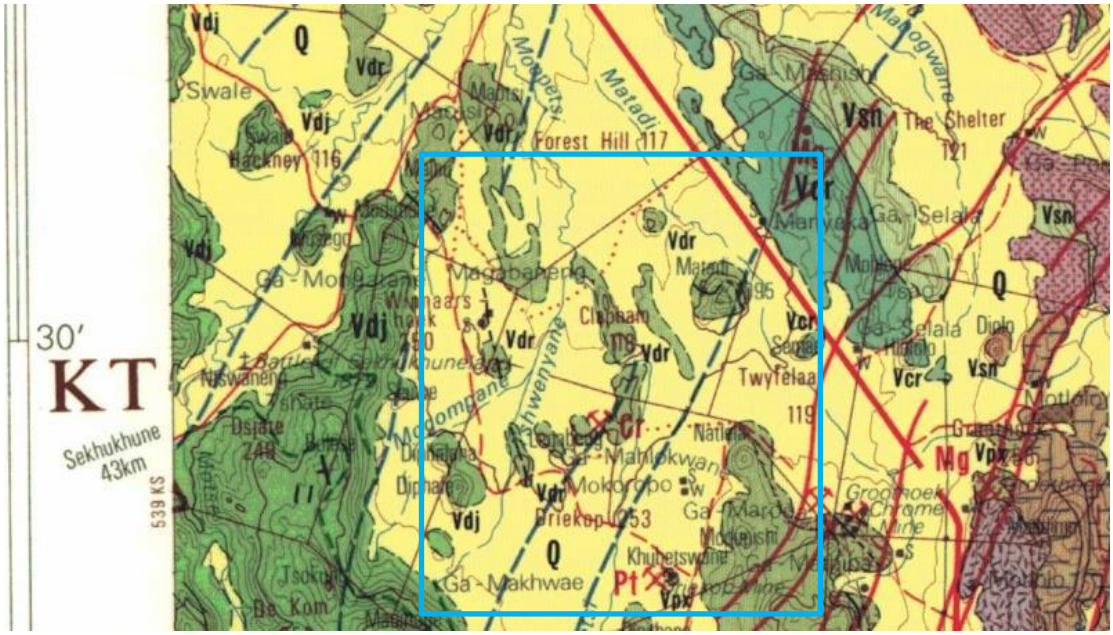

Figure 2: Geological map of the area around the Marula Mine. The location of the proposed project is indicated within the blue outline. Abbreviations of the rock types: Q = Quaternary soils and alluvium; Vdr = Dwars River Subsuite; Vcr = Croyden Subsuite; Vdj = Dsjate Subsuite. Map enlarged from the Geological Survey 1: 250 000 map 2430 Pilgrims Rest.

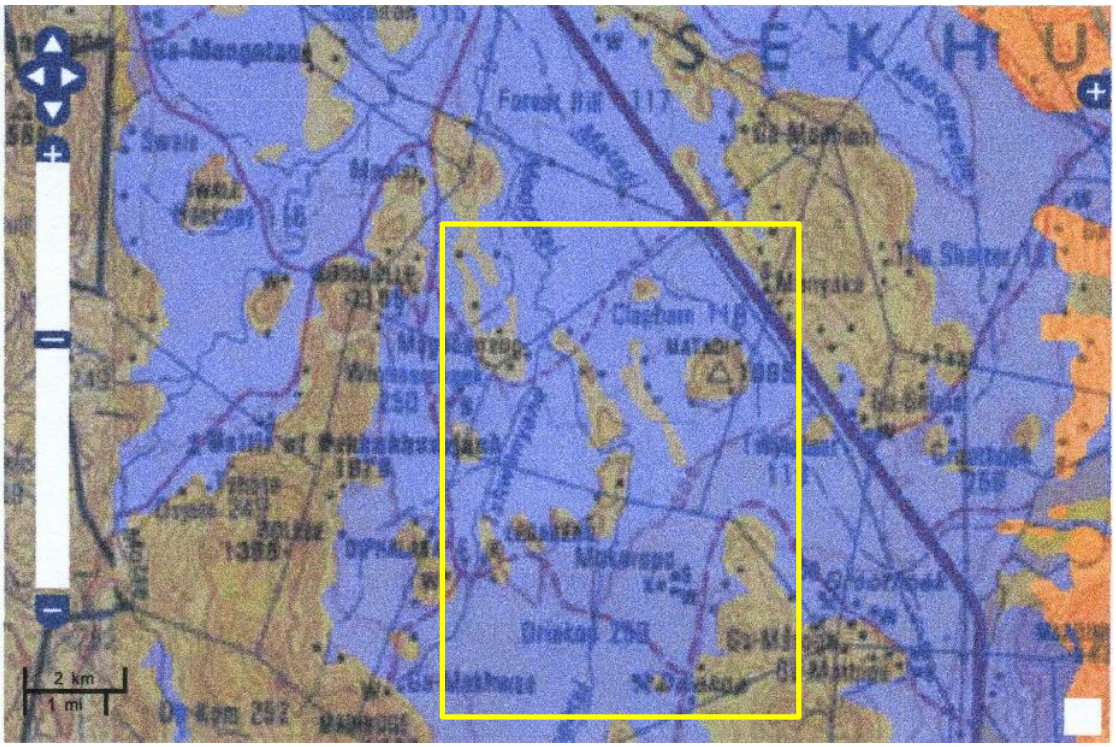

Figure 3: SAHRIS palaeosensitivity map for the site for the Marula Mine project shown within the yellow rectangle. Background colours indicate the following degrees of sensitivity: red = very highly sensitive; orange/yellow = high; green = moderate; blue = low; grey = insignificant/zero.

We are therefore requesting that no palaeontological impact be required for this project and that as far as the palaeontology is concerned, the project may proceed.

Yours faithfully

Prof Marion Bamford
Palaeobotanist; PhD (Wits 1990)

Reference cited:

Cawthorn, R.G., Eales, H.V., Walraven, F., Uken, R., Watkeys, M.K., 2006. The Bushveld Complex. In: Johnson, M.R., Anhaeusser, C.R. and Thomas, R.J., (Eds). The Geology of South Africa. Geological Society of South Africa, Johannesburg / Council for Geoscience, Pretoria. pp 261-281.

APPENDIX H: SPECIALIST STUDIES
FINANCIAL PROVISION

BASIS OF ESTIMATE

FOR

MARULA PLATINUM

EMPr AMENDMENT

DRAFT

REPORT NO: 00374

19 NOVEMBER 2021

DOCUMENT CONTROL

CLIENT:	**Marula Platinum (Pty) Ltd**
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DOCUMENT TITLE:	**Basis of Estimate**
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Project Number:	PN100460
Report Number:	RPT 00374
AUTHOR/S:	Joani Taljaard
REVIEWER/S:	Leon Koekemoer

DOCUMENT DISTRIBUTION:

REVISION	STATUS	ISSUED TO		DATE
		NAME		
0	Draft Report	Murendeni Makhado	Environmental Specialist	19/11/2021

DETAILS OF PRACTITIONERS

NAME	EXPERIENCE / PROFESSIONAL REGISTRATION
Leon Koekemoer *Director & Senior Estimator*	Leon has a National Diploma in Building (N.Dip. Building) and is an Associate Member of the Association of South African Quantity Surveyors (ASAQS), registration no. 29649790 and a member of the Land Rehabilitation Society of Southern Africa (LaRSSA). He was a Senior Project Manager for Beckers Building Contractors from 2005 – 2011, where his key roles included project management, cost control and quality control. Leon specialises in the development of closure liabilities and models as well as assisting and advising in the closure planning process for mining and industrial sites. His key experience includes the calculation of environmental liabilities and the representation thereof in closure models. His expertise allows him to address all categories associated with liabilities such as closure liability cash flows, rehabilitation cash flows, auditing of liabilities and operational closure costing.
Joani Taljaard *Quantity Surveyor*	Joani Taljaard graduated with a B.Sc Quantity Surveying (Hons) (Cum Laude) in 2015 from the University of Pretoria. She was a student Quantity Surveyor at Matla Quantity Surveyors (Pretoria) from 2014 to 2015, a junior Quantity Surveyor at Tronkon Construction (Potchefstroom) from 2016 to 2018 and a Candidate Quantity Surveyor at QS Africa Construction Consultants (Klerksdorp) from 2018 to 2021 where she managed the Potchefstroom office. She worked on a wide range of projects, including commercial developments, residential dwellings, health facilities, educational facilities, and insurance claims. She was employed by E-TEK Consulting in 2021 where she focusses on the calculation of closure liability estimates for scheduled and unscheduled closures, as well as the annual updating of the liability estimates.

NAME	EXPERIENCE / PROFESSIONAL REGISTRATION
Pieter Willem Botha *GIS Specialist*	PW Botha obtained his B.Sc degree in Geology and Geography in 2018 and his B.Sc Honours in Hydrology and Geohydrology in 2019 from the University of North-West. He completed his M.Sc degree in Hydrology and Geohydrology degree in 2021 while assisting in geophysical field work for the Centre of Water Sciences and Management for the North-West University. He joined E-TEK in 2021 as a GIS (Geographic Information Systems) Specialist where he is responsible for the following aspects: Preparation for annual mine closure liability assessments, Change detection analysis on mining infrastructure with ArcGIS, AutoCAD and field surveys, Design and create precise maps for mine closure liability forecasts, mine closure planning, monitoring and rehabilitation planning, Database administrator responsible for the acquisition, processing, management and maintenance of pertinent geospatial data for project databases for use by E-TEK and clients.

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TERMS AND ABBREVIATIONS

Table 1: List of Terms and Abbreviations used

TERMS AND ABBREVIATIONS	DESCRIPTION
ASAQS	Association of South African Quantity Surveyors
BoQ	Bill of Quantities
Care and maintenance	This involves the maintaining and corrective action as required as well as conducting the required inspection and monitoring to demonstrate achievement of success of the implemented measures
Closure	This involves the application for closure certificate and initiation of transfer of on-going care and maintenance to third parties
Contingencies	This allows for making reasonable allowance for possible oversights/omissions and possible work not foreseen at the time of compilation of the closure costs. An allowance of between 10 percent and 20 percent would usually be made based on the accuracy of the estimations. The South African Department of Minerals and Energy Guideline (January 2005) requires an allowance of 10 percent
Decommissioning	This relates to the situation after cessation of operations involving the deconstruction/removal and/or transfer of surface infrastructure and the initiation of general site reclamation
DMRE	Department of Mineral Resources and Energy
E-TEK	E-TEK Consulting
EMPr	Environmental Management Programme
FRD	Fine Residue Dump
GA Drawing	General Arrangement Drawing
GNR	Government Notice Regulation
Marula	Marula Platinum Limited
Life of Mine Closure	Closure that happens at the planned date and/or time horizon. Previously referred to as Scheduled Closure
LaRSSA	Land Rehabilitation Society of Southern Africa
MPRDA	Minerals Petroleum Resources Development Act (No. 28 of 2008)
NEMA	National Environmental Management Act (No. 107 of 1998)
Post-closure	The period after mine closure
Preliminary and Generals (P&Gs)	This is a key cost item which is directly related to whether or not third-party contractors have applied for site reclamation. This cost item comprises both fixed and time-related charges. The former makes allowance for establishment (and dis-establishment) of contractors on-site, as well as covering their operational requirements for their offices

	(electricity /water /communications), latrines, etc. Time-related items make allowance for the running costs of the fixed charge items for the contract period
Premature Closure	The immediate closure of a site, representing decommissioning and reclamation of the site in its present state. Previously referred to as Unscheduled Closure
Reclamation	The reinstatement of a disturbed area into a usable state (not necessarily its pre-mining state) as defined by broad land use and related performance objectives
Rehabilitation	The return of a disturbed area to its original state, or as close as possible to this state
Remediation	To assist in the reclamation process by enhancing the quality of an area through specific actions to improve especially bio-physical site conditions
Site relinquishment	Receipt of closure certificate and handover to third parties for on-going care and maintenance, if required
SLR	SLR Consulting (Africa) (Pty) Ltd
VAT	Value-added tax
ZAR	South African Rands

1. INTRODUCTION AND SUMMARY

1.1. INTRODUCTION

E-TEK Consulting (Pty) Ltd (E-TEK) was requested by Marula Platinum (Pty) Ltd (Marula) to assist with the determination of the financial provision for the proposed Ventilation Shaft 8 & 9 at the Marula Platinum Mine, Rustenburg Operation (Marula).

Marula is situated approximately 50km north of Burgersfort in the Limpopo Province. Marula is one of the first operations to be developed on the eastern limb of the Bushveld Complex. The operation consists of two decline shafts, concentrator plant, waste rock dump and a tailings complex.

The financial provision was calculated according to the requirements of the National Environmental Management Act, 1998 (Act No. 107 of 1998) (NEMA). (Refer to Government Notice Regulation (GNR) 1147) (GN R1147) published in November 2015.

This report summarises the financial provision required for the proposed project. The financial provision represents a 10-year liability forecast, as required by legislation:

Table 2: Financial Provision Forecast

OPERATION / PROJECT	PREMATURE CLOSURE	CLOSURE FORECAST
Proposed Ventilation Shaft 8 & 9	Y2021	Y2022 – Y2030

Table 3 presents a list of typical closure components and the applicability thereof as part of the calculation process:

Table 3: List of Closure Components

CLOSURE COMPONENTS		APPLICABLE
1	INFRASTRUCTURAL ASPECTS	
1.1	Plant and Related Structures	No
1.2	Shafts, Audits and Declines	Yes
1.3	Supporting Infrastructure	Yes
1.4	Underground Infrastructure	No
1.5	Social Infrastructure	No
1.6	Off-Site Infrastructure	No
1.7	Linear Items	Yes
1.8	Waste Disposal	Yes
1.9	River Diversion	No

CLOSURE COMPONENTS		APPLICABLE
2	MINING ASPECTS	
2.1	Opencast / Pit Areas	No
2.2	Waste Rock Dumps (WRDs) - Overburden and Spoils	No
2.3	Coarse Residue Deposits - Processing Waste	No
2.4	Fine Residue Deposits - Processing Waste	No
3	BIO-PHYSICAL CLOSURE ASPECTS	
3.1	Water Resources	No
3.2	Sensitive Habitats and Biodiversity	No
3.3	Land Use and Land Capability	No
3.4	Soil	No
3.5	Other; Air Quality and Topography	No
4	SOCIAL CLOSURE ASPECTS	
4.1	Employees	No
4.2	Interested and Affected Parties	No
4.3	Government	No
5	GENERAL ASPECTS	
5.1	General Surfaces	Yes
5.2	Post-Closure Monitoring and Maintenance	Yes
5.3	Specialist Studies	No

Note:

- Quantities were obtained from drawings and information as supplied by SLR.
- Rates used were obtained from E-TEK's existing database and in consultation with demolition and earthworks contractors. The rates are updated annually; and
- Closure cost estimates are based on the Y2021 rates.

1.2. SUMMARY

The financial provision represents a 10-year forecast of the proposed project. The financial provision takes into consideration the proposed project schedule for implementation. Marula is to financially provide for the highest liability figure out of the 10-year closure forecast, which has been calculated at:

- Closure Forecast (Y2029): R 11, 46million (Rounded).

The above figure includes Preliminary and Generals (P&G's) (6%), Contingencies (10%) and value-added tax (VAT) (15%).

Table 4 provides a summary of the closure liability estimates based on the 10-year Forecast:

Table 4: Marula Platinum Limited – Proposed Ventilation Shaft 8 & 9

MARULA PLATINUM - VENTILATION SHAFT - EMPr AMENDMENT FINANCIAL PROVISION SUMMARY												
ESTIMATED CLOSURE COST ESTIMATES (INCLUDES P&G'S, CONTINGENCIES AND VAT AND EXCLUDES ESCALATION)			Premature Closure	Closure Forecast	Closure Forecast	Closure Forecast	Closure Forecast	Closure Forecast	Closure Forecast	Closure Forecast	Closure Forecast	Closure Forecast
CLOSURE COMPONENTS			2021	2022	2023	2024	2025	2026	2027	2028	2029	2030
1	**INFRASTRUCTURAL ASPECTS**		**R -**	**R 1 788 534,33**	**R 3 743 630,12**	**R 4 128 636,04**	**R 4 128 636,04**	**R 4 874 488,13**	**R 4 874 488,13**	**R 4 874 488,13**	**R 7 165 732,21**	**R 7 165 732,21**
1,1	PLANT AND RELATED STRUCTURES		R -	R -	R -	R -	R -	R -	R -	R -	R -	R -
1,2	SHAFTS, ADITS AND DECLINES		R -	R 1 384 381,40	R 2 671 367,15	R 2 671 367,15	R 2 671 367,15	R 3 399 027,72	R 3 399 027,72	R 3 399 027,72	R 5 548 682,22	R 5 548 682,22
1,3	SUPPORTING INFRASTRUCTURE		R -	R -	R -	R 356 659,20	R 356 659,20	R 356 659,20	R 356 659,20	R 356 659,20	R 356 659,20	R 356 659,20
1,4	UNDERGROUND INFRASTRUCTURE		R -	R -	R -	R -	R -	R -	R -	R -	R -	R -
1,5	SOCIAL INFRASTRUCTURE		R -	R -	R -	R -	R -	R -	R -	R -	R -	R -
1,6	OFF-SITE INFRASTRUCTURE		R -	R -	R -	R -	R -	R -	R -	R -	R -	R -
1,7	LINEAR ITEMS		R -	R 360 345,11	R 990 470,11	R 994 349,81	R 994 349,81	R 994 349,81	R 994 349,81	R 994 349,81	R 994 349,81	R 994 349,81
1,8	WASTE DISPOSAL		R -	R 43 807,82	R 81 792,86	R 106 259,88	R 106 259,88	R 124 451,40	R 124 451,40	R 124 451,40	R 266 040,98	R 266 040,98
2	**MINING ASPECTS**		**R -**	**R -**	**R -**	**R -**	**R -**	**R -**	**R -**	**R -**	**R -**	**R -**
2,1	OPENCAST / PIT AREAS		R -	R -	R -	R -	R -	R -	R -	R -	R -	R -
2,2	WASTE ROCK DUMPS - OVERBURDEN AND SPOILS		R -	R -	R -	R -	R -	R -	R -	R -	R -	R -
2,3	COARSE RESIDUE DEPOSITS - PROCESSING WASTE		R -	R -	R -	R -	R -	R -	R -	R -	R -	R -
2,4	FINE RESIDUE DEPOSITS - PROCESSING WASTE		R -	R -	R -	R -	R -	R -	R -	R -	R -	R -
3	**BIO-PHYSICAL CLOSURE ASPECTS**		**R -**	**R -**	**R -**	**R -**	**R -**	**R -**	**R -**	**R -**	**R -**	**R -**
3,1	WATER RESOURCES		R -	R -	R -	R -	R -	R -	R -	R -	R -	R -
3,2	CLIMATE CHANGE		R -	R -	R -	R -	R -	R -	R -	R -	R -	R -
3,3	SENSITIVE HABITATS & BIODIVERSITY		R -	R -	R -	R -	R -	R -	R -	R -	R -	R -
3,4	LAND USE & LAND CAPABILITY		R -	R -	R -	R -	R -	R -	R -	R -	R -	R -
3,5	SOIL		R -	R -	R -	R -	R -	R -	R -	R -	R -	R -
3,6	OTHER: AIR QUALITY & TOPOGRAPHY		R -	R -	R -	R -	R -	R -	R -	R -	R -	R -
4	**SOCIAL CLOSURE ASPECTS**		**R -**	**R -**	**R -**	**R -**	**R -**	**R -**	**R -**	**R -**	**R -**	**R -**
4,1	EMPLOYEES		R -	R -	R -	R -	R -	R -	R -	R -	R -	R -
4,2	INTERESTED AND AFFECTED PARTIES		R -	R -	R -	R -	R -	R -	R -	R -	R -	R -
4,3	GOVERNMENT		R -	R -	R -	R -	R -	R -	R -	R -	R -	R -
5	**GENERAL ASPECTS**		**R -**	**R 1 407 926,46**	**R 1 407 926,46**	**R 1 407 926,46**	**R 1 749 102,24**	**R 1 422 690,43**	**R 1 422 690,43**	**R 1 422 690,43**	**R 1 422 690,43**	**R 1 407 926,46**
5,1	GENERAL SURFACES		R -	R 1 394 937,40	R 1 394 937,40	R 1 394 937,40	R 1 721 389,55	R 1 394 937,40	R 1 394 937,40	R 1 394 937,40	R 1 394 937,40	R 1 394 937,40
5,2	POST CLOSURE MONITORING AND MAINTENANCE		R -	R 12 989,06	R 12 989,06	R 12 989,06	R 27 712,69	R 27 753,03	R 27 753,03	R 27 753,03	R 27 753,03	R 12 989,06
5,3	SPECIALIST STUDIES		R -	R -	R -	R -	R -	R -	R -	R -	R -	R -
	SUB-TOTAL 1		**R -**	**R 3 196 460,80**	**R 5 151 556,58**	**R 5 536 562,51**	**R 5 877 738,28**	**R 6 297 178,56**	**R 6 297 178,56**	**R 6 297 178,56**	**R 8 588 422,64**	**R 8 573 658,68**
	Weighted Preliminary and General	6%	R -	R 191 008,30	R 308 314,05	R 331 414,41	R 351 001,54	R 376 165,53	R 376 165,53	R 376 165,53	R 513 640,18	R 513 640,18
	Weighted Contingencies	10%	R -	R 319 646,08	R 515 155,66	R 553 656,25	R 587 773,83	R 629 717,86	R 629 717,86	R 629 717,86	R 858 842,26	R 857 365,87
	SUB-TOTAL 2 FOR P&G's AND CONTINGENCIES		**R -**	**R 510 654,38**	**R 823 469,71**	**R 885 070,66**	**R 938 775,36**	**R 1 005 883,39**	**R 1 005 883,39**	**R 1 005 883,39**	**R 1 372 482,44**	**R 1 371 006,04**
	SUB-TOTAL 3		**R -**	**R 3 707 115,18**	**R 5 975 026,29**	**R 6 421 633,16**	**R 6 816 513,65**	**R 7 303 061,95**	**R 7 303 061,95**	**R 7 303 061,95**	**R 9 960 905,08**	**R 9 944 664,72**
	VAT	15%	R -	R 556 067,28	R 896 253,94	R 963 244,97	R 1 022 477,05	R 1 095 459,29	R 1 095 459,29	R 1 095 459,29	R 1 494 135,76	R 1 491 699,71
	GRAND-TOTAL		**R -**	**R 4 263 182,46**	**R 6 871 280,24**	**R 7 384 878,14**	**R 7 838 990,69**	**R 8 398 521,24**	**R 8 398 521,24**	**R 8 398 521,24**	**R 11 455 040,85**	**R 11 436 364,43**

2. CLOSURE COMPONENTS

The following components were identified and form part of the calculation:

- Ventilation Shaft 8 at the Clapham Shaft:
  - Ventilation shaft (Downcast);
  - Bulk air cooler;
  - Refrigeration plant & Condenser cooling towers.
- Ventilation Shaft 9 at the Driekop Shaft:
  - Ventilation shaft with surface main fans and electrical rooms.
- Water pipelines;
- Wastewater pipelines;
- Powerlines;
- TSF pipeline;
- Clapham change house;
- Driekop change house;
- Low grade ROM stockpile;
- Compressed airline upgrade

See Figure 1 depicting the general arrangement and locality of the proposed project in relation to the existing infrastructure:

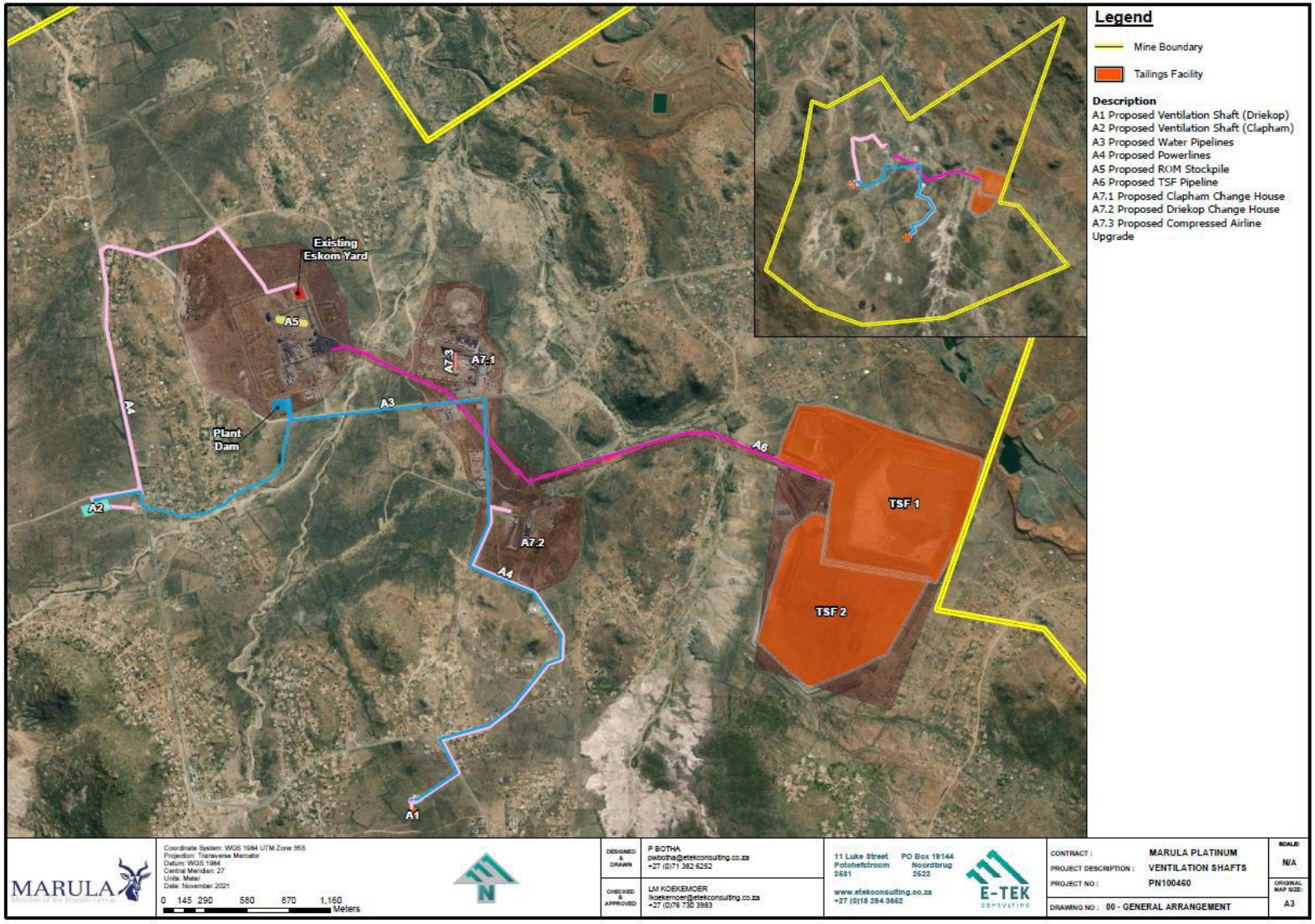

Figure 1: Locality of Proposed Project

3. CLOSURE COST ESTIMATION METHODOLOGY AND PROCEDURE

3.1. METHODOLOGY APPLIED TO LIABILITY MODEL

The following approach was applied to determine the financial provision:

- Financial models were developed to cater for the requirements of GNR 1147;
- The costing models were developed to address all the identified closure components applicable to Marula;
- The costing models provide the following output:
    - Executive Summary (Summary of all closure components and associated costs where applicable);
    - P&G's: Allocation of P&G's for each component and provides weighted P&G's, as certain P&G's allowances, can vary per component);
    - Contingencies (Allocation of Contingencies for each component and provides weighted Contingencies, as certain Contingency allowances can vary per component);
    - Closure Components Summary (Provides a summary of all costs per closure component). The five main closure components have been identified as follows:
        - Infrastructural Aspects;
        - Mining Aspects;
        - Biophysical Closure Aspects;
        - Social Closure Aspects; and
        - General Aspects.
    - Closure Components (Breakdown of the detail facilities and aspects under each of the five main closure components); and
    - Rates Table (Unit rates for various actions required).
- The following information is captured for each closure component where applicable:
    - Reference Map (Reference map number representing the associated closure component);
    - Geographical (GEO) Reference (Reference number for each closure component as represented on the reference map);
    - Year Captured (When each component was captured into the model or updated);
    - Cost Component (Name of closure component captured);
    - Description (Breakdown of the properties per cost component);
    - Supporting Documentation (Hyperlink to associated supporting information such as drawings, designs or Bill of Quantities);
    - Liable (Yes or No, indication if the mine is liable for the component or not);
    - Rate Code (Assigned rate code from the rates table);
    - Quantity (Quantity per component captured);
    - Unit (Unit of measurement);
    - Unit Rate (Rate assigned from the rate code aligned to the activity);

- Unit Total (Total amount for each component);
- Liable Value (Presentation of the total amount liable for per component); and
- Notes (Captures any assumptions or dedicated information).

