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Environmental Authorisation for the KPSX: Weltevreden Project

Heritage Impact Assessment

Project Number:

BHP2690

Prepared for:

BHP Billiton Energy Coal South Africa (Pty) Ltd

December 2014

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This document has been prepared by Digby Wells Environmental.

Report Type:	Heritage Impact Assessment
Project Name:	Environmental Authorisation for the KPSX: Weltevreden Project
Project Code:	BHP2690

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EXECUTIVE SUMMARY

Introduction

Digby Wells Environmental (hereafter Digby Wells) was requested by BHP Billiton Energy Coal South Africa Proprietary Limited (hereafter BECSA) to serve as the independent Environmental Assessment Practitioner (EAP) for the Klipspruit Extension: Weltevreden (KPSX: Weltevreden) project, inclusive of an Environmental Impact Assessment, public consultation and specialist studies. A Notification of Intent to Develop (NID) was compiled and submitted to the South African Heritage Resources Agency (SAHRA) (Case ID: 6397) and the Mpumalanga Provincial Heritage Resources Authority (MPHRA) for Statutory Comment as prescribed under section 38(8) of the National Heritage Resources Act, 1999 (Act No. 25 of 1999) (NHRA). Statutory Comment was issued on 25 September 2014.

As per the Statutory Comments (Case ID: 6397) a Heritage Impact Assessment (HIA) to assess the possible impacts on the built environment and burial grounds and graves was required. Additionally, the heritage specialist must be mindful of any archaeological resources during the field assessment. Further to this, SAHRA required that a professional palaeontologist undertake a Palaeontological Impact Assessment inclusive of a field and desktop assessment for the proposed development.

Findings

Field based data collection was undertaken by Justin du Piesanie, a qualified and accredited archaeologist, from 30 September 2014 to 02 October 2014. The project area was assessed through vehicular and pedestrian survey methodologies. Heritage resources identified within the Cultmatrix cc (De Jong, 2009) were verified and recorded using GPS technology, photographs and detailed notes to assist in the assessment of the significance of and potential impacts on these resources. Information gathered was supplemented through informal consultation with some of the land occupiers.

A total of 57 heritage resources were identified / verified within and surrounding the KPSX: Weltevreden project area. These included the following:

Heritage Resources	Number	Cultural Significance
Section 34 Built Structures	36	Negligible
Section 35 Archaeology, Palaeontology and Meteorites	1	Negligible
Section 36 Burial Grounds and Graves	20	High

Impact Assessment

The impact assessment considered changes to identified heritage resources with a significance value ranging from low – very high. Heritage resources with a negligible significance were not included in the impact assessment as they have been sufficiently recorded and do not require any additional mitigation. However, where structures older than 60 years are granted general protection under Section 34 of the NHRA, a destruction permit in conjunction with a 30 day public notice and commenting period is required.

A summary of the impact assessment is presented below.



Code	Impact	Pre-mitigation:						Post-mitigation:					
		Duration	Extent	Intensity	Consequence	Probability	Significance	Duration	Extent	Intensity	Consequence	Probability	Significance
V.High SoS	Damage to and/or destruction of burial ground	Permanent	International	Extremely high - negative	Extremely detrimental	Certain	Major - negative	Project Life	National	Very high - negative	Highly detrimental	Highly probable	Moderate - negative
V.High SoS	Degradation of cultural significance due to loss of / restricted access to burial ground	Project Life	Local	Extremely high - negative	Highly detrimental	Likely	Moderate - negative	Project Life	Very limited	Extremely high - positive	Moderately beneficial	Highly probable	Moderate - positive
V.High SoS	Health and safety risk to NoK when accessing / visiting burial ground	Project Life	Local	Extremely high - negative	Highly detrimental	Certain	Moderate - negative	Project Life	Very limited	Extremely high - positive	Moderately beneficial	Highly probable	Moderate - positive
GY15	Exposure of Graves	Permanent	International	Extremely high - negative	Extremely detrimental	Certain	Major - negative	Project Life	Very limited	Very high - negative	Moderately detrimental	Highly probable	Minor - negative

Conclusion and Recommendation

The proposed KPSX: Weltevreden Project is located in the Mpumalanga Province to the east of Ogies. A draft HIA was compiled by Cultmatrix cc (De Jong, 2009) in which the cultural landscape was described as a “Historical Farmland Context”. A review of relevant literature and other reports for the study area confirm this classification when one considers the distribution of identified heritage resources.

An NID (du Piesanie, 2014) completed and submitted to SAHRA and MPHRA in terms of Section 38(8) of the NHRA presented a baseline of the cultural landscape that informed this report. Statutory Comment issued on 25 September 2014 required that an HIA and palaeontological desktop and field assessment be undertaken. This was completed and the findings are presented in Appendix B.

A total of 57 heritage resources (See Table 3-1) were identified within and surrounding the project boundaries. Heritage resources associated with the built environment were found to have negligible significance ratings. These were not included in the impact assessment, however structures older than 60 years (See Table 4-1) will require permitting for destruction. Burial grounds are universally considered to have cultural significance. An impact assessment was completed and discussed under Section 4.2 above. Recommendation to the mitigation and management of these resources was presented and discussed under Section 5 above and summarised below.

Based on the findings of the NID and this report, Digby Wells recommend the following:

- There is no need for any further palaeontological assessment. If fossil plant material is discovered during mining operations, it is strongly recommended that a professional palaeontologist be called to assess the importance and rescue the fossils if necessary;
- A fossil monitoring programme as outlined below must be included in the EMP:
 - Photographs of fossil plants must be provided to the mine to assist in the identification of potential fossiliferous material in the shales and mudstone;
 - During the operational phase, shale and mudstones must be given a cursory inspection by the mine geologist or designated person before being added to the waste rock pile. Any identified fossiliferous material should be collected and stored in a suitable protected area to ensure mining operations are not disrupted;
 - On a regular basis, to be agreed upon by mine management and the qualified palaeobotanist sub-contractor, the palaeobotanist should visit the mine to inspect the selected material and waste rock dumps where feasible;
 - Fossil plants considered of good quality or scientific interest by the palaeobotanist must be removed, catalogued and housed in a suitable institution where they can be made available for further study. SAHRA permits will be required for this activity;

- If no good quality fossiliferous material is recovered, site inspection by the palaeobotanist can be reduced to annual events until mine closure.
- Project related mitigation should aim to exclude burial grounds from the project impact footprint to remove potential direct impacts. Irrespective of whether the burial ground will be directly or indirectly affected, agreement regarding the future of the site must be reached between BECSA and NoK through the implementation of a BGGC process in accordance with Section 36 of the NHRA and Chapter XI of the Regulations. This process must include agreements in respect of a CMP and possible GRP.
- As per the interim comments issued by SAHRA, the assessor was mindful of the general protection of archaeological resources under Section 35 of the NHRA. However, no archaeological resources were identified during the field reconnaissance survey. It is recommended that project specific Chance Find Protocols (CFPs) be developed and included in the EMP for the KPSX: Weltevreden Project. This should include:
 - Proactive Archaeological Monitoring;
 - Proactive Palaeontological Monitoring;
 - Chance Find Protocols; and
 - Training module for the on-site Environmental Officer or relevant staff.
- An assessment of the significance of the resources presented in Table 3-1 indicated that the significance of the built structures was negligible and were therefore excluded from the impact assessment. Nevertheless, a review of the historical aerial imagery presented within the NID indicated that some of these sites pre-date 1954 and are therefore generally protected under Section 34 of the NHRA (See Table 4-1). Based on these findings, it is recommended that BECSA apply for a Section 34 Destruction Permit with MPHRA to ensure compliance with the NHRA.

