



DIGBY WELLS
ENVIRONMENTAL



Addendum to the Environmental Impact Assessment Report for the Proposed Platreef Underground Mine, near Mokopane, Limpopo Province

Heritage Impact Assessment Addendum Report

Project Number:

IVA3396

Prepared for:

Ivanplats (Pty) Ltd

January 2016





Digby Wells and Associates (South Africa) (Pty) Ltd
(Subsidiary of Digby Wells & Associates (Pty) Ltd). Co. Reg. No. 2010/008577/07. Turnberry Office Park, 48
Grosvenor Road, Bryanston, 2191. Private Bag X10046, Randburg, 2125, South Africa
Tel: +27 11 789 9495, Fax: +27 11 789 9498, info@digbywells.com, www.digbywells.com

Directors: AJ Reynolds (Chairman) (British)*, GE Trusler (C.E.O), B Beringer, LF Koeslag, J Leaver*,
NA Mehlomaku, DJ Otto
*Non-Executive



This document has been prepared by Digby Wells Environmental.

Report Type:	Heritage Impact Assessment Addendum Report
Project Name:	Addendum to the Environmental Impact Assessment Report for the Proposed Platreef Underground Mine, near Mokopane, Limpopo Province
Project Code:	IVA3396

Name	Responsibility	Signature	Date
Justin du Piesanie Heritage Resources Management Consultant: Archaeologist ASAPA Member No 270	Report Compilation		December 2015
Natasha Higgitt Assistant Heritage Consultant ASAPA Membership No: 335	Pre-disturbance survey and Technical Review		December 2015
Michael Hennessy	Internal Review		January 2016
Lucy Koeslag	Exco Review		January 2016

This report is provided solely for the purposes set out in it and may not, in whole or in part, be used for any other purpose without Digby Wells Environmental prior written consent.

EXECUTIVE SUMMARY

Ivanplats (Pty) Ltd (hereafter Ivanplats) has undertaken to develop and operate an underground platinum mine near Mokopane, Limpopo Province (the Project). Ivanplats is currently the holder of an approved Mining Right (LP30/5/1/2/2/10067MR) issued by the Department of Mineral Resources (DMR). Subsequent to the issuing of this mining right, residential encroachment of the planned mining area has necessitated the need for an amendment to the approved mine layout plan. Digby Wells Environmental (Digby Wells) has been appointed by Ivanplats to review these amendments and identify and assess any additional impacts that may result from these amendments.

The Scope of Work included a survey of new proposed infrastructure to identify any heritage resources that would be affected by the proposed amendments. In particular, the re-routing of a 4.84 km section of the Tailings Storage Facility (TSF) pipeline and the new 3.02 km storm water drain were surveyed.

A total of seven heritage resources were identified along the amended infrastructure. Six of the identified heritage resources were graves and/or burial grounds, of which 2 burial sites had previously been identified as part of the HIA completed by Digby Wells in 2013 for the Mining Right Application and four newly identified burial sites as part of this survey. The new burial sites do not form part of the current Burial Grounds and Graves (BGG) Consultation process. The burial grounds were given a very high cultural significance (CS). The impact assessment on the burial grounds showed that a major negative impact would occur without relevant mitigation.

Additionally, one Iron Age surface occurrence was identified along the TSF pipeline, however it was not found *in-situ* and was given a negligible CS and not assessed further.

Heritage impacts to the identified burial grounds and graves were identified and assessed in relation to the re-routing of a section of the TSF pipeline and new storm water drain. Heritage impacts may manifest as either changes to the physical integrity of the sites due to certain activities, or changes to the intangible nature of the burial grounds from restricted and / or loss of access.

All identified burial grounds and graves within close proximity or within the development footprint of the linear infrastructure must, at a minimum:

- Adhere to the management procedures detailed under Section 8.3.4: Cemeteries and Graves of the Platreef Project Conservation Management Plan (CMP) (2016); and
- Be subject to a burial grounds consultation and relocation process. The current Burial Grounds and Graves (BGG) Consultation process being undertaken could be extended to include the new burial sites.

The consultation process must be completed in accordance with Chapter XI of the NHRA Regulations (GN R 548) and aim to:

- Identify descendants and family members of the deceased and any other person or communities who by tradition are concerned with the graves;
- Consult with identified stakeholders regarding the effect of the Project on graves; and
- Reach agreement with stakeholders on the future of identified graves, to retain sites *in situ* or exhume, relocate and reinter the contents of graves.

Where burial grounds and graves are located in areas where *in situ* preservation is possible, for example on the proposed linear infrastructure boundaries, mitigation must consider redesigning proposed routing options to exclude burial grounds from the development footprints. Consultation with stakeholders will, however, still be required to reach agreement on the *in situ* conservation, including access requirements. The following minimum buffer zones are recommended for gravesites that may be conserved *in situ*:

- At least 15 m from any linear infrastructure footprints such as pipelines, roads or conveyors, including servitudes;
- At least 25 m from other infrastructure footprints such as offices, parking areas, etc.; and
- At least 100 m from open pit areas.

Furthermore, it is recommended that a Watching Brief be undertaken during the construction. This will entail a qualified and accredited archaeologist on site during earth moving activities to assess and guide construction to minimise the risk of damage to burial grounds and graves.

Where burial grounds and graves are located in areas where *in situ* conservation will not be feasible or will be unsafe, mitigation must consider the exhumation and relocation of graves within the current process being undertaken. Exhumation and relocation is a permitted activity in accordance with Section 36(3) of the NHRA, and regulated by Chapters IX and XI of the NHRA: Regulations (GN R 548).

ACRONYMS

Abbreviation	Meaning
ASAPA	Association of Southern African Professional Archaeologists
BA	Bachelor of Arts
BGG	Burial Ground and Graves
BGGC	Burial Ground and Graves Consultation
BID	Background Information Document
BSc	Bachelor of Science
c.	circa, meaning approximately
CMP	Conservation Management Plan
CRR	Comments and Response Report
Digby Wells	Digby Wells Environmental
EAP	Environmental Assessment Practitioner
EFC	Early Farming Community (also known as Early Iron Age)
EIA	Environmental Impact Assessment
ESIA	Environmental and Social Impact Assessment
EMP	Environmental Management Programme
ESA	Early Stone Age
GIS	Geographical Information System
GPS	Global Positioning System
GRP	Grave Relocation Plan
HBE	Historical built environment
HIA	Heritage Impact Assessment
Hons	Honours degree
HRM	Heritage Resources Management
ICOMOS	International Council on Monuments and Sites
LFC	Late Farming Community also known as Late Iron Age
LIHRA	Limpopo Heritage Resources Authority
LoM	Life of Mine
LSA	Late Stone Age
MPRDA	Minerals and Petroleum Resources Development Act, 2002 (Act No. 28 of 2002)
MSA	Middle Stone Age
MSc	Master of Science
NEMA	National Environmental Management Act, 1998 (Act No. 107 of 1998)
NHRA	National Heritage Resources Act, 1999 (Act No. 25 of 1999)
NID	Notification of Intent to Develop
NoK	Next-of-Kin
RoD	Record of Decision
SAHRA	South African Heritage Resources Agency
SAHRIS	South African Heritage Resources Information System
SEP	Stakeholder Engagement Process
STP	Shovel Test Pit



TABLE OF CONTENTS

1	Introduction	1
1.1	Project Background	1
1.2	Project Description	2
1.3	Terms of Reference.....	2
1.4	Aims and Objectives.....	3
2	Specialist Details	5
3	Methodology.....	5
3.1	Qualitative Data Collection	5
3.2	Quantitative Data Collection	5
4	Assumptions and Limitations	6
5	Baseline Environment	6
5.1	Cultural Landscape Summary	6
5.2	Results of Pre-Disturbance Survey.....	7
5.2.1	<i>IVA3396/2428BB/BGG-001 – Burial ground</i>	<i>8</i>
5.2.2	<i>IVA3396/2428BB/BGG-002 – Grave.....</i>	<i>9</i>
5.2.3	<i>IVA3396/2428BB/BGG-003 – Grave.....</i>	<i>10</i>
5.2.4	<i>IVA3396/2428BB/BGG-004 – Burial ground</i>	<i>11</i>
5.2.5	<i>IVA3396/2428BB/St-005 – Farming Community.....</i>	<i>12</i>
5.2.6	<i>IVA3396/2428BB/BGG-006 – Burial ground</i>	<i>13</i>
5.2.7	<i>IVA3396/2428BB/BGG-007 – Burial ground</i>	<i>14</i>
6	Sensitivity Analysis and No-Go Areas.....	16
7	Impact Assessment.....	18
7.1	Methodology.....	18
7.1.1	<i>Evaluation of Significance.....</i>	<i>18</i>
7.1.2	<i>Field Ratings</i>	<i>19</i>
7.1.3	<i>Impact Assessment</i>	<i>21</i>
7.1.3.1	<i>Defining Heritage Impacts.....</i>	<i>21</i>
7.1.3.2	<i>Impact assessment.....</i>	<i>22</i>



7.1.4	<i>Mitigation Measures and Recommendations</i>	26
7.2	Cultural Significance Assessment	27
7.3	Impact Assessment Rating	29
7.3.1	<i>Impacts to Burial Grounds and Graves</i>	29
7.3.1.1	Impact Description	29
7.3.1.2	Management Objectives	29
7.3.1.3	Management Actions and Targets	30
7.3.1.4	Impact Ratings on Burial Grounds and Graves	30
8	Unplanned Events and Low Risks	34
9	Environmental Management Programme	36
9.1	Project activities with potentially significant impacts	37
9.2	Summary of Mitigation and Management	37
10	Monitoring Programme.....	41
11	Relevant Stakeholder Consultation.....	41
12	Relevant Comments and Responses	41
13	Conclusion and Recommendation	41
14	Bibliography	43

LIST OF FIGURES

Figure 5-1: Burial Ground at BGG-001	8
Figure 5-2: Grave at BGG-002	9
Figure 5-3: Potential Grave at BGG-003	10
Figure 5-4: Burial Ground at BGG-004.....	11
Figure 5-5: Surface occurrence of Farming Community Artefacts at St-005.....	12
Figure 5-6: Burial Ground identified at BGG-006.....	13
Figure 5-7: Burial Ground identified at BGG-007.....	14



LIST OF TABLES

Table 1-1: Location Data of the Project	1
Table 5-1: Heritage Resources Identified during the Pre-Disturbance Survey	8
Table 7-1: Ratings and Descriptions used in Determining CS and Field Ratings.....	20
Table 7-2: Description of duration, extent, intensity and probability ratings used in impact assessment.....	23
Table 7-3: Impact significance ratings, categories and relationship between consequence, probability and significance	25
Table 7-4: Summary of CS assessment of identified heritage resources.....	28
Table 7-5: Physical impacts to burial grounds and graves.....	31
Table 7-6: Summary of intangible impacts to burial grounds and graves.....	32
Table 8-1: Summary of potential unplanned events, potential impacts, and proposed mitigation and management.....	35
Table 9-1: Potentially Significant Impacts of the proposed infrastructure.....	37
Table 9-2: Project Activities Requiring Management	38
Table 9-3: Potential Impacts and Outcomes of the EMPr	39
Table 9-4: Proposed Mitigation and Management Measures.....	39
Table 9-5: Prescribed Environmental Management Standards, Practice, Guideline, Policy or Law	40

LIST OF PLANS

Plan 1: Comparative Project Layout	4
Plan 2: Identified Heritage Resources	15
Plan 3: Theoretical Viewshed in relation to the Makapan WHS	17

LIST OF APPENDICES

Appendix A: Declaration of Independence and Specialist CV	
---	--



1 Introduction

Ivanplats (Pty) Ltd (hereafter Ivanplats) has undertaken to develop and operate an underground platinum mine near Mokopane, Limpopo Province (the Project). Ivanplats is currently the holder of an approved Mining Right (LP30/5/1/2/2/10067MR) issued by the Department of Mineral Resources (DMR). Subsequent to the issuing of this mining right, residential encroachment of the planned mining area has necessitated the need for an amendment to the approved mine layout plan. Digby Wells Environmental (Digby Wells) has been appointed by Ivanplats to review these amendments and identify and assess any additional impacts that may result from these amendments.

This report serves as an addendum to the existing heritage specialist report compiled for the Platreef Project which was submitted to the South African Heritage Resources Agency (SAHRA) and Limpopo Heritage Resources Authority (LIHRA) via the South African Heritage Resources Information System (SAHRIS) on 11 October 2013 and approved on 8 November 2013 (Case ID: 566¹).

1.1 Project Background

The Project is located on the farms Macalacaskop 243 KR and Turfspruit 241 KR with the construction of a Tailings Storage Facility (TSF) on the farm Rietfontein 2 KS. These properties lie within the Northern Limb of the Bushveld Igneous Complex (BIC), approximately 280 km northeast of Johannesburg and 8 km northwest of the town of Mokopane (formerly known as Potgietersrus) in Limpopo Province of South Africa (see Table 1-1).

Table 1-1: Location Data of the Project

Province	Limpopo Province
Magisterial District / Local Authority	Mokopane Magisterial District
Local Authority	Waterberg District Municipality
Municipality	Mogalakwena Local Municipality
Property Name and Number	Turfspruit 241 KR Macalacaskop 243 KR Rietfontein 2 KS
1: 50 000 Map Sheet	2428BB Tinmyne and 2429AA Mokopane
GPS Co-ordinates	East/LON/X: -24.113113
(relative centre point of study area)	South/LAT/Y: 28.965987

¹ <http://www.sahra.org.za/sahris/cases/pla1677platreefplatinumproject>

The DMR issued Ivanplats with a Mining Right for this operation on 04 December 2014. Consequent to the granting of the licence, Ivanplats has commenced with the sinking of one of the planned mine production shafts (i.e. Shaft 1) and the development of certain project infrastructure, such as the installation of a mine boundary fence.