3.2. ASSESSMENT METHODOLOGY

The approach followed with the determination of the closure costs could be summarised as follows:

- Review of available information and identification of infrastructure that would need to be decommissioned at closure;
- Gathering of relevant data which forms the basis of the calculation;
- All-newly proposed infrastructure was assigned with a reference number which can be referenced directly to the costing model;
- Reference map was created indicating the position of the proposed infrastructure in relation to the existing infrastructure;
- Closure criteria was developed and workshopped with Marula as part of the annual liability assessment;
- The closure forecast was based on the proposed project timeframe;
- Compilation of a Bill of Quantities (BoQ) capturing the quantities and actions relating to the closure of the different closure aspects (Microsoft excel format); and
- Unit rates from E-TEK's database were updated to be aligned with the current market-related rates acquired from local civil- and demolition contractors. (Note – these rates refer to closure conditions when the mine is no longer operational).

4. INFORMATION

The following information formed the basis of the calculation process:

- Closure Criteria (E-TEK Database);
- Latest lidar imagery of 2021 (E-TEK Database);
- General Arrangement Drawing (SLR);
- Project Description (SLR); and
- Project Schedule (SLR).

5. ASSUMPTIONS

The following general and site-specific assumptions and qualifications for each of the closure components listed in section 2 and 3 for Marula are described below:

5.1. GENERAL ASSUMPTIONS

- The financial provision represents a 10-year closure forecast;
- The currency of estimate: South African Rands (ZAR);
- Costing was based on today's value and no allowance was made for future value;
- As per regulatory requirements, no allowance was made to offset the value of scrap steel and or salvageable equipment to the liability;

- It was accepted that all information used to support the costing supplied by Marula and Specialists was accurate and true; this report only addresses the decommissioning and reclamation costs, equating to an outside (third party) contractor establishing on-site and conducting reclamation-related work. Other components such as staffing of the site after decommissioning, the infrastructure and support services (e.g. power supply, etc.) for this staff as well as workforce matters such as separation packages, retraining /re-skilling, etc. are outside the scope of this report;
- Based on the above, dedicated contractors would be commissioned to conduct the demolition and reclamation work on the site. This would inter alia require the establishment and overhead costs for the contractors and hence, the allowance for P&Gs in the cost estimate;
- Allowance has also been made for third-party contractors and consultants to conduct post-closure care and maintenance work as well as compliance monitoring;
- The financial provision calculated represents the financial requirements to implement the closure criteria identified and agreed upon as part of the closure plan; and
- Weighted percentages for P&Gs and Contingencies have been applied, VAT is also included:
    - P&G's – 6% Overall Allowance;
    - Contingencies – 10% Overall Allowance; and
    - VAT – 15% Overall Allowance

5.2. SITE-SPECIFIC ASSUMPTIONS

- Quantities were obtained from information supplied by SLR and Marula.
- Where information was not available, estimates were made based on experience and benchmarked against similar facilities elsewhere.
- All drawings and information used is in the feasibility phase and construction drawings is required to confirm the final quantities.
- General surface rehabilitation as per Marula's current criteria will apply;
- Steel and re-useable material, salvaged from the plant demolition and which has a salvage value, will be relocated to an authorized facility within a 30km radius to be sold or auctioned off. However, as per the regulatory requirements, the salvage value of steel and salvageable equipment have not been considered as part of the closure costing;
- It has been assumed all inert demolition waste will be disposed of into shaft portals before capping; and
- No beneficial use for infrastructure is currently allowed for an all infrastructure will be removed.

6. CLOSURE CRITERIA

All physical closure criteria were updated and refined during the annual updating process of the liability. Internal workshop sessions were held to update the closure criteria for all physical closure components based on updated information and inputs from operational personnel.

Please see the IA Summary Tab (Appendix A) for the closure criteria applicable to the closure components quantified.

7. CONCLUSION AND WAY FORWARD

7.1. CONCLUSION

The closure costs as reflected in this report have been based on information obtained from SLR, Marula, and quantities updated by E-TEK. In the event of the required information not being available, estimates were made based on experience and benchmarked against similar facilities elsewhere. Unit rates for the costing were obtained from E-TEK's existing database and/or through previous experience and consultation with demolition, earthworks contractors, and rehabilitation practitioners. Where required, these were adapted to reflect site-specific conditions.

Notwithstanding the above, if the closure measures are implemented as envisaged, the reflected costs provide a good indication of the costs for the closure situations as calculated and should provide a good basis for making the required financial provision. The closure costs calculated will only apply to closure situations and do not cater for operational closure and concurrent rehabilitation during the operational phase. Operational closure will require higher allowances for P&G's and Contingencies to appointed contractors.

7.2. WAY FORWARD

Quantities will be verified when construction drawings are issued and updated on an annual basis as part of the annual closure liability update. All variances will be captured and updated accordingly.

Appendix A: Closure Liability Estimate

Appendix B: Reference Map

DOCUMENT SIGN-OFF

CONSULTANT SIGNATORIES:

Leon Koekemoer	**Joani Taljaard**
Director/ Senior Estimator	**Quantity Surveyor**

CLIENT SIGNATORIES:

Name	**Name**
Capacity	**Capacity**

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Marula Platinum

Ventilation Shaft 8 & 9 - EMPr Amendment

MARULA PLATINUM - VENTILATION SHAFT - EMPr AMENDMENT FINANCIAL PROVISION SUMMARY												
ESTIMATED CLOSURE COST ESTIMATES (INCLUDES P&G'S, CONTINGENCIES AND VAT AND EXCLUDES ESCALATION)			Premature Closure	Closure Forecast	Closure Forecast	Closure Forecast	Closure Forecast	Closure Forecast	Closure Forecast	Closure Forecast	Closure Forecast	Closure Forecast
CLOSURE COMPONENTS			2021	2022	2023	2024	2025	2026	2027	2028	2029	2030
1	**INFRASTRUCTURAL ASPECTS**		**R -**	**R 1 788 534,33**	**R 3 743 630,12**	**R 4 128 636,04**	**R 4 128 636,04**	**R 4 874 488,13**	**R 4 874 488,13**	**R 4 874 488,13**	**R 7 165 732,21**	**R 7 165 732,21**
1,1	PLANT AND RELATED STRUCTURES		R -	R -	R -	R -	R -	R -	R -	R -	R -	R -
1,2	SHAFTS, ADITS AND DECLINES		R -	R 1 384 381,40	R 2 671 367,15	R 2 671 367,15	R 2 671 367,15	R 3 399 027,72	R 3 399 027,72	R 3 399 027,72	R 5 548 682,22	R 5 548 682,22
1,3	SUPPORTING INFRASTRUCTURE		R -	R -	R -	R 356 659,20	R 356 659,20	R 356 659,20	R 356 659,20	R 356 659,20	R 356 659,20	R 356 659,20
1,4	UNDERGROUND INFRASTRUCTURE		R -	R -	R -	R -	R -	R -	R -	R -	R -	R -
1,5	SOCIAL INFRASTRUCTURE		R -	R -	R -	R -	R -	R -	R -	R -	R -	R -
1,6	OFF-SITE INFRASTRUCTURE		R -	R -	R -	R -	R -	R -	R -	R -	R -	R -
1,7	LINEAR ITEMS		R -	R 360 345,11	R 990 470,11	R 994 349,81	R 994 349,81	R 994 349,81	R 994 349,81	R 994 349,81	R 994 349,81	R 994 349,81
1,8	WASTE DISPOSAL		R -	R 43 807,82	R 81 792,86	R 106 259,88	R 106 259,88	R 124 451,40	R 124 451,40	R 124 451,40	R 266 040,98	R 266 040,98
2	**MINING ASPECTS**		**R -**	**R -**	**R -**	**R -**	**R -**	**R -**	**R -**	**R -**	**R -**	**R -**
2,1	OPENCAST / PIT AREAS		R -	R -	R -	R -	R -	R -	R -	R -	R -	R -
2,2	WASTE ROCK DUMPS - OVERBURDEN AND SPOILS		R -	R -	R -	R -	R -	R -	R -	R -	R -	R -
2,3	COARSE RESIDUE DEPOSITS - PROCESSING WASTE		R -	R -	R -	R -	R -	R -	R -	R -	R -	R -
2,4	FINE RESIDUE DEPOSITS - PROCESSING WASTE		R -	R -	R -	R -	R -	R -	R -	R -	R -	R -
3	**BIO-PHYSICAL CLOSURE ASPECTS**		**R -**	**R -**	**R -**	**R -**	**R -**	**R -**	**R -**	**R -**	**R -**	**R -**
3,1	WATER RESOURCES		R -	R -	R -	R -	R -	R -	R -	R -	R -	R -
3,2	CLIMATE CHANGE		R -	R -	R -	R -	R -	R -	R -	R -	R -	R -
3,3	SENSITIVE HABITATS & BIODIVERSITY		R -	R -	R -	R -	R -	R -	R -	R -	R -	R -
3,4	LAND USE & LAND CAPABILITY		R -	R -	R -	R -	R -	R -	R -	R -	R -	R -
3,5	SOIL		R -	R -	R -	R -	R -	R -	R -	R -	R -	R -
3,6	OTHER: AIR QUALITY & TOPOGRAPHY		R -	R -	R -	R -	R -	R -	R -	R -	R -	R -
4	**SOCIAL CLOSURE ASPECTS**		**R -**	**R -**	**R -**	**R -**	**R -**	**R -**	**R -**	**R -**	**R -**	**R -**
4,1	EMPLOYEES		R -	R -	R -	R -	R -	R -	R -	R -	R -	R -
4,2	INTERESTED AND AFFECTED PARTIES		R -	R -	R -	R -	R -	R -	R -	R -	R -	R -
4,3	GOVERNMENT		R -	R -	R -	R -	R -	R -	R -	R -	R -	R -
5	**GENERAL ASPECTS**		**R -**	**R 1 407 926,46**	**R 1 407 926,46**	**R 1 407 926,46**	**R 1 749 102,24**	**R 1 422 690,43**	**R 1 422 690,43**	**R 1 422 690,43**	**R 1 422 690,43**	**R 1 407 926,46**
5,1	GENERAL SURFACES		R -	R 1 394 937,40	R 1 394 937,40	R 1 394 937,40	R 1 721 389,55	R 1 394 937,40	R 1 394 937,40	R 1 394 937,40	R 1 394 937,40	R 1 394 937,40
5,2	POST CLOSURE MONITORING AND MAINTENANCE		R -	R 12 989,06	R 12 989,06	R 12 989,06	R 27 712,69	R 27 753,03	R 27 753,03	R 27 753,03	R 27 753,03	R 12 989,06
5,3	SPECIALIST STUDIES		R -	R -	R -	R -	R -	R -	R -	R -	R -	R -
	SUB-TOTAL 1		**R -**	**R 3 196 460,80**	**R 5 151 556,58**	**R 5 536 562,51**	**R 5 877 738,28**	**R 6 297 178,56**	**R 6 297 178,56**	**R 6 297 178,56**	**R 8 588 422,64**	**R 8 573 658,68**
	Weighted Preliminary and General	6%	R -	R 191 008,30	R 308 314,05	R 331 414,41	R 351 001,54	R 376 165,53	R 376 165,53	R 376 165,53	R 513 640,18	R 513 640,18
	Weighted Contingencies	10%	R -	R 319 646,08	R 515 155,66	R 553 656,25	R 587 773,83	R 629 717,86	R 629 717,86	R 629 717,86	R 858 842,26	R 857 365,87
	SUB-TOTAL 2 FOR P&G's AND CONTINGENCIES		**R -**	**R 510 654,38**	**R 823 469,71**	**R 885 070,66**	**R 938 775,36**	**R 1 005 883,39**	**R 1 005 883,39**	**R 1 005 883,39**	**R 1 372 482,44**	**R 1 371 006,04**
	SUB-TOTAL 3		**R -**	**R 3 707 115,18**	**R 5 975 026,29**	**R 6 421 633,16**	**R 6 816 513,65**	**R 7 303 061,95**	**R 7 303 061,95**	**R 7 303 061,95**	**R 9 960 905,08**	**R 9 944 664,72**
	VAT	15%	R -	R 556 067,28	R 896 253,94	R 963 244,97	R 1 022 477,05	R 1 095 459,29	R 1 095 459,29	R 1 095 459,29	R 1 494 135,76	R 1 491 699,71
	GRAND-TOTAL		**R -**	**R 4 263 182,46**	**R 6 871 280,24**	**R 7 384 878,14**	**R 7 838 990,69**	**R 8 398 521,24**	**R 8 398 521,24**	**R 8 398 521,24**	**R 11 455 040,85**	**R 11 436 364,43**

Marula Platinum

Ventilation Shaft 8 & 9 - EMPr Amendment

SUMMARY - INFRASTRUCTURAL ASPECTS												
1	INFRASTRUCTURAL CLOSURE COMPONENTS & CRITERIA			Premature Closure	Closure Forecast	Closure Forecast	Closure Forecast	Closure Forecast	Closure Forecast	Closure Forecast	Closure Forecast	Closure Forecast	Closure Forecast
ID	COMPONENT	CLOSURE CRITERIA		2021	2022	2023	2024	2025	2026	2027	2028	2029	2030
1,1	PLANT AND RELATED STRUCTURES	i. Removal of salvageable equipment (i.e. steel and re-useable material) ii. All plants and related infrastructure will be dismantled and removed at closure iii. All linear items will be removed (i.e. pipelines, powerlines and conveyors) (Refer to Linear Items component) iv. Foundations and structures will be removed to 1m below ground level v. Load and haul material (non-inert waste) vi. General surface rehabilitation of footprint areas (Refer to General Surfaces component) vii. Sorting, screening and disposal of demolition waste (Refer to Waste Disposal component)		R -	R -	R -	R -	R -	R -	R -	R -	R -	R -
1,2	SHAFTS, ADITS AND DECLINES	Ventilation shafts: i. Ventilation shafts and related infrastructure will be dismantled and removed ii. Concrete seal will be constructed as per Mine Health and Safety requirements iii. General surface rehabilitation of footprint areas (Refer to General Surfaces component) iv. Sorting, screening and disposal of demolition waste (Refer to Waste Disposal component)		R -	R 1 384 381,40	R 2 671 367,15	R 2 671 367,15	R 2 671 367,15	R 3 399 027,72	R 3 399 027,72	R 3 399 027,72	R 5 548 682,22	R 5 548 682,22
		Decline shafts (Clapham and Driekop): i. Concrete seal will be constructed at each of the 2 decline shafts as per Mine Health and Safety requirements ii. Portals will be backfilled with inert demolition waste iii. In addition portals will be backfilled with a combination of material sourced from the infrastructural footprint (engineered fill), balanced cut to fill and cemented dry tailings (3% cementation process)											
1,3	SUPPORTING INFRASTRUCTURE	i. All infrastructure will be dismantled and removed at closure ii. Foundations and underground structures will be removed to 1m below ground level iii. Mobile homes and steel containers will be load and hauled to nearest town (Burgersfort) iv. General surface rehabilitation of footprint areas (Refer to General Surfaces component) v. Sorting, screening and disposal of demolition waste (Refer to Waste Disposal component)		R -	R -	R -	R 356 659,20	R 356 659,20	R 356 659,20	R 356 659,20	R 356 659,20	R 356 659,20	R 356 659,20
		Return water dams: i. Remove the HDPE liner and dispose of at a licensed disposal facility ii. Remove a layer of 150mm of sediment material from the dam basin iii. Load and haul the material and dump onto the tailings facility before rehabilitation commences on the top surface of the tailings complex iv. Dam walls will be breached and the material will be dozed inwards to fill the dam basins v. Ameliorate and vegetate Settling dams & Earth lined stormwater dams: i. Remove the sediment layer 1.1m and 1.2m thick respectively from the dam basins. ii. Load and haul the material and dump onto the tailings facility before rehabilitation commences on the top surface of the tailings complex iii. Dam walls will be breached and the material will be dozed inwards to fill the dam basins iv. Ameliorate and vegetate										

1,4	UNDERGROUND INFRASTRUCTURE	Remove all infrastructure with pollution potential and decontaminate the areas.		R -	R -	R -	R -	R -	R -	R -	R -	R -	R -
1,5	SOCIAL INFRASTRUCTURE	i. All infrastructure will be dismantled and removed at closure ii. Foundations and underground structures will be removed to 1m below ground level iii. All mobile homes and steel containers will be load and hauled to nearest town (Burgersfort) iv. General surface rehabilitation of footprint areas (Refer to General Surfaces component) v. Sorting, screening and disposal of demolition waste (Refer to Waste Disposal component)		R -	R -	R -	R -	R -	R -	R -	R -	R -	R -
1,6	OFF-SITE INFRASTRUCTURE	No formal closure criteria for off-site infrastructure		R -	R -	R -	R -	R -	R -	R -	R -	R -	R -
1,7	LINEAR ITEMS	i. All linear items such as pipelines, fences (including security fences), power lines and overland conveyors will be removed ii. General surface rehabilitation of footprint areas (Refer to General Surfaces component) iii. Sorting, screening and disposal of demolition waste (Refer to Waste Disposal component)		R -	R 360 345,11	R 990 470,11	R 994 349,81	R 994 349,81	R 994 349,81	R 994 349,81	R 994 349,81	R 994 349,81	R 994 349,81
1,8	WASTE DISPOSAL	i. Sorting and screening of waste ii. Additional allowance was made to backfill the two portals with inert demolition waste - on site waste disposal iii. Domestic and non-hazardous waste are taken to the nearest, registered municipal waste sites (Atok) iv. 5% allowance for decontamination of waste v. X-ray machine at clinic - Radio-active waste (inventory)		R -	R 43 807,82	R 81 792,86	R 106 259,88	R 106 259,88	R 124 451,40	R 124 451,40	R 124 451,40	R 266 040,98	R 266 040,98
		SUB-TOTAL 1		**R -**	**R 1 788 534,33**	**R 3 743 630,12**	**R 4 128 636,04**	**R 4 128 636,04**	**R 4 874 488,13**	**R 4 874 488,13**	**R 4 874 488,13**	**R 7 165 732,21**	**R 7 165 732,21**

Marula Platinum

Ventilation Shaft 8 & 9 - EMPr Amendment

INFRASTRUCTURAL ASPECTS																
1,2	SHAFTS, ADITS AND DECLINES						Premature Closure							2021		
Line No	Reference Map	GEO Reference	Year Captured	COST COMPONENT	Description		LIABLE	Rate Code	QUANTITY	Unit	Unit Rate	Unit Total		LIABLE VALUE		Notes
1				**Clapham Shaft Complex**					0,00					R	-	
2				**Clapham Ventilation Shaft 8**												
3	00-GA	A2	Y2021	Vent Shaft 8												
4				Plant superstructures	Medium plant structures		No	2.3.2	0,00	m²	R 1 198,08	R	-	R	-	Construction to commence in 2023
5				Structural Concrete	Medium concrete, thickness between 250 and 750mm		No	4,2	0,00	m³	R 937,53	R	-	R	-	
6				Sealing of vertical shaft	Sealing of vertical shaft		No	7.1.1	0,00	sum	R 672 312,29	R	-	R	-	
7	00-GA	A2	Y2021	Bulk Air Cooler												Construction to commence in 2026
8				Plant superstructures	Medium plant structures		No	2.3.2	0,00	m²	R 1 198,08	R	-	R	-	
9				Structural Concrete	Medium concrete, thickness between 250 and 750mm		No	4,2	0,00	m³	R 937,53	R	-	R	-	
10	00-GA	A2	Y2021	Refrigeration Plant & Condenser Cooling Towers												Construction to commence in 2029
11				Refrigeration Plant Structure	Medium concrete, thickness between 250 and 750mm		No	4,2	0,00	m³	R 937,53	R	-	R	-	
12				Cooling Tower Structure	Medium concrete, thickness between 250 and 750mm		No	4,2	0,00	m³	R 937,53	R	-	R	-	
13				Transformer, LV & MV Room	Single storey building		No	3.2.1	0,00	m²	R 816,93	R	-	R	-	
14																
15				**Driekop Shaft Complex**					0,00					R	-	
16				**Driekop Ventilation Shaft 9**												
17	00-GA	A1	Y2021	Vent Shaft 9												
18				Plant superstructures	Medium plant structures		No	2.3.2	0,00	m²	R 1 198,08	R	-	R	-	Construction to commence in 2022
19				Structural Concrete	Medium concrete, thickness between 250 and 750mm		No	4,2	0,00	m³	R 937,53	R	-	R	-	
20				Sealing of vertical shaft	Sealing of vertical shaft		No	7.1.1	0,00	sum	R 672 312,29	R	-	R	-	
21				Sub station	Single storey building		No	3.2.1	0,00	m²	R 816,93	R	-	R	-	
22																
23				**Tailings Complex**					0,00					R	-	
24					Not Applicable		Yes	1,1	0,00	na	R -	R	-	R	-	
				SUB-TOTAL 1										R	-	
				Preliminaries and General		6%								R	-	
				Contingency		10%								R	-	
				SUB-TOTAL 2 (P&G's AND CONTINGENCIES)										R	-	
				GRAND-TOTAL										R	-	

Marula Platinum

Ventilation Shaft 8 & 9 - EMPr Amendment

INFRASTRUCTURAL ASPECTS														
1,2	SHAFTS, ADITS AND DECLINES						Closure Forecast						2022	
Line No	Reference Map	GEO Reference	Year Captured	COST COMPONENT	Description	LIABLE	Rate Code	QUANTITY	Unit	Unit Rate	Unit Total	LIABLE VALUE	Notes
1				**Clapham Shaft Complex**				0,00				**R -**	
2				**Clapham Ventilation Shaft 8**									
3	00-GA	A2	Y2021	Vent Shaft 8									
4				Plant superstructures	Medium plant structures	No	2.3.2	0,00	m²	R 1 198,08	R -	R -	Construction to commence in 2023
5				Structural Concrete	Medium concrete, thickness between 250 and 750mm	No	4,2	0,00	m³	R 937,53	R -	R -	
6				Sealing of vertical shaft	Sealing of vertical shaft	No	7.1.1	0,00	sum	R 672 312,29	R -	R -	
7	00-GA	A2	Y2021	Bulk Air Cooler									Construction to commence in 2026
8				Plant superstructures	Medium plant structures	No	2.3.2	0,00	m²	R 1 198,08	R -	R -	
9				Structural Concrete	Medium concrete, thickness between 250 and 750mm	No	4,2	0,00	m³	R 937,53	R -	R -	
10	00-GA	A2	Y2021	Refrigeration Plant & Condenser Cooling Towers									Construction to commence in 2029
11				Refrigeration Plant Structure	Medium concrete, thickness between 250 and 750mm	No	4,2	0,00	m³	R 937,53	R -	R -	
12				Cooling Tower Structure	Medium concrete, thickness between 250 and 750mm	No	4,2	0,00	m³	R 937,53	R -	R -	
13				Transformer, LV & MV Room	Single storey building	No	3.2.1	0,00	m²	R 816,93	R -	R -	
14													
15				**Driekop Shaft Complex**				234,77				**R 1 384 381,40**	
16				**Driekop Ventilation Shaft 9**									
17	00-GA	A1	Y2021	Vent Shaft 9									
18				Plant superstructures	Medium plant structures	Yes	2.3.2	359,00	m²	R 1 198,08	R 430 110,72	R 430 110,72	Construction commenced
19				Structural Concrete	Medium concrete, thickness between 250 and 750mm	Yes	4,2	150,00	m³	R 937,53	R 140 629,50	R 140 629,50	
20				Sealing of vertical shaft	Sealing of vertical shaft	Yes	7.1.1	1,00	sum	R 672 312,29	R 672 312,29	R 672 312,29	
21				Sub station	Single storey building	Yes	3.2.1	173,00	m²	R 816,93	R 141 328,89	R 141 328,89	
22													
23				**Tailings Complex**				0,00				**R -**	
24					Not Applicable	Yes	1,1	0,00	na	R -	R -	R -	
				SUB-TOTAL 1								**R 1 384 381,40**	
				Preliminaries and General		6%						R 83 062,88	
				Contingency		10%						R 138 438,14	
				SUB-TOTAL 2 (P&G's AND CONTINGENCIES)								**R 221 501,02**	
				GRAND-TOTAL								**R 1 605 882,42**	