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1 Introduction

1.1 Project Background

Digby Wells Environmental (hereafter Digby Wells) was requested by BHP Billiton Energy Coal South Africa Proprietary Limited (hereafter BECSA) to serve as the independent Environmental Assessment Practitioner (EAP) for the Klipspruit Extension: Weltevreden (KPSX: Weltevreden) Project. The Scope of Work (SoW) was inclusive of an Environmental Impact Assessment (EIA), a Stakeholder Engagement Process (SEP) and associated specialist studies.

Digby Wells compiled a Notification of Intent to Develop (NID) during the Scoping Phase of the KPSX: Weltevreden Project as part of the specialist heritage study. The NID took cognisance of the previously completed draft Heritage Impact Assessment (HIA) (De Jong, 2009) and provided an updated cultural heritage baseline for the study. The findings of the NID supported the interpretation that it is primarily associated with the Historical Period. As such, the following was recommended:

- A palaeontological desktop assessment to determine the real potential of significant fossils based on available geological and geochemical data. This assessment should provide further recommended mitigation and management measures;
- An assessment of the built environment including a field reconnaissance survey to identify, record, and document all structures that may exist in the project area, in addition to those identified by Cultmatrix cc (De Jong, 2009). This assessment should provide an inventory of structures that may require permits or management plans to be integrated into the EMP;
- An assessment of burial grounds and graves including a field reconnaissance survey to identify, record and document all burials that may exist in the project area, in addition to those identified by Cultmatrix cc (De Jong, 2009);
- Results from other specialist studies should be integrated to determine any possible living heritage in the project area. Studies that may be considered for integration include Stakeholder Engagement, Socio-Economic Impact Assessment, Botanical Assessment and Visual Assessment;
- Exemption from a comprehensive Archaeological Impact Assessment (AIA) based on the findings from the Cultmatrix cc (De Jong, 2009), and low distribution of identified section 35 heritage resources throughout the region;
- The HIA should include a register of heritage-specific authorisations that may be required if the project is awarded a mining right. This register should be included in the EIA and EMP.

The NID was submitted to the South African Heritage Resources Agency (SAHRA) (Case ID: 6397) and the Mpumalanga Provincial Heritage Resources Authority (MPHRA) for

Statutory Comment as prescribed under section 38(8) of the National Heritage Resources Act, 1999 (Act No. 25 of 1999) (NHRA). Statutory Comment was issued on 25 September 2014. These comments provided the Terms of Reference for this study, as outlined under Section 1.3 below.

1.2 Project Description

Currently, BECSA is a 90% owner-operator of the Klipspruit Mine (KPS). The Mine lies within the Springs-Witbank Coalfield and produces a nominal 8 million ton per annum (Mtpa) Run of Mine (RoM) of both high and low quality coal. Authorisation for the KPS was received in 2003 in terms of section 39 of the Minerals Act (Act No. 50 of 1991) (Ref: OT6/2/2/495 EM), with an expected Life of Mine (LoM) to the year 2020.

BECSA is a 50% shareholder with Anglo American Thermal Coal in the Phola Coal Processing Plant Joint Venture (PCPP JV) in a take-or-pay agreement until 2028. Here, RoM coal from KPS is processed and transported along the Richards Bay Coal Terminal (RBCT) railway line for export to international markets with a small component being for domestic use.

Currently, the Life of Asset (LoA) plan has a sharp decline in export tonnes as the operations at the KPS ramp down. To maintain the current export volume profile and fulfil the take-or-pay agreement at PCPP JV, BECSA intend to implement the KPSX: Weltevreden Project.

BECSA is the holder of three prospecting rights in close proximity to the existing Klipspruit operations, containing coal resources of approximately 500 million ton (Mt). The KPSX: Weltevreden Project is positioned to leverage off the existing export infrastructure, and extend the LoM by 20 years or more.

Additional project details, including relevant contacts, development context, legal framework and description of the cultural landscape were reported on in the NID available from <http://www.sahra.org.za/cases/klipspruit-extension-weltevreden-project>

1.3 Terms of Reference

SAHRA required an HIA to be undertaken as per the Interim Statutory Comment issued on 25 September 2014. The HIA needed to:

- Assess possible impacts on the built environment;
- Assess possible impacts on burial grounds and graves; and
- Assess any archaeological resources identified during the reconnaissance survey.

Further to this, SAHRA required that a professional palaeontologist undertake a Palaeontological Impact Assessment (PIA) inclusive of a field and desktop assessment for the proposed development.

1.4 Scope of Work

The Scope of Work (SoW) for the HIA was based the Interim Comment issued by SAHRA and included:

- A palaeontological assessment of the study area;
- Field survey of the study area to verify and record heritage resources;
- An assessment of the cultural significance of the identified heritage resources in accordance with Section 3 of the NHRA;
- An assessment of the direct, indirect, induced and cumulative impacts of project related activities on heritage resources; and
- Consideration of alternatives and recommendation of feasible mitigation measures.

1.5 Expertise of the Specialist

Justin du Piesanie obtained his Master of Science (MSc) degree in Archaeology from the University of the Witwatersrand in 2008, specialising in the Southern African Iron Age. He currently holds the position of Heritage Management Consultant: Archaeologist at Digby Wells. He has over 5 years combined experience in Heritage Resources Management (HRM) in South Africa, gaining further generalist experience since his appointment at Digby Wells in Burkina Faso, the Democratic Republic of Congo, Liberia and Mali.

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

Prof. Marion Bamford obtained her Doctor of Philosophy (PhD) degree in Palaeobotany from the University of the Witwatersrand in 1990. She currently holds the position of Professor and Senior Management Committee Member at the Evolutionary Studies Institute at the School of Geosciences at the University of the Witwatersrand. She has over 15 year's professional experience throughout southern Africa and has completed over 25 Palaeontological Impact Assessments since 2004.

The specialists' curricula vitae are attached as Appendix A.

2 HIA Methodology

2.1 Field Based Data Collection

Field based data collection was undertaken by Justin du Piesanie, a qualified and accredited archaeologist, from 30 September 2014 to 02 October 2014. The project area was surveyed through vehicular and pedestrian means. Heritage resources identified by de Jong (2009) were verified and recorded using GPS technology, photographs and detailed notes to assist in the assessment of the significance of and potential impacts on these resources.

Information gathered was supplemented through informal consultation with some of the land occupiers.

2.2 Evaluation of Significance

The significance rating process is designed to provide a numerical rating of the cultural significance¹ 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 subsection 3(3) of the NHRA, 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 (see the NID available from <http://www.sahra.org.za/cases/klipspruit-extension-weltevreden-project>) 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 can therefore be summarised as:

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

where

$$\text{Importance} = \text{average sum of Aesthetic} + \text{Historic} + \text{Scientific} + \text{Social Significance}$$

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. These values are based on, and summarised from, the criteria for inclusion into the national estate as outlined in subsection 3(3) of the NHRA, listed in Table 2-1.

¹ 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.