Furthermore, Ivanplats has also initiated heritage management measures for the Platreef Project. This includes the development of a Conservation Management Plan (CMP), and implementation of a Burial Grounds and Graves Consultation (BGGC) process in support of potential exhumations.

1.2 Project Description

Prior to the establishment of the mine boundary fence, the approved planned mining area was encroached upon by surrounding communities. This encroachment has resulted in the need to reduce the approved 420 hectare (ha) mining area by 74 ha to exclude the surrounding communities. This reduction in the footprint area necessitated the need for Ivanplats to amend the approved mine layout plan through changes to the footprint area and location of certain activities or infrastructure.

This addendum to the specialist Heritage Impact Assessment (HIA) for the Platreef Project (Higgitt, 2013) considers this reduction in the footprint area, as well as specifically the potential impacts to identified heritage resources by activities associated with the re-routing of a 4.84 km section of the TSF pipeline, and the inclusion of the 3.02 km storm water drain not previously assessed². Refer to Plan 1 for changes in project layout.

1.3 Terms of Reference

The Terms of Reference (ToR) for the Project heritage specialist study were to consider amendments to the mine layout plan, specifically the re-routing of a section of the TSF pipeline and the new storm water drain to:

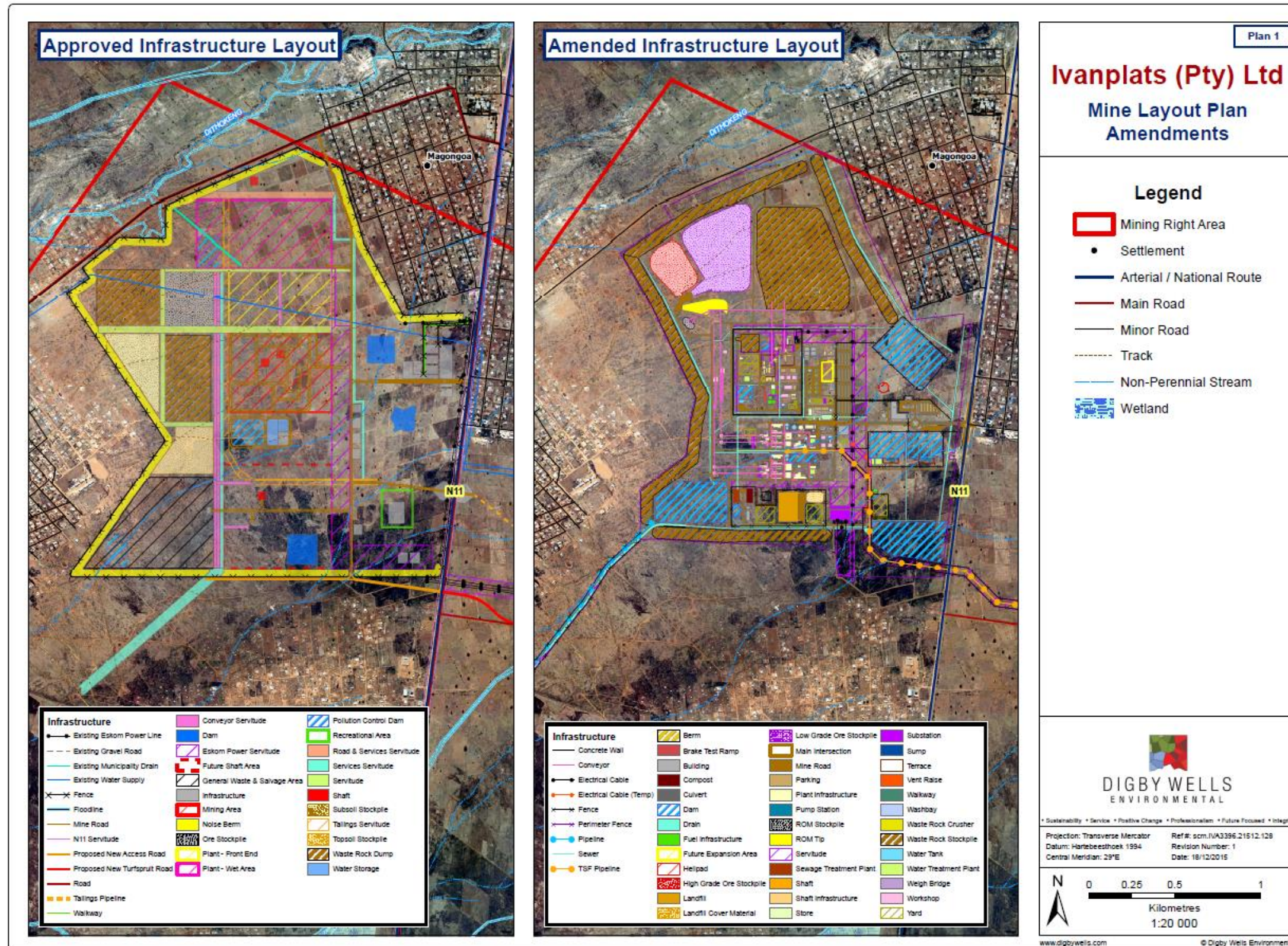
- Identify any new impacts to identified heritage resources;
- Complete an impact assessment based on the proposed amendments; and
- Provide specialist heritage resources management input into the addendum to the Environmental Impact Assessment (EIA) report.

² While the proposed routing option for the newly included storm water drain was not previously assessed as part of the specialist HIA completed in 2013, this amendment to the approved mine layout plan does not constitute a new listed activity in terms of the National Environmental Management Act, 1998 (Act No. 107 of 1998) (NEMA).

1.4 Aims and Objectives

The primary aim of this addendum to the specialist HIA for the Platreef Project (Higgitt, 2013) is to assess the proposed changes to the mine layout plan in relation to the identified heritage resources. The specific objectives include the following:

- Assess possible levels of change to identified heritage resources that may result from the proposed amendments;
- Identify any limitation or conditions to be applied to the proposed amendments; and
- Determine what general protections apply in terms of the National Heritage Resources Act, 1999 (Act No. 25 of 1999) (NHRA), and what formal protections may be consequently applied.



Plan 1: Comparative Project Layout

2 Specialist Details

Natasha Higgitt undertook the pre-disturbance survey and completed a technical review of this report. She obtained her Bachelor of Arts (BA) Honours degree in Archaeology in 2010 from the University of Pretoria. She held the position of Assistant Heritage Consultant: Archaeology Specialist at Digby Wells. She has more than 5 years' experience in archaeological survey and gained further generalist heritage experience since her appointment at Digby Wells in South Africa and Liberia.

Natasha is a professional member of the Association of Southern African Archaeologists (ASAPA) (*Member No. 335*).

Justin du Piesanie compiled the addendum to the specialist HIA report. He obtained his Master of Science (MSc) degree in Archaeology from the University of the Witwatersrand in 2008, specialising in the Southern African Iron Age. Justin also attended courses in architectural and urban conservation through the University of Cape Town's Faculty of Engineering and the Built Environment Continuing Professional Development Programme in 2013. He currently holds the position of Heritage Management Consultant: Archaeologist at Digby Wells. He has over 10 years combined experience in HRM in South Africa, including heritage assessments, archaeological mitigation and grave relocation. Justin has gained further generalist experience since his appointment at Digby Wells in Botswana, Burkina Faso, the Democratic Republic of Congo, Liberia and Mali on projects that have required compliance with International Finance Corporation (IFC) requirements such as Performance Standard 8: Cultural Heritage.

Justin is a professional member of ASAPA (*Member No. 270*) and the International Council on Monuments and Sites (ICOMOS) South Africa (*Member No. 14274*).

3 Methodology

3.1 Qualitative Data Collection

This report utilised the information contained within the approved specialist HIA for the Platreef Project (Higgitt, 2013). No additional literature was consulted to inform the cultural baseline.

3.2 Quantitative Data Collection

A pre-disturbance survey of the proposed TSF pipeline, storm water drain routes and associated buffer zones was undertaken by Natasha Higgitt, on 1 December 2015. The objective of the survey was to:

- Visually record the current state of the cultural landscape;
- Ground truth certain heritage previously identified; and
- Record all tangible heritage resources within the amended / additional infrastructure footprints.



The survey was completed as an adaptive, non-intrusive survey (i.e. no sampling or Shovel Test Pits (STPs)) through both vehicular and pedestrian survey methodologies. The areas surveyed were recorded through GPS track log, and identified heritage resources through waypoints using handheld GPS and documented through written and photographic record.

4 Assumptions and Limitations

The following assumptions and limitations were noted during the compilation of this addendum to the specialist HIA for the Platreef Project (Higgitt, 2013):

- While every effort was undertaken to survey as extensively as possible, the relatively dense vegetation (i.e. *Dichrostachys cinerea* (sickle bush)) and ground cover imposed a visual limitation with regards to the extent that distinguishing settlement features or material culture could be identified during the pre-disturbance survey, as well as restricting access to the northern sections of the proposed TSF pipeline routing;
- Burial grounds and graves recorded during the pre-disturbance survey as completed through the identification of visible surface markers only. No consultation was undertaken as part of this addendum to the specialist HIA for the Platreef Project (Higgitt, 2013); and
- Archaeological sites commonly occur at sub-surface levels with no or limited trace evidence on the surface. To investigate the potential of subsurface occurrences, permits regulated under Section 35 of the NHRA are required. No permits were held by the specialists, and as such, it is possible that archaeological sites may be identified during the construction and operational phase of the Project.

5 Baseline Environment

5.1 Cultural Landscape Summary

This section of the addendum to the specialist HIA report presents an abbreviated summary of the cultural heritage baseline discussed in the approved HIA. Detailed information and sources cited are not repeated here for the sake of brevity.

The area under consideration for this report has a time depth that spans from the Early Stone Age (ESA) through to the historical period.

Evidence for the Stone Age is represented by archaeological sites, such as the Cave of Hearths in the Makapans Valley (part of the Fossil Sites of South Africa World Heritage Site (WHS), approximately 20 km east of the project site. In addition to this, several stone tool accumulations have been recorded through previous studies completed in the region, commonly found within water courses and pans. These accumulations have primarily been ascribed to the Middle (MSA) and Late Stone Age (LSA) outside of any discernible context.

The Stone Age in southern Africa is followed by the Farming Community Period (also known as the Iron Age). Ceramic classification is universally used by archaeologists to establish



relative cultural-historical temporal sequences within southern African Farming Communities. In this way, relative dates can be assigned to sites, as well as inferring tenuous cultural similarities or associations. Based on this method of seriation, occupation of the area under consideration by Bantu-speaking farming communities spans from the Early (EFC) through to the Late Farming Community (LFC) Period. Previous studies in the area indicate that several sites associated with the LFC period have been identified and recorded, comprising of isolated ceramic scatters and sites comprising of several components and varying levels of complexity. The ceramics provide evidence of Farming Community settlement from at least the 17th century CE continuing to the 19th century CE. The combination of the various ceramic facies and types of stonewalled sites provide evidence of long-term occupation by Kekana as well as other groups.

Within this region of South Africa, there is sufficient evidence to indicate the continuity from the LFC into the historic period³, and that this division is largely artificial. The first recorded contact between Europeans and the Kekana occurred in 1837 with the arrival of the Voortrekkers at Louis Trichardt. Through time, the Voortrekkers settled throughout the region establishing Pietpotgietersrus (*today renamed Mokopane after Kekana chief Mugombane*) in the 1850s. The settlement of the Voortrekkers here increased tensions with the local Kekana inhabitants. These tensions culminated in the infamous 1854 siege of Mugombane at Makapansgat (part of the Fossil Sites of South Africa WHS). Subsequent to this event, the *Zuid-Afrikaansche Republiek* (ZAR) demarcated the three dominant chiefdoms, namely the Valtyn, Mapela and Bakenberg polities within the area under consideration through the establishment of a 17 km long, 5 km boundary within which these constructed polities were confined. The boundary was based where communities resided at the time. The consequence was the confinement of around 30 000 people within these limited borders, resulting in the loss of much traditional grazing and arable land. Under the ZAR, the post 1902 British Colonial administration and the 1910 Union administrations, official boundaries were continuously adjusted to the detriment of the three chiefdoms.

5.2 Results of Pre-Disturbance Survey

A pre-disturbance survey of the proposed TSF pipeline re-routing and storm water drain routing option was undertaken. The results of the pre-disturbance survey are presented in Table 5-1 below and Plan 2.

³ The authors acknowledge that the recent historical landscape is complex: issues such as succession disputes are representative of an inherent complex and conflicted heritage that is the current subject of much research and public debate. However, a comprehensive study of these issues is outside the scope of this study.



Table 5-1: Heritage Resources Identified during the Pre-Disturbance Survey

5.2.1 IVA3396/2428BB/BGG-001 – Burial ground

Cultural Significance: Very High	Co-ordinates	
	-24.09377	28.97022

The site constitutes a burial ground. Burial grounds and graves are generally protected under section 36 of the NHRA. BGG-001 can be described as a burial ground containing three graves located approximately 5 m from the proposed TSF pipeline re-routing. (See Figure 5-1 below). The burial ground is unfenced and unkempt, and located in a maize field. The tombstones were made from granite, and the middle tombstone had fallen over. Two of the graves could be dated (2003 and 2005).

BGG-001 has been identified and recorded as part of the current burial grounds consultation and relocation process being undertaken (Ref: 48_01).



Figure 5-1: Burial Ground at BGG-001



5.2.2 IVA3396/2428BB/BGG-002 – Grave

Cultural Significance: Very High	Co-ordinates	
	-24.09331	28.97014

The site constitutes a burial ground. Burial grounds and graves are generally protected under section 36 of the NHRA. BGG-002 can be described as a single grave located approximately 41 m from the proposed TSF pipeline re-routing (See Figure 5-2). The grave is located below a large Marula tree and unfenced. The headstone is a large lower grinding stone with a metal grave marker. No features to date the graves were noted.