Marula Platinum
Ventilation Shaft 8 & 9 - EMPr Amendment

INFRASTRUCTURAL ASPECTS							Closure Forecast						2023	
1,2	SHAFTS, ADITS AND DECLINES													
Line No	Reference Map	GEO Reference	Year Captured	COST COMPONENT	Description		LIABLE	Rate Code	QUANTITY	Unit	Unit Rate	Unit Total	LIABLE VALUE	Notes
1				**Clapham Shaft Complex**					148,30				R 1 286 985,75	
2				**Clapham Ventilation Shaft 8**										
3	00-GA	A2	Y2021	Vent Shaft 8										
4				Plant superstructures	Medium plant structures		Yes	2.3.2	397,00	m²	R 1 198,08	R 475 637,76	R 475 637,76	Construction commenced
5				Structural Concrete	Medium concrete, thickness between 250 and 750mm		Yes	4,2	148,30	m³	R 937,53	R 139 035,70	R 139 035,70	
6				Sealing of vertical shaft	Sealing of vertical shaft		Yes	7.1.1	1,00	sum	R 672 312,29	R 672 312,29	R 672 312,29	
7	00-GA	A2	Y2021	Bulk Air Cooler										Construction to commence in 2026
8				Plant superstructures	Medium plant structures		No	2.3.2	0,00	m²	R 1 198,08	R -	R -	
9				Structural Concrete	Medium concrete, thickness between 250 and 750mm		No	4,2	0,00	m³	R 937,53	R -	R -	
10	00-GA	A2	Y2021	Refrigeration Plant & Condenser Cooling Towers										Construction to commence in 2029
11				Refrigeration Plant Structure	Medium concrete, thickness between 250 and 750mm		No	4,2	0,00	m³	R 937,53	R -	R -	
12				Cooling Tower Structure	Medium concrete, thickness between 250 and 750mm		No	4,2	0,00	m³	R 937,53	R -	R -	
13				Transformer, LV & MV Room	Single storey building		No	3.2.1	0,00	m²	R 816,93	R -	R -	
14														
15				**Driekop Shaft Complex**					234,77				R 1 384 381,40	
16				**Driekop Ventilation Shaft 9**										
17	00-GA	A1	Y2021	Vent Shaft 9										
18				Plant superstructures	Medium plant structures		Yes	2.3.2	359,00	m²	R 1 198,08	R 430 110,72	R 430 110,72	
19				Structural Concrete	Medium concrete, thickness between 250 and 750mm		Yes	4,2	150,00	m³	R 937,53	R 140 629,50	R 140 629,50	
20				Sealing of vertical shaft	Sealing of vertical shaft		Yes	7.1.1	1,00	sum	R 672 312,29	R 672 312,29	R 672 312,29	
21				Sub station	Single storey building		Yes	3.2.1	173,00	m²	R 816,93	R 141 328,89	R 141 328,89	
22														
23				**Tailings Complex**					0,00				R -	
24					Not Applicable		Yes	1,1	0,00	na	R -	R -	R -	
					SUB-TOTAL 1								**R 2 671 367,15**	
					Preliminaries and General	6%							R 160 282,03	
					Contingency	10%							R 267 136,71	
					SUB-TOTAL 2 (P&G's AND CONTINGENCIES)								**R 427 418,74**	
					GRAND-TOTAL								**R 3 098 785,89**	

Marula Platinum

Ventilation Shaft 8 & 9 - EMPr Amendment

INFRASTRUCTURAL ASPECTS															
1,2	SHAFTS, ADITS AND DECLINES						Closure Forecast						2024		
Line No	Reference Map	GEO Reference	Year Captured	COST COMPONENT	Description		LIABLE	Rate Code	QUANTITY	Unit	Unit Rate	Unit Total	LIABLE VALUE		Notes
1				**Clapham Shaft Complex**					148,30				R	**1 286 985,75**	
2				**Clapham Ventilation Shaft 8**											
3	00-GA	A2	Y2021	Vent Shaft 8											
4				Plant superstructures	Medium plant structures		Yes	2.3.2	397,00	m²	R 1 198,08	R 475 637,76	R	475 637,76	
5				Structural Concrete	Medium concrete, thickness between 250 and 750mm		Yes	4,2	148,30	m³	R 937,53	R 139 035,70	R	139 035,70	
6				Sealing of vertical shaft	Sealing of vertical shaft		Yes	7.1.1	1,00	sum	R 672 312,29	R 672 312,29	R	672 312,29	
7	00-GA	A2	Y2021	Bulk Air Cooler											Construction to commence in 2026
8				Plant superstructures	Medium plant structures		No	2.3.2	0,00	m²	R 1 198,08	R -	R	-	
9				Structural Concrete	Medium concrete, thickness between 250 and 750mm		No	4,2	0,00	m³	R 937,53	R -	R	-	
10	00-GA	A2	Y2021	Refrigeration Plant & Condenser Cooling Towers											Construction to commence in 2029
11				Refrigeration Plant Structure	Medium concrete, thickness between 250 and 750mm		No	4,2	0,00	m³	R 937,53	R -	R	-	
12				Cooling Tower Structure	Medium concrete, thickness between 250 and 750mm		No	4,2	0,00	m³	R 937,53	R -	R	-	
13				Transformer, LV & MV Room	Single storey building		No	3.2.1	0,00	m²	R 816,93	R -	R	-	
14															
15				**Driekop Shaft Complex**					234,77				R	**1 384 381,40**	
16				**Driekop Ventilation Shaft 9**											
17	00-GA	A1	Y2021	Vent Shaft 9											
18				Plant superstructures	Medium plant structures		Yes	2.3.2	359,00	m²	R 1 198,08	R 430 110,72	R	430 110,72	
19				Structural Concrete	Medium concrete, thickness between 250 and 750mm		Yes	4,2	150,00	m³	R 937,53	R 140 629,50	R	140 629,50	
20				Sealing of vertical shaft	Sealing of vertical shaft		Yes	7.1.1	1,00	sum	R 672 312,29	R 672 312,29	R	672 312,29	
21				Sub station	Single storey building		Yes	3.2.1	173,00	m²	R 816,93	R 141 328,89	R	141 328,89	
22															
23				**Tailings Complex**					0,00				R	-	
24					Not Applicable		Yes	1,1	0,00	na	R -	R -	R	-	
						SUB-TOTAL 1							R	**2 671 367,15**	
						Preliminaries and General	6%						R	160 282,03	
						Contingency	10%						R	267 136,71	
						SUB-TOTAL 2 (P&G's AND CONTINGENCIES)							R	**427 418,74**	
						GRAND-TOTAL							R	**3 098 785,89**	

Marula Platinum

Ventilation Shaft 8 & 9 - EMPr Amendment

INFRASTRUCTURAL ASPECTS															
1,2	SHAFTS, ADITS AND DECLINES						Closure Forecast						2025		
Line No	Reference Map	GEO Reference	Year Captured	COST COMPONENT	Description		LIABLE	Rate Code	QUANTITY	Unit	Unit Rate	Unit Total	LIABLE VALUE		Notes
1				**Clapham Shaft Complex**					148,30				R	**1 286 985,75**	
2				**Clapham Ventilation Shaft 8**											
3	00-GA	A2	Y2021	Vent Shaft 8											
4				Plant superstructures	Medium plant structures		Yes	2.3.2	397,00	m²	R 1 198,08	R 475 637,76	R	475 637,76	
5				Structural Concrete	Medium concrete, thickness between 250 and 750mm		Yes	4,2	148,30	m³	R 937,53	R 139 035,70	R	139 035,70	
6				Sealing of vertical shaft	Sealing of vertical shaft		Yes	7.1.1	1,00	sum	R 672 312,29	R 672 312,29	R	672 312,29	
7	00-GA	A2	Y2021	Bulk Air Cooler											Construction to commence in 2026
8				Plant superstructures	Medium plant structures		No	2.3.2	0,00	m²	R 1 198,08	R -	R	-	
9				Structural Concrete	Medium concrete, thickness between 250 and 750mm		No	4,2	0,00	m³	R 937,53	R -	R	-	
10	00-GA	A2	Y2021	Refrigeration Plant & Condenser Cooling Towers											Construction to commence in 2029
11				Refrigeration Plant Structure	Medium concrete, thickness between 250 and 750mm		No	4,2	0,00	m³	R 937,53	R -	R	-	
12				Cooling Tower Structure	Medium concrete, thickness between 250 and 750mm		No	4,2	0,00	m³	R 937,53	R -	R	-	
13				Transformer, LV & MV Room	Single storey building		No	3.2.1	0,00	m²	R 816,93	R -	R	-	
14															
15				**Driekop Shaft Complex**					234,77				R	**1 384 381,40**	
16				**Driekop Ventilation Shaft 9**											
17	00-GA	A1	Y2021	Vent Shaft 9											
18				Plant superstructures	Medium plant structures		Yes	2.3.2	359,00	m²	R 1 198,08	R 430 110,72	R	430 110,72	
19				Structural Concrete	Medium concrete, thickness between 250 and 750mm		Yes	4,2	150,00	m³	R 937,53	R 140 629,50	R	140 629,50	
20				Sealing of vertical shaft	Sealing of vertical shaft		Yes	7.1.1	1,00	sum	R 672 312,29	R 672 312,29	R	672 312,29	
21				Sub station	Single storey building		Yes	3.2.1	173,00	m²	R 816,93	R 141 328,89	R	141 328,89	
22															
23				**Tailings Complex**					0,00				R	-	
24					Not Applicable		Yes	1,1	0,00	na	R -	R -	R	-	
						SUB-TOTAL 1							R	**2 671 367,15**	
						Preliminaries and General	6%						R	160 282,03	
						Contingency	10%						R	267 136,71	
						SUB-TOTAL 2 (P&G's AND CONTINGENCIES)							R	**427 418,74**	
						GRAND-TOTAL							R	**3 098 785,89**	

Marula Platinum

Ventilation Shaft 8 & 9 - EMPr Amendment

INFRASTRUCTURAL ASPECTS														
1,2	SHAFTS, ADITS AND DECLINES						Closure Forecast						2026	
Line No	Reference Map	GEO Reference	Year Captured	COST COMPONENT	Description	LIABLE	Rate Code	QUANTITY	Unit	Unit Rate	Unit Total	LIABLE VALUE	Notes
1				**Clapham Shaft Complex**				148,30				**R 2 014 646,32**	
2				**Clapham Ventilation Shaft 8**									
3	00-GA	A2	Y2021	Vent Shaft 8									
4				Plant superstructures	Medium plant structures	Yes	2.3.2	397,00	m²	R 1 198,08	R 475 637,76	R 475 637,76	
5				Structural Concrete	Medium concrete, thickness between 250 and 750mm	Yes	4,2	148,30	m³	R 937,53	R 139 035,70	R 139 035,70	
6				Sealing of vertical shaft	Sealing of vertical shaft	Yes	7.1.1	1,00	sum	R 672 312,29	R 672 312,29	R 672 312,29	
7	00-GA	A2	Y2021	Bulk Air Cooler									
8				Plant superstructures	Medium plant structures	Yes	2.3.2	265,00	m²	R 1 198,08	R 317 491,20	R 317 491,20	Construction commenced
9				Structural Concrete	Medium concrete, thickness between 250 and 750mm	Yes	4,2	437,50	m³	R 937,53	R 410 169,38	R 410 169,38	Assume 10m high
10	00-GA	A2	Y2021	Refrigeration Plant & Condenser Cooling Towers									Construction to commence in 2029
11				Refrigeration Plant Structure	Medium concrete, thickness between 250 and 750mm	No	4,2	0,00	m³	R 937,53	R -	R -	
12				Cooling Tower Structure	Medium concrete, thickness between 250 and 750mm	No	4,2	0,00	m³	R 937,53	R -	R -	
13				Transformer, LV & MV Room	Single storey building	No	3.2.1	0,00	m²	R 816,93	R -	R -	
14													
15				**Driekop Shaft Complex**				234,77				**R 1 384 381,40**	
16				**Driekop Ventilation Shaft 9**									
17	00-GA	A1	Y2021	Vent Shaft 9									
18				Plant superstructures	Medium plant structures	Yes	2.3.2	359,00	m²	R 1 198,08	R 430 110,72	R 430 110,72	
19				Structural Concrete	Medium concrete, thickness between 250 and 750mm	Yes	4,2	150,00	m³	R 937,53	R 140 629,50	R 140 629,50	
20				Sealing of vertical shaft	Sealing of vertical shaft	Yes	7.1.1	1,00	sum	R 672 312,29	R 672 312,29	R 672 312,29	
21				Sub station	Single storey building	Yes	3.2.1	173,00	m²	R 816,93	R 141 328,89	R 141 328,89	
22													
23				**Tailings Complex**				0,00				**R -**	
24					Not Applicable	Yes	1,1	0,00	na	R -	R -	R -	
					SUB-TOTAL 1							**R 3 399 027,72**	
					Preliminaries and General	6%						R 203 941,66	
					Contingency	10%						R 339 902,77	
					SUB-TOTAL 2 (P&G's AND CONTINGENCIES)							**R 543 844,44**	
					GRAND-TOTAL							**R 3 942 872,16**	

Marula Platinum

Ventilation Shaft 8 & 9 - EMPr Amendment

INFRASTRUCTURAL ASPECTS														
1,2	SHAFTS, ADITS AND DECLINES						Closure Forecast						2027	
Line No	Reference Map	GEO Reference	Year Captured	COST COMPONENT	Description	LIABLE	Rate Code	QUANTITY	Unit	Unit Rate	Unit Total	LIABLE VALUE	Notes
1				**Clapham Shaft Complex**				148,30				**R 2 014 646,32**	
2				**Clapham Ventilation Shaft 8**									
3	00-GA	A2	Y2021	Vent Shaft 8									
4				Plant superstructures	Medium plant structures	Yes	2.3.2	397,00	m²	R 1 198,08	R 475 637,76	R 475 637,76	
5				Structural Concrete	Medium concrete, thickness between 250 and 750mm	Yes	4,2	148,30	m³	R 937,53	R 139 035,70	R 139 035,70	
6				Sealing of vertical shaft	Sealing of vertical shaft	Yes	7.1.1	1,00	sum	R 672 312,29	R 672 312,29	R 672 312,29	
7	00-GA	A2	Y2021	Bulk Air Cooler									
8				Plant superstructures	Medium plant structures	Yes	2.3.2	265,00	m²	R 1 198,08	R 317 491,20	R 317 491,20	
9				Structural Concrete	Medium concrete, thickness between 250 and 750mm	Yes	4,2	437,50	m³	R 937,53	R 410 169,38	R 410 169,38	Assume 10m high
10	00-GA	A2	Y2021	Refrigeration Plant & Condenser Cooling Towers									Construction to commence in 2029
11				Refrigeration Plant Structure	Medium concrete, thickness between 250 and 750mm	No	4,2	0,00	m³	R 937,53	R -	R -	
12				Cooling Tower Structure	Medium concrete, thickness between 250 and 750mm	No	4,2	0,00	m³	R 937,53	R -	R -	
13				Transformer, LV & MV Room	Single storey building	No	3.2.1	0,00	m²	R 816,93	R -	R -	
14													
15				**Driekop Shaft Complex**				234,77				**R 1 384 381,40**	
16				**Driekop Ventilation Shaft 9**									
17	00-GA	A1	Y2021	Vent Shaft 9									
18				Plant superstructures	Medium plant structures	Yes	2.3.2	359,00	m²	R 1 198,08	R 430 110,72	R 430 110,72	
19				Structural Concrete	Medium concrete, thickness between 250 and 750mm	Yes	4,2	150,00	m³	R 937,53	R 140 629,50	R 140 629,50	
20				Sealing of vertical shaft	Sealing of vertical shaft	Yes	7.1.1	1,00	sum	R 672 312,29	R 672 312,29	R 672 312,29	
21				Sub station	Single storey building	Yes	3.2.1	173,00	m²	R 816,93	R 141 328,89	R 141 328,89	
22													
23				**Tailings Complex**				0,00				**R -**	
24					Not Applicable	Yes	1,1	0,00	na	R -	R -	R -	
					SUB-TOTAL 1							**R 3 399 027,72**	
					Preliminaries and General	6%						R 203 941,66	
					Contingency	10%						R 339 902,77	
					SUB-TOTAL 2 (P&G's AND CONTINGENCIES)							**R 543 844,44**	
					GRAND-TOTAL							**R 3 942 872,16**	

Marula Platinum
Ventilation Shaft 8 & 9 - EMPr Amendment

INFRASTRUCTURAL ASPECTS						Closure Forecast						2028	
1,2	SHAFTS, ADITS AND DECLINES												
Line No	Reference Map	GEO Reference	Year Captured	COST COMPONENT	Description	LIABLE	Rate Code	QUANTITY	Unit	Unit Rate	Unit Total	LIABLE VALUE	Notes
1				**Clapham Shaft Complex**				148,30				R 2 014 646,32	
2				**Clapham Ventilation Shaft 8**									
3	00-GA	A2	Y2021	Vent Shaft 8									
4				Plant superstructures	Medium plant structures	Yes	2.3.2	397,00	m²	R 1 198,08	R 475 637,76	R 475 637,76	
5				Structural Concrete	Medium concrete, thickness between 250 and 750mm	Yes	4,2	148,30	m³	R 937,53	R 139 035,70	R 139 035,70	
6				Sealing of vertical shaft	Sealing of vertical shaft	Yes	7.1.1	1,00	sum	R 672 312,29	R 672 312,29	R 672 312,29	
7	00-GA	A2	Y2021	Bulk Air Cooler									
8				Plant superstructures	Medium plant structures	Yes	2.3.2	265,00	m²	R 1 198,08	R 317 491,20	R 317 491,20	
9				Structural Concrete	Medium concrete, thickness between 250 and 750mm	Yes	4,2	437,50	m³	R 937,53	R 410 169,38	R 410 169,38	Assume 10m high
10	00-GA	A2	Y2021	Refrigeration Plant & Condenser Cooling Towers									Construction to commence in 2029
11				Refrigeration Plant Structure	Medium concrete, thickness between 250 and 750mm	No	4,2	0,00	m³	R 937,53	R -	R -	
12				Cooling Tower Structure	Medium concrete, thickness between 250 and 750mm	No	4,2	0,00	m³	R 937,53	R -	R -	
13				Transformer, LV & MV Room	Single storey building	No	3.2.1	0,00	m²	R 816,93	R -	R -	
14													
15				**Driekop Shaft Complex**				234,77				R 1 384 381,40	
16				**Driekop Ventilation Shaft 9**									
17	00-GA	A1	Y2021	Vent Shaft 9									
18				Plant superstructures	Medium plant structures	Yes	2.3.2	359,00	m²	R 1 198,08	R 430 110,72	R 430 110,72	
19				Structural Concrete	Medium concrete, thickness between 250 and 750mm	Yes	4,2	150,00	m³	R 937,53	R 140 629,50	R 140 629,50	
20				Sealing of vertical shaft	Sealing of vertical shaft	Yes	7.1.1	1,00	sum	R 672 312,29	R 672 312,29	R 672 312,29	
21				Sub station	Single storey building	Yes	3.2.1	173,00	m²	R 816,93	R 141 328,89	R 141 328,89	
22													
23				**Tailings Complex**				0,00				R -	
24					Not Applicable	Yes	1,1	0,00	na	R -	R -	R -	

SUB-TOTAL 1		**R 3 399 027,72**
Preliminaries and General	6%	R 203 941,66
Contingency	10%	R 339 902,77
SUB-TOTAL 2 (P&G's AND CONTINGENCIES)		**R 543 844,44**
GRAND-TOTAL		**R 3 942 872,16**

Marula Platinum

Ventilation Shaft 8 & 9 - EMPr Amendment

INFRASTRUCTURAL ASPECTS														
1,2	SHAFTS, ADITS AND DECLINES						Closure Forecast						2029	
Line No	Reference Map	GEO Reference	Year Captured	COST COMPONENT	Description	LIABLE	Rate Code	QUANTITY	Unit	Unit Rate	Unit Total	LIABLE VALUE		Notes
1				**Clapham Shaft Complex**				2390,47				R	**4 164 300,82**	
2				**Clapham Ventilation Shaft 8**										
3	00-GA	A2	Y2021	Vent Shaft 8										
4				Plant superstructures	Medium plant structures	Yes	2.3.2	397,00	m²	R 1 198,08	R 475 637,76	R	475 637,76	
5				Structural Concrete	Medium concrete, thickness between 250 and 750mm	Yes	4,2	148,30	m³	R 937,53	R 139 035,70	R	139 035,70	
6				Sealing of vertical shaft	Sealing of vertical shaft	Yes	7.1.1	1,00	sum	R 672 312,29	R 672 312,29	R	672 312,29	
7	00-GA	A2	Y2021	Bulk Air Cooler										
8				Plant superstructures	Medium plant structures	Yes	2.3.2	265,00	m²	R 1 198,08	R 317 491,20	R	317 491,20	
9				Structural Concrete	Medium concrete, thickness between 250 and 750mm	Yes	4,2	437,50	m³	R 937,53	R 410 169,38	R	410 169,38	Assume 10m high
10	00-GA	A2	Y2021	Refrigeration Plant & Condenser Cooling Towers										Construction commenced
11				Refrigeration Plant Structure	Medium concrete, thickness between 250 and 750mm	Yes	4,2	1249,50	m³	R 937,53	R 1 171 443,74	R	1 171 443,74	Assume 10m high
12				Cooling Tower Structure	Medium concrete, thickness between 250 and 750mm	Yes	4,2	927,50	m³	R 937,53	R 869 559,08	R	869 559,08	Assume 10m high
13				Transformer, LV & MV Room	Single storey building	Yes	3.2.1	133,00	m²	R 816,93	R 108 651,69	R	108 651,69	
14														
15				**Driekop Shaft Complex**				234,77				R	**1 384 381,40**	
16				**Driekop Ventilation Shaft 9**										
17	00-GA	A1	Y2021	Vent Shaft 9										
18				Plant superstructures	Medium plant structures	Yes	2.3.2	359,00	m²	R 1 198,08	R 430 110,72	R	430 110,72	
19				Structural Concrete	Medium concrete, thickness between 250 and 750mm	Yes	4,2	150,00	m³	R 937,53	R 140 629,50	R	140 629,50	
20				Sealing of vertical shaft	Sealing of vertical shaft	Yes	7.1.1	1,00	sum	R 672 312,29	R 672 312,29	R	672 312,29	
21				Sub station	Single storey building	Yes	3.2.1	173,00	m²	R 816,93	R 141 328,89	R	141 328,89	
22														
23				**Tailings Complex**				0,00				R	**-**	
24					Not Applicable	Yes	1,1	0,00	na	R -	R -	R	-	
					SUB-TOTAL 1							R	**5 548 682,22**	
					Preliminaries and General	6%						R	332 920,93	
					Contingency	10%						R	554 868,22	
					SUB-TOTAL 2 (P&G's AND CONTINGENCIES)							R	**887 789,16**	
					GRAND-TOTAL							R	**6 436 471,38**	

Marula Platinum

Ventilation Shaft 8 & 9 - EMPr Amendment

INFRASTRUCTURAL ASPECTS															
1,2	SHAFTS, ADITS AND DECLINES						Closure Forecast						2030		
Line No	Reference Map	GEO Reference	Year Captured	COST COMPONENT	Description		LIABLE	Rate Code	QUANTITY	Unit	Unit Rate	Unit Total	LIABLE VALUE		Notes
1				**Clapham Shaft Complex**					2390,47				R	**4 164 300,82**	
2				**Clapham Ventilation Shaft 8**											
3	00-GA	A2	Y2021	Vent Shaft 8											
4				Plant superstructures	Medium plant structures		Yes	2.3.2	397,00	m²	R 1 198,08	R 475 637,76	R	475 637,76	
5				Structural Concrete	Medium concrete, thickness between 250 and 750mm		Yes	4,2	148,30	m³	R 937,53	R 139 035,70	R	139 035,70	
6				Sealing of vertical shaft	Sealing of vertical shaft		Yes	7.1.1	1,00	sum	R 672 312,29	R 672 312,29	R	672 312,29	
7	00-GA	A2	Y2021	Bulk Air Cooler											
8				Plant superstructures	Medium plant structures		Yes	2.3.2	265,00	m²	R 1 198,08	R 317 491,20	R	317 491,20	
9				Structural Concrete	Medium concrete, thickness between 250 and 750mm		Yes	4,2	437,50	m³	R 937,53	R 410 169,38	R	410 169,38	Assume 10m high
10	00-GA	A2	Y2021	Refrigeration Plant & Condenser Cooling Towers											
11				Refrigeration Plant Structure	Medium concrete, thickness between 250 and 750mm		Yes	4,2	1249,50	m³	R 937,53	R 1 171 443,74	R	1 171 443,74	Assume 10m high
12				Cooling Tower Structure	Medium concrete, thickness between 250 and 750mm		Yes	4,2	927,50	m³	R 937,53	R 869 559,08	R	869 559,08	Assume 10m high
13				Transformer, LV & MV Room	Single storey building		Yes	3.2.1	133,00	m²	R 816,93	R 108 651,69	R	108 651,69	
14															
15				**Driekop Shaft Complex**					234,77				R	**1 384 381,40**	
16				**Driekop Ventilation Shaft 9**											
17	00-GA	A1	Y2021	Vent Shaft 9											
18				Plant superstructures	Medium plant structures		Yes	2.3.2	359,00	m²	R 1 198,08	R 430 110,72	R	430 110,72	
19				Structural Concrete	Medium concrete, thickness between 250 and 750mm		Yes	4,2	150,00	m³	R 937,53	R 140 629,50	R	140 629,50	
20				Sealing of vertical shaft	Sealing of vertical shaft		Yes	7.1.1	1,00	sum	R 672 312,29	R 672 312,29	R	672 312,29	
21				Sub station	Single storey building		Yes	3.2.1	173,00	m²	R 816,93	R 141 328,89	R	141 328,89	
22															
23				**Tailings Complex**					0,00				R	**-**	
24					Not Applicable		Yes	1,1	0,00	na	R -	R -	R	-	
													R	**5 548 682,22**	
					Preliminaries and General	6%							R	332 920,93	
					Contingency	10%							R	554 868,22	
					SUB-TOTAL 2 (P&G's AND CONTINGENCIES)								**R**	**887 789,16**	
					GRAND-TOTAL								**R**	**6 436 471,38**	