Table 2-1: NHRA criteria for inclusion of heritage resources into the national estate

NHRA reference	Description of defining criteria
3(1)(a)	its importance in the community, or pattern of South Africa's history;
3(1)(b)	its possession of uncommon, rare or endangered aspects of South Africa's natural or cultural heritage;
3(1)(c)	its potential to yield information that will contribute to an understanding of South Africa's natural or cultural heritage;
3(1)(d)	its importance in demonstrating the principal characteristics of a particular class of South Africa's natural or cultural places or objects;
3(1)(e)	its importance in exhibiting particular aesthetic characteristics valued by a community or cultural group;
3(1)(f)	its importance in demonstrating a high degree of creative or technical achievement at a particular period;
3(1)(g)	its strong or special association with a particular community or cultural group for social, cultural or spiritual reasons;
3(1)(h)	its strong or special association with the life or work of a person, group or organisation of importance in the history of South Africa; and
3(1)(i)	sites of significance relating to the history of slavery in South Africa.

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 2-2 to Table 2-13.

Table 2-2: Rating options: Importance

Rating	Description / guideline
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.
1	Common, well represented throughout diverse cultural landscapes
2	Generally well represented but exhibits superior qualities in comparison to other similar examples
3	The resource exhibits attributes that are rare and uncommon within a region. It is important to specific communities.
4	Rare and uncommon, value of national importance
5	The resource exhibits attributes that are considered singular, unique and/or irreplaceable to the degree that its significance can be universally accepted.
-	Not assessed - dimension and/or attribute not considered in determining value.

Table 2-3: Rating options: Integrity

Rating	Description / guideline
0	No information potential, complete loss of meaning, Fabric completely degraded, original setting lost
1	Fabric poorly preserved, limited information, little meaning ascribed, extensive encroachment on setting
2	Fabric is preserved, some information potential (quality questionable) and meaning evident, some encroachment on setting
3	Fabric well preserved, good quality information and meaning evident, limited encroachment
4	Excellent preservation of fabric, high information potential of high quality, meaning is well established, no encroachment on setting

Table 2-4: Significance ratings

Score	Description	Rating
0-5	Resource of negligible heritage value	Negligible
6-10	Resource of low heritage value; change to resource not significant	Low
11-12	Resource of medium heritage value: project mitigation must aim to reduce negative change	Medium
13-14	Resource of medium high heritage value: heritage mitigation to reduce negative change	Medium High
15-17	Resource of high heritage value: resource must be partly conserved and heritage mitigation implemented to reduce negative change	High
17-20	Resource of very high heritage value: resource must be preserved/conserved and included in a management plan	Very High

2.3 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.

The field rating process is designed to provide a numerical rating of the recommend 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 can be summarised as:

$$\text{Field rating} = \text{average sum of Aesthetic} + \text{Historic} + \text{Scientific} + \text{Social Field Ratings}$$

The weight assigned to the various field rating parameters in the formula and the sum of the average ratings are presented in Table 2-5 and Table 2-6.

Table 2-5: Rating options: Field Ratings

Rating	Grade	Description
7	Grade I	Mainly of national significance
6	Grade II	Mainly of provincial significance
5	Grade III A	Mainly local with very high significance
4	Grade III B	Mainly local with high significance
3	General Protection A	Generally protected resource with Medium to Medium-High significance
2	General Protection B	Generally protected resource with Low significance
1	General Protection C	Generally protected resource with Negligible significance

Table 2-6: Field ratings

Score	Description	Rating
6,5 to 7,0	Heritage resources with qualities so exceptional that they are of special national significance	Grade I
5,5 to 6,4	Heritage resources which, although forming part of the national estate, can be considered to have special qualities which make them significant within the context of a province or a region	Grade II
4,5 to 5,4	Heritage resources which, although forming part of the national estate, can be considered to have special qualities which make them significant within a more localised context -very high significance rating	Grade III A
3,5 to 4,4	Heritage resources which, although forming part of the national estate, can be considered to have special qualities which make them significant within a more localised context - high significance rating	Grade III B
2,5 to 3,4	Resources under general protection in terms of NHRA sections 34 to 37 with Medium to Medium-High significance	General Protected IV A
1,5 to 2,4	Resources under general protection in terms of NHRA sections 34 to 37 with Low significance	General Protected IV B
1,0 to 1,4	Resources under general protection in terms of NHRA sections 34 to 37 with Negligible significance	General Protected IV C

2.4 Assessment of Impacts²

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, as shown below:

$$\text{Significance} = \text{consequence of an event} \times \text{probability of the event occurring}$$

Where:

$$\text{Consequence} = \text{Type of impact} \times (\text{Intensity} + \text{Spatial Scale} + \text{Duration})$$

And:

$$\text{Probability} = \text{Likelihood of an impact occurring}$$

In the formula for calculating consequence:

$$\text{Type of impact} = +1 \text{ (for positive impacts) or } -1 \text{ (for negative impacts)}$$

The weight assigned to the various parameters for positive and negative impacts in the formula is presented in Table 2-2 to Table 2-11 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. This may include alteration, restoration or demolition of structures under a permit issued by MPHRA and/or SAHRA.

Table 2-7: Rating options: Intensity

Rating	Type of impact
+/- 7	Major change to Heritage Resource with High-Very High Value
+/- 6	Moderate change to Heritage Resource with High-Very High Value
+/- 5	Minor change to Heritage Resource with High-Very High Value
+/- 4	Major change to Heritage Resource with Medium-Medium High Value

² The impact assessment methodology has been adapted from the Social Impact Assessment methodology developed by Jan Perold (PhD), Digby Wells Social Department manager.

Rating	Type of impact
+/- 3	Moderate change to Heritage Resource with Medium - Medium High Value
+/- 2	Minor change to Heritage Resource with Medium - Medium High Value
+/- 1	No change to Heritage Resource with values medium or higher, or Any change to Heritage Resource with Low Value

Table 2-8: Rating options: Spatial scale

Value	Exposure	Description
7	International	The effect will occur across international borders
6	National	Will affect the entire country
5	Region	Heritage resources within region
4	Municipal area	Heritage resources outside project area changed
3	Local	Most or all heritage resources change
2	Limited	One or more heritage resource will be changed
1	Very Limited	Isolated aspects of individual heritage resource

Table 2-9: Rating options: Duration

Value	Probability	Description
7	Permanent	Impact will permanently alter or change the heritage resource and/or value (Complete loss of information)
6	Beyond Project Life	Impact will reduce over time after project life (Mainly renewable resources and indirect impacts)
5	Project Life	The impact will cease after project life.
4	Long Term	Impact will remain for >50% - Project Life
3	Medium Term	Impact will remain for >10% - 50% of Project Life
2	Short Term	Impact will remain for <10% of Project Life
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.

Table 2-10: Rating options: Probability

Value	Probability	Description
7	Certain/Definite	Happens frequently.
		The impact will occur regardless of the implementation of any preventative or corrective actions.
6	High probability	Happens often.
		It is most likely that the impact will occur.
5	Likely	Could easily happen.
		The impact may occur.
4	Probable	Could happen.
		Has occurred here or elsewhere.
3	Unlikely / Low probability	Has not happened yet but could happen once in the lifetime of the project.
		There is a possibility that the impact will occur.
2	Rare / Improbable	Conceivable, but only in extreme circumstances.
		Have not happened during 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	Highly Unlikely /None	Expected never to happen.
		Impact will not occur.

Impacts are rated prior to mitigation and again after consideration of the proposed mitigation measures. The impact is then determined and categorised into one of eight categories, as indicated in Table 2-11 and Table 2-12 below. The relationship between the consequence, probability and significance ratings is graphically depicted in Figure 2-1 below.