This grave has not been identified and recorded as part of the current burial grounds consultation and relocation process being undertaken.



Figure 5-2: Grave at BGG-002

5.2.3 IVA3396/2428BB/BGG-003 – Grave

Cultural Significance: Very High	Co-ordinates	
	-24.09678	28.98378

The site constitutes a potential burial ground. Burial grounds and graves are generally protected under section 36 of the NHRA.

BGG-003 can be described as a potential grave located within the proposed TSF pipeline re-routing. BGG-003 was recorded due to the presence of a small metal cup at the base of a tree stump (See Figure 5-3). It is customary to leave cups or bottles at graves as gifts for the deceased. No features to date the graves were noted.

This grave has not been identified and recorded as part of the current burial grounds consultation and relocation process being undertaken.



Figure 5-3: Potential Grave at BGG-003



5.2.4 IVA3396/2428BB/BGG-004 – Burial ground

Cultural Significance: Very High	Co-ordinates	
	-24.09760	28.99092

The site constitutes a burial ground. Burial grounds and graves are generally protected under section 36 of the NHRA.

BGG-004 can be described as a burial ground containing two graves located approximately 5 m from the proposed TSF pipeline re-routing. (See Figure 5-4 below). The burial ground is unfenced and unkempt, and located in a maize field. The tombstones were made from granite and date to 1939 and 1941.

This burial ground has not been identified and recorded as part of the current burial grounds consultation and relocation process being undertaken.



Figure 5-4: Burial Ground at BGG-004



5.2.5 IVA3396/2428BB/St-005 – Farming Community

Cultural Significance: Negligible	Co-ordinates	
	-24.09401	28.97037

The site constitutes surface scatters of material culture associated with the farming community period. Archaeological sites are generally protected under section 35 of the NHRA.

St-005 can be described as surface accumulations of LFC ceramic sherds and a broken lower grinding stone located within the proposed TSF pipeline re-routing (See Figure 5-5). The pottery pieces were not diagnostic, but had indications of decorations i.e. straight lines and comb-stamped lines. The artefacts were not found *in-situ* due to agricultural activities, however there is a high possibility of additional heritage resources located sub-surface.

This site has been sufficiently recorded and is **not considered further** in this assessment.



Figure 5-5: Surface occurrence of Farming Community Artefacts at St-005



5.2.6 IVA3396/2428BB/BGG-006 – Burial ground

Cultural Significance: Very High	Co-ordinates	
	-24.10229	28.94401

The site constitutes a burial ground. Burial grounds and graves are generally protected under section 36 of the NHRA.

BGG-006 can be described as a burial ground containing approximately 40 graves located approximately 129 m from the proposed storm water drain route (See Figure 5-6). The burial ground is fenced and marginally kempt. Several of the graves had granite tombstones, while other graves were simple stone circles. There were no features to date the stone graves.

BGG-006 has been identified and recorded as part of the current burial grounds consultation and relocation process being undertaken (Ref: 52_01).



Figure 5-6: Burial Ground identified at BGG-006



5.2.7 IVA3396/2428BB/BGG-007 – Burial ground

Cultural Significance: Very High	Co-ordinates	
	-24.11078	28.93334

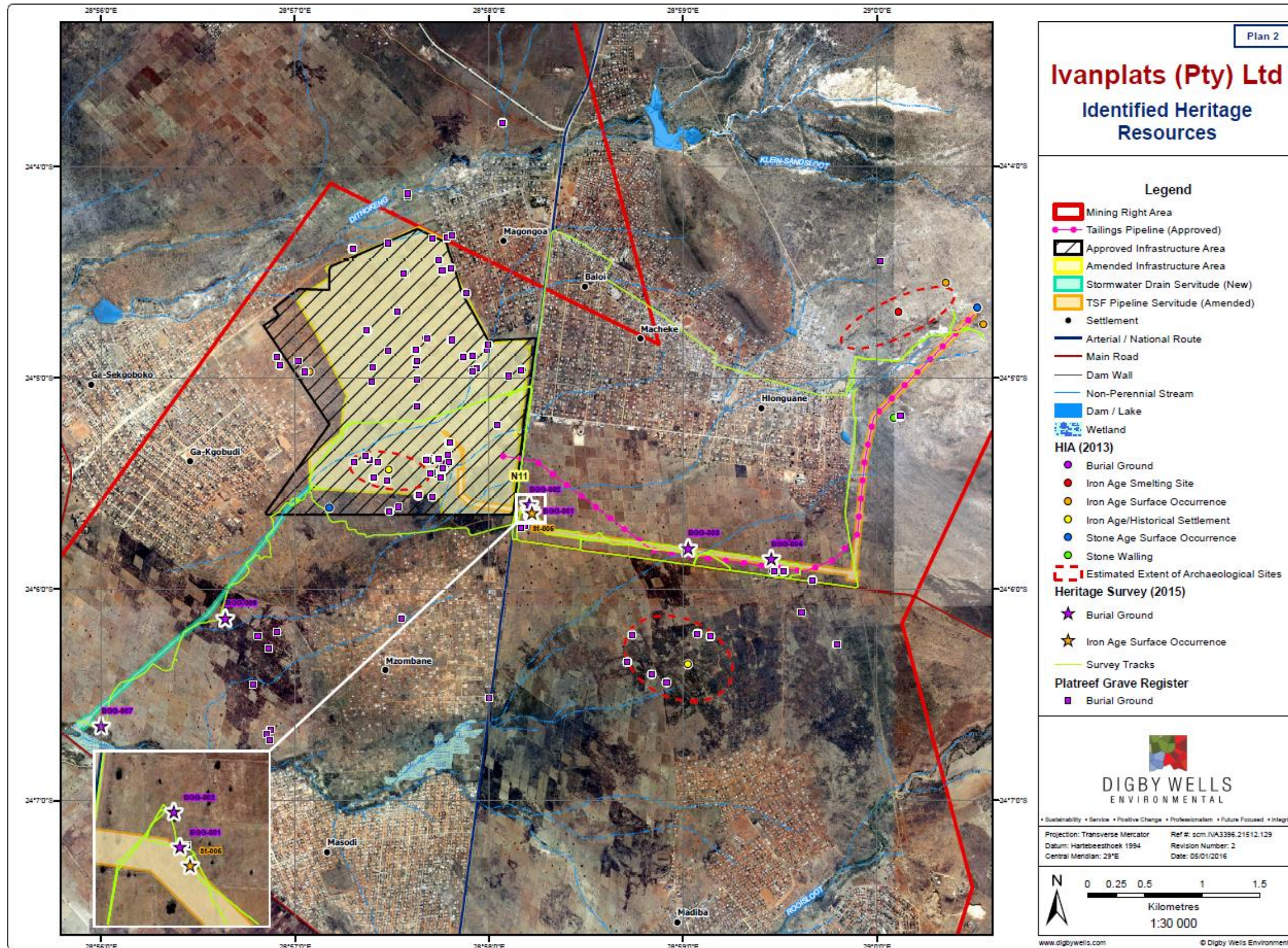
The site constitutes a burial ground. Burial grounds and graves are generally protected under section 36 of the NHRA.

BGG-007 can be described as a burial ground containing at least 15 graves located approximately 100 m from the proposed storm water drain route (See Figure 5-7). The burial ground is fenced and marginally kempt. One of the burials had a granite tombstone, while the remaining burials were simple stone circles. There were no features to date the stone graves.

BGG-007 has not been identified and recorded as part of the current burial grounds consultation and relocation process being undertaken.



Figure 5-7: Burial Ground identified at BGG-007



Plan 2: Identified Heritage Resources



6 Sensitivity Analysis and No-Go Areas

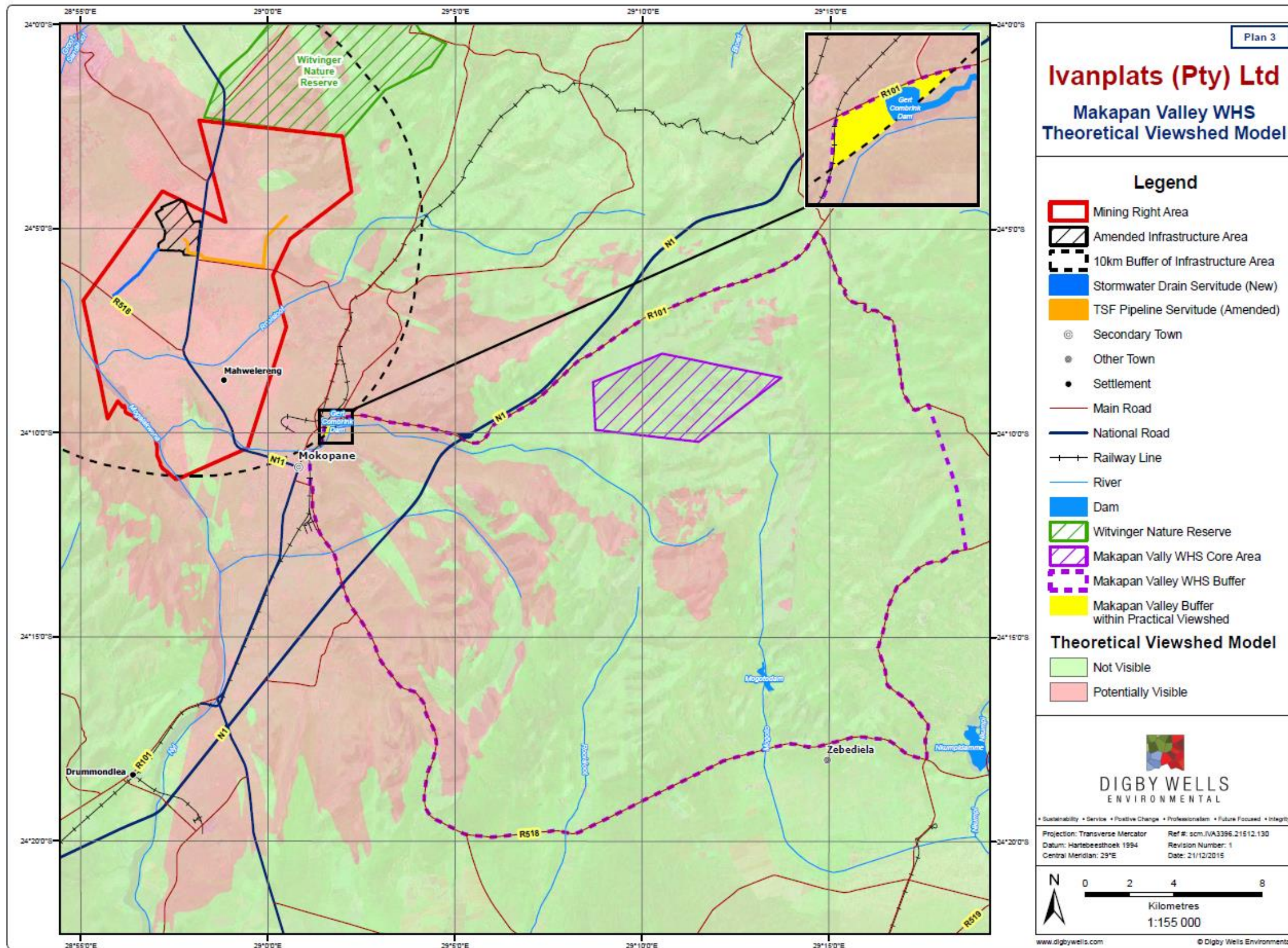
The Makapan Valley, as part of the Fossil Sites of South Africa (WHS) (hereafter referred to as the Makapan WHS) occurs approximately 17 km east of the Project. The immediate Makapan WHS footprint is 2 220 ha with a buffer area that extends 48 065 ha (Government Gazette GR. 1197 of 2007).

This is a highly sensitive area and can be considered as a 'no-go'. All potential impacts to the Makapan WHS must be considered. Environmental noise, air quality and visual assessments considered the Makapan WHS during the compilation of the Platreef Project EIA. The results of these specialist studies indicated that the core Makapan WHS would not be impacted upon by the Project.

An addendum to the specialist Visual Impact Assessment (VIA)⁴ was completed as part of the overall study to assess an increase in height of several infrastructure areas and structures which may result in increased visibility. The updated VIA showed that the area of impact to the buffer zone of the Makapan WHS site has increased as a result of the proposed infrastructure changes. Previously, 16.73% of the buffer zone was affected visually by the Platreef Project. The closest zone of impact to the core zone was 1.3 km to the north. As part of the update, the percentage of visual impact to the buffer zone of the Makapan WHS has increased to 22.55% with the closest zone of impact to the core zone 300 m to the north (See Plan 3 below). This assessment is based on the theoretical viewshed model which indicates the areas from which the Project will potentially be visible. The theoretical viewshed model was refined to a practical viewshed model with a buffer of 10 km around the proposed infrastructure area. Due to the nature of the receiving environment it is unlikely that the proposed infrastructure will be noticeable beyond this 10 km buffer. Only 27.87 ha of the buffer zone of the Makapan WHS site falls within this practical viewshed area.

While the level of impact has increased and the distance to the zone of impact has reduced, the intensity of the impact has not increased significantly. The buffer zone is already impacted on by the N1 and the town of Mokopane, while the core zone is not visually impacted. Should the boundaries of the core zone of the WHS increase, this could result in an impact, and this would need to be reassessed.

⁴ This section of the addendum to the specialist HIA only presents a brief summary of the visual assessment in relation to the Makapans WHS. For detailed descriptions, methodologies and analysis, refer to the addendum to the VIA for the Platreef Project.



Plan 3: Theoretical Viewshed in relation to the Makapan WHS



7 Impact Assessment

7.1 Methodology

7.1.1 Evaluation of Significance

The significance rating process is designed to provide a numerical rating of the cultural significance⁵ of identified heritage resources. The evaluation was done as objectively as possible through a matrix developed by Digby Wells for this purpose. In addition, the methodology aims to allow ratings to be reproduced independently should it be required, provided that the same information sources are used.