Marula Platinum

Ventilation Shaft 8 & 9 - EMPr Amendment

INFRASTRUCTURAL ASPECTS							Premature Closure						2021	
1,3	SUPPORTING INFRASTRUCTURE													
Line No	Reference Map	GEO Reference	Year Captured	COST COMPONENT	Description		LIABLE	Rate Code	QUANTITY	Unit	Unit Rate	Unit Total	LIABLE VALUE	Notes
1				**Clapham Shaft Complex**					0,00				R -	
2				**Clapham Ventilation Shaft 8**										
3	00-GA	A7.1	Y2021	Change House	Single storey building		No	3.1.1	0,00	m²	R 440,32	R -	R -	Construction to commence in 2024
4														
5				**Driekop Shaft Complex**					0,00				R -	
6				**Driekop Ventilation Shaft 9**										
7	00-GA	A7.2	Y2021	Change house	Single storey building		No	3.1.1	0,00	m²	R 440,32	R -	R -	Construction to commence in 2024
8														
9				**Tailings Complex**									R -	
10					Not Applicable		Yes	1,1	0,00	na	R -	R -	R -	
						SUB-TOTAL 1							R -	
						Preliminaries and General	6%						R -	
						Contingency	10%						R -	
						SUB-TOTAL 2 (P&G's AND CONTINGENCIES)							R -	
						GRAND-TOTAL							R -	

Marula Platinum

Ventilation Shaft 8 & 9 - EMPr Amendment

INFRASTRUCTURAL ASPECTS							Closure Forecast						2022	
1,3	SUPPORTING INFRASTRUCTURE													
Line No	Reference Map	GEO Reference	Year Captured	COST COMPONENT	Description		LIABLE	Rate Code	QUANTITY	Unit	Unit Rate	Unit Total	LIABLE VALUE	Notes
1				Clapham Shaft Complex					0,00				R -	
2				Clapham Ventilation Shaft 8										
3	00-GA	A7.1	Y2021	Change House	Single storey building		No	3.1.1	0,00	m²	R 440,32	R -	R -	Construction to commence in 2024
4														
5				Driekop Shaft Complex					0,00				R -	
6				Driekop Ventilation Shaft 9										
7	00-GA	A7.2	Y2021	Change house	Single storey building		No	3.1.1	0,00	m²	R 440,32	R -	R -	Construction to commence in 2024
8														
9				Tailings Complex									R -	
10					Not Applicable		Yes	1,1	0,00	na	R -	R -	R -	
						SUB-TOTAL 1							R -	
						Preliminaries and General	6%						R -	
						Contingency	10%						R -	
						SUB-TOTAL 2 (P&G's AND CONTINGENCIES)							R -	
						GRAND-TOTAL							R -	

Marula Platinum

Ventilation Shaft 8 & 9 - EMPr Amendment

INFRASTRUCTURAL ASPECTS							Closure Forecast						2023	
1,3	SUPPORTING INFRASTRUCTURE													
Line No	Reference Map	GEO Reference	Year Captured	COST COMPONENT	Description		LIABLE	Rate Code	QUANTITY	Unit	Unit Rate	Unit Total	LIABLE VALUE	Notes
1				**Clapham Shaft Complex**					0,00				R -	
2				**Clapham Ventilation Shaft 8**										
3	00-GA	A7.1	Y2021	Change House	Single storey building		No	3.1.1	0,00	m²	R 440,32	R -	R -	Construction to commence in 2024
4														
5				**Driekop Shaft Complex**					0,00				R -	
6				**Driekop Ventilation Shaft 9**										
7	00-GA	A7.2	Y2021	Change house	Single storey building		No	3.1.1	0,00	m²	R 440,32	R -	R -	Construction to commence in 2024
8														
9				**Tailings Complex**									R -	
10					Not Applicable		Yes	1,1	0,00	na	R -	R -	R -	
						SUB-TOTAL 1							R -	
						Preliminaries and General	6%						R -	
						Contingency	10%						R -	
						SUB-TOTAL 2 (P&G's AND CONTINGENCIES)							R -	
						GRAND-TOTAL							R -	

Marula Platinum

Ventilation Shaft 8 & 9 - EMPr Amendment

INFRASTRUCTURAL ASPECTS							Closure Forecast						2024	
1,3	SUPPORTING INFRASTRUCTURE													
Line No	Reference Map	GEO Reference	Year Captured	COST COMPONENT	Description		LIABLE	Rate Code	QUANTITY	Unit	Unit Rate	Unit Total	LIABLE VALUE	Notes
1				**Clapham Shaft Complex**					215,60				**R 193 740,80**	
2				**Clapham Ventilation Shaft 8**										
3	00-GA	A7.1	Y2021	Change House	Single storey building		Yes	3.1.1	440,00	m²	R 440,32	R 193 740,80	R 193 740,80	Construction commenced
4														
5				**Driekop Shaft Complex**					181,30				**R 162 918,40**	
6				**Driekop Ventilation Shaft 9**										
7	00-GA	A7.2	Y2021	Change house	Single storey building		Yes	3.1.1	370,00	m²	R 440,32	R 162 918,40	R 162 918,40	Construction commenced
8														
9				**Tailings Complex**									**R -**	
10					Not Applicable		Yes	1,1	0,00	na	R -	R -	R -	
						SUB-TOTAL 1							**R 356 659,20**	
						Preliminaries and General	6%						R 21 399,55	
						Contingency	10%						R 35 665,92	
						SUB-TOTAL 2 (P&G's AND CONTINGENCIES)							**R 57 065,47**	
						GRAND-TOTAL							**R 413 724,67**	

Marula Platinum

Ventilation Shaft 8 & 9 - EMPr Amendment

INFRASTRUCTURAL ASPECTS							Closure Forecast						2025	
1,3	SUPPORTING INFRASTRUCTURE													
Line No	Reference Map	GEO Reference	Year Captured	COST COMPONENT	Description		LIABLE	Rate Code	QUANTITY	Unit	Unit Rate	Unit Total	LIABLE VALUE	Notes
1				**Clapham Shaft Complex**					215,60				**R 193 740,80**	
2				**Clapham Ventilation Shaft 8**										
3	00-GA	A7.1	Y2021	Change House	Single storey building		Yes	3.1.1	440,00	m²	R 440,32	R 193 740,80	R 193 740,80	
4														
5				**Driekop Shaft Complex**					181,30				**R 162 918,40**	
6				**Driekop Ventilation Shaft 9**										
7	00-GA	A7.2	Y2021	Change house	Single storey building		Yes	3.1.1	370,00	m²	R 440,32	R 162 918,40	R 162 918,40	
8														
9				**Tailings Complex**									**R -**	
10					Not Applicable		Yes	1,1	0,00	na	R -	R -	R -	
					SUB-TOTAL 1								**R 356 659,20**	
					Preliminaries and General	6%							R 21 399,55	
					Contingency	10%							R 35 665,92	
					SUB-TOTAL 2 (P&G's AND CONTINGENCIES)								**R 57 065,47**	
					GRAND-TOTAL								**R 413 724,67**	

Marula Platinum

Ventilation Shaft 8 & 9 - EMPr Amendment

INFRASTRUCTURAL ASPECTS							Closure Forecast						2026	
1,3	SUPPORTING INFRASTRUCTURE													
Line No	Reference Map	GEO Reference	Year Captured	COST COMPONENT	Description		LIABLE	Rate Code	QUANTITY	Unit	Unit Rate	Unit Total	LIABLE VALUE	Notes
1				**Clapham Shaft Complex**					215,60				**R 193 740,80**	
2				**Clapham Ventilation Shaft 8**										
3	00-GA	A7.1	Y2021	Change House	Single storey building		Yes	3.1.1	440,00	m²	R 440,32	R 193 740,80	R 193 740,80	
4														
5				**Driekop Shaft Complex**					181,30				**R 162 918,40**	
6				**Driekop Ventilation Shaft 9**										
7	00-GA	A7.2	Y2021	Change house	Single storey building		Yes	3.1.1	370,00	m²	R 440,32	R 162 918,40	R 162 918,40	
8														
9				**Tailings Complex**									**R -**	
10					Not Applicable		Yes	1,1	0,00	na	R -	R -	R -	
						SUB-TOTAL 1							**R 356 659,20**	
						Preliminaries and General	6%						R 21 399,55	
						Contingency	10%						R 35 665,92	
						SUB-TOTAL 2 (P&G's AND CONTINGENCIES)							**R 57 065,47**	
						GRAND-TOTAL							**R 413 724,67**	

Marula Platinum

Ventilation Shaft 8 & 9 - EMPr Amendment

INFRASTRUCTURAL ASPECTS							Closure Forecast						2027	
1,3	SUPPORTING INFRASTRUCTURE													
Line No	Reference Map	GEO Reference	Year Captured	COST COMPONENT	Description		LIABLE	Rate Code	QUANTITY	Unit	Unit Rate	Unit Total	LIABLE VALUE	Notes
1				**Clapham Shaft Complex**					215,60				**R 193 740,80**	
2				**Clapham Ventilation Shaft 8**										
3	00-GA	A7.1	Y2021	Change House	Single storey building		Yes	3.1.1	440,00	m²	R 440,32	R 193 740,80	R 193 740,80	
4														
5				**Driekop Shaft Complex**					181,30				**R 162 918,40**	
6				**Driekop Ventilation Shaft 9**										
7	00-GA	A7.2	Y2021	Change house	Single storey building		Yes	3.1.1	370,00	m²	R 440,32	R 162 918,40	R 162 918,40	
8														
9				**Tailings Complex**									**R -**	
10					Not Applicable		Yes	1,1	0,00	na	R -	R -	R -	
					SUB-TOTAL 1								**R 356 659,20**	
					Preliminaries and General	6%							R 21 399,55	
					Contingency	10%							R 35 665,92	
					SUB-TOTAL 2 (P&G's AND CONTINGENCIES)								**R 57 065,47**	
					GRAND-TOTAL								**R 413 724,67**	

Marula Platinum

Ventilation Shaft 8 & 9 - EMPr Amendment

INFRASTRUCTURAL ASPECTS							Closure Forecast						2028	
1,3	SUPPORTING INFRASTRUCTURE													
Line No	Reference Map	GEO Reference	Year Captured	COST COMPONENT	Description		LIABLE	Rate Code	QUANTITY	Unit	Unit Rate	Unit Total	LIABLE VALUE	Notes
1				**Clapham Shaft Complex**					215,60				**R 193 740,80**	
2				**Clapham Ventilation Shaft 8**										
3	00-GA	A7.1	Y2021	Change House	Single storey building		Yes	3.1.1	440,00	m²	R 440,32	R 193 740,80	R 193 740,80	
4														
5				**Driekop Shaft Complex**					181,30				**R 162 918,40**	
6				**Driekop Ventilation Shaft 9**										
7	00-GA	A7.2	Y2021	Change house	Single storey building		Yes	3.1.1	370,00	m²	R 440,32	R 162 918,40	R 162 918,40	
8														
9				**Tailings Complex**									**R -**	
10					Not Applicable		Yes	1,1	0,00	na	R -	R -	R -	
						SUB-TOTAL 1							**R 356 659,20**	
						Preliminaries and General	6%						R 21 399,55	
						Contingency	10%						R 35 665,92	
						SUB-TOTAL 2 (P&G's AND CONTINGENCIES)							**R 57 065,47**	
						GRAND-TOTAL							**R 413 724,67**	

Marula Platinum

Ventilation Shaft 8 & 9 - EMPr Amendment

INFRASTRUCTURAL ASPECTS							Closure Forecast						2029	
1,3	SUPPORTING INFRASTRUCTURE													
Line No	Reference Map	GEO Reference	Year Captured	COST COMPONENT	Description		LIABLE	Rate Code	QUANTITY	Unit	Unit Rate	Unit Total	LIABLE VALUE	Notes
1				**Clapham Shaft Complex**					215,60				**R 193 740,80**	
2				**Clapham Ventilation Shaft 8**										
3	00-GA	A7.1	Y2021	Change House	Single storey building		Yes	3.1.1	440,00	m²	R 440,32	R 193 740,80	R 193 740,80	
4														
5				**Driekop Shaft Complex**					181,30				**R 162 918,40**	
6				**Driekop Ventilation Shaft 9**										
7	00-GA	A7.2	Y2021	Change house	Single storey building		Yes	3.1.1	370,00	m²	R 440,32	R 162 918,40	R 162 918,40	
8														
9				**Tailings Complex**									**R -**	
10					Not Applicable		Yes	1,1	0,00	na	R -	R -	R -	
					SUB-TOTAL 1								**R 356 659,20**	
					Preliminaries and General	6%							R 21 399,55	
					Contingency	10%							R 35 665,92	
					SUB-TOTAL 2 (P&G's AND CONTINGENCIES)								**R 57 065,47**	
					GRAND-TOTAL								**R 413 724,67**	

Marula Platinum

Ventilation Shaft 8 & 9 - EMPr Amendment

INFRASTRUCTURAL ASPECTS							Closure Forecast						2030	
1,3	SUPPORTING INFRASTRUCTURE													
Line No	Reference Map	GEO Reference	Year Captured	COST COMPONENT	Description		LIABLE	Rate Code	QUANTITY	Unit	Unit Rate	Unit Total	LIABLE VALUE	Notes
1				**Clapham Shaft Complex**					215,60				**R 193 740,80**	
2				**Clapham Ventilation Shaft 8**										
3	00-GA	A7.1	Y2021	Change House	Single storey building		Yes	3.1.1	440,00	m²	R 440,32	R 193 740,80	R 193 740,80	
4														
5				**Driekop Shaft Complex**					181,30				**R 162 918,40**	
6				**Driekop Ventilation Shaft 9**										
7	00-GA	A7.2	Y2021	Change house	Single storey building		Yes	3.1.1	370,00	m²	R 440,32	R 162 918,40	R 162 918,40	
8														
9				**Tailings Complex**									**R -**	
10					Not Applicable		Yes	1,1	0,00	na	R -	R -	R -	
					SUB-TOTAL 1								**R 356 659,20**	
					Preliminaries and General	6%							R 21 399,55	
					Contingency	10%							R 35 665,92	
					SUB-TOTAL 2 (P&G's AND CONTINGENCIES)								**R 57 065,47**	
					GRAND-TOTAL								**R 413 724,67**	

Marula Platinum

Ventilation Shaft 8 & 9 - EMPr Amendment

INFRASTRUCTURAL ASPECTS														
1,7	LINEAR ITEMS													
						Premature Closure							2021	
Line No	Reference Map	GEO Reference	Year Captured	COST COMPONENT	Description	LIABLE	Rate Code	QUANTITY	Unit	Unit Rate	Unit Total		LIABLE VALUE	Notes
1				**Clapham Shaft Complex**				0,00					R -	
2				**Clapham Ventilation Shaft 8**										
3	00-GA	A3	Y2021	Pipeline - Water Supply	Overland HDPE pipelines on plinths (<200mm)	No	5.2.4	0,00	m	R 17,07	R -		R -	Construction to commence in 2023
4	00-GA	A3	Y2021	Pipeline - Waste Water	Overland HDPE pipelines on plinths (<200mm)	No	5.2.4	0,00	m	R 17,07	R -		R -	Construction to commence in 2023
5	00-GA	A4	Y2021	Power Line	Major lines	No	5.3.2	0,00	m	R 88,75	R -		R -	Construction to commence in 2023
6	00-GA	A7.3	Y2021	Compressed Airline	Overland HDPE pipelines on plinths (350-500mm)	No	5.2.6	0,00	m	R 35,27	R -		R -	Construction to commence in 2024
7	00-GA	A2	Y2022	Fencing - Around 8# & Bulk Air Cooler	Dismantling of security fencing	No	5.5.3	0,00	m	R 23,89	R -		R -	Construction to commence in 2022
8	00-GA	A2	Y2022	Fencing - Around Fridge Palnt & Cooling Tower	Dismantling of security fencing	No	5.5.3	0,00	m	R 23,89	R -		R -	Construction to commence in 2022
9														
10				**Driekop Shaft Complex**				0,00					R -	
11				**Driekop Ventilation Shaft 9**										
12	00-GA	A3	Y2021	Pipeline - Water Supply	Overland HDPE pipelines on plinths (<200mm)	No	5.2.4	0,00	m	R 17,07	R -		R -	Construction to commence in 2023
13	00-GA	A3	Y2021	Pipeline - Waste Water	Overland HDPE pipelines on plinths (<200mm)	No	5.2.4	0,00	m	R 17,07	R -		R -	Construction to commence in 2023
14	00-GA	A4	Y2021	Power Line	Major lines	No	5.3.2	0,00	m	R 88,75	R -		R -	Construction to commence in 2023
15														
16				**Tailings Complex**				0,00					R -	
17	00-GA	A6	Y2021	Pipeline - FRD Tailings Line	Overland steel pipelines on plinths (350-500mm)	No	5.2.3	0,00	m	R 95,57	R -		R -	
					SUB-TOTAL 1								**R -**	
					Preliminaries and General	6%							R -	
					Contingency	10%							R -	
					SUB-TOTAL 2 (P&G's AND CONTINGENCIES)								**R -**	
					GRAND-TOTAL								**R -**	

Marula Platinum

Ventilation Shaft 8 & 9 - EMPr Amendment

INFRASTRUCTURAL ASPECTS							Closure Forecast						2022	
1,7	LINEAR ITEMS													
Line No	Reference Map	GEO Reference	Year Captured	COST COMPONENT	Description		LIABLE	Rate Code	QUANTITY	Unit	Unit Rate	Unit Total	LIABLE VALUE	Notes
1				**Clapham Shaft Complex**					0,00				**R 15 050,70**	
2				**Clapham Ventilation Shaft 8**										
3	00-GA	A3	Y2021	Pipeline - Water Supply	Overland HDPE pipelines on plinths (<200mm)		No	5.2.4	0,00	m	R 17,07	R -	R -	Construction to commence in 2023
4	00-GA	A3	Y2021	Pipeline - Waste Water	Overland HDPE pipelines on plinths (<200mm)		No	5.2.4	0,00	m	R 17,07	R -	R -	Construction to commence in 2023
5	00-GA	A4	Y2021	Power Line	Major lines		No	5.3.2	0,00	m	R 88,75	R -	R -	Construction to commence in 2023
6	00-GA	A7.3	Y2021	Compressed Airline	Overland HDPE pipelines on plinths (350-500mm)		No	5.2.6	0,00	m	R 35,27	R -	R -	Construction to commence in 2024
7	00-GA	A2	Y2022	Fencing - Around 8# & Bulk Air Cooler	Dismantling of security fencing		Yes	5.5.3	190,00	m	R 23,89	R 4 539,10	R 4 539,10	Construction commenced
8	00-GA	A2	Y2022	Fencing - Around Fridge Palnt & Cooling Tower	Dismantling of security fencing		Yes	5.5.3	440,00	m	R 23,89	R 10 511,60	R 10 511,60	Construction commenced
9														
10				**Driekop Shaft Complex**					0,00				**R -**	
11				**Driekop Ventilation Shaft 9**										
12	00-GA	A3	Y2021	Pipeline - Water Supply	Overland HDPE pipelines on plinths (<200mm)		No	5.2.4	5200,00	m	R 17,07	R 88 764,00	R -	Construction to commence in 2023
13	00-GA	A3	Y2021	Pipeline - Waste Water	Overland HDPE pipelines on plinths (<200mm)		No	5.2.4	5200,00	m	R 17,07	R 88 764,00	R -	Construction to commence in 2023
14	00-GA	A4	Y2021	Power Line	Major lines		No	5.3.2	3300,00	m	R 88,75	R 292 875,00	R -	Construction to commence in 2023
15														
16				**Tailings Complex**					0,00				**R 345 294,41**	
17	00-GA	A6	Y2021	Pipeline - FRD Tailings Line	Overland steel pipelines on plinths (350-500mm)		Yes	5.2.3	3613,00	m	R 95,57	R 345 294,41	R 345 294,41	Assume the same as the other Tailings pipeline.
					SUB-TOTAL 1								**R 360 345,11**	
					Preliminaries and General	6%							R 21 620,71	
					Contingency	10%							R 36 034,51	
					SUB-TOTAL 2 (P&G's AND CONTINGENCIES)								**R 57 655,22**	
					GRAND-TOTAL								**R 418 000,33**	

Marula Platinum

Ventilation Shaft 8 & 9 - EMPr Amendment

INFRASTRUCTURAL ASPECTS							Closure Forecast						2023	
1,7	LINEAR ITEMS													
Line No	Reference Map	GEO Reference	Year Captured	COST COMPONENT	Description		LIABLE	Rate Code	QUANTITY	Unit	Unit Rate	Unit Total	LIABLE VALUE	Notes
1				**Clapham Shaft Complex**					0,00				**R 352 300,70**	
2				**Clapham Ventilation Shaft 8**										
3	00-GA	A3	Y2021	Pipeline - Water Supply	Overland HDPE pipelines on plinths (<200mm)		No	5.2.4	2100,00	m	R 17,07	R 35 847,00	R -	150mm HDPE Pipes laid below ground. Pipes to remain buried post closure.
4	00-GA	A3	Y2021	Pipeline - Waste Water	Overland HDPE pipelines on plinths (<200mm)		No	5.2.4	2100,00	m	R 17,07	R 35 847,00	R -	50mm HDPE Pipes laid below ground for wastewater. Pipes to remain buried post closure.
5	00-GA	A4	Y2021	Power Line	Major lines		Yes	5.3.2	3800,00	m	R 88,75	R 337 250,00	R 337 250,00	Construction commenced.
6	00-GA	A7.3	Y2021	Compressed Airline	Overland HDPE pipelines on plinths (350-500mm)		No	5.2.6	0,00	m	R 35,27	R -	R -	Construction to commence in 2024
7	00-GA	A2	Y2022	Fencing - Around 8# & Bulk Air Cooler	Dismantling of security fencing		Yes	5.5.3	190,00	m	R 23,89	R 4 539,10	R 4 539,10	
8	00-GA	A2	Y2022	Fencing - Around Fridge Palnt & Cooling Tower	Dismantling of security fencing		Yes	5.5.3	440,00	m	R 23,89	R 10 511,60	R 10 511,60	
9														
10				**Driekop Shaft Complex**					0,00				**R 292 875,00**	
11				**Driekop Ventilation Shaft 9**										
12	00-GA	A3	Y2021	Pipeline - Water Supply	Overland HDPE pipelines on plinths (<200mm)		No	5.2.4	5200,00	m	R 17,07	R 88 764,00	R -	150mm HDPE Pipes laid below ground. Pipes to remain buried post closure.
13	00-GA	A3	Y2021	Pipeline - Waste Water	Overland HDPE pipelines on plinths (<200mm)		No	5.2.4	5200,00	m	R 17,07	R 88 764,00	R -	50mm HDPE Pipes laid below ground for wastewater. Pipes to remain buried post closure.
14	00-GA	A4	Y2021	Power Line	Major lines		Yes	5.3.2	3300,00	m	R 88,75	R 292 875,00	R 292 875,00	Construction commenced.
15														
16				**Tailings Complex**					0,00				**R 345 294,41**	
17	00-GA	A6	Y2021	Pipeline - FRD Tailings Line	Overland steel pipelines on plinths (350-500mm)		Yes	5.2.3	3613,00	m	R 95,57	R 345 294,41	R 345 294,41	Assume the same as the other Tailings pipeline.
					SUB-TOTAL 1								**R 990 470,11**	
					Preliminaries and General	6%							R 59 428,21	
					Contingency	10%							R 99 047,01	
					SUB-TOTAL 2 (P&G's AND CONTINGENCIES)								**R 158 475,22**	
					GRAND-TOTAL								**R 1 148 945,33**	

Marula Platinum

Ventilation Shaft 8 & 9 - EMPr Amendment

INFRASTRUCTURAL ASPECTS							Closure Forecast						2024	
1,7	LINEAR ITEMS													
Line No	Reference Map	GEO Reference	Year Captured	COST COMPONENT	Description		LIABLE	Rate Code	QUANTITY	Unit	Unit Rate	Unit Total	LIABLE VALUE	Notes
1				**Clapham Shaft Complex**					0,00				**R 356 180,40**	
2				**Clapham Ventilation Shaft 8**										
3	00-GA	A3	Y2021	Pipeline - Water Supply	Overland HDPE pipelines on plinths (<200mm)		No	5.2.4	2100,00	m	R 17,07	R 35 847,00	R -	150mm HDPE Pipes laid below ground. Pipes to remain buried post closure.
4	00-GA	A3	Y2021	Pipeline - Waste Water	Overland HDPE pipelines on plinths (<200mm)		No	5.2.4	2100,00	m	R 17,07	R 35 847,00	R -	50mm HDPE Pipes laid below ground for wastewater. Pipes to remain buried post closure.
5	00-GA	A4	Y2021	Power Line	Major lines		Yes	5.3.2	3800,00	m	R 88,75	R 337 250,00	R 337 250,00	
6	00-GA	A7.3	Y2021	Compressed Airline	Overland HDPE pipelines on plinths (350-500mm)		Yes	5.2.6	110,00	m	R 35,27	R 3 879,70	R 3 879,70	Construction commenced.
7	00-GA	A2	Y2022	Fencing - Around 8# & Bulk Air Cooler	Dismantling of security fencing		Yes	5.5.3	190,00	m	R 23,89	R 4 539,10	R 4 539,10	
8	00-GA	A2	Y2022	Fencing - Around Fridge Palnt & Cooling Tower	Dismantling of security fencing		Yes	5.5.3	440,00	m	R 23,89	R 10 511,60	R 10 511,60	
9														
10				**Driekop Shaft Complex**					0,00				**R 292 875,00**	
11				**Driekop Ventilation Shaft 9**										
12	00-GA	A3	Y2021	Pipeline - Water Supply	Overland HDPE pipelines on plinths (<200mm)		No	5.2.4	5200,00	m	R 17,07	R 88 764,00	R -	150mm HDPE Pipes laid below ground. Pipes to remain buried post closure.
13	00-GA	A3	Y2021	Pipeline - Waste Water	Overland HDPE pipelines on plinths (<200mm)		No	5.2.4	5200,00	m	R 17,07	R 88 764,00	R -	50mm HDPE Pipes laid below ground for wastewater. Pipes to remain buried post closure.
14	00-GA	A4	Y2021	Power Line	Major lines		Yes	5.3.2	3300,00	m	R 88,75	R 292 875,00	R 292 875,00	
15														
16				**Tailings Complex**					0,00				**R 345 294,41**	
17	00-GA	A6	Y2021	Pipeline - FRD Tailings Line	Overland steel pipelines on plinths (350-500mm)		Yes	5.2.3	3613,00	m	R 95,57	R 345 294,41	R 345 294,41	Assume the same as the other Tailings pipeline.
					SUB-TOTAL 1								**R 994 349,81**	
					Preliminaries and General	6%							R 59 660,99	
					Contingency	10%							R 99 434,98	
					SUB-TOTAL 2 (P&G's AND CONTINGENCIES)								**R 159 095,97**	
					GRAND-TOTAL								**R 1 153 445,78**	