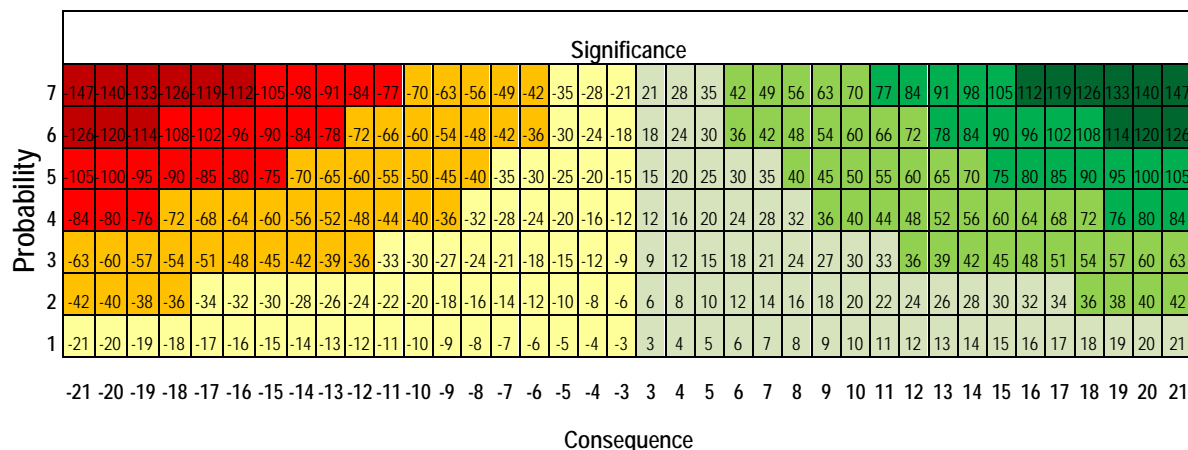


Figure 2-1: Relationship between consequence, probability and significance ratings

Table 2-11: Impact significance ratings

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)



Score	Description	Rating
-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)

Table 2-12: Relationship of significance of negative impacts to specific categories of heritage

Score	Archaeological attributes	Built heritage or Historic Urban Landscape attributes	Historic landscape attributes	Intangible Cultural Heritage attributes or Associations	Rating
-3 to -35	No change.	No change to fabric or setting.	No change to elements, parcels or components; no visual or audible changes; no changes in amenity or community factors.	No change	Negligible
-36 to -72	Very minor changes to key archaeological materials, or setting.	Slight changes to historic building elements or setting that hardly affect it.	Very minor changes to key historic landscape elements, parcels or components; virtually unchanged visual effects; very slight changes in noise levels or sound quality; very slight changes to use or access; resulting in a very small change to historic landscape character.	Very minor changes to area that affect the ICH activities or associations or visual links and cultural appreciation.	Minor
-73 to -108	Changes to key archaeological materials, such that the resource is slightly altered. Slight changes to setting.	Change to key historic building elements, such that the asset is slightly different. Change to setting of an historic building, such that it is noticeably changed.	Change to few key historic landscape elements, parcels or components; slight visual changes to few key aspects of historic landscape; limited changes to noise levels or sound quality; slight changes to use or access; resulting in limited change to historic landscape character.	Changes to area that affect the ICH activities or associations or visual links and cultural appreciation.	Moderate



-109 to -147	<p>Changes to many key archaeological materials, such that the resource is clearly modified.</p> <p>Considerable changes to setting that affect the character of the asset.</p> <p>Changes to attributes that convey outstanding value of national estate.</p> <p>Most or all key archaeological materials, including those that contribute to outstanding value of national estate such that the resource is totally altered.</p> <p>Comprehensive changes to setting</p>	<p>Changes to many key historic building elements, such that the resource is significantly modified.</p> <p>Changes to the setting of an historic building, such that it is significantly modified.</p> <p>Change to key historic building elements that contribute to outstanding value of national estate, such that the resource is totally altered.</p> <p>Comprehensive changes to the setting.</p>	<p>Change to many key historic landscape elements, parcels or components; visual change to many key aspects of the historic landscape; noticeable differences in noise or sound quality; considerable changes to use or access; resulting in moderate changes to historic landscape character.</p> <p>Change to most or all key historic landscape elements, parcels or components; extreme visual effects; gross change of noise or change to sound quality; fundamental changes to use or access; resulting in total change to historic landscape character unit and loss of outstanding value of national estate.</p>	<p>Considerable changes to area that affect the ICH activities or associations or visual links and cultural appreciation.</p> <p>Major changes to area that affect the ICH activities or associations or visual links and cultural appreciation.</p>	Major
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2.5 Mitigation Measures and Recommendations³

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 SAHRA Minimum Standards⁴ (See Table 2-13 below). Recommended mitigation is therefore divided into categories: *project related* and *mitigation of heritage resources* defined below.

Table 2-13: Recommended minimum level of required mitigation

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

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 Conservation Management Plans (CMPs) are required; and

³ This section is an adaptation from the Social Impact Assessment methodology developed by Jan Perold (PhD), Digby Wells Social Department Manager.

⁴ It must be noted that these minimum standards serve as a guide, and the recommendations provided herein are project specific.

- 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”;
- 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.

2.6 Constraints and Limitations

The following constraints and limitations were experienced as part of this study:

- The project area was in excess of 7 000 ha. Due to time and budgetary constraints, systematic controlled survey of the project area was not possible;
- The reconnaissance survey was primarily a verification survey of the identified heritage resources listed in the 2009 draft HIA (De Jong, 2009). Although comprehensive, the identified heritage resources are not an exhaustive list of all heritage resources that may occur within the project area;
- During the verification survey, no graves were identified at the location of GY2, GY3, GY11 and GY19. These sites were previously identified in the initial HIA completed in

2009 (De Jong, 2009). Due to the sub-surface nature of burials, surface indicators may have been removed and no longer present through natural or anthropogenic processes. As such these sites were still considered in this assessment and recommended mitigation measures.

- Heritage resources commonly occur at sub-surface levels with no visible surface features to assist in their identification. This assessment, while as comprehensive as possible, does acknowledge this constraint and provide appropriate management measures in the event of discovery.
- Access to Weltevreden 324 JS RE and Portion 2 & 6 was restricted. Upon arrival the access gate was locked and up close assessment of the farmstead and associated infrastructure (FR1, FH6 and FH7) was not undertaken. These heritage resources were still considered in this assessment.

3 Statement of Significance

The cultural significance of identified heritage resources located within and near the project area are depicted in Plan 1 and presented in Table 3-1. The assigned values take into consideration the importance of individual resources in relation to aesthetic, historic, scientific and social criteria, as well as the integrity of the resource.

Table 3-1: Summary of Statements of Significance for identified heritage resources

Resource ID ⁵	Type	Description	VALUE	Designation	Recommended Field Rating
FD9	Site	Modern homestead. Aerial imagery indicates that structures in the location of FD9 were present in 1954, suggesting elements are older than 60 years	1	Negligible	General Protection C
FH16	Site	Small modern farmstead. Not older than 60 years	2	Negligible	General Protection C
L	Site	Old Minnaar Location site. The site pre-dates 1954 on the aerial imagery, granting it provisional protection under section 34 of the NHRA. Area presently disturbed. No structures visible.	3	Negligible	General Protection C
M	Site	Old Minnaar Colliery and Compound Site. The site pre-dates 1954 on the aerial imagery, granting it provisional protection under section 34 of the NHRA. Area presently disturbed. No visible structures	3	Negligible	General Protection C

⁵ The draft HIA numbering for identified sites has been used in this report for continuation and ease of cross-referencing. Newly identified sites have been prefixed by the relevant SAHRA section, i.e. S.34, S.35 and S.36 and their specific site number.