This matrix takes into account heritage resources assessment criteria set out in Section 3(3) of the NHRA (see Box 1), which determines the intrinsic, comparative and contextual significance of identified heritage resources. A resource's importance rating is based on information obtained through review of available credible sources and representivity or uniqueness (i.e. known examples of similar resources to exist). The final significance attributed to a resource furthermore takes into account the physical integrity of the fabric of the resource. The formula used to determine significance is summarised in Box 2.

The rationale behind the heritage value matrix takes into account the fact that a heritage resource's value is a direct indication of its sensitivity to change (impacts). Value therefore needs to be determined prior to the completion of any assessment of impacts. This matrix rates the potential, or importance, of an identified resource relative to its contribution to certain values – aesthetic, historical, scientific and social.

Dimension	Attributes considered	NHRA Ref.
Aesthetic & technical	1 Importance in aesthetic characteristics	S.3(3)(e)
	2 Degree of technical / creative skill at a particular period	S.3(3)(f)
Historical importance & associations	3 Importance to community or pattern in country's history	S.3(3)(a)
	4 Site of significance relating to history of slavery	S.3(3)(i)
	5 Association with life or work of a person, group or organisation of importance in the history of the country	S.3(3)(h)
Information potential	6 Possession of uncommon, rare or endangered natural or cultural heritage aspects	S.3(3)(b)
	7 Information potential	S.3(3)(c)
	8 Importance in demonstrating principle characteristics	S.3(3)(d)
Social	9 Association to community or cultural group for social, cultural or spiritual reasons	S.3(3)(g)

Box 1: NHRA Section 3(3) criteria

$$\text{Value} = \text{Importance} \times \text{Integrity}$$

where

$$\text{Importance} = \text{average sum}$$

of

$$\text{Aesthetic} + \text{Historic} + \text{Scientific} + \text{Social}$$

Box 2: Cultural Significance formula

⁵ Cultural significance is defined in the NHRA as the intrinsic "aesthetic, architectural, historical, scientific, social, spiritual, linguistic or technological value or significance" of a heritage resource. These attributes are combined and reduced to four themes used in the Digby Wells significance matrix: aesthetic, historical, scientific and social.

The significance of a resource is directly related to the impact on it that could result from project-related activities, as it provides minimum accepted levels of change to the resource. SAHRA has published minimum standards that include minimum required mitigation of heritage resources. These minimum requirements are integrated into the matrix to guide both assessments of impacts and recommendations for mitigation and management of resources.

The weight assigned to the various parameters for significance in the formula, significance ratings and recommended mitigation are presented in Table 7-1.

7.1.2 Field Ratings

Although grading of heritage resources remains the responsibility of heritage resources authorities, SAHRA requires in terms of its Minimum Standards that heritage reports include Field Ratings for identified resources to comply with section 38 of the NHRA. The NHRA in terms of section 7 provides for a system of grading of heritage resources that form part of the national estate, distinguishing between three categories.

*Field Rating = average sum
of
Aesthetic + Historic + Scientific + Social*

Box 3: Field rating formula

The field rating process is designed to provide a numerical rating of the recommended grading of identified heritage resources. The evaluation was done as objectively as possible by integrating the field rating into the significance matrix. Field ratings guide decision-making in terms of appropriate minimum required mitigation measures and consequent management responsibilities in accordance with section 8 of the NHRA. The formula used to determine field ratings is summarised in Box 3. The weight assigned to the various field rating parameters in the formula and the sum of the average ratings are presented in Table 7-1.

Table 7-1: Ratings and Descriptions used in Determining CS and Field Ratings

Rating	IMPORTANCE <i>A heritage resource's contribution to aesthetic, historic, scientific and social value.</i>	INTEGRITY <i>The undivided or unbroken state, material wholeness, completeness or entirety of a resource or site</i>	FIELD RATING <i>Recommended grading of identified heritage resources in terms of NHRA Section 7</i>
-	Not assessed - dimension and/or attribute not considered in determining value.		Not assessed - dimension and/or attribute not considered in field rating.
0	The resource exhibits attributes that may be considered in a particular dimension, but it is so poorly represented that it cannot or does not contribute to the resource's overall value.	No information potential, complete loss of meaning, Fabric completely degraded, original setting lost	
1	Common, well represented throughout diverse cultural landscapes	Fabric poorly preserved, limited information, little meaning ascribed, extensive encroachment on setting	Resources under general protection in terms of NHRA sections 34 to 37 with Negligible significance
2	Generally well represented but exhibits superior qualities in comparison to other similar examples	Fabric is preserved, some information potential (quality questionable) and meaning evident, some encroachment on setting	Resources under general protection in terms of NHRA sections 34 to 37 with Low significance
3	The resource exhibits attributes that are rare and uncommon within a region. It is important to specific communities.	Fabric well preserved, good quality information and meaning evident, limited encroachment	Resources under general protection in terms of NHRA sections 34 to 37 with Medium to Medium-High significance
4	Rare and uncommon, value of national importance	Excellent preservation of fabric, high information potential of high quality, meaning is well established, no encroachment on setting	Resources under general protection in terms of NHRA sections 34 to 37 with High significance
5	The resource exhibits attributes that are considered singular, unique and/or irreplaceable to the degree that its significance can be universally accepted.		Resources under general protection in terms of NHRA sections 34 to 37 with Very High significance
6			Heritage resources under formal protection that can be considered to have special qualities which make them significant within the context of a province or a region
7			Heritage resources under formal protection that can be considered to have special qualities which make them significant within a national and / or international context.



7.1.3 Impact Assessment

The potential impacts were considered through an examination of the project phase and activity, the environmental aspect, the interdependencies between aspects, an assessment and classification of categories, and consideration of the potential impact on heritage resources.

7.1.3.1 Defining Heritage Impacts

Different heritage impacts may manifest in different geographical areas and diverse communities. For instance, heritage impacts can simultaneously affect the physical resource and have social repercussions: this is compounded when the intensity of physical impacts and social repercussions differ significantly. In addition, heritage impacts can influence the cultural significance of heritage resources without any actual physical impact on the resources taking place. Heritage impacts can therefore generally be placed into three broad categories (adapted from Winter & Bauman 2005: 36):

- **Direct or primary heritage impacts** affect the fabric or physical integrity of the heritage resource, for example destruction of an archaeological site or historical building. Direct or primary impacts may be the most immediate and noticeable. Such impacts are usually ranked as the most intense, but can often be erroneously assessed as high-ranking.
- **Indirect, induced or secondary heritage impacts** can occur later in time or at a different place from the causal activity, or as a result of a complex pathway. For example, restricted access to a heritage resource resulting in the gradual erosion of its cultural significance that may be dependent on ritual patterns of access. Although the physical fabric of the resource is not affected through any primary impact, its significance is affected that can ultimately result in the loss of the resource itself.
- **Cumulative heritage impacts** result from in-combination effects on heritage resources acting within a host of processes that are insignificant when seen in isolation, but which collectively have a significant effect. Cumulative effects can be:
 - **Additive:** the simple sum of all the effects, e.g. the total number of development activities that will occur within the study area.
 - **Synergistic:** effects interact to produce a total effect greater than the sum of the individual effects, e.g. the effect of each different activity on the archaeological landscape in the study area.
 - **Time crowding:** frequent, repetitive impacts on a particular resource at the same time, e.g. the effect of regular blasting activities on a nearby rock art site or protected historical building high.
 - **Neutralizing:** where the effects may counteract each other to reduce the overall effect, e.g. the effect of changes in land use could reduce the overall impact on sites within the archaeological landscape of the study area.



- **Space crowding:** high spatial density of impacts on a heritage resource, e.g. density of new buildings resulting in suburbanisation of a historical rural landscape.

The relevance of the above distinction to defining the study areas arises from the fact that heritage resources do not exist in isolation to the wider natural, social, cultural and heritage landscape: cultural significance is therefore also linked to rarity / uniqueness, physical integrity and importance to diverse communities.

In addition, the NHRA requires that heritage resources are graded in terms of national, provincial and local concern based on their importance and consequent official (i.e. State) management effort required. The type and level of baseline information required to adequately predict heritage impacts varies between these categories. Three 'concentric' study areas were defined for the purposes of this study.

7.1.3.2 Impact assessment

The impact rating process is designed to provide a numerical rating of the identified heritage impacts. The significance rating follows an established impact/risk assessment formula is shown in Box 4. The weight assigned to the various parameters for positive and negative impacts in the formula is presented in Table 7-3 below.

Project-related impacts on heritage resources have taken into account the inherent value of heritage resources, described above, and only applied to resources with values above negligible. As a result, the impact assessment did not consider individual resources, but was applied to diverse resources grouped in terms of similar values.

The magnitude will then be applied to pre- and post-mitigation scenarios with the intention of removing all impacts on heritage resources. Where project related mitigation does not avoid or sufficiently reduce negative changes/impacts on heritage resources with high values, mitigation of these resources may be required.

Significance = consequence of an event x probability of the event occurring

where:

Consequence = type of impact x (Intensity + Spatial Scale + Duration)

and

Probability = Likelihood of an impact occurring

In the formula for calculating consequence:

Type of impact = +1 (positive) or -1 (negative)

Box 4: Impact assessment formula

This may include alteration, restoration or demolition of structures under a permit issued by the relevant Heritage Resources Authorities (HRAs).

Impacts were rated prior to mitigation and again after consideration of the proposed mitigation measures. Impacts were then categories into one of eight categories listed in Table 7-3. The relationship between the consequence, probability and significance ratings is also graphically depicted in Table 7-3.

Table 7-2: Description of duration, extent, intensity and probability ratings used in impact assessment

Value	DURATION RATING - A measure of the lifespan of the impact		EXTENT RATING A measure of how wide the impact would occur		INTENSITY RATING- A measure of the degree of harm, injury or loss.		PROBABILITY RATING - A measure of the chance that consequences of that selected level of severity could occur during the exposure window.	
	Probability	Description	Exposure	Description	Intensity	Description	Probability	Description
7	Permanent	Impact will permanently alter or change the heritage resource and/or value (Complete loss of information)	International	Impacts on heritage resources will have international repercussions, issues or effects, i.e. in context of international cultural significance, legislation, associations, etc.	Extremely high	Major change to Heritage Resource with High-Very High Value	Certain/Definite	Happens frequently. The impact will occur regardless of the implementation of any preventative or corrective actions.
6	Beyond Project Life	Impact will reduce over time after project life (Mainly renewable resources and indirect impacts)	National	Impacts on heritage resources will have national repercussions, issues or effects, i.e. in context of national cultural significance, legislation, associations, etc.	Very high	Moderate change to Heritage Resource with High-Very High Value	High probability	Happens often. It is most likely that the impact will occur.
5	Project Life	The impact will cease after project life.	Region	Impacts on heritage resources will have provincial repercussions, issues or effects, i.e. in context of provincial cultural significance, legislation, associations, etc.	High	Minor change to Heritage Resource with High-Very High Value	Likely	Could easily happen. The impact may occur.
4	Long Term	Impact will remain for >50% - Project Life	Municipal area	Impacts on heritage resources will have regional repercussions, issues or effects, i.e. in context of the regional study area.	Moderately high	Major change to Heritage Resource with Medium-Medium High Value	Probable	Could happen. Has occurred here or elsewhere
3	Medium Term	Impact will remain for >10% - 50% of Project Life	Local	Impacts on heritage resources will have local repercussions, issues or effects, i.e. in context of the local study area.	Moderate	Moderate change to Heritage Resource with Medium - Medium High Value	Unlikely / Low probability	Has not happened yet, but could happen once in a lifetime of the project. There is a possibility that the impact will occur.

Value	DURATION RATING - A measure of the lifespan of the impact		EXTENT RATING A measure of how wide the impact would occur		INTENSITY RATING- A measure of the degree of harm, injury or loss.		PROBABILITY RATING - A measure of the chance that consequences of that selected level of severity could occur during the exposure window.	
	Probability	Description	Exposure	Description	Intensity	Description	Probability	Description
2	Short Term	Impact will remain for <10% of Project Life	Limited	Impacts on heritage resources will have site specific repercussions, issues or effects, i.e. in context of the site specific study area.	Low	Minor change to Heritage Resource with Medium - Medium High Value	Rare / Improbable	Conceivable, but only in extreme circumstances. Have not happened during the lifetime of the project, but has happened elsewhere. The possibility of the impact materialising is very low as a result of design, historic experience or implementation of adequate mitigation measures
1	Transient	Impact may be sporadic/limited duration and can occur at any time. E.g. Only during specific times of operation, and not affecting heritage value.	Very Limited	Impacts on heritage resources will be limited to the identified resource and its immediate surroundings, i.e. in context of the specific heritage site.	Very low	No change to Heritage Resource with values medium or higher, or Any change to Heritage Resource with Low Value	Highly Unlikely /None	Expected never to happen. Impact will not occur.