Marula Platinum

Ventilation Shaft 8 & 9 - EMPr Amendment

INFRASTRUCTURAL ASPECTS							Closure Forecast						2025	
1,7	LINEAR ITEMS													
Line No	Reference Map	GEO Reference	Year Captured	COST COMPONENT	Description		LIABLE	Rate Code	QUANTITY	Unit	Unit Rate	Unit Total	LIABLE VALUE	Notes
1				**Clapham Shaft Complex**					0,00				**R 356 180,40**	
2				**Clapham Ventilation Shaft 8**										
3	00-GA	A3	Y2021	Pipeline - Water Supply	Overland HDPE pipelines on plinths (<200mm)		No	5.2.4	2100,00	m	R 17,07	R 35 847,00	R -	150mm HDPE Pipes laid below ground. Pipes to remain buried post closure.
4	00-GA	A3	Y2021	Pipeline - Waste Water	Overland HDPE pipelines on plinths (<200mm)		No	5.2.4	2100,00	m	R 17,07	R 35 847,00	R -	50mm HDPE Pipes laid below ground for wastewater. Pipes to remain buried post closure.
5	00-GA	A4	Y2021	Power Line	Major lines		Yes	5.3.2	3800,00	m	R 88,75	R 337 250,00	R 337 250,00	
6	00-GA	A7.3	Y2021	Compressed Airline	Overland HDPE pipelines on plinths (350-500mm)		Yes	5.2.6	110,00	m	R 35,27	R 3 879,70	R 3 879,70	
7	00-GA	A2	Y2022	Fencing - Around 8# & Bulk Air Cooler	Dismantling of security fencing		Yes	5.5.3	190,00	m	R 23,89	R 4 539,10	R 4 539,10	
8	00-GA	A2	Y2022	Fencing - Around Fridge Palnt & Cooling Tower	Dismantling of security fencing		Yes	5.5.3	440,00	m	R 23,89	R 10 511,60	R 10 511,60	
9														
10				**Driekop Shaft Complex**					0,00				**R 292 875,00**	
11				**Driekop Ventilation Shaft 9**										
12	00-GA	A3	Y2021	Pipeline - Water Supply	Overland HDPE pipelines on plinths (<200mm)		No	5.2.4	5200,00	m	R 17,07	R 88 764,00	R -	150mm HDPE Pipes laid below ground. Pipes to remain buried post closure.
13	00-GA	A3	Y2021	Pipeline - Waste Water	Overland HDPE pipelines on plinths (<200mm)		No	5.2.4	5200,00	m	R 17,07	R 88 764,00	R -	50mm HDPE Pipes laid below ground for wastewater. Pipes to remain buried post closure.
14	00-GA	A4	Y2021	Power Line	Major lines		Yes	5.3.2	3300,00	m	R 88,75	R 292 875,00	R 292 875,00	
15														
16				**Tailings Complex**					0,00				**R 345 294,41**	
17	00-GA	A6	Y2021	Pipeline - FRD Tailings Line	Overland steel pipelines on plinths (350-500mm)		Yes	5.2.3	3613,00	m	R 95,57	R 345 294,41	R 345 294,41	Assume the same as the other Tailings pipeline.
					SUB-TOTAL 1								**R 994 349,81**	
					Preliminaries and General	6%							R 59 660,99	
					Contingency	10%							R 99 434,98	
					SUB-TOTAL 2 (P&G's AND CONTINGENCIES)								**R 159 095,97**	
					GRAND-TOTAL								**R 1 153 445,78**	

Marula Platinum

Ventilation Shaft 8 & 9 - EMPr Amendment

INFRASTRUCTURAL ASPECTS							Closure Forecast						2026	
1,7	LINEAR ITEMS													
Line No	Reference Map	GEO Reference	Year Captured	COST COMPONENT	Description		LIABLE	Rate Code	QUANTITY	Unit	Unit Rate	Unit Total	LIABLE VALUE	Notes
1				**Clapham Shaft Complex**					0,00				**R 356 180,40**	
2				**Clapham Ventilation Shaft 8**										
3	00-GA	A3	Y2021	Pipeline - Water Supply	Overland HDPE pipelines on plinths (<200mm)		No	5.2.4	2100,00	m	R 17,07	R 35 847,00	R -	150mm HDPE Pipes laid below ground. Pipes to remain buried post closure.
4	00-GA	A3	Y2021	Pipeline - Waste Water	Overland HDPE pipelines on plinths (<200mm)		No	5.2.4	2100,00	m	R 17,07	R 35 847,00	R -	50mm HDPE Pipes laid below ground for wastewater. Pipes to remain buried post closure.
5	00-GA	A4	Y2021	Power Line	Major lines		Yes	5.3.2	3800,00	m	R 88,75	R 337 250,00	R 337 250,00	
6	00-GA	A7.3	Y2021	Compressed Airline	Overland HDPE pipelines on plinths (350-500mm)		Yes	5.2.6	110,00	m	R 35,27	R 3 879,70	R 3 879,70	
7	00-GA	A2	Y2022	Fencing - Around 8# & Bulk Air Cooler	Dismantling of security fencing		Yes	5.5.3	190,00	m	R 23,89	R 4 539,10	R 4 539,10	
8	00-GA	A2	Y2022	Fencing - Around Fridge Palnt & Cooling Tower	Dismantling of security fencing		Yes	5.5.3	440,00	m	R 23,89	R 10 511,60	R 10 511,60	
9														
10				**Driekop Shaft Complex**					0,00				**R 292 875,00**	
11				**Driekop Ventilation Shaft 9**										
12	00-GA	A3	Y2021	Pipeline - Water Supply	Overland HDPE pipelines on plinths (<200mm)		No	5.2.4	5200,00	m	R 17,07	R 88 764,00	R -	150mm HDPE Pipes laid below ground. Pipes to remain buried post closure.
13	00-GA	A3	Y2021	Pipeline - Waste Water	Overland HDPE pipelines on plinths (<200mm)		No	5.2.4	5200,00	m	R 17,07	R 88 764,00	R -	50mm HDPE Pipes laid below ground for wastewater. Pipes to remain buried post closure.
14	00-GA	A4	Y2021	Power Line	Major lines		Yes	5.3.2	3300,00	m	R 88,75	R 292 875,00	R 292 875,00	
15														
16				**Tailings Complex**					0,00				**R 345 294,41**	
17	00-GA	A6	Y2021	Pipeline - FRD Tailings Line	Overland steel pipelines on plinths (350-500mm)		Yes	5.2.3	3613,00	m	R 95,57	R 345 294,41	R 345 294,41	Assume the same as the other Tailings pipeline.
					SUB-TOTAL 1								**R 994 349,81**	
					Preliminaries and General	6%							R 59 660,99	
					Contingency	10%							R 99 434,98	
					SUB-TOTAL 2 (P&G's AND CONTINGENCIES)								**R 159 095,97**	
					GRAND-TOTAL								**R 1 153 445,78**	

Marula Platinum

Ventilation Shaft 8 & 9 - EMPr Amendment

INFRASTRUCTURAL ASPECTS							Closure Forecast						2027	
1,7	LINEAR ITEMS													
Line No	Reference Map	GEO Reference	Year Captured	COST COMPONENT	Description		LIABLE	Rate Code	QUANTITY	Unit	Unit Rate	Unit Total	LIABLE VALUE	Notes
1				**Clapham Shaft Complex**					0,00				**R 356 180,40**	
2				**Clapham Ventilation Shaft 8**										
3	00-GA	A3	Y2021	Pipeline - Water Supply	Overland HDPE pipelines on plinths (<200mm)		No	5.2.4	2100,00	m	R 17,07	R 35 847,00	R -	150mm HDPE Pipes laid below ground. Pipes to remain buried post closure.
4	00-GA	A3	Y2021	Pipeline - Waste Water	Overland HDPE pipelines on plinths (<200mm)		No	5.2.4	2100,00	m	R 17,07	R 35 847,00	R -	50mm HDPE Pipes laid below ground for wastewater. Pipes to remain buried post closure.
5	00-GA	A4	Y2021	Power Line	Major lines		Yes	5.3.2	3800,00	m	R 88,75	R 337 250,00	R 337 250,00	
6	00-GA	A7.3	Y2021	Compressed Airline	Overland HDPE pipelines on plinths (350-500mm)		Yes	5.2.6	110,00	m	R 35,27	R 3 879,70	R 3 879,70	
7	00-GA	A2	Y2022	Fencing - Around 8# & Bulk Air Cooler	Dismantling of security fencing		Yes	5.5.3	190,00	m	R 23,89	R 4 539,10	R 4 539,10	
8	00-GA	A2	Y2022	Fencing - Around Fridge Palnt & Cooling Tower	Dismantling of security fencing		Yes	5.5.3	440,00	m	R 23,89	R 10 511,60	R 10 511,60	
9														
10				**Driekop Shaft Complex**					0,00				**R 292 875,00**	
11				**Driekop Ventilation Shaft 9**										
12	00-GA	A3	Y2021	Pipeline - Water Supply	Overland HDPE pipelines on plinths (<200mm)		No	5.2.4	5200,00	m	R 17,07	R 88 764,00	R -	150mm HDPE Pipes laid below ground. Pipes to remain buried post closure.
13	00-GA	A3	Y2021	Pipeline - Waste Water	Overland HDPE pipelines on plinths (<200mm)		No	5.2.4	5200,00	m	R 17,07	R 88 764,00	R -	50mm HDPE Pipes laid below ground for wastewater. Pipes to remain buried post closure.
14	00-GA	A4	Y2021	Power Line	Major lines		Yes	5.3.2	3300,00	m	R 88,75	R 292 875,00	R 292 875,00	
15														
16				**Tailings Complex**					0,00				**R 345 294,41**	
17	00-GA	A6	Y2021	Pipeline - FRD Tailings Line	Overland steel pipelines on plinths (350-500mm)		Yes	5.2.3	3613,00	m	R 95,57	R 345 294,41	R 345 294,41	Assume the same as the other Tailings pipeline.
					SUB-TOTAL 1								**R 994 349,81**	
					Preliminaries and General	6%							R 59 660,99	
					Contingency	10%							R 99 434,98	
					SUB-TOTAL 2 (P&G's AND CONTINGENCIES)								**R 159 095,97**	
					GRAND-TOTAL								**R 1 153 445,78**	

Marula Platinum

Ventilation Shaft 8 & 9 - EMPr Amendment

INFRASTRUCTURAL ASPECTS							Closure Forecast						2028	
1,7	LINEAR ITEMS													
Line No	Reference Map	GEO Reference	Year Captured	COST COMPONENT	Description		LIABLE	Rate Code	QUANTITY	Unit	Unit Rate	Unit Total	LIABLE VALUE	Notes
1				**Clapham Shaft Complex**					0,00				**R 356 180,40**	
2				**Clapham Ventilation Shaft 8**										
3	00-GA	A3	Y2021	Pipeline - Water Supply	Overland HDPE pipelines on plinths (<200mm)		No	5.2.4	2100,00	m	R 17,07	R 35 847,00	R -	150mm HDPE Pipes laid below ground. Pipes to remain buried post closure.
4	00-GA	A3	Y2021	Pipeline - Waste Water	Overland HDPE pipelines on plinths (<200mm)		No	5.2.4	2100,00	m	R 17,07	R 35 847,00	R -	50mm HDPE Pipes laid below ground for wastewater. Pipes to remain buried post closure.
5	00-GA	A4	Y2021	Power Line	Major lines		Yes	5.3.2	3800,00	m	R 88,75	R 337 250,00	R 337 250,00	
6	00-GA	A7.3	Y2021	Compressed Airline	Overland HDPE pipelines on plinths (350-500mm)		Yes	5.2.6	110,00	m	R 35,27	R 3 879,70	R 3 879,70	
7	00-GA	A2	Y2022	Fencing - Around 8# & Bulk Air Cooler	Dismantling of security fencing		Yes	5.5.3	190,00	m	R 23,89	R 4 539,10	R 4 539,10	
8	00-GA	A2	Y2022	Fencing - Around Fridge Palnt & Cooling Tower	Dismantling of security fencing		Yes	5.5.3	440,00	m	R 23,89	R 10 511,60	R 10 511,60	
9														
10				**Driekop Shaft Complex**					0,00				**R 292 875,00**	
11				**Driekop Ventilation Shaft 9**										
12	00-GA	A3	Y2021	Pipeline - Water Supply	Overland HDPE pipelines on plinths (<200mm)		No	5.2.4	5200,00	m	R 17,07	R 88 764,00	R -	150mm HDPE Pipes laid below ground. Pipes to remain buried post closure.
13	00-GA	A3	Y2021	Pipeline - Waste Water	Overland HDPE pipelines on plinths (<200mm)		No	5.2.4	5200,00	m	R 17,07	R 88 764,00	R -	50mm HDPE Pipes laid below ground for wastewater. Pipes to remain buried post closure.
14	00-GA	A4	Y2021	Power Line	Major lines		Yes	5.3.2	3300,00	m	R 88,75	R 292 875,00	R 292 875,00	
15														
16				**Tailings Complex**					0,00				**R 345 294,41**	
17	00-GA	A6	Y2021	Pipeline - FRD Tailings Line	Overland steel pipelines on plinths (350-500mm)		Yes	5.2.3	3613,00	m	R 95,57	R 345 294,41	R 345 294,41	Assume the same as the other Tailings pipeline.
					SUB-TOTAL 1								**R 994 349,81**	
					Preliminaries and General	6%							R 59 660,99	
					Contingency	10%							R 99 434,98	
					SUB-TOTAL 2 (P&G's AND CONTINGENCIES)								**R 159 095,97**	
					GRAND-TOTAL								**R 1 153 445,78**	

Marula Platinum

Ventilation Shaft 8 & 9 - EMPr Amendment

INFRASTRUCTURAL ASPECTS														
1,7	LINEAR ITEMS					Closure Forecast						2029		
Line No	Reference Map	GEO Reference	Year Captured	COST COMPONENT	Description	LIABLE	Rate Code	QUANTITY	Unit	Unit Rate	Unit Total	LIABLE VALUE		Notes
1				**Clapham Shaft Complex**				0,00				**R**	**356 180,40**	
2				**Clapham Ventilation Shaft 8**										
3	00-GA	A3	Y2021	Pipeline - Water Supply	Overland HDPE pipelines on plinths (<200mm)	No	5.2.4	2100,00	m	R 17,07	R 35 847,00	R	-	150mm HDPE Pipes laid below ground. Pipes to remain buried post closure.
4	00-GA	A3	Y2021	Pipeline - Waste Water	Overland HDPE pipelines on plinths (<200mm)	No	5.2.4	2100,00	m	R 17,07	R 35 847,00	R	-	50mm HDPE Pipes laid below ground for wastewater. Pipes to remain buried post closure.
5	00-GA	A4	Y2021	Power Line	Major lines	Yes	5.3.2	3800,00	m	R 88,75	R 337 250,00	R	337 250,00	
6	00-GA	A7.3	Y2021	Compressed Airline	Overland HDPE pipelines on plinths (350-500mm)	Yes	5.2.6	110,00	m	R 35,27	R 3 879,70	R	3 879,70	
7	00-GA	A2	Y2022	Fencing - Around 8# & Bulk Air Cooler	Dismantling of security fencing	Yes	5.5.3	190,00	m	R 23,89	R 4 539,10	R	4 539,10	
8	00-GA	A2	Y2022	Fencing - Around Fridge Palnt & Cooling Tower	Dismantling of security fencing	Yes	5.5.3	440,00	m	R 23,89	R 10 511,60	R	10 511,60	
9														
10				**Driekop Shaft Complex**				0,00				**R**	**292 875,00**	
11				**Driekop Ventilation Shaft 9**										
12	00-GA	A3	Y2021	Pipeline - Water Supply	Overland HDPE pipelines on plinths (<200mm)	No	5.2.4	5200,00	m	R 17,07	R 88 764,00	R	-	150mm HDPE Pipes laid below ground. Pipes to remain buried post closure.
13	00-GA	A3	Y2021	Pipeline - Waste Water	Overland HDPE pipelines on plinths (<200mm)	No	5.2.4	5200,00	m	R 17,07	R 88 764,00	R	-	50mm HDPE Pipes laid below ground for wastewater. Pipes to remain buried post closure.
14	00-GA	A4	Y2021	Power Line	Major lines	Yes	5.3.2	3300,00	m	R 88,75	R 292 875,00	R	292 875,00	
15														
16				**Tailings Complex**				0,00				**R**	**345 294,41**	
17	00-GA	A6	Y2021	Pipeline - FRD Tailings Line	Overland steel pipelines on plinths (350-500mm)	Yes	5.2.3	3613,00	m	R 95,57	R 345 294,41	R	345 294,41	Assume the same as the other Tailings pipeline.
					SUB-TOTAL 1							**R**	**994 349,81**	
					Preliminaries and General	6%						R	59 660,99	
					Contingency	10%						R	99 434,98	
					SUB-TOTAL 2 (P&G's AND CONTINGENCIES)							**R**	**159 095,97**	
					GRAND-TOTAL							**R**	**1 153 445,78**	

Marula Platinum

Ventilation Shaft 8 & 9 - EMPr Amendment

INFRASTRUCTURAL ASPECTS														
1,7	LINEAR ITEMS					Closure Forecast						2030		
Line No	Reference Map	GEO Reference	Year Captured	COST COMPONENT	Description	LIABLE	Rate Code	QUANTITY	Unit	Unit Rate	Unit Total	LIABLE VALUE		Notes
1				**Clapham Shaft Complex**				0,00				**R**	**356 180,40**	
2				**Clapham Ventilation Shaft 8**										
3	00-GA	A3	Y2021	Pipeline - Water Supply	Overland HDPE pipelines on plinths (<200mm)	No	5.2.4	2100,00	m	R 17,07	R 35 847,00	R	-	150mm HDPE Pipes laid below ground. Pipes to remain buried post closure.
4	00-GA	A3	Y2021	Pipeline - Waste Water	Overland HDPE pipelines on plinths (<200mm)	No	5.2.4	2100,00	m	R 17,07	R 35 847,00	R	-	50mm HDPE Pipes laid below ground for wastewater. Pipes to remain buried post closure.
5	00-GA	A4	Y2021	Power Line	Major lines	Yes	5.3.2	3800,00	m	R 88,75	R 337 250,00	R	337 250,00	
6	00-GA	A7.3	Y2021	Compressed Airline	Overland HDPE pipelines on plinths (350-500mm)	Yes	5.2.6	110,00	m	R 35,27	R 3 879,70	R	3 879,70	
7	00-GA	A2	Y2022	Fencing - Around 8# & Bulk Air Cooler	Dismantling of security fencing	Yes	5.5.3	190,00	m	R 23,89	R 4 539,10	R	4 539,10	
8	00-GA	A2	Y2022	Fencing - Around Fridge Palnt & Cooling Tower	Dismantling of security fencing	Yes	5.5.3	440,00	m	R 23,89	R 10 511,60	R	10 511,60	
9														
10				**Driekop Shaft Complex**				0,00				**R**	**292 875,00**	
11				**Driekop Ventilation Shaft 9**										
12	00-GA	A3	Y2021	Pipeline - Water Supply	Overland HDPE pipelines on plinths (<200mm)	No	5.2.4	5200,00	m	R 17,07	R 88 764,00	R	-	150mm HDPE Pipes laid below ground. Pipes to remain buried post closure.
13	00-GA	A3	Y2021	Pipeline - Waste Water	Overland HDPE pipelines on plinths (<200mm)	No	5.2.4	5200,00	m	R 17,07	R 88 764,00	R	-	50mm HDPE Pipes laid below ground for wastewater. Pipes to remain buried post closure.
14	00-GA	A4	Y2021	Power Line	Major lines	Yes	5.3.2	3300,00	m	R 88,75	R 292 875,00	R	292 875,00	
15														
16				**Tailings Complex**				0,00				**R**	**345 294,41**	
17	00-GA	A6	Y2021	Pipeline - FRD Tailings Line	Overland steel pipelines on plinths (350-500mm)	Yes	5.2.3	3613,00	m	R 95,57	R 345 294,41	R	345 294,41	Assume the same as the other Tailings pipeline.
					SUB-TOTAL 1							**R**	**994 349,81**	
					Preliminaries and General	6%						R	59 660,99	
					Contingency	10%						R	99 434,98	
					SUB-TOTAL 2 (P&G's AND CONTINGENCIES)							**R**	**159 095,97**	
					GRAND-TOTAL							**R**	**1 153 445,78**	

Marula Platinum

Ventilation Shaft 8 & 9 - EMPr Amendment

INFRASTRUCTURAL ASPECTS							Premature Closure						2021	
1,8	WASTE DISPOSAL													
Line No	Reference Map	GEO Reference	Year Captured	COST COMPONENT	Description		LIABLE	Rate Code	QUANTITY	Unit	Unit Rate	Unit Total	LIABLE VALUE	Notes
1				**Clapham Shaft Complex**									R -	
2				**Clapham Ventilation Shaft 8**										
2			Y2021	Sorting & Screening of Waste	Sorting and screening of waste		Yes	6,1	0,00	%	2,5%	R -	R -	
3			Y2021	Disposal of Waste	Load and haul for 2km distance		Yes	9.6.3	0,00	m³/km	R 39,18	R -	R -	
4														
5				**Driekop Shaft Complex**									R -	
6				**Driekop Ventilation Shaft 9**										
7			Y2021	Sorting & Screening of Waste	Sorting and screening of waste		Yes	6,1	0,00	%	2,5%	R -	R -	
8			Y2021	Disposal of Waste	Load and haul for 2km distance		Yes	9.6.3	0,00	m³/km	R 39,18	R -	R -	
9														
10				**Tailings Complex**									R -	
11					Not Applicable		Yes	1,1	0,00	na	R -	R -	R -	
						SUB-TOTAL 1							R -	
						Preliminaries and General	6%						R -	
						Contingency	10%						R -	
						SUB-TOTAL 2 (P&G's AND CONTINGENCIES)							R -	
						GRAND-TOTAL							R -	

Marula Platinum

Ventilation Shaft 8 & 9 - EMPr Amendment

INFRASTRUCTURAL ASPECTS							Closure Forecast						2022	
1,8	WASTE DISPOSAL													
Line No	Reference Map	GEO Reference	Year Captured	COST COMPONENT	Description		LIABLE	Rate Code	QUANTITY	Unit	Unit Rate	Unit Total	LIABLE VALUE	Notes
1				**Clapham Shaft Complex**									**R -**	
2				**Clapham Ventilation Shaft 8**										
2			Y2021	Sorting & Screening of Waste	Sorting and screening of waste		Yes	6,1	0,00	%	2,5%	R -	R -	2.5% of total demolition cost.
3			Y2021	Disposal of Waste	Load and haul for 2km distance		Yes	9.6.3	0,00	m³/km	R 39,18	R -	R -	2km for load and haul of total inert waste and to be dumped into shaft.
4														
5				**Driekop Shaft Complex**									**R 43 807,82**	
6				**Driekop Ventilation Shaft 9**										
7			Y2021	Sorting & Screening of Waste	Sorting and screening of waste		Yes	6,1	1384381,40	%	2,5%	R 34 609,54	R 34 609,54	2.5% of total demolition cost.
8			Y2021	Disposal of Waste	Load and haul for 2km distance		Yes	9.6.3	234,77	m³/km	R 39,18	R 9 198,29	R 9 198,29	2km for load and haul of total inert waste and to be dumped into shaft.
9														
10				**Tailings Complex**									**R -**	
11					Not Applicable		Yes	1,1	0,00	na	R -	R -	R -	
					SUB-TOTAL 1								**R 43 807,82**	
					Preliminaries and General	6%							R 2 628,47	
					Contingency	10%							R 4 380,78	
					SUB-TOTAL 2 (P&G's AND CONTINGENCIES)								**R 7 009,25**	
					GRAND-TOTAL								**R 50 817,08**	

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Ventilation Shaft 8 & 9 - EMPr Amendment

INFRASTRUCTURAL ASPECTS							Closure Forecast						2023	
1,8	WASTE DISPOSAL													
Line No	Reference Map	GEO Reference	Year Captured	COST COMPONENT	Description		LIABLE	Rate Code	QUANTITY	Unit	Unit Rate	Unit Total	LIABLE VALUE	Notes
1				Clapham Shaft Complex									R 37 985,04	
2				Clapham Ventilation Shaft 8										
2			Y2021	Sorting & Screening of Waste	Sorting and screening of waste		Yes	6,1	1286985,75	%	2,5%	R 32 174,64	R 32 174,64	2.5% of total demolition cost.
3			Y2021	Disposal of Waste	Load and haul for 2km distance		Yes	9.6.3	148,30	m³/km	R 39,18	R 5 810,39	R 5 810,39	2km for load and haul of total inert waste and to be dumped into shaft.
4														
5				Driekop Shaft Complex									R 43 807,82	
6				Driekop Ventilation Shaft 9										
7			Y2021	Sorting & Screening of Waste	Sorting and screening of waste		Yes	6,1	1384381,40	%	2,5%	R 34 609,54	R 34 609,54	2.5% of total demolition cost.
8			Y2021	Disposal of Waste	Load and haul for 2km distance		Yes	9.6.3	234,77	m³/km	R 39,18	R 9 198,29	R 9 198,29	2km for load and haul of total inert waste and to be dumped into shaft.
9														
10				Tailings Complex									R -	
11					Not Applicable		Yes	1,1	0,00	na	R -	R -	R -	
						SUB-TOTAL 1							R 81 792,86	
						Preliminaries and General	6%						R 4 907,57	
						Contingency	10%						R 8 179,29	
						SUB-TOTAL 2 (P&G's AND CONTINGENCIES)							R 13 086,86	
						GRAND-TOTAL							R 94 879,72	