Resource ID ⁵	Type	Description	VALUE	Designation	Recommended Field Rating
GY16	Burial / grave	Old Minnaar Colliery Cemetery.	20	Very High	General Protection A
H	Site	Oakhouse lodge. Modern venue. Structures visible on 1954 aerial imagery, suggesting elements are older than 60 years	5	Negligible	Grade III B
FH10	Site	Ruins of structure. Pre-dates 1954 granting it provisional protection under section 34 of the NHRA.	1	Negligible	General Protection C
FD3	Site	Modern, actively used farmstead. Structures appear on the 1954 aerial imagery suggesting that elements are older than 60 years. This grants it general protection under section 34 of the NHRA.	2	Negligible	General Protection C
FH3	Site	Dilapidated structure, appear to be abandoned. Structures appear on 1954 aerial imagery suggesting that they are older than 60 years. This grants it general protection under section 34 of NHRA	1	Negligible	General Protection C
FH4	Site	Structures in state of decay, still in use by farm labourers. Structure appears on 1954 aerial imagery suggesting that they are older than 60 years. This grants it general protection under section 34 of NHRA	1	Negligible	General Protection C
FH5	Site	Structures in state of decay, still in use by farm labourers. Structure appears on 1954 aerial imagery suggesting that they are older than 60 years. This grants it general protection under section 34 of NHRA	1	Negligible	General Protection C
FD1	Site	Modern farmstead still in use. Not visible on the 1954 aerial imagery suggesting that it is younger than 60 years.	4	Negligible	General Protection C
FH1	Site	Dilapidated structure. Structure appears on 1954 aerial imagery suggesting that they are older than 60 years. This grants it general protection under section 34 of NHRA	1	Negligible	General Protection C
FH2	Site	Dilapidated structure. Structure appears on 1954 aerial imagery suggesting that they are older than 60 years. This grants it general protection under section 34 of NHRA	1	Negligible	General Protection C
GY12	Burial / grave	Location of approximately 5 graves.	20	Very High	General Protection A
GY13	Burial / grave	Burial ground is unkempt and overgrown. Grave with tombstone indicated that burial ground is older than 60 years. Demarcated by a fence.	20	Very High	General Protection A



Resource ID ⁵	Type	Description	VALUE	Designation	Recommended Field Rating
GY14	Burial / grave	Potential burial ground containing at least 5 graves. Surface dressing consists of stone. Age could not be determined.	20	Very High	General Protection A
GY15	Burial / grave	Located within Lonerock Quarries. Single grave with tombstone. Burial fenced off and access restricted. Excavation has place grave at risk of exposure through erosion.	20	Very High	General Protection A
FR6	Site	Located on the project boundary, site consists of an abandoned old brick structure. Structures visible on 1954 aerial imagery suggesting it is older than 60 years and therefore granted general protection under section 34 of the NHRA.	2	Negligible	General Protection C
FR7	Site	Located outside the project boundary. Site consists of an abandoned old brick structure. Structures visible on 1954 aerial imagery suggesting it is older than 60 years and therefore granted general protection under section 34 of the NHRA.	2	Negligible	General Protection C
GY8	Burial / grave	Situated outside of project area. Approximately 5 graves	20	Very High	General Protection A
GY7	Burial / grave	Situated outside of project area. Approximately 4 graves	20	Very High	General Protection A
S.36-001	Burial / grave	Situated outside of project area. Cemetery adjacent to road consisting of approximately 50 graves.	20	Very High	General Protection A
S.36-002	Burial / grave	Located on project boundary. Cemetery adjacent to road consisting of approximately 40 graves. Oldest identifiable date is 1969.	20	Very High	Grade III B
FD4	Site	Farmstead younger than 60 years. Currently occupied and utilised.	2	Negligible	General Protection C
FH11	Site	Homestead visible on the 1954 aerial imagery suggesting that it is older than 60 year and provisionally protected under section 34 of the NHRA. Currently occupied and utilised.	2	Negligible	General Protection C
FR8	Site	Identified as ruins. Aerial imagery indicated that structures present in 1954, therefore generally protected under section 34 of the NHRA. No structures identified during field survey. Point recorded in current conveyor servitude, suggesting site has been destroyed.	0	Negligible	General Protection C
FH6	Site	Currently occupied farmstead. Structures visible on 1954 aerial imagery suggesting that elements are older than 60 years. Structures generally protected under section 34 of NHRA.	2	Negligible	General Protection C



Resource ID ⁵	Type	Description	VALUE	Designation	Recommended Field Rating
FR1	Site	Currently occupied farmstead. Structures visible on 1954 aerial imagery suggesting that elements are older than 60 years. Structures generally protected under section 34 of NHRA.	2	Negligible	General Protection C
FD2	Site	Modern structure associated with farmstead. Not on 1954 aerial imagery	2	Negligible	General Protection C
FH8	Site	Structure visible on 1954 aerial imagery, suggesting that it is older than 60 years and generally protected under section 34 of NHRA	2	Negligible	General Protection C
FH9	Site	Structure visible on 1954 aerial imagery, suggesting that it is older than 60 years and generally protected under section 34 of NHRA	2	Negligible	General Protection C
S5	Mine	Old mine shaft	1	Negligible	General Protection C
GY1	Burial / grave	Cemetery associated with farm workers. Approximately 10 graves, 4 with formal surface dressing	20	Very High	General Protection A
FH7	Site	Structure visible on 1954 aerial imagery, suggesting that it is older than 60 years and generally protected under section 34 of NHRA	2	Negligible	General Protection C
FH14	Site	Remains of public swimming facility. Not on aerial imagery prior to 1954	2	Negligible	General Protection C
FR4	Site	Ruins of structure. Pre-dates 1954 granting it provisional protection under section 34 of the NHRA.	2	Negligible	General Protection C
FR5	Site	Ruins of structure. Pre-dates 1954 granting it provisional protection under section 34 of the NHRA.	2	Negligible	General Protection C
FD8	Site	Modern structure younger than 60 years. Confirmed by occupier	2	Negligible	General Protection C
GY5	Burial / grave	Informal cemetery with at least 6 graves. Adjacent to homestead ruins.	20	Very High	General Protection A
FD7	Site	Modern structure younger than 60 years.	2	Negligible	General Protection C
FD5	Site	Farmstead not visible on 1954 aerial imagery.	3	Negligible	General Protection C
FH12	Site	Ruins of structure. Not visible on 1954 aerial imagery	2	Negligible	General Protection C
FH13	Site	Structure is modern, although aerial imagery indicated that elements may be older than 60 years. Therefore generally protected under section 34 of the NHRA	2	Negligible	General Protection C
GY4	Burial / grave	Single grave dating to 1970	20	Very High	General Protection A
GY6	Burial / grave	Single grave dating to 1959	20	Very High	General Protection A