Table 7-3: Impact significance ratings, categories and relationship between consequence, probability and significance

Score	Description	Rating
109 to 147	A very beneficial impact which may be sufficient by itself to justify implementation of the project. The impact may result in permanent positive change.	Major (positive)
73 to 108	A beneficial impact which may help to justify the implementation of the project. These impacts would be considered by society as constituting a major and usually a long-term positive change to the heritage resources.	Moderate (positive)
36 to 72	An important positive impact. The impact is insufficient by itself to justify the implementation of the project. These impacts will usually result in positive medium to long-term effect on the heritage resources.	Minor (positive)
3 to 35	A small positive impact. The impact will result in medium to short term effects on the heritage resources.	Negligible (positive)
-3 to -35	An acceptable negative impact for which mitigation is desirable but not essential. The impact by itself is insufficient even in combination with other low impacts to prevent the development being approved. These impacts will result in negative medium to short term effects on the heritage resources.	Negligible (negative)
-36 to -72	An important negative impact which requires mitigation. The impact is insufficient by itself to prevent the implementation of the project but which in conjunction with other impacts may prevent its implementation. These impacts will usually result in negative medium to long-term effect on the heritage resources.	Minor (negative)
-73 to -108	A serious negative impact which may prevent the implementation of the project. These impacts would be considered by society as constituting a major and usually a long-term change to the heritage resources and result in severe effects.	Moderate (negative)
-109 to -147	A very serious negative impact which may be sufficient by itself to prevent implementation of the project. The impact may result in permanent change. Very often these impacts are immitigable and usually result in very severe effects.	Major (negative)

Relationship between consequence, probability and significance ratings																																						
Probability	Significance																																					
	7	-147	-140	-133	-126	-119	-112	-105	-98	-91	-84	-77	-70	-63	-56	-49	-42	-35	-28	-21	21	28	35	42	49	56	63	70	77	84	91	98	105	112	119	126	133	140
6	-126	-120	-114	-108	-102	-96	-90	-84	-78	-72	-66	-60	-54	-48	-42	-36	-30	-24	-18	18	24	30	36	42	48	54	60	66	72	78	84	90	96	102	108	114	120	126
5	-105	-100	-95	-90	-85	-80	-75	-70	-65	-60	-55	-50	-45	-40	-35	-30	-25	-20	-15	15	20	25	30	35	40	45	50	55	60	65	70	75	80	85	90	95	100	105
4	-84	-80	-76	-72	-68	-64	-60	-56	-52	-48	-44	-40	-36	-32	-28	-24	-20	-16	-12	12	16	20	24	28	32	36	40	44	48	52	56	60	64	68	72	76	80	84
3	-63	-60	-57	-54	-51	-48	-45	-42	-39	-36	-33	-30	-27	-24	-21	-18	-15	-12	-9	9	12	15	18	21	24	27	30	33	36	39	42	45	48	51	54	57	60	63
2	-42	-40	-38	-36	-34	-32	-30	-28	-26	-24	-22	-20	-18	-16	-14	-12	-10	-8	-6	6	8	10	12	14	16	18	20	22	24	26	28	30	32	34	36	38	40	42
1	-21	-20	-19	-18	-17	-16	-15	-14	-13	-12	-11	-10	-9	-8	-7	-6	-5	-4	-3	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21
	-21	-20	-19	-18	-17	-16	-15	-14	-13	-12	-11	-10	-9	-8	-7	-6	-5	-4	-3	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21
	Consequence																																					

7.1.4 Mitigation Measures and Recommendations

The desired outcome of an impact assessment is the removal of negative impacts on heritage resources through the implementation of feasible mitigation measures. The mitigation and management measures recommended in this section comply with the General Principles set out under Section 5 of the NHRA. The recommendations further considered the cultural significance of heritage resources and the recommended minimum level of mitigation as published in the South African Heritage Resources Agency (SAHRA) Minimum Standards⁶ (See Box 5).

Designation	Recommended mitigation
Negligible	Sufficiently recorded, no mitigation required
Low	Resource must be recorded before destruction, including detailed site mapping, surface sampling may be required
Medium	Mitigation of resource to include detailed recording and mapping, and limited sampling, e.g. STPs.
Medium High	Project design should aim to reduce or remove changes; Mitigation of resource to include extensive sampling and recording, e.g. test excavation, analyses, etc.
High	Project design must aim to avoid change to resource; Partly conserved, Conservation Management Plan (CMP)
Very High	Project design must change to avoid all change to resource; Conserved in entirety, CMP

Box 5: Recommended minimum level of required mitigation

Recommended mitigation is therefore divided into two categories: *project related* and *mitigation of heritage resources* defined below.

- Project-related mitigation requires changes or amendments to project design, planning and siting of infrastructure to avoid or reduce physical impacts on heritage resources. Project-related mitigation measures are always the preferred option, especially where heritage resources with higher cultural significance will be impacted on. Project-related mitigation may include:
 - *In situ* preservation (i.e. no-development) of heritage resources for which CMPs are required; and
 - Conservation of heritage resources through, for example, incorporating the resources into project design and planning, for which CMPs are also required.

- Mitigation of heritage resources may be necessary where project-related mitigation will not sufficiently conserve or preserve heritage resources, thus resulting in partial or complete changes (including destruction) to a resource. Such resources need to be mitigated to ensure that they are fully recorded, documented and researched before any negative change occurs. This may require mitigation such as:
 - Intensive detailed recording of sites through various non-intrusive techniques to create a documentary record of the site – “preservation by record”;

⁶ It must be noted that these minimum standards serve as a guide, and the recommendations provided in this addendum are project specific.



- Intrusive recording and sampling such as shovel test pits (STPs) and excavations, relocation (usually burial grounds and graves, but certain types of sites may be relocated), restoration and alteration. Any form of intrusive mitigation is a regulated permitted activity for which permits need to be issued by the relevant heritage authorities. Such mitigation may result in a reassessment of the value of a resource that could require conservation measures to be implemented. Alternatively, an application for a destruction permit may be made if the resource has been sufficiently sampled; and
- Where resources have negligible significance the specialist may recommend that no further mitigation is required and the site may be destroyed, for which a destruction permit must be applied for.

Appropriate mitigation measures were identified for each impact, and the procedure discussed above was to assess the possible consequence, probability and significance of each impact post-mitigation.

The post-mitigation rating provided an indication of the significance of residual impacts, while the difference between an impact's pre- and post-mitigation ratings represents the degree to which the recommended mitigation measures are expected to be effective in reducing or ameliorating that impact.

7.2 Cultural Significance Assessment

The assessment of CS considers criteria defined in Box 1. The CS assigned to the identified heritage resources is summarised in Table 7-4. The assessment of CS indicated that the identified heritage resources designations range from negligible to very high significance.

Table 7-4: Summary of CS assessment of identified heritage resources

Resource ID	Type	CS	CS Motivation	Field Rating	Field Rating Motivation
BGG-001	Burial / grave	Very High	Burial grounds and graves are considered against social criteria where the significance of this resource is universally accepted. The meaning of burial grounds and graves is well established resulting in excellent preservation of fabric.	General Protection IV A	Burial grounds and graves are generally protected under Section 36 of the NHRA
BGG-002					
BGG-003					
BGG-004					
BGG-006					
BGG-007					
St-005	Site	Negligible	The site has attributes that can be considered on historic, scientific and social criteria. This type of site is common and well represented throughout diverse cultural landscapes. It may, however, have some importance to specific communities within the region, but the integrity of the site is low, and encroachment on the setting has made the information potential and quality questionable.	General Protection IV C	Archaeological sites are generally protected under section 35 of the NHRA



7.3 Impact Assessment Rating

The HIA completed for the Platreef Project, and the findings presented therein still have relevance and must be considered. This section of the addendum to the specialist HIA for the Platreef Project (Higgitt, 2013), in relation to the project description presented under Section 1.2 above, considers specifically the potential impacts to identified heritage resources by activities associated with the re-routing of the TSF pipeline, and the inclusion of the storm water drain not previously assessed.

7.3.1 Impacts to Burial Grounds and Graves

7.3.1.1 Impact Description

Heritage impacts on burial grounds and graves located within or in proximity to the proposed linear infrastructure will manifest as either changes to the physical integrity of the sites due to certain activities, or changes to the intangible nature of the burial grounds from restricted and / or loss of access.

Physical changes to burial grounds and graves will occur as a result of activities associated with the construction phase of the Project. The construction activities may include site clearance, topsoil removal and construction of the linear infrastructure. Intangible changes will occur as a result of the inherent access restrictions that will apply to the mining area in general. Restricted or loss of access impacts on the ability of descendants and family members, or other persons or communities who by tradition are concerned with graves, to express their living heritage as it may pertain to graves and associated ancestral rites.

Both physical and intangible impacts may result in unplanned events such as the degradation of the intrinsic cultural significance of gravesites, as well as social repercussions. In addition, there are inherent health and safety risks associated with access to operating mine properties by visitors.

7.3.1.2 Management Objectives

All identified burial grounds and graves within close proximity or within the development footprint of the linear infrastructure must, at a minimum:

- Adhere to the management procedures detailed under Section 8.3.4: Cemeteries and Graves of the Platreef Project CMP (2016); and
- Be subject to a burial grounds consultation and relocation process. The current BGGC process being undertaken could be extended to include the new burial sites.



The consultation process must be completed in accordance with Chapter XI of the NHRA Regulations (GN R 548) and aim to:

- Identify descendants and family members of the deceased and any other person or communities who by tradition are concerned with the graves;
- Consult with identified stakeholders regarding the effect of the Project on graves; and
- Reach agreement with stakeholders on the future of identified graves, to retain sites *in situ* or exhume, relocate and reinter the contents of graves.

7.3.1.3 Management Actions and Targets

Where burial grounds and graves are located in areas where *in situ* preservation is possible, for example on the proposed linear infrastructure boundaries, mitigation must consider redesigning proposed routing options to exclude burial grounds from the development footprints. Consultation with stakeholders will, however, still be required to reach agreement on the *in situ* conservation, including access requirements. The following minimum buffer zones are recommended for gravesites that may be conserved *in situ*:

- At least 15 m from any linear infrastructure footprints such as pipelines, roads or conveyors, including servitudes;
- At least 25 m from other infrastructure footprints such as offices, parking areas, etc.; and
- At least 100 m from open pit areas.

It is recommended that Chance Find Protocols (CFPs) be developed and included in the Environmental Management Plan (EMP) as a condition of authorisation. Furthermore, during the construction phase it is recommended that a qualified and accredited archaeologist be on call to assess any chance finds identified and guide construction to minimise the risk of damage to burial grounds and graves or other heritage resources.

Where burial grounds and graves are located in areas where *in situ* conservation will not be feasible or will be unsafe, mitigation must consider the exhumation and relocation of graves within the current process being undertaken. Exhumation and relocation is a permitted activity in accordance with Section 36(3) of the NHRA, and regulated by Chapters IX and XI of the NHRA: Regulations.

7.3.1.4 Impact Ratings on Burial Grounds and Graves

The assessment of the impacts as described under Section 7.3.1 above and the ratings assigned are summarised in Table 7-5 and Table 7-6.


Table 7-5: Physical impacts to burial grounds and graves

IMPACT DESCRIPTION: Physical impacts to burial grounds and graves				
Predicted for project phase:	Pre-construction	Construction	Operation	Decommissioning
Dimension	Rating	Motivation		
PRE-MITIGATION				
Duration	Permanent (7)	Destruction of burial grounds and graves through construction activities will be permanent	Consequence: Extremely detrimental (-20)	Significance: Major - negative (-140)
Extent	National (6)	Unmitigated alteration to the status quo of known burials will have repercussions to Next-of-Kin (NoK) and the reputation of Ivanplats. In addition, unmitigated changes to burials will result in the involvement of local, provincial and national authorities, as well as potentially national media attention		
Intensity x type of impact	Extremely high - negative (-7)	This will be a major change to a resource with very high significance		
Probability	Certain (7)	Without mitigation, the identified impact is certain to occur		
MITIGATION				
<p>The newly identified burial grounds and graves must be subject to a burial grounds consultation and relocation process. The current consultation and relocation process could be extended to include these graves. The consultation process is regulated by Chapter XI of the NHRA regulations that aim to:</p> <ul style="list-style-type: none"> ▪ Identify descendants and family members of the deceased and any other person or communities who by tradition are concerned with the graves; ▪ Consult with identified stakeholders regarding the effect of the Project on graves; and ▪ Reach agreement with stakeholders on the future of identified graves, to retain sites in situ or exhume, relocate and reinter the contents of the graves. <p>Where burial grounds and graves are located in areas where in situ preservation is possible, Ivanplats must consider the redesign of routing options to exclude burial grounds from the development footprint. It is recommended that CFPs be developed and included in the EMP as a condition of authorisation. Furthermore, during the construction phase it is recommended that a qualified and accredited archaeologist be on call to assess any chance finds and guide construction to minimise the risk of damage to burial grounds and graves or other heritage resources.</p>				



IMPACT DESCRIPTION: Physical impacts to burial grounds and graves				
Predicted for project phase:	Pre-construction	Construction	Operation	Decommissioning
Dimension	Rating	Motivation		
POST-MITIGATION				
Duration	Beyond project life (6)	The impact will extend beyond the project life, specifically if graves are relocated	Consequence: Moderately detrimental (-13)	Significance: Moderate - negative (-78)
Extent	Limited (2)	The extent of the impact will be limited to specific burial grounds and identified NoK		
Intensity x type of impact	High - negative (-5)	The mitigation will result in a minor change to a heritage resource with very high significance. Grave relocation is inherently negative, as the physical and social contexts of graves are destroyed through the act of exhumation and relocation. In terms of in situ conservation, loss or restricted access will still negatively affect the graves and persons associated.		
Probability	Highly probable (6)	It is probable that mitigation measures will reduce the consequence of the identified impact.		