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Ventilation Shaft 8 & 9 - EMPr Amendment

INFRASTRUCTURAL ASPECTS							Closure Forecast						2024	
1,8	WASTE DISPOSAL													
Line No	Reference Map	GEO Reference	Year Captured	COST COMPONENT	Description		LIABLE	Rate Code	QUANTITY	Unit	Unit Rate	Unit Total	LIABLE VALUE	Notes
1				**Clapham Shaft Complex**									**R 51 275,77**	
2				**Clapham Ventilation Shaft 8**										
2			Y2021	Sorting & Screening of Waste	Sorting and screening of waste		Yes	6,1	1480726,55	%	2,5%	R 37 018,16	R 37 018,16	2.5% of total demolition cost.
3			Y2021	Disposal of Waste	Load and haul for 2km distance		Yes	9.6.3	363,90	m³/km	R 39,18	R 14 257,60	R 14 257,60	2km for load and haul of total inert waste and to be dumped into shaft.
4														
5				**Driekop Shaft Complex**									**R 54 984,12**	
6				**Driekop Ventilation Shaft 9**										
7			Y2021	Sorting & Screening of Waste	Sorting and screening of waste		Yes	6,1	1547299,80	%	2,5%	R 38 682,50	R 38 682,50	2.5% of total demolition cost.
8			Y2021	Disposal of Waste	Load and haul for 2km distance		Yes	9.6.3	416,07	m³/km	R 39,18	R 16 301,62	R 16 301,62	2km for load and haul of total inert waste and to be dumped into shaft.
9														
10				**Tailings Complex**									**R -**	
11					Not Applicable		Yes	1,1	0,00	na	R -	R -	R -	
					SUB-TOTAL 1								**R 106 259,88**	
					Preliminaries and General	6%							R 6 375,59	
					Contingency	10%							R 10 625,99	
					SUB-TOTAL 2 (P&G's AND CONTINGENCIES)								**R 17 001,58**	
					GRAND-TOTAL								**R 123 261,46**	

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Ventilation Shaft 8 & 9 - EMPr Amendment

INFRASTRUCTURAL ASPECTS							Closure Forecast						2025	
1,8	WASTE DISPOSAL													
Line No	Reference Map	GEO Reference	Year Captured	COST COMPONENT	Description		LIABLE	Rate Code	QUANTITY	Unit	Unit Rate	Unit Total	LIABLE VALUE	Notes
1				**Clapham Shaft Complex**									**R 51 275,77**	
2				**Clapham Ventilation Shaft 8**										
2			Y2021	Sorting & Screening of Waste	Sorting and screening of waste		Yes	6,1	1480726,55	%	2,5%	R 37 018,16	R 37 018,16	2.5% of total demolition cost.
3			Y2021	Disposal of Waste	Load and haul for 2km distance		Yes	9.6.3	363,90	m³/km	R 39,18	R 14 257,60	R 14 257,60	2km for load and haul of total inert waste and to be dumped into shaft.
4														
5				**Driekop Shaft Complex**									**R 54 984,12**	
6				**Driekop Ventilation Shaft 9**										
7			Y2021	Sorting & Screening of Waste	Sorting and screening of waste		Yes	6,1	1547299,80	%	2,5%	R 38 682,50	R 38 682,50	2.5% of total demolition cost.
8			Y2021	Disposal of Waste	Load and haul for 2km distance		Yes	9.6.3	416,07	m³/km	R 39,18	R 16 301,62	R 16 301,62	2km for load and haul of total inert waste and to be dumped into shaft.
9														
10				**Tailings Complex**									**R -**	
11					Not Applicable		Yes	1,1	0,00	na	R -	R -	R -	
					SUB-TOTAL 1								**R 106 259,88**	
					Preliminaries and General	6%							R 6 375,59	
					Contingency	10%							R 10 625,99	
					SUB-TOTAL 2 (P&G's AND CONTINGENCIES)								**R 17 001,58**	
					GRAND-TOTAL								**R 123 261,46**	

Marula Platinum

Ventilation Shaft 8 & 9 - EMPr Amendment

INFRASTRUCTURAL ASPECTS							Closure Forecast						2026	
1,8	WASTE DISPOSAL													
Line No	Reference Map	GEO Reference	Year Captured	COST COMPONENT	Description		LIABLE	Rate Code	QUANTITY	Unit	Unit Rate	Unit Total	LIABLE VALUE	Notes
1				**Clapham Shaft Complex**									**R 69 467,28**	
2				**Clapham Ventilation Shaft 8**										
2			Y2021	Sorting & Screening of Waste	Sorting and screening of waste		Yes	6,1	2208387,12	%	2,5%	R 55 209,68	R 55 209,68	2.5% of total demolition cost.
3			Y2021	Disposal of Waste	Load and haul for 2km distance		Yes	9.6.3	363,90	m³/km	R 39,18	R 14 257,60	R 14 257,60	2km for load and haul of total inert waste and to be dumped into shaft.
4														
5				**Driekop Shaft Complex**									**R 54 984,12**	
6				**Driekop Ventilation Shaft 9**										
7			Y2021	Sorting & Screening of Waste	Sorting and screening of waste		Yes	6,1	1547299,80	%	2,5%	R 38 682,50	R 38 682,50	2.5% of total demolition cost.
8			Y2021	Disposal of Waste	Load and haul for 2km distance		Yes	9.6.3	416,07	m³/km	R 39,18	R 16 301,62	R 16 301,62	2km for load and haul of total inert waste and to be dumped into shaft.
9														
10				**Tailings Complex**									**R -**	
11					Not Applicable		Yes	1,1	0,00	na	R -	R -	R -	
						SUB-TOTAL 1							**R 124 451,40**	
						Preliminaries and General	6%						R 7 467,08	
						Contingency	10%						R 12 445,14	
						SUB-TOTAL 2 (P&G's AND CONTINGENCIES)							**R 19 912,22**	
						GRAND-TOTAL							**R 144 363,62**	

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Ventilation Shaft 8 & 9 - EMPr Amendment

INFRASTRUCTURAL ASPECTS							Closure Forecast						2027	
1,8	WASTE DISPOSAL													
Line No	Reference Map	GEO Reference	Year Captured	COST COMPONENT	Description		LIABLE	Rate Code	QUANTITY	Unit	Unit Rate	Unit Total	LIABLE VALUE	Notes
1				**Clapham Shaft Complex**									**R 69 467,28**	
2				**Clapham Ventilation Shaft 8**										
2			Y2021	Sorting & Screening of Waste	Sorting and screening of waste		Yes	6,1	2208387,12	%	2,5%	R 55 209,68	R 55 209,68	2.5% of total demolition cost.
3			Y2021	Disposal of Waste	Load and haul for 2km distance		Yes	9.6.3	363,90	m³/km	R 39,18	R 14 257,60	R 14 257,60	2km for load and haul of total inert waste and to be dumped into shaft.
4														
5				**Driekop Shaft Complex**									**R 54 984,12**	
6				**Driekop Ventilation Shaft 9**										
7			Y2021	Sorting & Screening of Waste	Sorting and screening of waste		Yes	6,1	1547299,80	%	2,5%	R 38 682,50	R 38 682,50	2.5% of total demolition cost.
8			Y2021	Disposal of Waste	Load and haul for 2km distance		Yes	9.6.3	416,07	m³/km	R 39,18	R 16 301,62	R 16 301,62	2km for load and haul of total inert waste and to be dumped into shaft.
9														
10				**Tailings Complex**									**R -**	
11					Not Applicable		Yes	1,1	0,00	na	R -	R -	R -	
						SUB-TOTAL 1							**R 124 451,40**	
						Preliminaries and General	6%						R 7 467,08	
						Contingency	10%						R 12 445,14	
						SUB-TOTAL 2 (P&G's AND CONTINGENCIES)							**R 19 912,22**	
						GRAND-TOTAL							**R 144 363,62**	

Marula Platinum

Ventilation Shaft 8 & 9 - EMPr Amendment

INFRASTRUCTURAL ASPECTS							Closure Forecast						2028	
1,8	WASTE DISPOSAL													
Line No	Reference Map	GEO Reference	Year Captured	COST COMPONENT	Description		LIABLE	Rate Code	QUANTITY	Unit	Unit Rate	Unit Total	LIABLE VALUE	Notes
1				**Clapham Shaft Complex**									**R 69 467,28**	
2				**Clapham Ventilation Shaft 8**										
2			Y2021	Sorting & Screening of Waste	Sorting and screening of waste		Yes	6,1	2208387,12	%	2,5%	R 55 209,68	R 55 209,68	2.5% of total demolition cost.
3			Y2021	Disposal of Waste	Load and haul for 2km distance		Yes	9.6.3	363,90	m³/km	R 39,18	R 14 257,60	R 14 257,60	2km for load and haul of total inert waste and to be dumped into shaft.
4														
5				**Driekop Shaft Complex**									**R 54 984,12**	
6				**Driekop Ventilation Shaft 9**										
7			Y2021	Sorting & Screening of Waste	Sorting and screening of waste		Yes	6,1	1547299,80	%	2,5%	R 38 682,50	R 38 682,50	2.5% of total demolition cost.
8			Y2021	Disposal of Waste	Load and haul for 2km distance		Yes	9.6.3	416,07	m³/km	R 39,18	R 16 301,62	R 16 301,62	2km for load and haul of total inert waste and to be dumped into shaft.
9														
10				**Tailings Complex**									**R -**	
11					Not Applicable		Yes	1,1	0,00	na	R -	R -	R -	
					SUB-TOTAL 1								**R 124 451,40**	
					Preliminaries and General	6%							R 7 467,08	
					Contingency	10%							R 12 445,14	
					SUB-TOTAL 2 (P&G's AND CONTINGENCIES)								**R 19 912,22**	
					GRAND-TOTAL								**R 144 363,62**	

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Ventilation Shaft 8 & 9 - EMPr Amendment

INFRASTRUCTURAL ASPECTS							Closure Forecast						2029	
1,8	WASTE DISPOSAL													
Line No	Reference Map	GEO Reference	Year Captured	COST COMPONENT	Description		LIABLE	Rate Code	QUANTITY	Unit	Unit Rate	Unit Total	LIABLE VALUE	Notes
1				**Clapham Shaft Complex**									**R 211 056,86**	
2				**Clapham Ventilation Shaft 8**										
2			Y2021	Sorting & Screening of Waste	Sorting and screening of waste		Yes	6,1	4358041,62	%	2,5%	R 108 951,04	R 108 951,04	2.5% of total demolition cost.
3			Y2021	Disposal of Waste	Load and haul for 2km distance		Yes	9.6.3	2606,07	m³/km	R 39,18	R 102 105,82	R 102 105,82	2km for load and haul of total inert waste and to be dumped into shaft.
4														
5				**Driekop Shaft Complex**									**R 54 984,12**	
6				**Driekop Ventilation Shaft 9**										
7			Y2021	Sorting & Screening of Waste	Sorting and screening of waste		Yes	6,1	1547299,80	%	2,5%	R 38 682,50	R 38 682,50	2.5% of total demolition cost.
8			Y2021	Disposal of Waste	Load and haul for 2km distance		Yes	9.6.3	416,07	m³/km	R 39,18	R 16 301,62	R 16 301,62	2km for load and haul of total inert waste and to be dumped into shaft.
9														
10				**Tailings Complex**									**R -**	
11					Not Applicable		Yes	1,1	0,00	na	R -	R -	R -	
					SUB-TOTAL 1								**R 266 040,98**	
					Preliminaries and General	6%							R 15 962,46	
					Contingency	10%							R 26 604,10	
					SUB-TOTAL 2 (P&G's AND CONTINGENCIES)								**R 42 566,56**	
					GRAND-TOTAL								**R 308 607,54**	

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Ventilation Shaft 8 & 9 - EMPr Amendment

INFRASTRUCTURAL ASPECTS							Closure Forecast						2030	
1,8	WASTE DISPOSAL													
Line No	Reference Map	GEO Reference	Year Captured	COST COMPONENT	Description		LIABLE	Rate Code	QUANTITY	Unit	Unit Rate	Unit Total	LIABLE VALUE	Notes
1				Clapham Shaft Complex									R 211 056,86	
2				Clapham Ventilation Shaft 8										
2			Y2021	Sorting & Screening of Waste	Sorting and screening of waste		Yes	6,1	4358041,62	%	2,5%	R 108 951,04	R 108 951,04	2.5% of total demolition cost.
3			Y2021	Disposal of Waste	Load and haul for 2km distance		Yes	9.6.3	2606,07	m³/km	R 39,18	R 102 105,82	R 102 105,82	2km for load and haul of total inert waste and to be dumped into shaft.
4														
5				Driekop Shaft Complex									R 54 984,12	
6				Driekop Ventilation Shaft 9										
7			Y2021	Sorting & Screening of Waste	Sorting and screening of waste		Yes	6,1	1547299,80	%	2,5%	R 38 682,50	R 38 682,50	2.5% of total demolition cost.
8			Y2021	Disposal of Waste	Load and haul for 2km distance		Yes	9.6.3	416,07	m³/km	R 39,18	R 16 301,62	R 16 301,62	2km for load and haul of total inert waste and to be dumped into shaft.
9														
10				Tailings Complex									R -	
11					Not Applicable		Yes	1,1	0,00	na	R -	R -	R -	
						SUB-TOTAL 1							R 266 040,98	
						Preliminaries and General	6%						R 15 962,46	
						Contingency	10%						R 26 604,10	
						SUB-TOTAL 2 (P&G's AND CONTINGENCIES)							R 42 566,56	
						GRAND-TOTAL							R 308 607,54	

Marula Platinum

Ventilation Shaft 8 & 9 - EMPr Amendment

SUMMARY - GENERAL ASPECTS											
5	GENERAL CLOSURE COMPONENTS & CRITERIA			Premature Closure	Closure Forecast	Closure Forecast	Closure Forecast	Closure Forecast	Closure Forecast	Closure Forecast	Closure Forecast	Closure Forecast	Closure Forecast
ID	COMPONENT	CLOSURE CRITERIA		2021	2022	2023	2024	2025	2026	2027	2028	2029	2030
5,1	GENERAL SURFACES	Infrastructural footprints: i. Shape and level area ii. Fill voids and make the area free draining iii. Rip 500mm deep iv. Import 250mm topsoil from the local stockpile onto the levelled surface v. Ameliorate and vegetate		R -	R 1 394 937,40	R 1 394 937,40	R 1 394 937,40	R 1 721 389,55	R 1 394 937,40	R 1 394 937,40	R 1 394 937,40	R 1 394 937,40	R 1 394 937,40
5,2	POST CLOSURE MONITORING AND MAINTENANCE	Surface water monitoring: i. Allowance was made for 4 monitoring points Groundwater monitoring: i. Allowance was made for a period of 40 years post closure with a quarterly sampling frequency ii. Allowance was made for 8 monitoring points Biomonitoring: i. Allowance was made for 4 monitoring points Air Quality monitoring: i. Allowance was made for 4 monitoring points		R -	R 12 989,06	R 12 989,06	R 12 989,06	R 27 712,69	R 27 753,03	R 27 753,03	R 27 753,03	R 27 753,03	R 12 989,06
5,3	SPECIALIST STUDIES	Not Applicable		R -	R -	R -	R -	R -	R -	R -	R -	R -	R -
		SUB-TOTAL 1		**R -**	**R 1 407 926,46**	**R 1 407 926,46**	**R 1 407 926,46**	**R 1 749 102,24**	**R 1 422 690,43**	**R 1 422 690,43**	**R 1 422 690,43**	**R 1 422 690,43**	**R 1 407 926,46**

Marula Platinum

Ventilation Shaft 8 & 9 - EMPr Amendment

GENERAL ASPECTS							Premature Closure						2021	
5,1	GENERAL SURFACES													
Line No	Reference Map	GEO Reference	Year Captured	COST COMPONENT	Description		LIABLE	Rate Code	QUANTITY	Unit	Unit Rate	Unit Total	LIABLE VALUE	Notes
1				**Clapham Shaft Complex**									R -	
2				**Clapham Ventilation Shaft 8**										
3	00-GA	A2	Y2021	General Surface Reclamation										
4				Dozing	Shaping, levelling of footprint areas (500mm)		No	10.1.1	0,00	ha	R 62 669,86	R -	R -	
5				Transport	Load and haul for 3km distance		No	9.6.4	0,00	m³/km	R 46,89	R -	R -	
6				Ripping	Ripping of areas to alleviate compaction		No	9.5.1	0,00	ha	R 14 659,31	R -	R -	
7				Establish vegetation	Establishment of vegetation (general)		No	10.4.1	0,00	ha	R 15 658,65	R -	R -	
8	00-GA	A3	Y2021	Water Supply Pipelines - Reclamation of disturbed area										
9				Dozing	Shaping, levelling of footprint areas (500mm)		No	10.1.1	0,00	ha	R 62 669,86	R -	R -	
10				Transport	Load and haul for 3km distance		No	9.6.4	0,00	m³/km	R 46,89	R -	R -	
11				Ripping	Ripping of areas to alleviate compaction		No	9.5.1	0,00	ha	R 14 659,31	R -	R -	
12				Establish vegetation	Establishment of vegetation (general)		No	10.4.1	0,00	ha	R 15 658,65	R -	R -	
13	00-GA	A4	Y2021	Low Grade ROM Stockpile - Reclamation of disturbed area										
14				Liner	Removal of single HDPE liner		No	6,4	0,00	m²	R 10,24	R -	R -	
19														
20				**Driekop Shaft Complex**									R -	
21				**Driekop Ventilation Shaft 9**										
22	00-GA	A1	Y2021	General Surface Reclamation										
23				Dozing	Shaping, levelling of footprint areas (500mm)		No	10.1.1	0,00	ha	R 62 669,86	R -	R -	
24				Transport	Load and haul for 3km distance		No	9.6.4	0,00	m³/km	R 46,89	R -	R -	
25				Ripping	Ripping of areas to alleviate compaction		No	9.5.1	0,00	ha	R 14 659,31	R -	R -	
26				Establish vegetation	Establishment of vegetation (general)		No	10.4.1	0,00	ha	R 15 658,65	R -	R -	
27	00-GA	A3	Y2021	Water Supply Pipelines - Reclamation of disturbed area										
28				Dozing	Shaping, levelling of footprint areas (500mm)		No	10.1.1	0,00	ha	R 62 669,86	R -	R -	
29				Transport	Load and haul for 3km distance		No	9.6.4	0,00	m³/km	R 46,89	R -	R -	
30				Ripping	Ripping of areas to alleviate compaction		No	9.5.1	0,00	ha	R 14 659,31	R -	R -	
31				Establish vegetation	Establishment of vegetation (general)		No	10.4.1	0,00	ha	R 15 658,65	R -	R -	
32														
33				**Tailings Complex**									R -	
34					Not Applicable		Yes	1,1	0,00	na	R -	R -	R -	
					SUB-TOTAL 1								R -	
					Preliminaries and General	6%							R -	
					Contingency	10%							R -	
					SUB-TOTAL 2 (P&G's AND CONTINGENCIES)								R -	
					GRAND-TOTAL								R -	

Marula Platinum

Ventilation Shaft 8 & 9 - EMPr Amendment

GENERAL ASPECTS							Closure Forecast						2022	
5,1	GENERAL SURFACES													
Line No	Reference Map	GEO Reference	Year Captured	COST COMPONENT	Description		LIABLE	Rate Code	QUANTITY	Unit	Unit Rate	Unit Total	LIABLE VALUE	Notes
1				**Clapham Shaft Complex**									**R 1 350 217,93**	
2				**Clapham Ventilation Shaft 8**										
3	00-GA	A2	Y2021	General Surface Reclamation										1,36ha needs to be rehabilitated.
4				Dozing	Shaping, levelling of footprint areas (500mm)		Yes	10.1.1	0,68	ha	R 62 669,86	R 42 615,50	R 42 615,50	Assume 50% of footprint
5				Transport	Load and haul for 3km distance		Yes	9.6.4	3400,00	m³/km	R 46,89	R 159 426,00	R 159 426,00	250mm thick layer from local stockpiles
6				Ripping	Ripping of areas to alleviate compaction		Yes	9.5.1	1,36	ha	R 14 659,31	R 19 936,66	R 19 936,66	500 mm Deep ripping
7				Establish vegetation	Establishment of vegetation (general)		Yes	10.4.1	1,36	ha	R 15 658,65	R 21 295,76	R 21 295,76	Includes soil amelioration, cultivation and seeding actions
8	00-GA	A3	Y2021	Water Supply Pipelines - Reclamation of disturbed area										Construction to commence in 2023
9				Dozing	Shaping, levelling of footprint areas (500mm)		No	10.1.1	0,00	ha	R 62 669,86	R -	R -	
10				Transport	Load and haul for 3km distance		No	9.6.4	0,00	m³/km	R 46,89	R -	R -	
11				Ripping	Ripping of areas to alleviate compaction		No	9.5.1	0,00	ha	R 14 659,31	R -	R -	
12				Establish vegetation	Establishment of vegetation (general)		No	10.4.1	0,00	ha	R 15 658,65	R -	R -	
13	00-GA	A4	Y2021	Low Grade ROM Stockpile - Reclamation of disturbed area										General Surface Reclamation already included in the current liability.
14				Liner	Removal of single HDPE liner		Yes	6,4	108100,00	m²	R 10,24	R 1 106 944,00	R 1 106 944,00	Class 3 waste assume facility is lined with HDPE liner
19														
20				**Driekop Shaft Complex**									**R 44 719,47**	
21				**Driekop Ventilation Shaft 9**										
22	00-GA	A1	Y2021	General Surface Reclamation										0,25ha needs to be rehabilitated.
23				Dozing	Shaping, levelling of footprint areas (500mm)		Yes	10.1.1	0,13	ha	R 62 669,86	R 7 833,73	R 7 833,73	Assume 50% of footprint
24				Transport	Load and haul for 3km distance		Yes	9.6.4	625,00	m³/km	R 46,89	R 29 306,25	R 29 306,25	250mm thick layer from local stockpiles
25				Ripping	Ripping of areas to alleviate compaction		Yes	9.5.1	0,25	ha	R 14 659,31	R 3 664,83	R 3 664,83	500 mm Deep ripping
26				Establish vegetation	Establishment of vegetation (general)		Yes	10.4.1	0,25	ha	R 15 658,65	R 3 914,66	R 3 914,66	Includes soil amelioration, cultivation and seeding actions
27	00-GA	A3	Y2021	Water Supply Pipelines - Reclamation of disturbed area										Construction to commence in 2023
28				Dozing	Shaping, levelling of footprint areas (500mm)		No	10.1.1	0,00	ha	R 62 669,86	R -	R -	
29				Transport	Load and haul for 3km distance		No	9.6.4	0,00	m³/km	R 46,89	R -	R -	
30				Ripping	Ripping of areas to alleviate compaction		No	9.5.1	0,00	ha	R 14 659,31	R -	R -	
31				Establish vegetation	Establishment of vegetation (general)		No	10.4.1	0,00	ha	R 15 658,65	R -	R -	
32														
33				**Tailings Complex**									**R -**	
34					Not Applicable		Yes	1,1	0,00	na	R -	R -	R -	
				SUB-TOTAL 1									**R 1 394 937,40**	
				Preliminaries and General		6%							R 83 696,24	
				Contingency		10%							R 139 493,74	
				SUB-TOTAL 2 (P&G's AND CONTINGENCIES)									**R 223 189,98**	
				GRAND-TOTAL									**R 1 618 127,39**	

Marula Platinum

Ventilation Shaft 8 & 9 - EMPr Amendment

GENERAL ASPECTS							Closure Forecast						2023	
5,1	GENERAL SURFACES													
Line No	Reference Map	GEO Reference	Year Captured	COST COMPONENT	Description		LIABLE	Rate Code	QUANTITY	Unit	Unit Rate	Unit Total	LIABLE VALUE	Notes
1				**Clapham Shaft Complex**									**R 1 350 217,93**	
2				**Clapham Ventilation Shaft 8**										
3	00-GA	A2	Y2021	General Surface Reclamation										1,36ha needs to be rehabilitated.
4				Dozing	Shaping, levelling of footprint areas (500mm)		Yes	10.1.1	0,68	ha	R 62 669,86	R 42 615,50	R 42 615,50	Assume 50% of footprint
5				Transport	Load and haul for 3km distance		Yes	9.6.4	3400,00	m³/km	R 46,89	R 159 426,00	R 159 426,00	250mm thick layer from local stockpiles
6				Ripping	Ripping of areas to alleviate compaction		Yes	9.5.1	1,36	ha	R 14 659,31	R 19 936,66	R 19 936,66	500 mm Deep ripping
7				Establish vegetation	Establishment of vegetation (general)		Yes	10.4.1	1,36	ha	R 15 658,65	R 21 295,76	R 21 295,76	Includes soil amelioration, cultivation and seeding actions
8	00-GA	A3	Y2021	Water Supply Pipelines - Reclamation of disturbed area										Area of disturbance for the establishment of water supply pipelines = 1,30Ha
9				Dozing	Shaping, levelling of footprint areas (500mm)		No	10.1.1	0,00	ha	R 62 669,86	R -	R -	Construction to commence in 2023
10				Transport	Load and haul for 3km distance		No	9.6.4	0,00	m³/km	R 46,89	R -	R -	
11				Ripping	Ripping of areas to alleviate compaction		No	9.5.1	0,00	ha	R 14 659,31	R -	R -	
12				Establish vegetation	Establishment of vegetation (general)		No	10.4.1	0,00	ha	R 15 658,65	R -	R -	
13	00-GA	A4	Y2021	Low Grade ROM Stockpile - Reclamation of disturbed area										General Surface Reclamation already included in the current liability.
14				Liner	Removal of single HDPE liner		Yes	6,4	108100,00	m²	R 10,24	R 1 106 944,00	R 1 106 944,00	Class 3 waste assume facility is lined with HDPE liner
19														
20				**Driekop Shaft Complex**									**R 44 719,47**	
21				**Driekop Ventilation Shaft 9**										
22	00-GA	A1	Y2021	General Surface Reclamation										0,25ha needs to be rehabilitated.
23				Dozing	Shaping, levelling of footprint areas (500mm)		Yes	10.1.1	0,13	ha	R 62 669,86	R 7 833,73	R 7 833,73	Assume 50% of footprint
24				Transport	Load and haul for 3km distance		Yes	9.6.4	625,00	m³/km	R 46,89	R 29 306,25	R 29 306,25	250mm thick layer from local stockpiles
25				Ripping	Ripping of areas to alleviate compaction		Yes	9.5.1	0,25	ha	R 14 659,31	R 3 664,83	R 3 664,83	500 mm Deep ripping
26				Establish vegetation	Establishment of vegetation (general)		Yes	10.4.1	0,25	ha	R 15 658,65	R 3 914,66	R 3 914,66	Includes soil amelioration, cultivation and seeding actions
27	00-GA	A3	Y2021	Water Supply Pipelines - Reclamation of disturbed area										Construction to commence in 2023
28				Dozing	Shaping, levelling of footprint areas (500mm)		Yes	10.1.1	0,00	ha	R 62 669,86	R -	R -	
29				Transport	Load and haul for 3km distance		Yes	9.6.4	0,00	m³/km	R 46,89	R -	R -	
30				Ripping	Ripping of areas to alleviate compaction		Yes	9.5.1	0,00	ha	R 14 659,31	R -	R -	
31				Establish vegetation	Establishment of vegetation (general)		Yes	10.4.1	0,00	ha	R 15 658,65	R -	R -	
32														
33				**Tailings Complex**									**R -**	
34					Not Applicable		Yes	1,1	0,00	na	R -	R -	R -	
					SUB-TOTAL 1								**R 1 394 937,40**	
					Preliminaries and General	6%							R 83 696,24	
					Contingency	10%							R 139 493,74	
					SUB-TOTAL 2 (P&G's AND CONTINGENCIES)								**R 223 189,98**	
					GRAND-TOTAL								**R 1 618 127,39**	