Resource ID ⁵	Type	Description	VALUE	Designation	Recommended Field Rating
GY18	Burial / grave	Burial ground located within the Darwo Lodge property	20	Very High	General Protection A
GY10	Burial / grave	Phola cemetery located outside of the project boundary	20	Very High	General Protection A
FR3	Site	Ruins outside of project boundary younger than 60 years	2	Negligible	General Protection C
GY9	Burial / grave	Informal cemetery with approximately 10 graves. Some with formal surface dressing. Where identifiable, burial s date to the 1960s	20	Very High	General Protection A
GY17	Burial / grave	Informal cemetery consisting of approximately 15 graves. Oldest identifiable date was 1960. Area is overgrown and unkempt.	20	Very High	General Protection A
S.36-003	Burial / grave	Informal cemetery consisting of approximately 30 graves. Situated outside of the project area	20	Very High	General Protection A
S.36-004	Burial / grave	Informal cemetery consisting of approximately 20 graves. Grave have formal surface dressing, but dates are not visible on tombstone. Situated outside of the project area	20	Very High	General Protection A
S.34-005	Site	Ruin of homestead. Potential for associated graves. Not visible on 1954 aerial imagery.	2	Negligible	General Protection C
S.35-006	Natural feature	Sandstone rocky outcrop with negligible fossil potential.	4	Negligible	General Protection C
S.34-007	Site	Ruin of homestead that may be older than 60 years and generally protected under section 34 of the NHRA	2	Negligible	General Protection C
S.36-008	Burial / grave	Family cemetery associated with the Prinsloo family. Oldest identifiable date 1935	20	Very High	General Protection A

KPSX Weltevreden

Identified Heritage Resources

Legend

Identified Heritage Resources

- Built Environment
- Burial Grounds and Graves
- Palaeontology
- Heritage Tracks
- Project Area
- Secondary Town
- Settlement
- Arterial / National Route
- Main Road
- Minor Road
- Railway Line
- Non-Perennial River
- Perennial River
- Perennial Pan
- Non-Perennial Pan
- Wetland
- Dam

Proposed Infrastructure

- Berm
- Building Fence
- Conveyor
- Road Diversion
- Road Option
- Tip Area
- Trench
- Pit Dewatering Pipeline
- Raw Water Distribution Pipeline
- Raw Water Transfer Pipeline
- Sec to Pri PCD
- Borrow Pit
- Boxcut
- Dump
- PCD
- Pit BD
- Pit H
- Substation
- Topsoil Stockpile



• Sustainability • Service • Positive Change • Professionalism • Future Focused • Integrity

Projection: Transverse Mercator Ref #idp.BHP2690.201411.087
 Datum: WGS 1994 Revision Number: 1
 Central Meridian: 29°E Date: 19/11/2014

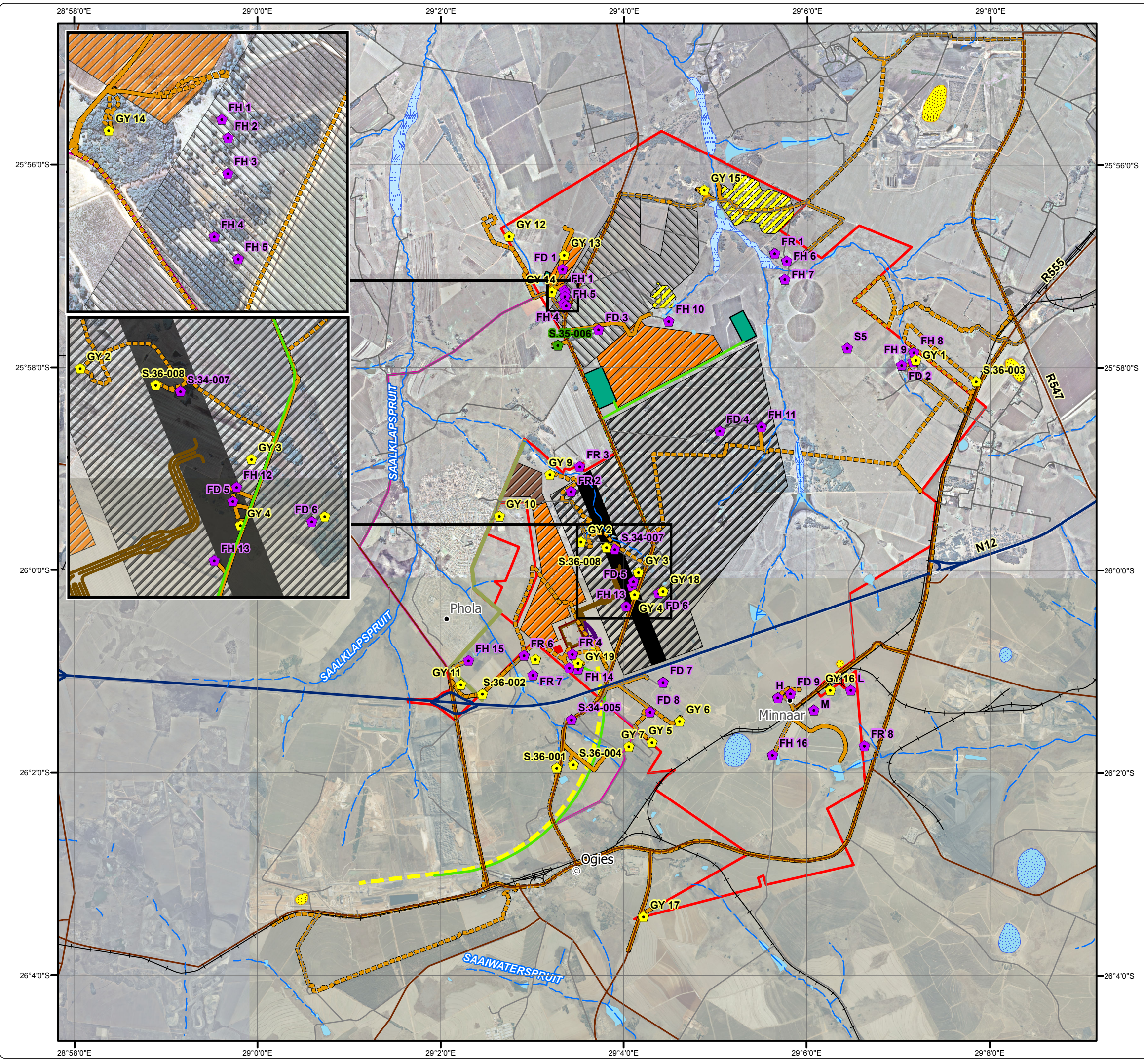
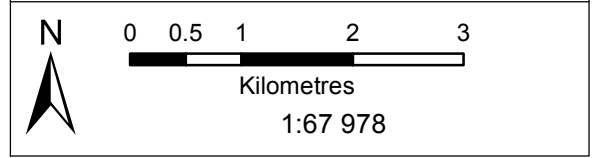




Figure 3-1: Modern house (FD 2) within farmstead



Figure 3-2: Dilapidated structure (FH15)



Figure 3-3: Abandoned structure (FH12)



Figure 3-4: Ruined structure (S.34-007)



Figure 3-5: Unkept burial ground (GY17)



Figure 3-6: Potential graves (GY14)



Figure 3-7: Farmstead cemetery (S.36-008)



Figure 3-8: Informal cemetery (S.36-002)

4 Impact Assessment and Mitigation

4.1 Introduction

In the following sections the discussion of each impact is structured as follows:

1. Narrative description of the sources of risk and potential impacts;
2. Discussion of mitigation measures to avoid and/or ameliorate negative impacts and enhance positive ones including a table presenting the rating of the impact, summary of the recommended mitigation measures, and explains the motivation for assigning particular ratings to an impact.

The potential impacts were considered through examination of the environmental aspect, identifying the potential issues and finally considering the potential effect (*impact*) on the heritage resources.