Table 7-6: Summary of intangible impacts to burial grounds and graves

IMPACT DESCRIPTION: Intangible impacts to burial grounds and graves				
Predicted for project phase:	Pre-construction	Construction	Operation	Decommissioning
Dimension	Rating	Motivation		
PRE-MITIGATION				
Duration	Project Life (5)	Intangible impacts to burial grounds will occur throughout the life of the Project	Consequence: Highly detrimental (-16)	Significance: Moderate - negative (-80)



IMPACT DESCRIPTION: Intangible impacts to burial grounds and graves				
Predicted for project phase:	Pre-construction	Construction	Operation	Decommissioning
Dimension	Rating	Motivation		
Extent	National (6)	Social repercussions resulting from unmitigated changes to graves could affect at the very least descendant communities residing in the region. In addition, unmitigated changes to graves will result in the involvement of local, provincial and national authorities, as well as potentially national media attention.		
Intensity x type of impact	High - negative (-5)	The intensity of the intangible impacts will result in a moderate change to burial grounds and graves		
Probability	Likely (5)	if unmitigated, it is likely that identified intangible impacts will manifest		
MITIGATION				
<p>Where in situ preservation is possible, redesign of development footprints to exclude graves from the development footprint must be considered. A buffer of at least 15m from any linear infrastructure footprints must be maintained. It is recommended that CFPs be developed and included in the EMP as a condition of authorisation. Furthermore, during the construction phase it is recommended that a qualified and accredited archaeologist be on call to assess any chance finds and guide construction to minimise the risk of damage to burial grounds and graves or other heritage resources.</p> <p>Consultation, as part of the current process being undertaken, will still be required to reach agreement on the in situ conservation, including access requirements.</p> <p>The results of the consultation and any agreements reached must be encapsulated in the CMP currently being compiled.</p>				
POST-MITIGATION				
Duration	Project Life (5)	As for pre-mitigation	Consequence: Highly beneficial (15)	Significance: Moderate - positive (75)
Extent	Municipal Area (4)	Agreements must involve at the very least the local municipality.		



IMPACT DESCRIPTION: Intangible impacts to burial grounds and graves				
Predicted for project phase:	Pre-construction	Construction	Operation	Decommissioning
Dimension	Rating	Motivation		
Intensity x type of impact	Very high - positive (6)	Loss of or restricted access to in situ burial grounds will still negatively affect associated NoK. However, through the development and implementation of the CMP in consultation with the NoK and communities, the intrinsic CS of burial sites can be preserved through the expressions of living heritage		
Probability	Likely (5)	Mitigation will ensure that grave sites are conserved in situ according to the requirements of affected communities, and within legal requirements. This will ensure that the CS of gravesites is enhanced through sustainable use by affected communities.		

8 Unplanned Events and Low Risks

Risk is defined as the potential consequence(s) of an interaction combined with its likelihood. Should a risk eventuate, it will manifest as an impact. These concepts are often misconstrued and lead to disproportionate amounts of effort spent on assessing minor risks with potentially insignificant impacts, at the cost of overlooking more important ones. The identification of project risks should take place during the scoping phase of the ESIA. This allows for input from stakeholders prior to commencement of the impact assessment phase.

Broad mitigation and monitoring measures were provided for low risks and unplanned events which **were not assessed in detail** (i.e., with significance ratings). In general monitoring is an accepted form of mitigation for low risks.

Certain project activities may represent low risks to heritage resources or cause unplanned events. Low risks, where identified, can be monitored to gauge if the baseline changes and mitigation is required. Unplanned events are events that can occur on any project and cannot be monitored, but can, however, be planned for to reduce the severity of potential impacts if and where they occur.

Information on the potential impacts of these events and management plans are provided in this section. These are summarised in Table 8-1.



Table 8-1: Summary of potential unplanned events, potential impacts, and proposed mitigation and management

Unplanned event	Potential impact	Mitigation / Management / Monitoring
Accidental exposure of <i>in situ</i> MSA and LSA accumulations during the construction of the Project	Damage or destruction of heritage resources generally protected under section 35 of the NHRA	Project specific Chance Find Protocols (CFPs) must be developed and included in the Environmental Management Plan (EMP) as a condition of authorisation. The CFPs must clearly describe the type of heritage resources that may occur within the site specific project area, the protocol to follow in the event of accidental exposure of previously unidentified heritage resources, and the appropriate management measures and reporting structures to be adhered to.
Accidental exposure of <i>in situ</i> LFC settlement sites during the construction phase of the Project		
Accidental exposure of human remains during the construction phase of the Project	Damage or destruction of heritage resources generally protected under section 36 of the NHRA	The CFPs must be defined and established prior to the pre-construction phase of the proposed infrastructure.
Restricted and / or loss of access to burial grounds and graves	Degradation of the intrinsic cultural significance of burial grounds and graves	Include all identified burial grounds and graves within the current consultation process to identify Next-of-Kin, consult with stakeholders and reach agreement on the future of the identified graves.
Spillage from a burst slurry pipeline	Damage to heritage resources generally protected under section 35 and 36 of the NHRA	Identified heritage resources within proximity to the TSF pipeline must be included within the CMP. The CMP should stipulate monitoring procedures to gauge levels of change and determine if mitigation is required to reduce negative impacts.



9 Environmental Management Programme

An EMPr is a delivery mechanism for the measures identified in Section 7.2 and ensures a systematic approach to bringing environmental and social considerations into decision making and day-to-day operations. It establishes a framework for tracking, evaluating and communicating environmental and social performance and helps ensure that environmental risks and liabilities are identified, minimized and managed. This EMPr details the additional mitigation measures Ivanplats will implement throughout the project lifecycle.

The EMPr has been developed to meet national environmental requirements, in particular the provisions of the National Environmental Management Act, 1998 (Act No. 107 of 1998) (NEMA). Ivanplats will, therefore, need to commit to preventing pollution and making resources available to ensure that all reasonable safeguards are in place to do so. In addition, Ivanplats will need to accept accountability and financial liability for any pollution that may occur as a result of project activities.

The EMPr will be a living document, and will continue to develop during the design and construction phase to enable continuous improvement of the project's social and environmental performance. The EMPr will also be reviewed against changes in the regulatory regime and in the event of new policies or guidelines from the relevant Competent Authorities. Periodic reviews and updating will also be carried out throughout the project lifecycle, to incorporate changes in activities and any changes in the overarching management systems.

The ultimate goal of the EMPr is to:

- Incorporate environmental management into project design and operating procedures;
- Serve as an action plan for environmental management for the Project and provide a framework for implementing project environmental commitments (i.e. mitigation measures identified in the EIA);
- Ensure that all workers, subcontractors and others involved in the Project meet legal and other requirements with regard to environmental management;
- Address concerns and issues raised in the EIA's stakeholder consultation process and those that will likely continue to arise during the Project's lifetime; and
- Prepare and maintain records of project environmental performance (i.e. monitoring, audits and non-compliance tracking).



9.1 Project activities with potentially significant impacts

A summary of potentially significant impacts to heritage resources in reference to project activities is summarised in Table 9-1. These impacts are associated with identified burial grounds and graves that may be affected by the re-routing of a section of the TSF pipeline and the new storm water drain option.

Table 9-1: Potentially significant impacts of the proposed infrastructure

Aspects	Potential Significant Impacts	Comment
TSF Pipeline	Physical alteration to burial grounds and graves	The proposed re-routing of a section of the TSF pipeline may result in the damage and / or destruction of burial grounds and graves generally protected under section 36 of the NHRA
Storm water drain	Intangible impacts to burial grounds and graves	Linear infrastructure may result in restricted and / or the loss of access to burial grounds of family members or other persons or communities who by tradition are concerned with graves to express their living heritage as it may pertain to graves and ancestral rites.

9.2 Summary of Mitigation and Management

Table 9-2 to Table 9-5 provides a summary of the proposed project activities, environmental aspects and impacts on the receiving environment. Information on the frequency of mitigation, relevant legal requirements, recommended management plans, timing of implementation, and roles / responsibilities of persons implementing the EMP.

Table 9-2: Project Activities Requiring Management

Activities	Phase	Size and Scale of Disturbance	Potential Impact	Mitigation Measures	Compliance with Standards	Time Period for Implementation
TSF pipeline and Storm water drain	Construction	4.84 km – TSF pipeline 3.02 km – Storm water drain	Physical alteration to burial grounds and graves	<p>Burial grounds and graves must be subject to a consultation and relocation process, and could form part of the existing process being undertaken.</p> <p>Where burial grounds and graves are located in areas where in situ preservation is possible, Ivanplats must consider the redesign of routing options to exclude burial grounds from the development footprint. It is recommended that CFPs be developed and included in the EMP as a condition of authorisation. Furthermore, during the construction phase it is recommended that a qualified and accredited archaeologist be on call to assess any chance finds and guide construction to minimise the risk of damage to burial grounds and graves or other heritage resources.</p> <p>Where burial grounds and graves are located in areas where in situ conservation will not be feasible or unsafe, mitigation must consider the exhumation and relocation of graves within the current process being undertaken.</p>	<p>Burial grounds and graves are protected under section 36 of the NHRA.</p> <p>The consultation process is regulated by Chapter XI of the Regulations to the NHRA.</p> <p>The relocation process is regulated by Chapter IX and XI of the Regulations to the NHRA</p>	Prior to the construction phase
			Intangible impacts to burial grounds and graves			

Table 9-3: Potential Impacts and Outcomes of the EMP

Activities	Potential Impacts	Phase	Mitigation	Standard to be Achieved/Objective
TSF pipeline and Storm water drain	Physical alteration to burial grounds and graves	Construction	<p>Modify through amendment to the design as far as is feasible to preserve burial grounds and graves <i>in situ</i>, and include in the current consultation process to establish in conjunction with identified bona fide NoK, a management measures for the identified burial grounds and graves for inclusion in the CMP.</p> <p>Where project alternatives are not feasible, the potential impact to burial grounds and graves must be remedied through the implementation relocation process supported through the consultation and relevant permits.</p>	Compliance with the section 36 of the NHRA and Chapter XI of the Regulations to the Act (GNR 548).

Table 9-4: Proposed Mitigation and Management Measures

Activities	Potential Impacts	Aspects Affected	Mitigation Type	Time Period for Implementation	Compliance with Standards
TSF pipeline and Storm water drain	Physical alteration to burial grounds and graves	Heritage and Social (Burial grounds and graves)	<p>Modify through amendment to the design as far as is feasible to preserve burial grounds and graves <i>in situ</i>, and include in the current consultation process to establish in conjunction with identified bona fide NoK, a management measures for the identified burial grounds and graves for inclusion in the CMP.</p> <p>Where project alternatives are not feasible, the potential impact to burial grounds and graves must be remedied through the implementation relocation process supported through the consultation and relevant permit approvals.</p>	Prior to the construction phase	<p>Burial grounds and graves are protected under section 36 of the NHRA.</p> <p>The consultation process is regulated by Chapter XI of the Regulations to the NHRA.</p> <p>The relocation process is regulated by Chapter IX and XI of the Regulations to the NHRA</p>

Table 9-5: Prescribed Environmental Management Standards, Practice, Guideline, Policy or Law

Applicable Standard, Practice, Guideline, Policy or Law		
Title	Description of Requirements	Relevance to Project
Legislation (National, Provincial, Local)		
The National Heritage Resources Act, 1999 (Act No. 25 of 1999)	Heritage resources within the Project development footprint are protected under section 35 and 36 of the NHRA, and may not be impacted upon without the approval and necessary permits issued by SAHRA	Archaeological sites within the development footprint will undergo Phase 2 mitigations. Burial grounds and graves are currently under assessment through a consultation and relocation process. A CMP which considers the requirements of the NHRA has been developed for the Project.
Regulations to the National Heritage Resources Act, 1999 (Act No. 25 of 1999) (GN R 548)	Provisions for permit applications are regulated under Chapter II of GN R 548. Furthermore, applications for heritage resources protected under sections 35 and 36 of the NHRA are regulated by Chapters IV and IX respectively. For burial grounds and graves specifically, consideration must also be given to Chapters XI and XII for procedures of consultation and the identification of previously unknown graves.	Permitted activities, including mitigation of archaeological sites and current burial grounds consultation and relocation process are permitted activities regulated by GN R 548. These activities must be cognisant of and adhere to the regulations to ensure compliance with the legislative framework.
Mogalakwena Local Municipality Cemetery By-laws, 2007	Municipal by-laws governing the exhumation of bodies are stipulated under sections 53, 57 – 63.	Municipal requirements must be considered as part of the current burial grounds consultation and relocation process as relevant.
Applicable Guideline/Standards		
SAHRA guidelines for the development of plans for the management of heritage sites or places.	Guidelines applicable to the development of a management plan of heritage sites or places, that defines: <ul style="list-style-type: none"> ▪ What needs to be done; ▪ How it will be done; ▪ Who is responsible for the implementation; ▪ How it will be funded; and ▪ When activities or actions will be done. 	A CMP which considered the guidelines during the development of the plan has been developed for the Project.



10 Monitoring Programme

The monitoring programme must adhere to the framework outlined in the Platreef Project CMP, as stipulated under Section 8.2: Heritage Management Framework. Additionally, it is recommended that CFPs be developed and included in the EMP as a condition of authorisation. Furthermore, during the construction phase it is recommended that a qualified and accredited archaeologist be on call to assess any chance finds and guide construction to minimise the risk of damage to burial grounds and graves or other heritage resources.

11 Relevant Stakeholder Consultation

No stakeholder engagement was undertaken as part of the addendum to the specialist HIA for the Platreef Project (Higgitt, 2013).

12 Relevant Comments and Responses

This addendum to the specialist HIA represents the un-consulted version for public consumption. Once the report has been submitted for public review, and comments received, the comments and responses will be included within this section.

13 Conclusion and Recommendation

The addendum to the specialist HIA for the Platreef Project (Higgitt, 2013) considered changes to the amendment of the approved mine layout plan to accommodate the encroachment of communities within the Project boundary. The amendment has resulted in the reduction of the overall footprint of the Project, which will not exclude heritage resources that may have previously been impacted upon. No new impacts on heritage resources have been identified by the proposed reduction of the footprint area, and the recommendations provided in the specialist HIA for the Platreef Project remain relevant.

In addition to the reduction of the development footprint, this report considers the inclusion of new linear infrastructure into the amended mine layout plan, specifically the re-routing of a 4.84 km section of the TSF pipeline and the addition of a 3.02 km storm water drain. Identified heritage resources and potential impacts from project related activities are discussed with specific reference to these two infrastructures only.