Marula Platinum

Ventilation Shaft 8 & 9 - EMPr Amendment

GENERAL ASPECTS							Closure Forecast						2024	
5,1	GENERAL SURFACES													
Line No	Reference Map	GEO Reference	Year Captured	COST COMPONENT	Description		LIABLE	Rate Code	QUANTITY	Unit	Unit Rate	Unit Total	LIABLE VALUE	Notes
1				**Clapham Shaft Complex**									**R 1 350 217,93**	
2				**Clapham Ventilation Shaft 8**										
3	00-GA	A2	Y2021	General Surface Reclamation										1,36ha needs to be rehabilitated.
4				Dozing	Shaping, levelling of footprint areas (500mm)		Yes	10.1.1	0,68	ha	R 62 669,86	R 42 615,50	R 42 615,50	Assume 50% of footprint
5				Transport	Load and haul for 3km distance		Yes	9.6.4	3400,00	m³/km	R 46,89	R 159 426,00	R 159 426,00	250mm thick layer from local stockpiles
6				Ripping	Ripping of areas to alleviate compaction		Yes	9.5.1	1,36	ha	R 14 659,31	R 19 936,66	R 19 936,66	500 mm Deep ripping
7				Establish vegetation	Establishment of vegetation (general)		Yes	10.4.1	1,36	ha	R 15 658,65	R 21 295,76	R 21 295,76	Includes soil amelioration, cultivation and seeding actions
8	00-GA	A3	Y2021	Water Supply Pipelines - Reclamation of disturbed area										Area of disturbance for the establishment of water supply pipelines = 1,30Ha
9				Dozing	Shaping, levelling of footprint areas (500mm)		No	10.1.1	0,00	ha	R 62 669,86	R -	R -	Construction to be completed in 2024
10				Transport	Load and haul for 3km distance		No	9.6.4	0,00	m³/km	R 46,89	R -	R -	
11				Ripping	Ripping of areas to alleviate compaction		No	9.5.1	0,00	ha	R 14 659,31	R -	R -	
12				Establish vegetation	Establishment of vegetation (general)		No	10.4.1	0,00	ha	R 15 658,65	R -	R -	
13	00-GA	A4	Y2021	Low Grade ROM Stockpile - Reclamation of disturbed area										General Surface Reclamation already included in the current liability.
14				Liner	Removal of single HDPE liner		Yes	6,4	108100,00	m²	R 10,24	R 1 106 944,00	R 1 106 944,00	Class 3 waste assume facility is lined with HDPE liner
19														
20				**Driekop Shaft Complex**									**R 44 719,47**	
21				**Driekop Ventilation Shaft 9**										
22	00-GA	A1	Y2021	General Surface Reclamation										0,25ha needs to be rehabilitated.
23				Dozing	Shaping, levelling of footprint areas (500mm)		Yes	10.1.1	0,13	ha	R 62 669,86	R 7 833,73	R 7 833,73	Assume 50% of footprint
24				Transport	Load and haul for 3km distance		Yes	9.6.4	625,00	m³/km	R 46,89	R 29 306,25	R 29 306,25	250mm thick layer from local stockpiles
25				Ripping	Ripping of areas to alleviate compaction		Yes	9.5.1	0,25	ha	R 14 659,31	R 3 664,83	R 3 664,83	500 mm Deep ripping
26				Establish vegetation	Establishment of vegetation (general)		Yes	10.4.1	0,25	ha	R 15 658,65	R 3 914,66	R 3 914,66	Includes soil amelioration, cultivation and seeding actions
27	00-GA	A3	Y2021	Water Supply Pipelines - Reclamation of disturbed area										Area of disturbance for the establishment of water supply pipelines = 1,30Ha
28				Dozing	Shaping, levelling of footprint areas (500mm)		Yes	10.1.1	0,00	ha	R 62 669,86	R -	R -	Construction to be completed in 2024
29				Transport	Load and haul for 3km distance		Yes	9.6.4	0,00	m³/km	R 46,89	R -	R -	
30				Ripping	Ripping of areas to alleviate compaction		Yes	9.5.1	0,00	ha	R 14 659,31	R -	R -	
31				Establish vegetation	Establishment of vegetation (general)		Yes	10.4.1	0,00	ha	R 15 658,65	R -	R -	
32														
33				**Tailings Complex**									**R -**	
34					Not Applicable		Yes	1,1	0,00	na	R -	R -	R -	
				SUB-TOTAL 1									**R 1 394 937,40**	
				Preliminaries and General		6%							R 83 696,24	
				Contingency		10%							R 139 493,74	
				SUB-TOTAL 2 (P&G's AND CONTINGENCIES)									**R 223 189,98**	
				GRAND-TOTAL									**R 1 618 127,39**	

Marula Platinum

Ventilation Shaft 8 & 9 - EMPr Amendment

GENERAL ASPECTS															
5,1	GENERAL SURFACES						Closure Forecast						2025		
Line No	Reference Map	GEO Reference	Year Captured	COST COMPONENT	Description		LIABLE	Rate Code	QUANTITY	Unit	Unit Rate	Unit Total	LIABLE VALUE	Notes
1				**Clapham Shaft Complex**									**R 1 582 759,19**	
2				**Clapham Ventilation Shaft 8**										
3	00-GA	A2	Y2021	General Surface Reclamation										1,36ha needs to be rehabilitated.
4				Dozing	Shaping, levelling of footprint areas (500mm)		Yes	10.1.1	0,68	ha	R 62 669,86	R 42 615,50	R 42 615,50	Assume 50% of footprint
5				Transport	Load and haul for 3km distance		Yes	9.6.4	3400,00	m³/km	R 46,89	R 159 426,00	R 159 426,00	250mm thick layer from local stockpiles
6				Ripping	Ripping of areas to alleviate compaction		Yes	9.5.1	1,36	ha	R 14 659,31	R 19 936,66	R 19 936,66	500 mm Deep ripping
7				Establish vegetation	Establishment of vegetation (general)		Yes	10.4.1	1,36	ha	R 15 658,65	R 21 295,76	R 21 295,76	Includes soil amelioration, cultivation and seeding actions
8	00-GA	A3	Y2021	Water Supply Pipelines - Reclamation of disturbed area										Area of disturbance for the establishment of water supply pipelines = 1,30Ha
9				Dozing	Shaping, levelling of footprint areas (500mm)		Yes	10.1.1	0,65	ha	R 62 669,86	R 40 735,41	R 40 735,41	Assume 50% of footprint
10				Transport	Load and haul for 3km distance		Yes	9.6.4	3250,00	m³/km	R 46,89	R 152 392,50	R 152 392,50	250mm thick layer from local stockpiles
11				Ripping	Ripping of areas to alleviate compaction		Yes	9.5.1	1,30	ha	R 14 659,31	R 19 057,10	R 19 057,10	500 mm Deep ripping
12				Establish vegetation	Establishment of vegetation (general)		Yes	10.4.1	1,30	ha	R 15 658,65	R 20 356,25	R 20 356,25	Includes soil amelioration, cultivation and seeding actions
13	00-GA	A4	Y2021	Low Grade ROM Stockpile - Reclamation of disturbed area										General Surface Reclamation already included in the current liability.
14				Liner	Removal of single HDPE liner		Yes	6,4	108100,00	m²	R 10,24	R 1 106 944,00	R 1 106 944,00	Class 3 waste assume facility is lined with HDPE liner
19														
20				**Driekop Shaft Complex**									**R 138 630,36**	
21				**Driekop Ventilation Shaft 9**										
22	00-GA	A1	Y2021	General Surface Reclamation										0,25ha needs to be rehabilitated.
23				Dozing	Shaping, levelling of footprint areas (500mm)		Yes	10.1.1	0,13	ha	R 62 669,86	R 7 833,73	R 7 833,73	Assume 50% of footprint
24				Transport	Load and haul for 3km distance		Yes	9.6.4	625,00	m³/km	R 46,89	R 29 306,25	R 29 306,25	250mm thick layer from local stockpiles
25				Ripping	Ripping of areas to alleviate compaction		Yes	9.5.1	0,25	ha	R 14 659,31	R 3 664,83	R 3 664,83	500 mm Deep ripping
26				Establish vegetation	Establishment of vegetation (general)		Yes	10.4.1	0,25	ha	R 15 658,65	R 3 914,66	R 3 914,66	Includes soil amelioration, cultivation and seeding actions
27	00-GA	A3	Y2021	Water Supply Pipelines - Reclamation of disturbed area										Area of disturbance for the establishment of water supply pipelines = 1,30Ha
28				Dozing	Shaping, levelling of footprint areas (500mm)		Yes	10.1.1	0,26	ha	R 62 669,86	R 16 450,84	R 16 450,84	Assume 50% of footprint
29				Transport	Load and haul for 3km distance		Yes	9.6.4	1312,50	m³/km	R 46,89	R 61 543,13	R 61 543,13	250mm thick layer from local stockpiles
30				Ripping	Ripping of areas to alleviate compaction		Yes	9.5.1	0,53	ha	R 14 659,31	R 7 696,14	R 7 696,14	500 mm Deep ripping
31				Establish vegetation	Establishment of vegetation (general)		Yes	10.4.1	0,53	ha	R 15 658,65	R 8 220,79	R 8 220,79	Includes soil amelioration, cultivation and seeding actions
32														
33				**Tailings Complex**									**R -**	
34					Not Applicable		Yes	1,1	0,00	na	R -	R -	R -	
					SUB-TOTAL 1								**R 1 721 389,55**	
					Preliminaries and General	6%							R 103 283,37	
					Contingency	10%							R 172 138,96	
					SUB-TOTAL 2 (P&G's AND CONTINGENCIES)								**R 275 422,33**	
					GRAND-TOTAL								**R 1 996 811,88**	

Marula Platinum

Ventilation Shaft 8 & 9 - EMPr Amendment

GENERAL ASPECTS							Closure Forecast						2026	
5,1	GENERAL SURFACES													
Line No	Reference Map	GEO Reference	Year Captured	COST COMPONENT	Description		LIABLE	Rate Code	QUANTITY	Unit	Unit Rate	Unit Total	LIABLE VALUE	Notes
1				**Clapham Shaft Complex**									**R 1 350 217,93**	
2				**Clapham Ventilation Shaft 8**										
3	00-GA	A2	Y2021	General Surface Reclamation										1,36ha needs to be rehabilitated.
4				Dozing	Shaping, levelling of footprint areas (500mm)		Yes	10.1.1	0,68	ha	R 62 669,86	R 42 615,50	R 42 615,50	Assume 50% of footprint
5				Transport	Load and haul for 3km distance		Yes	9.6.4	3400,00	m³/km	R 46,89	R 159 426,00	R 159 426,00	250mm thick layer from local stockpiles
6				Ripping	Ripping of areas to alleviate compaction		Yes	9.5.1	1,36	ha	R 14 659,31	R 19 936,66	R 19 936,66	500 mm Deep ripping
7				Establish vegetation	Establishment of vegetation (general)		Yes	10.4.1	1,36	ha	R 15 658,65	R 21 295,76	R 21 295,76	Includes soil amelioration, cultivation and seeding actions
8	00-GA	A3	Y2021	Water Supply Pipelines - Reclamation of disturbed area										Surface rehabilitation completed in 2025
9				Dozing	Shaping, levelling of footprint areas (500mm)		No	10.1.1	0,00	ha	R 62 669,86	R -	R -	
10				Transport	Load and haul for 3km distance		No	9.6.4	0,00	m³/km	R 46,89	R -	R -	
11				Ripping	Ripping of areas to alleviate compaction		No	9.5.1	0,00	ha	R 14 659,31	R -	R -	
12				Establish vegetation	Establishment of vegetation (general)		No	10.4.1	0,00	ha	R 15 658,65	R -	R -	
13	00-GA	A4	Y2021	Low Grade ROM Stockpile - Reclamation of disturbed area										General Surface Reclamation already included in the current liability.
14				Liner	Removal of single HDPE liner		Yes	6,4	108100,00	m²	R 10,24	R 1 106 944,00	R 1 106 944,00	Class 3 waste assume facility is lined with HDPE liner
19														
20				**Driekop Shaft Complex**									**R 44 719,47**	
21				**Driekop Ventilation Shaft 9**										
22	00-GA	A1	Y2021	General Surface Reclamation										0,25ha needs to be rehabilitated.
23				Dozing	Shaping, levelling of footprint areas (500mm)		Yes	10.1.1	0,13	ha	R 62 669,86	R 7 833,73	R 7 833,73	Assume 50% of footprint
24				Transport	Load and haul for 3km distance		Yes	9.6.4	625,00	m³/km	R 46,89	R 29 306,25	R 29 306,25	250mm thick layer from local stockpiles
25				Ripping	Ripping of areas to alleviate compaction		Yes	9.5.1	0,25	ha	R 14 659,31	R 3 664,83	R 3 664,83	500 mm Deep ripping
26				Establish vegetation	Establishment of vegetation (general)		Yes	10.4.1	0,25	ha	R 15 658,65	R 3 914,66	R 3 914,66	Includes soil amelioration, cultivation and seeding actions
27	00-GA	A3	Y2021	Water Supply Pipelines - Reclamation of disturbed area										Surface rehabilitation completed in 2025
28				Dozing	Shaping, levelling of footprint areas (500mm)		No	10.1.1	0,00	ha	R 62 669,86	R -	R -	
29				Transport	Load and haul for 3km distance		No	9.6.4	0,00	m³/km	R 46,89	R -	R -	
30				Ripping	Ripping of areas to alleviate compaction		No	9.5.1	0,00	ha	R 14 659,31	R -	R -	
31				Establish vegetation	Establishment of vegetation (general)		No	10.4.1	0,00	ha	R 15 658,65	R -	R -	
32														
33				**Tailings Complex**									**R -**	
34					Not Applicable		Yes	1,1	0,00	na	R -	R -	R -	
					SUB-TOTAL 1								**R 1 394 937,40**	
					Preliminaries and General	6%							R 83 696,24	
					Contingency	10%							R 139 493,74	
					SUB-TOTAL 2 (P&G's AND CONTINGENCIES)								**R 223 189,98**	
					GRAND-TOTAL								**R 1 618 127,39**	

Marula Platinum

Ventilation Shaft 8 & 9 - EMPr Amendment

GENERAL ASPECTS															
5,1	GENERAL SURFACES						Closure Forecast						2027		
Line No	Reference Map	GEO Reference	Year Captured	COST COMPONENT	Description		LIABLE	Rate Code	QUANTITY	Unit	Unit Rate	Unit Total	LIABLE VALUE		Notes
1				**Clapham Shaft Complex**									**R**	**1 350 217,93**	
2				**Clapham Ventilation Shaft 8**											
3	00-GA	A2	Y2021	General Surface Reclamation											1,36ha needs to be rehabilitated.
4				Dozing	Shaping, levelling of footprint areas (500mm)		Yes	10.1.1	0,68	ha	R 62 669,86	R 42 615,50	R	42 615,50	Assume 50% of footprint
5				Transport	Load and haul for 3km distance		Yes	9.6.4	3400,00	m³/km	R 46,89	R 159 426,00	R	159 426,00	250mm thick layer from local stockpiles
6				Ripping	Ripping of areas to alleviate compaction		Yes	9.5.1	1,36	ha	R 14 659,31	R 19 936,66	R	19 936,66	500 mm Deep ripping
7				Establish vegetation	Establishment of vegetation (general)		Yes	10.4.1	1,36	ha	R 15 658,65	R 21 295,76	R	21 295,76	Includes soil amelioration, cultivation and seeding actions
8	00-GA	A3	Y2021	Water Supply Pipelines - Reclamation of disturbed area											Surface rehabilitation completed in 2025
9				Dozing	Shaping, levelling of footprint areas (500mm)		No	10.1.1	0,00	ha	R 62 669,86	R -	R	-	
10				Transport	Load and haul for 3km distance		No	9.6.4	0,00	m³/km	R 46,89	R -	R	-	
11				Ripping	Ripping of areas to alleviate compaction		No	9.5.1	0,00	ha	R 14 659,31	R -	R	-	
12				Establish vegetation	Establishment of vegetation (general)		No	10.4.1	0,00	ha	R 15 658,65	R -	R	-	
13	00-GA	A4	Y2021	Low Grade ROM Stockpile - Reclamation of disturbed area											General Surface Reclamation already included in the current liability.
14				Liner	Removal of single HDPE liner		Yes	6,4	108100,00	m²	R 10,24	R 1 106 944,00	R	1 106 944,00	Class 3 waste assume facility is lined with HDPE liner
19															
20				**Driekop Shaft Complex**									**R**	**44 719,47**	
21				**Driekop Ventilation Shaft 9**											
22	00-GA	A1	Y2021	General Surface Reclamation											0,25ha needs to be rehabilitated.
23				Dozing	Shaping, levelling of footprint areas (500mm)		Yes	10.1.1	0,13	ha	R 62 669,86	R 7 833,73	R	7 833,73	Assume 50% of footprint
24				Transport	Load and haul for 3km distance		Yes	9.6.4	625,00	m³/km	R 46,89	R 29 306,25	R	29 306,25	250mm thick layer from local stockpiles
25				Ripping	Ripping of areas to alleviate compaction		Yes	9.5.1	0,25	ha	R 14 659,31	R 3 664,83	R	3 664,83	500 mm Deep ripping
26				Establish vegetation	Establishment of vegetation (general)		Yes	10.4.1	0,25	ha	R 15 658,65	R 3 914,66	R	3 914,66	Includes soil amelioration, cultivation and seeding actions
27	00-GA	A3	Y2021	Water Supply Pipelines - Reclamation of disturbed area											Surface rehabilitation completed in 2025
28				Dozing	Shaping, levelling of footprint areas (500mm)		No	10.1.1	0,00	ha	R 62 669,86	R -	R	-	Surface rehabilitation completed in 2025
29				Transport	Load and haul for 3km distance		No	9.6.4	0,00	m³/km	R 46,89	R -	R	-	
30				Ripping	Ripping of areas to alleviate compaction		No	9.5.1	0,00	ha	R 14 659,31	R -	R	-	
31				Establish vegetation	Establishment of vegetation (general)		No	10.4.1	0,00	ha	R 15 658,65	R -	R	-	
32															
33				**Tailings Complex**									**R**	**-**	
34					Not Applicable		Yes	1,1	0,00	na	R -	R -	R	-	
				SUB-TOTAL 1									**R**	**1 394 937,40**	
				Preliminaries and General		6%							R	83 696,24	
				Contingency		10%							R	139 493,74	
				SUB-TOTAL 2 (P&G's AND CONTINGENCIES)									**R**	**223 189,98**	
				GRAND-TOTAL									**R**	**1 618 127,39**	

Marula Platinum

Ventilation Shaft 8 & 9 - EMPr Amendment

GENERAL ASPECTS							Closure Forecast						2028	
5,1	GENERAL SURFACES													
Line No	Reference Map	GEO Reference	Year Captured	COST COMPONENT	Description		LIABLE	Rate Code	QUANTITY	Unit	Unit Rate	Unit Total	LIABLE VALUE	Notes
1				**Clapham Shaft Complex**									**R 1 350 217,93**	
2				**Clapham Ventilation Shaft 8**										
3	00-GA	A2	Y2021	General Surface Reclamation										1,36ha needs to be rehabilitated.
4				Dozing	Shaping, levelling of footprint areas (500mm)		Yes	10.1.1	0,68	ha	R 62 669,86	R 42 615,50	R 42 615,50	Assume 50% of footprint
5				Transport	Load and haul for 3km distance		Yes	9.6.4	3400,00	m³/km	R 46,89	R 159 426,00	R 159 426,00	250mm thick layer from local stockpiles
6				Ripping	Ripping of areas to alleviate compaction		Yes	9.5.1	1,36	ha	R 14 659,31	R 19 936,66	R 19 936,66	500 mm Deep ripping
7				Establish vegetation	Establishment of vegetation (general)		Yes	10.4.1	1,36	ha	R 15 658,65	R 21 295,76	R 21 295,76	Includes soil amelioration, cultivation and seeding actions
8	00-GA	A3	Y2021	Water Supply Pipelines - Reclamation of disturbed area										Surface rehabilitation completed in 2025
9				Dozing	Shaping, levelling of footprint areas (500mm)		No	10.1.1	0,00	ha	R 62 669,86	R -	R -	
10				Transport	Load and haul for 3km distance		No	9.6.4	0,00	m³/km	R 46,89	R -	R -	
11				Ripping	Ripping of areas to alleviate compaction		No	9.5.1	0,00	ha	R 14 659,31	R -	R -	
12				Establish vegetation	Establishment of vegetation (general)		No	10.4.1	0,00	ha	R 15 658,65	R -	R -	
13	00-GA	A4	Y2021	Low Grade ROM Stockpile - Reclamation of disturbed area										General Surface Reclamation already included in the current liability.
14				Liner	Removal of single HDPE liner		Yes	6,4	108100,00	m²	R 10,24	R 1 106 944,00	R 1 106 944,00	Class 3 waste assume facility is lined with HDPE liner
19														
20				**Driekop Shaft Complex**									**R 44 719,47**	
21				**Driekop Ventilation Shaft 9**										
22	00-GA	A1	Y2021	General Surface Reclamation										0,25ha needs to be rehabilitated.
23				Dozing	Shaping, levelling of footprint areas (500mm)		Yes	10.1.1	0,13	ha	R 62 669,86	R 7 833,73	R 7 833,73	Assume 50% of footprint
24				Transport	Load and haul for 3km distance		Yes	9.6.4	625,00	m³/km	R 46,89	R 29 306,25	R 29 306,25	250mm thick layer from local stockpiles
25				Ripping	Ripping of areas to alleviate compaction		Yes	9.5.1	0,25	ha	R 14 659,31	R 3 664,83	R 3 664,83	500 mm Deep ripping
26				Establish vegetation	Establishment of vegetation (general)		Yes	10.4.1	0,25	ha	R 15 658,65	R 3 914,66	R 3 914,66	Includes soil amelioration, cultivation and seeding actions
27	00-GA	A3	Y2021	Water Supply Pipelines - Reclamation of disturbed area										Surface rehabilitation completed in 2025
28				Dozing	Shaping, levelling of footprint areas (500mm)		No	10.1.1	0,00	ha	R 62 669,86	R -	R -	Surface rehabilitation completed in 2025
29				Transport	Load and haul for 3km distance		No	9.6.4	0,00	m³/km	R 46,89	R -	R -	
30				Ripping	Ripping of areas to alleviate compaction		No	9.5.1	0,00	ha	R 14 659,31	R -	R -	
31				Establish vegetation	Establishment of vegetation (general)		No	10.4.1	0,00	ha	R 15 658,65	R -	R -	
32														
33				**Tailings Complex**									**R -**	
34					Not Applicable		Yes	1,1	0,00	na	R -	R -	R -	
												SUB-TOTAL 1	**R 1 394 937,40**	
												Preliminaries and General	R 83 696,24	
						6%						Contingency	R 139 493,74	
						10%						**SUB-TOTAL 2 (P&G's AND CONTINGENCIES)**	**R 223 189,98**	
												GRAND-TOTAL	**R 1 618 127,39**	