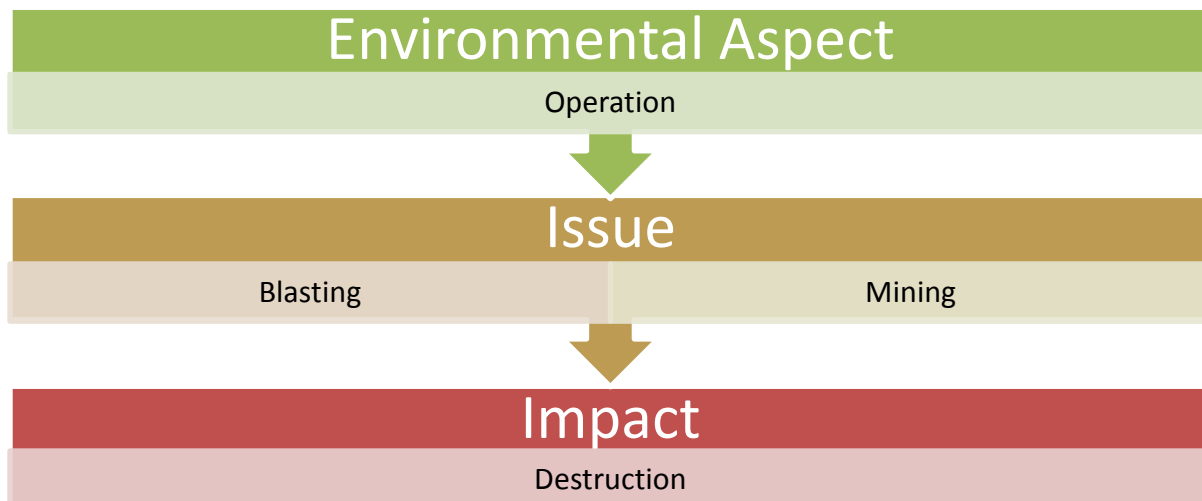


Figure 4-1: Example of potential impacts on heritage resources

The impact assessment considered changes to identified heritage resources with a cultural significance value ranging from low to very high. Heritage resources with a negligible cultural significance were not included in the impact assessment as they have been sufficient recorded and do not require any additional mitigation. However, even though structures older than 60 years are deemed negligible, these sites are however granted general protection under section 34 of the NHRA, a destruction permit in conjunction with a 30 day public notice and commenting period is required.

This is applicable to the following sites:

Table 4-1: Identified built structures protected under section 34 of NHRA

Sites			
FD9	L	M	H
FH10	FD3	FH3	FH4
FH5	FH1	FH2	FR6
FR7	FH11	FR8	FH6
FR1	FH8	FH9	FH7
FR4	FR5	FH13	S.34-007

4.2 Identified Sources of Risk

Identified sources of risk associated with the KPSX: Weltevreden Project are related to the listed activities described in Table 7-1 in the NID (du Piesanie, 2014). The highest likelihood of negative impacts on heritage resources to occur is associated with activities that will be undertaken during construction phase of the proposed projects. Here, the potential to negatively impact heritage resources, such as damage or destruction, is the greatest.

For the KPSX: Weltevreden Project, activities identified as sources of risk during construction include:

- GN R 544 Activity 1, 2, 10, 11, and 12; GN R 546 Activity 2; and GN R 545 Activity 3, 5, and 19: Construction of facilities and infrastructure will cause damage to or destroy any physical heritage resources that may be present in the footprint areas;
- GN R 544 Activity 22 and GN R 546 Activity 19: The construction and/or widening of roads will cause damage to or destroy any physical heritage resources that may be present in the impact footprint; and
- GN R 544 Activity 37 and 52; and GN R Activity 23: Physical alteration of land in connection with the expansion of facilities will change the character of the land and possibly destroy *in situ* heritage resources.

The cultural significance ratings of the identified heritage resources are provided under Section 3 above. Burial grounds identified within and surrounding the project area are the only heritage resources with a significance rating high enough to warrant assessment. However, it must be re-iterated that structures older than 60 years (See Table 4-1) do have general protection under section 34 of the NHRA and will require a permit and 30 day notification period before any alteration or destruction.

The conceptually identified impacts on the burial grounds include the following:

- Damage to and/or destruction of the burial ground during the construction and operational phase;
- Degradation of the cultural fabric of the burial ground due to loss of or restricted access to the burial grounds; and
- Health and safety risks to Next-of-Kin (NoK) when accessing / visiting burial grounds retained *in situ*.

The impact assessment for the burial grounds is summarised in Table 4-2, Table 4-3, and Table 4-4 below.

4.3 Discussion of Impacts

Project related activities will have both direct and indirect impacts on identified burial grounds situated within and surrounding the impact footprint of the KPSX: Weltevreden

project. These impacts are discussed separately in relation to the proposed mine infrastructure (See Plan 1).

4.3.1 Direct impact on graves from associated mine infrastructure

Project related activities during the construction and operation phases for the Pit BD and the boxcut infrastructure may have a direct impact on the following graves:

- GY2;
- GY3;
- GY4;
- GY18; and
- S.36-008.

The environmental aspect considered is the construction and operational activities associated with Pit BD and the boxcut. The identified issue relates to the site preparation, site clearing and mining of these infrastructures, where the impact may be the damage to and/or destruction of burial grounds.

Project related activities during the construction and operation phases for pit dewatering and raw water distribution pipelines infrastructure may have a direct impact on the following graves:

- GY19

The environmental aspect considered is the construction and operational activities associated with the installation and operation of the proposed pipelines. The identified issues related to these activities include earth moving activities and the potential for spillage or rupture of the pipeline where the potential impact would be the damage to and/or destruction of burial grounds.

Project related activities during the construction phase for the trench infrastructure may have a direct impact on the following graves:

- GY10;
- GY11; and
- S.36-002.

The environmental aspect considered is the construction activities associated with the Trench. The identified issues related to these activities would include site clearing as part of the preparation and earth moving activities that may result in the potential impact of damage to and/or destruction of burial grounds.

Project related activities during the construction phase for the Topsoil Stockpile infrastructure may have a direct impact on the following graves:

- GY9.

The environmental aspect considered is the construction activities associated with the Topsoil Stockpile. Issues related to this activity would include earth moving activities and establishment of the stockpile that will result in the damage to and/or destruction of the burial ground.

Project related activities during the construction and operation phases for the Pit H and Dump infrastructure may have a direct impact on the following graves:

- GY13; and
- GY14.

The environmental aspect considered is the construction and operational activities associated with Pit H and Dump. The identified issue relates to the site preparation, site clearing, mining and dumping, where the impact may be the damage to and/or destruction of burial grounds.

Project related activities during the construction and operation phases for the Road Option infrastructure may have a direct impact on the following graves:

- GY2;
- GY3;
- GY4;
- GY18;
- S.36-008;
- GY19;
- S.36-001; and
- S.36-004

The environmental aspect considered is the construction and operational activities associated with the Road Option. The identified issue relates to the site preparation, site clearing and use of the road, where the impact may be the damage to and/or destruction of burial grounds.

The impact assessment for damage to and/or destruction of burial grounds is summarised in Table 4-2.