A total of seven heritage resources were identified during a pre-disturbance survey of the development footprint of the TSF pipeline and storm water drain. These included six burial grounds and graves, and one LFC site. The LFC site (St-005) was assigned a negligible CS and deemed to have been sufficiently recorded. This site was not considered further in this addendum. Heritage impacts to the identified burial grounds and graves were identified and assessed in relation to the re-routing of a section of the TSF pipeline and the addition of a storm water drain. Heritage impacts may manifest as either changes to the physical integrity of the sites due to certain activities, or changes to the intangible nature of the burial grounds from restricted and / or loss of access.

It is recommended all identified burial grounds and graves within proximity or within the development footprint of the linear infrastructure be subject to a burial grounds consultation process. The current burial grounds consultation and relocation process could be extended to achieve this. The consultation process must be completed in accordance with Chapter XI of the NHRA Regulations (GN R 548) and aim to:

- Identify descendants and family members of the deceased and any other person or communities who by tradition are concerned with the graves;
- Consult with identified stakeholders regarding the effect of the Project on graves; and
- Reach agreement with stakeholders on the future of identified graves, to retain sites *in situ* or exhume, relocate and reinter the contents of graves.

Where burial grounds and graves are located in areas where *in situ* preservation is possible, for example on the proposed linear infrastructure boundaries, mitigation must consider redesigning proposed routing options to exclude burial grounds from the development footprints. Consultation with stakeholders will, however, still be required to reach agreement on the *in situ* conservation, including access requirements. The following minimum buffer zones are recommended for gravesites that may be conserved *in situ*:

- At least 15 m from any linear infrastructure footprints such as pipelines, roads or conveyors, including servitudes;
- At least 25 m from other infrastructure footprints such as offices, parking areas, etc.; and
- At least 100 m from open pit areas.

It is recommended that CFPs be developed and included in the EMP as a condition of authorisation. Furthermore, during the construction phase it is recommended that a qualified and accredited archaeologist be on call to assess any chance finds and guide construction to minimise the risk of damage to burial grounds and graves or other heritage resources.

Where burial grounds and graves are located in areas where *in situ* conservation will not be feasible or will be unsafe, mitigation must consider the exhumation and relocation of graves within the current process being undertaken. Exhumation and relocation is a permitted activity in accordance with Section 36(3) of the NHRA, and regulated by Chapters IX and XI of the NHRA: Regulations.

14 Bibliography

Higgitt, N. (2013). *Heritage Impact Assessment for the Platreef Platinum Project on the farms Bultongfontein 886 LR, Turfsruit 241 KR, Macalacaskop 243 KR and Rietfontein 2 KS in Mokopane, Limpopo Province*. Digby Wells Environmental: Unpublished report.

Heritage Impact Assessment Addendum Report

Addendum to the Environmental Impact Assessment Report for the Proposed Platreef
Underground Mine, near Mokopane, Limpopo Province

IVA3396



DIGBY WELLS
ENVIRONMENTAL

Appendix A: Declaration of Independence and Specialist CV



Digby Wells and Associates (South Africa) (Pty) Ltd

Contact person: Justin du Piesanie

Digby Wells House

Tel: 011 789 9495

Turnberry Office Park

Fax: 011 789 9498

48 Grosvenor Road

E-mail: justin.dupiesanie@digbywells.com

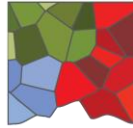
Bryanston

2191

South Africa

I, Justin du Piesanie as duly authorised representative of Digby Wells and Associates (South Africa) (Pty) Ltd., hereby confirm my independence (as well as that of Digby Wells and Associates (South Africa) (Pty) Ltd.) and declare that neither I nor Digby Wells and Associates (South Africa) (Pty) Ltd. have any interest, be it business, financial, personal or other, in any proposed activity, application or appeal in respect of the addendum to the Platreef Underground Mine Environmental Impact Assessment, other than fair remuneration for work performed, specifically in connection with the proposed Project, Limpopo Province.

Full Name	Justin du Piesanie
Title / Position	Heritage Management Consultant: Archaeologist
Qualifications	Master of Science (MSc)
Experience (Years)	10 Years
Registration	Association of Southern African Professional Archaeologists (ASAPA) International Council on Monuments and Sites (ICOMOS) South Africa



DIGBY WELLS

ENVIRONMENTAL

Mr. Justin du Piesanie
Heritage Management Consultant: Archaeologist
Social Sciences Department
Digby Wells Environmental

1 Education

Date	Degree(s) or Diploma(s) obtained	Institution
2013	Continued Professional Development Programme, Architectural and Urban Conservation: Researching and Assessing Local Environments	University of Cape Town
2008	MSc	University of the Witwatersrand
2005	BA (Honours) (Archaeology)	University of the Witwatersrand
2004	BA	University of the Witwatersrand
2001	Matric	Norkem Park High School

2 Language Skills

Language	Written	Spoken
English	Excellent	Excellent
Afrikaans	Proficient	Good

3 Employment

Period	Company	Title/position
08/2011 to present	Digby Wells Environmental	Heritage Management Consultant: Archaeologist

Digby Wells and Associates (South Africa) (Pty) Ltd (Subsidiary of Digby Wells & Associates (Pty) Ltd). Co. Reg. No. 2010/008577/07. Fern Isle, Section 10, 359 Pretoria Ave Randburg Private Bag X10046, Randburg, 2125, South Africa
Tel: +27 11 789 9495, Fax: +27 11 789 9498, info@digbywells.com, www.digbywells.com

Directors: A Sing*, AR Wilke, DJ Otto, GB Beringer, LF Koeslag, AJ Reynolds (Chairman) (British)*, J Leaver*, GE Trusler (C.E.O)
*Non-Executive

Period	Company	Title/position
2009-2011	University of the Witwatersrand	Archaeology Collections Manager
2009-2011	Independent	Archaeologist
2006-2007	Maropeng & Sterkfontein Caves UNESCO World Heritage Site	Tour guide

4 Professional Affiliations

Position	Professional Body	Registration Number
Member	Association for Southern African Professional Archaeologists (ASAPA); ASAPA Cultural Resources Management (CRM) section	270
Member	International Council on Monuments and Sites (ICOMOS)	14274
Member	Society for Africanist Archaeologists (SAfA)	N/A

5 Publications

- Huffman, T.N. & du Piesanie, J.J. 2011. Khami and the Venda in the Mapungubwe Landscape. *Journal of African Archaeology* 9(2): 189-206

6 Experience

I have 5 years experiences in the field of heritage resources management (HRM) including archaeological and heritage assessments, grave relocation, social consultation and mitigation of archaeological sites. During my studies I was involved in academic research projects associated with the Stone Age, Iron Age, and Rock Art. These are summarised below:

- Wits Fieldschool - Excavation at Meyersdal, Klipriviersberg Johannesburg (Late Iron Age Settlement).
- Wits Fieldschool - Phase 1 Survey of Prentjiesberg in Ugie / Maclear area, Eastern Cape.
- Wits Fieldschool – Excavation at Kudu Kopje, Mapungubwe National Park Limpopo Province.

- Wits Fieldschool – Excavation of Weipe 508 (2229 AB 508) on farm Weipe, Limpopo Province.
- Survey at Meyerdal, Klipriviersberg Johannesburg.
- Mapping of Rock Art Engravings at Klipbak 1 & 2, Kalahari.
- Survey at Sonop Mines, Windsorton Northern Cape (Vaal Archaeological Research Unit).
- Excavation of Kudu Kopje, Mapungubwe National Park Limpopo Province.
- Excavation of KK (2229 AD 110), VK (2229 AD 109), VK2 (2229 AD 108) & Weipe 508 (2229 AB 508) (Origins of Mapungubwe Project)
- Phase 1 Survey of farms Venetia, Hamilton, Den Staat and Little Muck, Limpopo Province (Origins of Mapungubwe Project)
- Excavation of Canteen Kopje Stone Age site, Barkley West, Northern Cape
- Excavation of Khami Period site AB32 (2229 AB 32), Den Staat Farm, Limpopo Province

Since 2011 I have been actively involved in environmental management throughout Africa, focusing on heritage assessments in compliance with International Finance Corporation (IFC) Performance Standards and other World Bank Standards and Equator Principles. This exposure to environmental, and specifically heritage management has allowed me to work to international best practice standards in accordance with international conservation bodies such as UNESCO and ICOMOS. In addition, I have also been involved in the collection of quantitative data for a Relocation Action Plan (RAP) in Burkina Faso. The exposure to this aspect of environmental management has afforded me the opportunity to understand the significance of integration of various studies in the assessment of heritage resources and recommendations for feasible mitigation measures. I have worked throughout South Africa, as well as Burkina Faso, the Democratic Republic of Congo, Liberia and Mali.

7 Project Experience

Please see the following table for relevant project experience:



Project Title	Project Location	Date:	Description of the Project	Role of Firm in the Project	Own Role in the Project	Time involved (man months)	Name of Client	Contract Outcomes	Reference
Klipriviersberg Archaeological Survey	Meyersdal, Gauteng, South Africa	2005 2006	Survey of residential development in Meyersdal. This included the recording of identified stone walled settlements through detailed mapping and photographs. Included was the Phase 2 Mitigation of two stone walled settlements	Archaeological Impact Assessments	Researcher, Archaeological Assistant	2 Months		Completed survey, excavations and reporting	Archaeological Resource Management (ARM) Prof T.N. Huffman thomas.huffman@wits.ac.za
Sun City Archaeological Site Mapping	Sun City, Pilanesberg, North West Province, South Africa	2006 2006	Recording of an identified Late Iron Age stonewalled settlement through detailed mapping	Mapping	Archaeological Assistant, Mapper	1 Month	Sun City	Completed mapping	Archaeological Resources Management (ARM) Prof T.N. Huffman thomas.huffman@wits.ac.za
Witbank Dam Archaeological Impact Assessment	Witbank, Mpumalanga, South Africa	2007 2007	Archaeological survey for proposed residential development at the Witbank dam	Archaeological Impact Assessment	Archaeological Assistant	1 Week		Completed Archaeological Impact Assessment report	Archaeological Resources Management (ARM) Prof T.N. Huffman thomas.huffman@wits.ac.za
Archaeological Assessment of Modderfontein AH Holdings	Johannesburg, Gauteng, South Africa	2008 2008	Archaeological survey and basic assessment of Modderfontein Holdings	Archaeological Impact Assessment	Archaeologist	1 Month		Completed the assessment of 13 properties	Heritage Contracts Unit Jaco van der Walt jaco.heritage@gmail.com
Heritage Assessment of Rhino Mines	Thabazimbi, Limpopo Province, South Africa	2008 2008	Heritage Assessment for expansion of mining area at Rhino Mines	Heritage Impact Assessment	Archaeologist	2 Weeks	Rhino Mines	Completed the assessment	Archaeological Resources Management (ARM) Prof T.N. Huffman thomas.huffman@wits.ac.za
Cronimet Project	Thabazimbi, Limpopo Province, South Africa	2008 2008	Archaeological survey of Moddergat 389 KQ, Schilpadnest 385 KQ, and Swartkop 369 KQ,	Archaeological Impact Assessment	Archaeologist	1 Weeks	Cronimet	Completed field survey and reporting	Heritage Contracts Unit Jaco van der Walt jaco.heritage@gmail.com



Project Title	Project Location	Date:	Description of the Project	Role of Firm in the Project	Own Role in the Project	Time involved (man months)	Name of Client	Contract Outcomes	Reference
Eskom Thohoyandou SEA Project	Limpopo Province, South Africa	2008 2008	Heritage Statement defining the cultural landscape of the Limpopo Province to assist in establishing sensitive receptors for the Eskom Thohoyadou SEA Project	Heritage Statement	Archaeologist	2 Months	Eskom	Completed Heritage Statement	Heritage Contracts Unit Jaco van der Walt jaco.heritage@gmail.com
Wenzelrust Excavations	Shoshanguve, Gauteng, South Africa	2009 2009	Contracted by the Heritage Contracts Unit to help facilitate the Phase 2 excavations of a Late Iron Age / historical site identified in Shoshanguve	Excavation and Mapping	Archaeologist	1 Week	Heritage Contracts Unit	Completed excavations	Heritage Contracts Unit Jaco van der Walt jaco.heritage@gmail.com
University of the Witwatersrand Parys LIA Shelter Project	Parys, Free State, South Africa	2009 2009	Mapping of a Late Iron Age rock shelter being studied by the Archaeology Department of the University of the Witwatersrand	Mapping	Archaeologist	1 Day	University of the Witwatersrand	Completed mapping of the shelter	University of the Witwatersrand Karim Sadr karim.sadr@wits.ac.za
Transnet NMPP Line	Kwa-Zulu Natal, South Africa	2010 2010	Heritage Survey of the Anglo-Boer War Vaalkrans Battlefield where the servitude of the NMP pipeline	Heritage Impact Assessment	Archaeologist	1 Week	Umlando Consultants	Completed survey	Umlando Consultants Gavin Anderson umlando@gmail.com
Archaeological Impact Assessment – Witpoortjie Project	Johannesburg, Gauteng, South Africa	2010 2010	Heritage survey of Witpoortjie 254 IQ, Mindale Ext 7 and Nooitgedacht 534 IQ for residential development project	Archaeological Impact Assessment	Archaeologist	1 Week	ARM	Completed survey for the AIA	Archaeological Resources Management (ARM) Prof T.N. Huffman thomas.huffman@wits.ac.za
Der Brochen Excavations	Steelpoort, Mpumalanga, South Africa	2010 2010	Phase 2 archaeological excavations of Late Iron Age Site	Archaeological Excavation	Archaeologist	2 Weeks	Heritage Contracts Unit	Completed excavations	Heritage Contracts Unit Jaco van der Walt jaco.heritage@gmail.com