Marula Platinum

Ventilation Shaft 8 & 9 - EMPr Amendment

GENERAL ASPECTS															
5,1	GENERAL SURFACES						Closure Forecast						2029		
Line No	Reference Map	GEO Reference	Year Captured	COST COMPONENT	Description		LIABLE	Rate Code	QUANTITY	Unit	Unit Rate	Unit Total	LIABLE VALUE		Notes
1				**Clapham Shaft Complex**									**R**	**1 350 217,93**	
2				**Clapham Ventilation Shaft 8**											
3	00-GA	A2	Y2021	General Surface Reclamation											1,36ha needs to be rehabilitated.
4				Dozing	Shaping, levelling of footprint areas (500mm)		Yes	10.1.1	0,68	ha	R 62 669,86	R 42 615,50	R	42 615,50	Assume 50% of footprint
5				Transport	Load and haul for 3km distance		Yes	9.6.4	3400,00	m³/km	R 46,89	R 159 426,00	R	159 426,00	250mm thick layer from local stockpiles
6				Ripping	Ripping of areas to alleviate compaction		Yes	9.5.1	1,36	ha	R 14 659,31	R 19 936,66	R	19 936,66	500 mm Deep ripping
7				Establish vegetation	Establishment of vegetation (general)		Yes	10.4.1	1,36	ha	R 15 658,65	R 21 295,76	R	21 295,76	Includes soil amelioration, cultivation and seeding actions
8	00-GA	A3	Y2021	Water Supply Pipelines - Reclamation of disturbed area											Surface rehabilitation completed in 2025
9				Dozing	Shaping, levelling of footprint areas (500mm)		No	10.1.1	0,00	ha	R 62 669,86	R -	R	-	
10				Transport	Load and haul for 3km distance		No	9.6.4	0,00	m³/km	R 46,89	R -	R	-	
11				Ripping	Ripping of areas to alleviate compaction		No	9.5.1	0,00	ha	R 14 659,31	R -	R	-	
12				Establish vegetation	Establishment of vegetation (general)		No	10.4.1	0,00	ha	R 15 658,65	R -	R	-	
13	00-GA	A4	Y2021	Low Grade ROM Stockpile - Reclamation of disturbed area											General Surface Reclamation already included in the current liability.
14				Liner	Removal of single HDPE liner		Yes	6,4	108100,00	m²	R 10,24	R 1 106 944,00	R	1 106 944,00	Class 3 waste assume facility is lined with HDPE liner
19															
20				**Driekop Shaft Complex**									**R**	**44 719,47**	
21				**Driekop Ventilation Shaft 9**											
22	00-GA	A1	Y2021	General Surface Reclamation											0,25ha needs to be rehabilitated.
23				Dozing	Shaping, levelling of footprint areas (500mm)		Yes	10.1.1	0,13	ha	R 62 669,86	R 7 833,73	R	7 833,73	Assume 50% of footprint
24				Transport	Load and haul for 3km distance		Yes	9.6.4	625,00	m³/km	R 46,89	R 29 306,25	R	29 306,25	250mm thick layer from local stockpiles
25				Ripping	Ripping of areas to alleviate compaction		Yes	9.5.1	0,25	ha	R 14 659,31	R 3 664,83	R	3 664,83	500 mm Deep ripping
26				Establish vegetation	Establishment of vegetation (general)		Yes	10.4.1	0,25	ha	R 15 658,65	R 3 914,66	R	3 914,66	Includes soil amelioration, cultivation and seeding actions
27	00-GA	A3	Y2021	Water Supply Pipelines - Reclamation of disturbed area											Surface rehabilitation completed in 2025
28				Dozing	Shaping, levelling of footprint areas (500mm)		No	10.1.1	0,00	ha	R 62 669,86	R -	R	-	Surface rehabilitation completed in 2025
29				Transport	Load and haul for 3km distance		No	9.6.4	0,00	m³/km	R 46,89	R -	R	-	
30				Ripping	Ripping of areas to alleviate compaction		No	9.5.1	0,00	ha	R 14 659,31	R -	R	-	
31				Establish vegetation	Establishment of vegetation (general)		No	10.4.1	0,00	ha	R 15 658,65	R -	R	-	
32															
33				**Tailings Complex**									**R**	**-**	
34					Not Applicable		Yes	1,1	0,00	na	R -	R -	R	-	
				SUB-TOTAL 1									**R**	**1 394 937,40**	
				Preliminaries and General		6%							R	83 696,24	
				Contingency		10%							R	139 493,74	
				SUB-TOTAL 2 (P&G's AND CONTINGENCIES)									**R**	**223 189,98**	
				GRAND-TOTAL									**R**	**1 618 127,39**	

Marula Platinum

Ventilation Shaft 8 & 9 - EMPr Amendment

GENERAL ASPECTS							Closure Forecast						2030	
5,1	GENERAL SURFACES													
Line No	Reference Map	GEO Reference	Year Captured	COST COMPONENT	Description		LIABLE	Rate Code	QUANTITY	Unit	Unit Rate	Unit Total	LIABLE VALUE	Notes
1				**Clapham Shaft Complex**									**R 1 350 217,93**	
2				**Clapham Ventilation Shaft 8**										
3	00-GA	A2	Y2021	General Surface Reclamation										1,36ha needs to be rehabilitated.
4				Dozing	Shaping, levelling of footprint areas (500mm)		Yes	10.1.1	0,68	ha	R 62 669,86	R 42 615,50	R 42 615,50	Assume 50% of footprint
5				Transport	Load and haul for 3km distance		Yes	9.6.4	3400,00	m³/km	R 46,89	R 159 426,00	R 159 426,00	250mm thick layer from local stockpiles
6				Ripping	Ripping of areas to alleviate compaction		Yes	9.5.1	1,36	ha	R 14 659,31	R 19 936,66	R 19 936,66	500 mm Deep ripping
7				Establish vegetation	Establishment of vegetation (general)		Yes	10.4.1	1,36	ha	R 15 658,65	R 21 295,76	R 21 295,76	Includes soil amelioration, cultivation and seeding actions
8	00-GA	A3	Y2021	Water Supply Pipelines - Reclamation of disturbed area										Surface rehabilitation completed in 2025
9				Dozing	Shaping, levelling of footprint areas (500mm)		No	10.1.1	0,00	ha	R 62 669,86	R -	R -	
10				Transport	Load and haul for 3km distance		No	9.6.4	0,00	m³/km	R 46,89	R -	R -	
11				Ripping	Ripping of areas to alleviate compaction		No	9.5.1	0,00	ha	R 14 659,31	R -	R -	
12				Establish vegetation	Establishment of vegetation (general)		No	10.4.1	0,00	ha	R 15 658,65	R -	R -	
13	00-GA	A4	Y2021	Low Grade ROM Stockpile - Reclamation of disturbed area										General Surface Reclamation already included in the current liability.
14				Liner	Removal of single HDPE liner		Yes	6,4	108100,00	m²	R 10,24	R 1 106 944,00	R 1 106 944,00	Class 3 waste assume facility is lined with HDPE liner
19														
20				**Driekop Shaft Complex**									**R 44 719,47**	
21				**Driekop Ventilation Shaft 9**										
22	00-GA	A1	Y2021	General Surface Reclamation										0,25ha needs to be rehabilitated.
23				Dozing	Shaping, levelling of footprint areas (500mm)		Yes	10.1.1	0,13	ha	R 62 669,86	R 7 833,73	R 7 833,73	Assume 50% of footprint
24				Transport	Load and haul for 3km distance		Yes	9.6.4	625,00	m³/km	R 46,89	R 29 306,25	R 29 306,25	250mm thick layer from local stockpiles
25				Ripping	Ripping of areas to alleviate compaction		Yes	9.5.1	0,25	ha	R 14 659,31	R 3 664,83	R 3 664,83	500 mm Deep ripping
26				Establish vegetation	Establishment of vegetation (general)		Yes	10.4.1	0,25	ha	R 15 658,65	R 3 914,66	R 3 914,66	Includes soil amelioration, cultivation and seeding actions
27	00-GA	A3	Y2021	Water Supply Pipelines - Reclamation of disturbed area										Surface rehabilitation completed in 2025
28				Dozing	Shaping, levelling of footprint areas (500mm)		No	10.1.1	0,00	ha	R 62 669,86	R -	R -	Surface rehabilitation completed in 2025
29				Transport	Load and haul for 3km distance		No	9.6.4	0,00	m³/km	R 46,89	R -	R -	
30				Ripping	Ripping of areas to alleviate compaction		No	9.5.1	0,00	ha	R 14 659,31	R -	R -	
31				Establish vegetation	Establishment of vegetation (general)		No	10.4.1	0,00	ha	R 15 658,65	R -	R -	
32														
33				**Tailings Complex**									**R -**	
34					Not Applicable		Yes	1,1	0,00	na	R -	R -	R -	
				SUB-TOTAL 1									**R 1 394 937,40**	
				Preliminaries and General		6%							R 83 696,24	
				Contingency		10%							R 139 493,74	
				SUB-TOTAL 2 (P&G's AND CONTINGENCIES)									**R 223 189,98**	
				GRAND-TOTAL									**R 1 618 127,39**	

Marula Platinum

Ventilation Shaft 8 & 9 - EMPr Amendment

GENERAL ASPECTS							Premature Closure						2021	
5,2		POST CLOSURE MONITORING AND MAINTENANCE												
Line No	Reference Map	GEO Reference	Year Captured	COST COMPONENT	Description		LIABLE	Rate Code	QUANTITY	Unit	Unit Rate	Unit Total	LIABLE VALUE	Notes
1				**Clapham Shaft Complex**									**R -**	
2				**Clapham Ventilation Shaft 8**										
3			Y2021	General Surface Monitoring	Care and maintenance		Yes	12.2.1	0,00	ha	R 8 067,74	R -	R -	5 years care and maintenance.
4														
5				**Driekop Shaft Complex**									**R -**	
6				**Driekop Ventilation Shaft 9**										
7			Y2021	General Surface Monitoring	Care and maintenance		Yes	12.2.1	0,00	ha	R 8 067,74	R -	R -	5 years care and maintenance.
8														
9				**Tailings Complex**									**R -**	
10					Not Applicable		Yes	1,1	0,00	na	R -	R -	R -	
					SUB-TOTAL 1								**R -**	
					Preliminaries and General	0%							R -	
					Contingency	10%							R -	
					SUB-TOTAL 2 (P&G's AND CONTINGENCIES)								**R -**	
					GRAND-TOTAL								**R -**	

Marula Platinum

Ventilation Shaft 8 & 9 - EMPr Amendment

GENERAL ASPECTS							Closure Forecast						2022	
5,2	POST CLOSURE MONITORING AND MAINTENANCE													
Line No	Reference Map	GEO Reference	Year Captured	COST COMPONENT	Description		LIABLE	Rate Code	QUANTITY	Unit	Unit Rate	Unit Total	LIABLE VALUE	Notes
1				**Clapham Shaft Complex**									**R 10 972,13**	
2				**Clapham Ventilation Shaft 8**										
3			Y2021	General Surface Monitoring	Care and maintenance		Yes	12.2.1	1,36	ha	R 8 067,74	R 10 972,13	R 10 972,13	5 years care and maintenance.
4														
5				**Driekop Shaft Complex**									**R 2 016,94**	
6				**Driekop Ventilation Shaft 9**										
7			Y2021	General Surface Monitoring	Care and maintenance		Yes	12.2.1	0,25	ha	R 8 067,74	R 2 016,94	R 2 016,94	5 years care and maintenance.
8														
9				**Tailings Complex**									**R -**	
10					Not Applicable		Yes	1,1	0,00	na	R -	R -	R -	
					SUB-TOTAL 1								**R 12 989,06**	
					Preliminaries and General	0%							R -	
					Contingency	10%							R 1 298,91	
					SUB-TOTAL 2 (P&G's AND CONTINGENCIES)								**R 1 298,91**	
					GRAND-TOTAL								**R 14 287,97**	

Marula Platinum

Ventilation Shaft 8 & 9 - EMPr Amendment

GENERAL ASPECTS							Closure Forecast						2023	
5,2	POST CLOSURE MONITORING AND MAINTENANCE													
Line No	Reference Map	GEO Reference	Year Captured	COST COMPONENT	Description		LIABLE	Rate Code	QUANTITY	Unit	Unit Rate	Unit Total	LIABLE VALUE	Notes
1				**Clapham Shaft Complex**									**R 10 972,13**	
2				**Clapham Ventilation Shaft 8**										
3			Y2021	General Surface Monitoring	Care and maintenance		Yes	12.2.1	1,36	ha	R 8 067,74	R 10 972,13	R 10 972,13	5 years care and maintenance.
4														
5				**Driekop Shaft Complex**									**R 2 016,94**	
6				**Driekop Ventilation Shaft 9**										
7			Y2021	General Surface Monitoring	Care and maintenance		Yes	12.2.1	0,25	ha	R 8 067,74	R 2 016,94	R 2 016,94	5 years care and maintenance.
8														
9				**Tailings Complex**									**R -**	
10					Not Applicable		Yes	1,1	0,00	na	R -	R -	R -	
						SUB-TOTAL 1							**R 12 989,06**	
						Preliminaries and General	0%						R -	
						Contingency	10%						R 1 298,91	
						SUB-TOTAL 2 (P&G's AND CONTINGENCIES)							**R 1 298,91**	
						GRAND-TOTAL							**R 14 287,97**	

Marula Platinum

Ventilation Shaft 8 & 9 - EMPr Amendment

GENERAL ASPECTS							Closure Forecast						2024	
5,2	POST CLOSURE MONITORING AND MAINTENANCE													
Line No	Reference Map	GEO Reference	Year Captured	COST COMPONENT	Description		LIABLE	Rate Code	QUANTITY	Unit	Unit Rate	Unit Total	LIABLE VALUE	Notes
1				**Clapham Shaft Complex**									**R 10 972,13**	
2				**Clapham Ventilation Shaft 8**										
3			Y2021	General Surface Monitoring	Care and maintenance		Yes	12.2.1	1,36	ha	R 8 067,74	R 10 972,13	R 10 972,13	5 years care and maintenance.
4														
5				**Driekop Shaft Complex**									**R 2 016,94**	
6				**Driekop Ventilation Shaft 9**										
7			Y2021	General Surface Monitoring	Care and maintenance		Yes	12.2.1	0,25	ha	R 8 067,74	R 2 016,94	R 2 016,94	5 years care and maintenance.
8														
9				**Tailings Complex**									**R -**	
10					Not Applicable		Yes	1,1	0,00	na	R -	R -	R -	
					SUB-TOTAL 1								**R 12 989,06**	
					Preliminaries and General	0%							R -	
					Contingency	10%							R 1 298,91	
					SUB-TOTAL 2 (P&G's AND CONTINGENCIES)								**R 1 298,91**	
					GRAND-TOTAL								**R 14 287,97**	

Marula Platinum

Ventilation Shaft 8 & 9 - EMPr Amendment

GENERAL ASPECTS							Closure Forecast						2025	
5,2	POST CLOSURE MONITORING AND MAINTENANCE													
Line No	Reference Map	GEO Reference	Year Captured	COST COMPONENT	Description		LIABLE	Rate Code	QUANTITY	Unit	Unit Rate	Unit Total	LIABLE VALUE	Notes
1				**Clapham Shaft Complex**									**R 21 460,19**	
2				**Clapham Ventilation Shaft 8**										
3			Y2021	General Surface Monitoring	Care and maintenance		Yes	12.2.1	2,66	ha	R 8 067,74	R 21 460,19	R 21 460,19	5 years care and maintenance.
4														Reclamation of disturbed area of Water Supply Pipelines included.
5				**Driekop Shaft Complex**									**R 6 252,50**	
6				**Driekop Ventilation Shaft 9**										
7			Y2021	General Surface Monitoring	Care and maintenance		Yes	12.2.1	0,78	ha	R 8 067,74	R 6 252,50	R 6 252,50	5 years care and maintenance.
8														Reclamation of disturbed area of Water Supply Pipelines included.
9				**Tailings Complex**									**R -**	
10					Not Applicable		Yes	1,1	0,00	na	R -	R -	R -	
						SUB-TOTAL 1							**R 27 712,69**	
						Preliminaries and General	0%						R -	
						Contingency	10%						R 2 771,27	
						SUB-TOTAL 2 (P&G's AND CONTINGENCIES)							**R 2 771,27**	
						GRAND-TOTAL							**R 30 483,96**	

Marula Platinum

Ventilation Shaft 8 & 9 - EMPr Amendment

GENERAL ASPECTS							Closure Forecast						2026	
5,2		POST CLOSURE MONITORING AND MAINTENANCE												
Line No	Reference Map	GEO Reference	Year Captured	COST COMPONENT	Description		LIABLE	Rate Code	QUANTITY	Unit	Unit Rate	Unit Total	LIABLE VALUE	Notes
1				**Clapham Shaft Complex**									**R 21 460,19**	
2				**Clapham Ventilation Shaft 8**										
3			Y2021	General Surface Monitoring	Care and maintenance		Yes	12.2.1	2,66	ha	R 8 067,74	R 21 460,19	R 21 460,19	5 years care and maintenance.
4														
5				**Driekop Shaft Complex**									**R 6 292,84**	
6				**Driekop Ventilation Shaft 9**										
7			Y2021	General Surface Monitoring	Care and maintenance		Yes	12.2.1	0,78	ha	R 8 067,74	R 6 292,84	R 6 292,84	5 years care and maintenance.
8														
9				**Tailings Complex**									**R -**	
10					Not Applicable		Yes	1,1	0,00	na	R -	R -	R -	
					SUB-TOTAL 1								**R 27 753,03**	
					Preliminaries and General	0%							R -	
					Contingency	10%							R 2 775,30	
					SUB-TOTAL 2 (P&G's AND CONTINGENCIES)								**R 2 775,30**	
					GRAND-TOTAL								**R 30 528,33**	

Marula Platinum

Ventilation Shaft 8 & 9 - EMPr Amendment

GENERAL ASPECTS							Closure Forecast						2027	
5,2	POST CLOSURE MONITORING AND MAINTENANCE													
Line No	Reference Map	GEO Reference	Year Captured	COST COMPONENT	Description		LIABLE	Rate Code	QUANTITY	Unit	Unit Rate	Unit Total	LIABLE VALUE	Notes
1				**Clapham Shaft Complex**									**R 21 460,19**	
2				**Clapham Ventilation Shaft 8**										
3			Y2021	General Surface Monitoring	Care and maintenance		Yes	12.2.1	2,66	ha	R 8 067,74	R 21 460,19	R 21 460,19	5 years care and maintenance.
4														
5				**Driekop Shaft Complex**									**R 6 292,84**	
6				**Driekop Ventilation Shaft 9**										
7			Y2021	General Surface Monitoring	Care and maintenance		Yes	12.2.1	0,78	ha	R 8 067,74	R 6 292,84	R 6 292,84	5 years care and maintenance.
8														
9				**Tailings Complex**									**R -**	
10					Not Applicable		Yes	1,1	0,00	na	R -	R -	R -	
					SUB-TOTAL 1								**R 27 753,03**	
					Preliminaries and General	0%							R -	
					Contingency	10%							R 2 775,30	
					SUB-TOTAL 2 (P&G's AND CONTINGENCIES)								**R 2 775,30**	
					GRAND-TOTAL								**R 30 528,33**	

Marula Platinum

Ventilation Shaft 8 & 9 - EMPr Amendment

GENERAL ASPECTS							Closure Forecast						2028	
5,2	POST CLOSURE MONITORING AND MAINTENANCE													
Line No	Reference Map	GEO Reference	Year Captured	COST COMPONENT	Description		LIABLE	Rate Code	QUANTITY	Unit	Unit Rate	Unit Total	LIABLE VALUE	Notes
1				**Clapham Shaft Complex**									**R 21 460,19**	
2				**Clapham Ventilation Shaft 8**										
3			Y2021	General Surface Monitoring	Care and maintenance		Yes	12.2.1	2,66	ha	R 8 067,74	R 21 460,19	R 21 460,19	5 years care and maintenance.
4														
5				**Driekop Shaft Complex**									**R 6 292,84**	
6				**Driekop Ventilation Shaft 9**										
7			Y2021	General Surface Monitoring	Care and maintenance		Yes	12.2.1	0,78	ha	R 8 067,74	R 6 292,84	R 6 292,84	5 years care and maintenance.
8														
9				**Tailings Complex**									**R -**	
10					Not Applicable		Yes	1,1	0,00	na	R -	R -	R -	
					SUB-TOTAL 1								**R 27 753,03**	
					Preliminaries and General	0%							R -	
					Contingency	10%							R 2 775,30	
					SUB-TOTAL 2 (P&G's AND CONTINGENCIES)								**R 2 775,30**	
					GRAND-TOTAL								**R 30 528,33**	

Marula Platinum

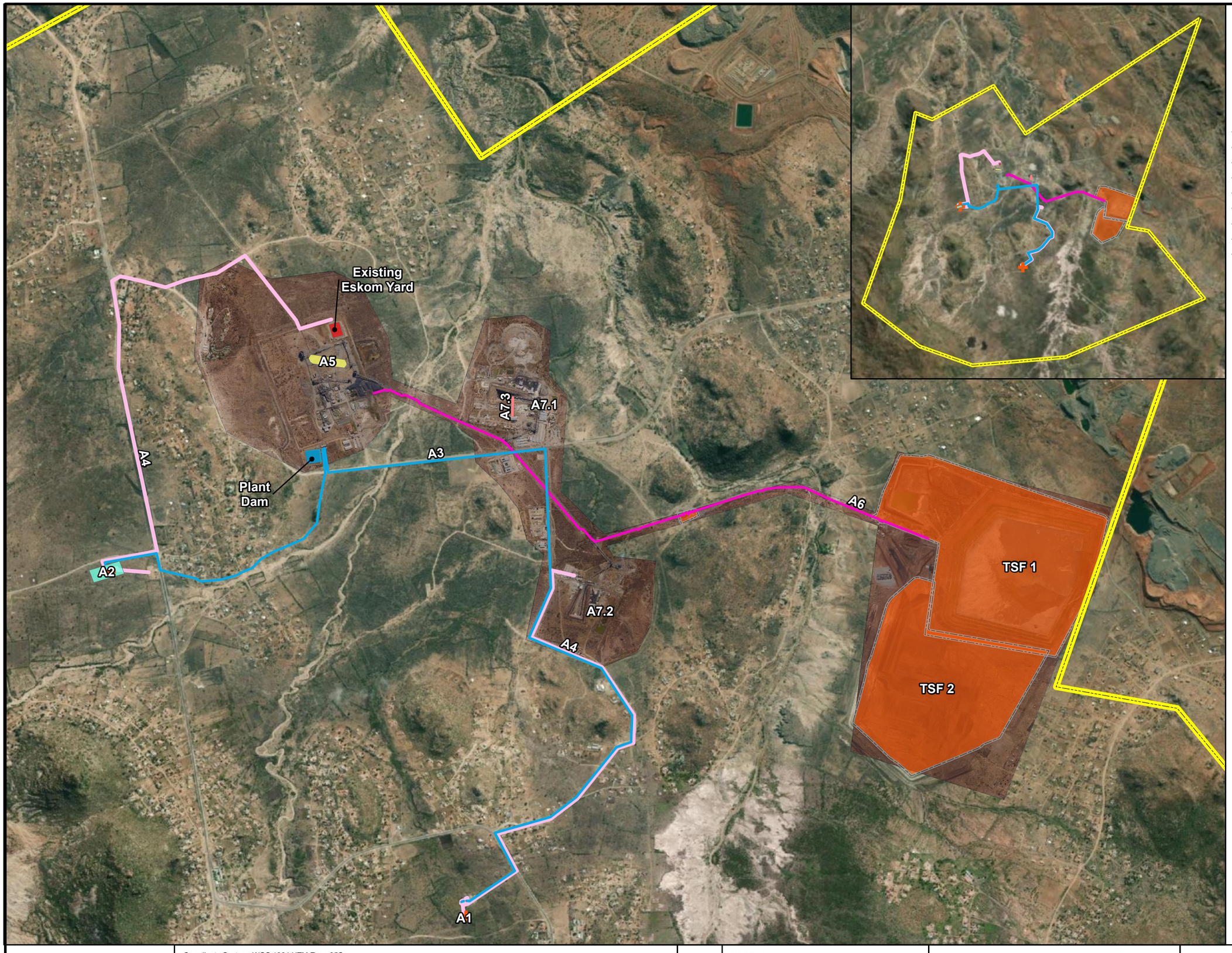
Ventilation Shaft 8 & 9 - EMPr Amendment

GENERAL ASPECTS							Closure Forecast						2029	
5,2	POST CLOSURE MONITORING AND MAINTENANCE													
Line No	Reference Map	GEO Reference	Year Captured	COST COMPONENT	Description		LIABLE	Rate Code	QUANTITY	Unit	Unit Rate	Unit Total	LIABLE VALUE	Notes
1				**Clapham Shaft Complex**									**R 21 460,19**	
2				**Clapham Ventilation Shaft 8**										
3			Y2021	General Surface Monitoring	Care and maintenance		Yes	12.2.1	2,66	ha	R 8 067,74	R 21 460,19	R 21 460,19	5 years care and maintenance.
4														
5				**Driekop Shaft Complex**									**R 6 292,84**	
6				**Driekop Ventilation Shaft 9**										
7			Y2021	General Surface Monitoring	Care and maintenance		Yes	12.2.1	0,78	ha	R 8 067,74	R 6 292,84	R 6 292,84	5 years care and maintenance.
8														
9				**Tailings Complex**									**R -**	
10					Not Applicable		Yes	1,1	0,00	na	R -	R -	R -	
					SUB-TOTAL 1								**R 27 753,03**	
					Preliminaries and General	0%							R -	
					Contingency	10%							R 2 775,30	
					SUB-TOTAL 2 (P&G's AND CONTINGENCIES)								**R 2 775,30**	
					GRAND-TOTAL								**R 30 528,33**	

Marula Platinum

Ventilation Shaft 8 & 9 - EMPr Amendment

GENERAL ASPECTS							Closure Forecast						2030	
5,2	POST CLOSURE MONITORING AND MAINTENANCE													
Line No	Reference Map	GEO Reference	Year Captured	COST COMPONENT	Description		LIABLE	Rate Code	QUANTITY	Unit	Unit Rate	Unit Total	LIABLE VALUE	Notes
1				**Clapham Shaft Complex**									**R 10 972,13**	
2				**Clapham Ventilation Shaft 8**										
3			Y2021	General Surface Monitoring	Care and maintenance		Yes	12.2.1	1,36	ha	R 8 067,74	R 10 972,13	R 10 972,13	5 years care and maintenance.
4														
5				**Driekop Shaft Complex**									**R 2 016,94**	
6				**Driekop Ventilation Shaft 9**										
7			Y2021	General Surface Monitoring	Care and maintenance		Yes	12.2.1	0,25	ha	R 8 067,74	R 2 016,94	R 2 016,94	5 years care and maintenance.
8														
9				**Tailings Complex**									**R -**	
10					Not Applicable		Yes	1,1	0,00	na	R -	R -	R -	
					SUB-TOTAL 1								**R 12 989,06**	
					Preliminaries and General	0%							R -	
					Contingency	10%							R 1 298,91	
					SUB-TOTAL 2 (P&G's AND CONTINGENCIES)								**R 1 298,91**	
					GRAND-TOTAL								**R 14 287,97**	



Legend

Mine Boundary

Tailings Facility

Description

A1 Proposed Ventilation Shaft (Driekop)
A2 Proposed Ventilation Shaft (Clapham)
A3 Proposed Water Pipelines
A4 Proposed Powerlines
A5 Proposed ROM Stockpile
A6 Proposed TSF Pipeline
A7.1 Proposed Clapham Change House
A7.2 Proposed Driekop Change House
A7.3 Proposed Compressed Airline Upgrade

MARULA
Member of the Implats Group

Coordinate System: WGS 1984 UTM Zone 35S
Projection: Transverse Mercator
Datum: WGS 1984
Central Meridian: 27
Units: Meter
Date: November 2021

0 145 290 580 870 1,160 Meters

N

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CONTRACT :	MARULA PLATINUM
PROJECT DESCRIPTION :	VENTILATION SHAFTS
PROJECT NO :	PN100460
DRAWING NO :	00 - GENERAL ARRANGEMENT
SCALE:	N/A
ORIGINAL MAP SIZE:	A3