Project Title	Project Location	Date:	Description of the Project	Role of Firm in the Project	Own Role in the Project	Time involved (man months)	Name of Client	Contract Outcomes	Reference
De Brochen and Booyensdal Archaeology Project	Steelpoort, Mpumalanga, South Africa	2010 2010	Mapping of archaeological sites 23, 26, 27, 28a & b on the Anglo Platinum Mines De Brochen and Booyensdal	Mapping	Archaeologist	1 Week	Heritage Contracts Unit	Completed Mapping	Heritage Contracts Unit Jaco van der Walt jaco.heritage@gmail.com
Eskom Thohoyandou Electricity Master Network	Limpopo Province, South Africa	2010 2010	Desktop study to identify heritage sensitivity of the Limpopo Province	Desktop Study	Archaeologist	1 Month	Strategic Environmental Focus	Completed Report	Strategic Environmental Focus (SEF) Vici Napier vici@sefsa.co.za
Bathako Mine Expansion	North-West Province, South Africa	2010 2010	Mapping of historical sites located within the Bathako Mine Expansion Area	Mapping	Archaeologist	1 Week	Heritage Contracts Unit	Completed Mapping	Heritage Contracts Unit Jaco van der Walt jaco.heritage@gmail.com
Kibali Gold Project Grave Relocation Plan	Oriental Province, Democratic Republic of Congo	2011 2013	Implementation of the Grave Relocation Project for the Randgold Kibali Gold Project	Grave Relocation	Archaeologist	2 Years	Randgold Resources	Successful relocation of approximately 3000 graves	Kibali Gold Mine Cyrille Mutombo Cyrille.c.mutombo@kibaligold.com
Kibali Gold Hydro-Power Project	Oriental Province, Democratic Republic of Congo	2012 2014	Assessment of 7 proposed hydro-power stations along the Kibali River	ESIA	Heritage Consultant	2 Years	Randgold Resources	Completed Heritage Impact Assessment	Randgold Resources Charles Wells Charles.wells@randgoldreources.com
Everest North Mining Project	Steelpoort, Mpumalanga, South Africa	2012 2012	Heritage Impact Assessment on the farm Vygenhoek	EIA and EMP	Heritage Consultant	6 Months	Aquarius Resources	Completed Heritage Impact Assessment	Aquarius Resources
Environmental Authorisation for the Gold One Geluksdal TSF and Pipeline	Gauteng, South Africa	2012 2012	Heritage impact Assessment for the proposed TSF and Pipeline of Geluksdal Mine	EIA and EMP	Heritage Consultant	4 Months	Gold One International	Completed Heritage Impact Assessment	Gold One International
Platreef Burial Grounds and Graves Survey	Mokopane, Limpopo Province, South Africa	2012 2012	Survey for Burial Grounds and Graves	Burial Grounds and Graves Management Plan	Heritage Consultant	4 Months	Platreef Resources	Project closed by client due to safety risks	Platreef Resources Gerick Mouton



Project Title	Project Location	Date:	Description of the Project	Role of Firm in the Project	Own Role in the Project	Time involved (man months)	Name of Client	Contract Outcomes	Reference
Resgen Boikarabelo Coal Mine	Limpopo Province, South Africa	2012 2012	Archaeological Excavation of identified sites	Archaeological Excavation	Heritage Consultant	4 Months	Resources Generation	Completed excavation and reporting, destruction permits approved	Resources Generation Louise Nicolai
Bokoni Platinum Road Watching Brief	Burgersfort, Limpopo Province, South Africa	2012 2012	Watching brief for construction of new road	Watching Brief	Heritage Consultant	1 Week	Bokoni Platinum Mine	Completed watching brief, reviewed report	Bokoni Platinum Mines (Pty) Ltd
SEGA Gold Mining Project	Burkina Faso	2012 2013	Socio Economic and Asset Survey	RAP	Social Consultant	3 Months	Cluff Gold PLC	Completed field survey and data collection	Cluff Gold PLC
SEGA Gold Mining Project	Burkina Faso	2013 2013	Specialist Review of Heritage Impact Assessment	Reviewer	Heritage Consultant	1 Week	Cluff Gold PLC	Reviewed specialist report and made appropriate recommendations	Cluff Gold PLC
Consbrey and Harwar Collieries Project	Breyton, Mpumalanga, South Africa	2013 2013	Heritage Impact Assessment for the proposed Consbrey and Harwar Collieries	EIA and EMP	Heritage Consultant	2 Months	Msobo	Completed Heritage Impact Assessments	Msobo
New Liberty Gold Project	Liberia	2013 2014	Implementation of the Grave Relocation Project for the New Liberty Gold Project	Grave Relocation	Heritage Consultant	5 Months	Aureus Mining	Grave Relocation completed	Aureus Mining
Falea Uranium Mine Environmental Assessment	Falea, Mali	2013 2013	Heritage Scoping for the proposed Falea Uranium Mine	Environmental Assessment	Heritage Consultant	2 Months	Rockgate Capital	Completed scoping report and recommended further studies	Rockgate Capital
Putu Iron Ore Mine Project	Petroken, Liberia	2013 2014	Heritage impact Assessment for the proposed Putu Iron Ore Mine, road extension and railway line	EIA and EMP	Heritage Consultant	6 Months	Atkins Limited	Completed Heritage Impact Assessment and provided recommendations for further studies	Atkins Limited Irene Bopp Irene.Bopp@atkinglobal.com



Project Title	Project Location	Date:	Description of the Project	Role of Firm in the Project	Own Role in the Project	Time involved (man months)	Name of Client	Contract Outcomes	Reference
Sasol Twistdraai Project	Secunda, Mpumalanga, South Africa	2013 2014	Notification of intent to Develop and Heritage Statement for the Sasol Twistdraai Expansion	NID	Heritage Consultant	2 Months	ERM Southern Africa	Completed NID and Heritage Statement	ERM Southern Africa Alan Cochran Alan.Cochran@erm.com
Daleside Acetylene Gas Production Facility	Gauteng, South Africa	2013 2013	Project Management of the heritage study	NID	Project Manager	3 Months	ERM Southern Africa	Project completed	ERM Southern Africa Kasantha Moodley Kasantha.Moodley@erm.com
Exxaro Belfast, Paardeplaats and Eerstelingsfontein GRP	Belfast, Mpumalanga, South Africa	2013 2014	Grave Relocation Plan for the Belfast, Paardeplaats and Eerstelingsfontein Projects	GRP	Project Manager, Heritage Consultant	2 Years	Exxaro	Burial Grounds and Graves consultation complete and applications to authorities submitted for permitting	Exxaro Johan van der Bijl Johan.vanderbijl@exxaro.com
Nzoro 2 Hydro Power Project	Orientele Province, Democratic Republic of Congo	2014 2014	Social consultation for the Relocation Action Plan component of the Nzoro 2 Hydro Power Station	RAP	Social Consultant	2 Months	Randgold Resources	Completed introductory meetings – project has been placed on hold	Kibali Gold Mine Cyrille Mutombo Cyrille.c.mutombo@kibaligold.com
Eastern Basin AMD Project	Springs, Gauteng, South Africa	2014 2014	Heritage Impact Assessment for the proposed new sludge storage facility and pipeline	EIA and EMP	Heritage Consultant	2 Months	AECOM	Completed HIA and submitted to the authorities	AECOM
Soweto Cluster Reclamation Project	Soweto, Gauteng, South Africa	2014 2014	Heritage Impact Assessment for reclamation activities associated with the Soweto Cluster Dumps	EIA and EMP	Heritage Consultant	3 Months	ERGO	Completed HIA and submitted to the authorities	ERGO Greg Ovens greg.ovens@drdgold.com
Klipspruit South Project	Ogies, Mpumalanga, South Africa	2014 2014	NID and Heritage Statement for the Section 102 Amendment of the Klipspruit Mine EMP	EIA and EMP	Heritage Consultant	6 Months	BHP Billiton	HIA finalised and submitted to the authorities	BHP Billiton



Project Title	Project Location	Date:	Description of the Project	Role of Firm in the Project	Own Role in the Project	Time involved (man months)	Name of Client	Contract Outcomes	Reference
Klipspruit Extension: Weltevreden Project	Ogies, Mpumalanga, South Africa	2014 2014	NID and Heritage Statement for the expansion of the Klipspruit Mine	EIA and EMP	Heritage Consultant	6 Months	BHP Billiton	HIA finalised and submitted to authorities	BHP Billiton
Ergo Rondebult Pipeline Basic Assessment	Johannesburg, South Africa	2014 2014	NID and Heritage Statement for the construction of the Rondebult Pipeline	BA	Heritage Consultant	1 Week	ERGO	Completed screening assessment and NID	ERGO Greg Ovens greg.ovens@drdgold.com
Kibali ESIA Update Project	Orientele Province, Democratic Republic of Congo	2014 2014	Update of the Kibali ESIA for the inclusion of new open-cast pit areas	ESIA	Heritage Consultant	1 Month	Randgold Resources	Completed heritage assessment and input into the ESIA	Randgold Resources Charles Wells Charles.wells@randgoldresources.com
GoldOne EMP Consolidation	Westonaria, Gauteng, South Africa	2014 2014	Gap analysis for the EMP consolidation of operations west of Johannesburg	Gap Analysis	Heritage Consultant	1 Month	Gold One International	Gap analysis complete and proposed way forward submitted	Gold One International
Yzermite PIA	Wakkerstroom, Mpumalanga, South Africa	2014 2014	Palaeontological Assessment for the Yzermite Project	PIA	Project Management	1 Month	EcoPartners	Completed report and submitted to authorities	EcoPartners San Oosthuizen san@ecopartners.co.za
Sasol Mooikraal Basic Assessment	Sasolburg, Free State, South Africa	2014 2014	Heritage Basic Assessment for the proposed Mooikraal Pipeline	HBA	Heritage Consultant	4 Months	Sasol Mining	Completed Heritage Basic Assessment and submitted to the authorities	
Everest North Mining Project	Steelpoort, Mpumalanga, South Africa	2012 2015	EIA and EMP for the Aquarius Everest North Mining Project	EIA and EMP	Project Manager	1 Year	Aquarius Resources	EIA and EMP amended and submitted to authorities. Authorisation received.	Aquarius Resources Robyn Mellett Robyn.Mellett@aquariussa.co.za
Oakleaf ESIA Project	Bronkhorstspuit, Gauteng, South Africa	2014 2015	Heritage impact Assessment for the Oakleaf Project	EIA and EMP	Heritage Consultant	4 Months	Oakleaf Investment Holdings	HIA report finalised and submitted to the authorities	



Project Title	Project Location	Date:	Description of the Project	Role of Firm in the Project	Own Role in the Project	Time involved (man months)	Name of Client	Contract Outcomes	Reference
Rea Vaya Phase II C Project	Johannesburg, Gauteng, South Africa	2014 2014	Heritage Impact Assessment on 2 structures along Rea Vaya Routing	HIA	Project Manager	1 year	Iliso Consulting	HIA report finalised and submitted to the authorities	Iliso Consulting
NTEM Iron Ore Mine and Pipeline Project	Cameroon	2014 2015	Review of Heritage Impact Assessment for the NTEM ESIA	EIA and EMP	Specialist Reviewer	1 Month	International Mining and Infrastructure Corporation plc	Specialist reports reviewed and comments provided	
Imvula Project	Kriel, Mpumalanga, South Africa	2014 2015	Heritage Scoping Report for Imvula EIA	EIA and EMP	Heritage Consultant	1 Year 4 Months	Ixia Coal	Project completed and submitted	
Sibanye WRTRP	Gauteng, South Africa	2014 2016	Heritage Impact Assessment for the Sibanye WRTRP	EIA and EMP	Heritage Consultant	On-going	Sibanye	Project is on-going	
VMIC Vanadium EIA Project	Mokopane, Limpopo, South Africa	2014 2015	Heritage Impact Assessment for the Vanadium Project	EIA and EMP	Heritage Consultant	1 Year	VM Investment Company	HIA report finalised and submitted to the authorities	
NLGM Constructed Wetlands Project	Liberia	2015 2015	Heritage Assessment for the proposed constructed wetlands	HIA	Heritage Consultant	1 Month	Aureus Mining	HIA report finalised and submitted	
ERPM Section 34 Destruction Permits Applications	Johannesburg, Gauteng, South Africa	2015 2015	Section 34 Destruction Permit Applications for the SEV and Cason Shafts	HIA and S.34 Applications	Project Manager	4 Months	Ergo Mining	Application submitted and permits received	Ergo Mining Greg Ovens greg.ovens@drdgold.com
JMEP II EIA	Botswana	2015 2015	Heritage Impact Assessment for the JMEP II Wellfields	HIA	Heritage Consultant	2 Months	Jindal	HIA completed and submitted to authorities	
Gino's Building Section 34 Destruction Permit Application	Johannesburg, Gauteng, South Africa	2015 2016	Heritage Impact Assessment and Section 34 Destruction Permit Application	HIA and S. 34 Applications	Project Manager	On-going	Bigen Africa Services (Pty) Ltd	Project is on-going	Bigen Africa Services (Pty) Ltd Kamantha Veerasamy Kamantha.Veerasamy@bigenafrica.com
EDC Block Refurbishment Project	Johannesburg, Gauteng, South Africa	2015 2016	Heritage Impact Assessment and Section 34 Permit Application	HIA and S. 34 Applications	Project Manager	On-going	Bigen Africa Services (Pty) Ltd	Project is on-going	Bigen Africa Services (Pty) Ltd Taka Sande Taka.Sande@bigenafrica.com



Project Title	Project Location	Date:	Description of the Project	Role of Firm in the Project	Own Role in the Project	Time involved (man months)	Name of Client	Contract Outcomes	Reference
Namane IPP and Transmission Line EIA	Steenbokpan, Limpopo Province, South Africa	2015 2016	Heritage Impact Assessment	EIA and EMP	Heritage Consultant	On-going	Namane Resources (Pty) Ltd	Project is on-going	
Temo Coal Road Diversion and Rail Loop EIA	Steenbokpan, Limpopo Province, South Africa	2015 2016	Heritage Impact Assessment	EIA and EMP	Heritage Consultant	On-going	Namane Resources (Pty) Ltd	Project is on-going	



DIGBY WELLS
ENVIRONMENTAL