Table 4-2: Summary of Impact Assessment related to damage to and/or destruction of burial grounds

IMPACT DESCRIPTION: Damage to and/or destruction of burial ground				
Predicted for project phase:		Construction	Operation	
Dimension	Rating	Motivation		
PRE-MITIGATION				
Duration	Permanent (7)	Where mitigations are not implemented, project related activities will result in major changes to the burial ground.	Consequence: Extremely detrimental (-21)	Significance: Major - negative (-147)
Extent	International (7)	The major changes to the burial ground may have international repercussions to the reputation of BECSA		
Intensity x type of impact	Extremely high - negative (-7)	Without appropriate mitigation, a major change to a resource with a high significance will occur.		
Probability	Certain (7)	Without appropriate mitigation, project related activities related activities will result in a major change to the burial ground.		
MITIGATION:				
As far as is feasible, mine infrastructure design and siting should be amended to remove any physical, direct impacts on the burial ground. Irrespective of whether the burial ground will be directly or indirectly affected, agreement regarding the future of the site must be reached between BECSA and NoK through the implementation of a Burial Grounds and Graves Consultation process in accordance with Section 36 of the NHRA and Chapter XI of the Regulations. This process must include agreements in respect of a Conservation Management Plan and possible Grave Relocation Plan.				
POST-MITIGATION				
Duration	Project Life (5)	The potential for change to the burial grounds will be present throughout the project life.	Consequence: Highly detrimental (-17)	Significance: Moderate - negative (-102)
Extent	National (6)	The proper management of the burial grounds and graves will have an impact on the national reputation of BECSA		
Intensity x type of impact	Very high - negative (-6)	Mitigation measures will ensure the retention and management of the tangible remains, although <i>in situ</i> management may still result in change to the intangible aspects of the resource.		
Probability	Highly probable (6)	If mitigation measures are implemented, it is still probable that change on both the tangible and intangible aspects of the burial ground may occur.		

4.3.2 Indirect, Induced or Secondary Impacts

Indirect, induced or secondary effects on heritage resources occur later in time or at a different place from the causal activity, or as a result of a complex pathway. In this instance, two scenarios were identified in relation to identified burial grounds and graves.

Firstly, the environmental aspect under consideration here is the proposed KPSX: Weltevreden Project throughout the LoM. The project will require the demarcation and fencing of the mine boundaries resulting in the loss of / restricted access to burial grounds and graves by NoK. The associated impact will be the degradation of the sites cultural fabric.

The impact assessment for the loss of / restricted access to burial grounds is summarised in Table 4-3.

Table 4-3: Summary of Impact Assessment in regards to loss of / restricted access to burial grounds

IMPACT DESCRIPTION: Degradation of cultural significance due to loss of / restricted access to burial ground				
Predicted for project phase:		Construction	Operation	Decommissioning
Dimension	Rating	Motivation		
PRE-MITIGATION				
Duration	Project Life (5)	Where <i>in situ</i> preservation takes place, loss of or restricted access to the burial ground will occur throughout the project life	Consequence: Highly detrimental (-15)	Significance: Moderate - negative (-75)
Extent	Local (3)	The extent of the impact will primarily be on the local environs.		
Intensity x type of impact	Extremely high - negative (-7)	Loss of access to the burial ground will be highly negative to NoK who may want to visit and attend to the graves, ultimately resulting in the deterioration of the historical fabric of the site. This is considered a major change to a heritage resource with high significance.		
Probability	Likely (5)	Without mitigation, it is likely that the loss of or restricted access to the burial ground will result in the degradation of the historical fabric of the site.		
MITIGATION:				
Consult with bona fide NoK regulated under Chapter XI of the NHRA regulations, and any other applicable legislation Develop an entitlement framework for NoK in which the terms and conditions for access to the burial ground are agreed upon				
POST-MITIGATION				
Duration	Project Life (5)	Where access to burial grounds is encapsulated within an Entitlement Framework, NoK should have a right to access the burial ground throughout the project life.	Consequence: Moderately beneficial (13)	Significance: Moderate - positive (78)
Extent	Very limited (1)	The extent of the impact will be very limited as NoK will be granted access through prior arrangement as agreed upon within an Entitlement Framework		



Intensity x type of impact	Extremely high - positive (7)	Mitigation will result in a positive major change to a heritage resource with high significance has both the tangible and intangible aspects of the burial ground will be managed and maintained.		
Probability	Highly probable (6)	It is highly probable that proposed mitigation measures will result in a positive major change to the tangible and intangible aspects of the burial ground.		

Associated with the loss of / restricted access to burial grounds, are the potential health and safety risks to NoK who are granted access through the implementation of the proposed mitigation measures. Although this is not a direct heritage impact, it must be considered as part of this assessment as it is a directly associated with the outcome of NHRA Chapter XI Regulations mitigation measures.

The impact assessment for the loss of / restricted access to burial grounds is summarised in Table 4-4.

Table 4-4: Summary of Impact Assessment in regards to health and safety risk to NoK when accessing / visiting burial grounds

IMPACT DESCRIPTION: Health and safety risk to NoK when accessing / visiting burial ground				
Predicted for project phase:		Construction	Operation	Decommissioning
Dimension	Rating	Motivation		
PRE-MITIGATION				
Duration	Project Life (5)	Health and safety risks will be present throughout the project life	Consequence: Highly detrimental (-15)	Significance: Moderate - negative (-105)
Extent	Local (3)	The risks will be limited to the project area in extent		
Intensity x type of impact	Extremely high - negative (-7)	The health and safety risks may result in loss of access to the burial ground which could potentially result in a major change to the historical fabric of the resource.		
Probability	Certain (7)	Without appropriate mitigation, it is certain that a major change to the intangible aspect of the burial ground will occur		
MITIGATION:				
Consult with bona fide NoK regulated under Chapter XI of the NHRA regulations, and any other applicable legislation Develop an entitlement framework for NoK in which the health and safety risks are identified and remedial preventative measures are agreed upon				

POST-MITIGATION				
Duration	Project Life (5)	As for pre-mitigation		
Extent	Very limited (1)	The extent of the impact will be very limited as NoK will be granted access through prior arrangement as agreed upon within an Entitlement Framework		Consequence: Moderately beneficial (13) Significance: Moderate - positive (78)
Intensity x type of impact	Extremely high - positive (7)	Management of the health and safety risks will be positive to the burial ground as it will allow for the continued management of the tangible and intangible aspects of the burial ground		
Probability	Highly probable (6)	Through the development of an Entitlement Framework, it is highly probable that health and safety risks will be managed and that the tangible and intangible aspects of the burial ground will be conserved.		

4.3.3 Burial Ground GY15

During the field assessment for the specialist heritage study between 30 September 2014 and 02 October 2014, it was noted that the burial ground, GY15 (the “Site”) on Hartebeestlaagte 325 JR currently owned by BECSA, was at risk of exposure. Following due process, BECSA and SAHRA Burial Grounds and Graves (BGG) Unit was informed via email of 03 October 2014.

The developer of the site, Lonerock Quarries, has undertaken sand mining on the property that has resulted in an increased risk of exposure of the site. Although BECSA has not been responsible for any development of the site, it does have a responsibility to ensure continued protection and management thereof in its capacity as landowner.

Due to the present risk of exposure, a separate impact assessment table was completed for GY15 and presented as Table 4-5.



Figure 4-2: GY15 at risk of exposure.



Figure 4-3: GY15 at risk of exposure.

Table 4-5: Summary of Impact Assessment in regards to the exposure of grave GY15

IMPACT DESCRIPTION: Exposure of Grave				
Predicted for project phase:	Pre-construction	Construction	Operation	Decommissioning
Dimension	Rating	Motivation		
PRE-MITIGATION				
Duration	Permanent (7)	The exposure of the grave will be permanent.	Consequence: Extremely detrimental (-21)	Significance: Major - negative (-147)
Extent	International (7)	Failure of BECSA to intervene and prevent the exposure will have international reputation repercussions		
Intensity x type of impact	Extremely high - negative (-7)	The exposure of the grave is extremely negative		
Probability	Certain (7)	Without appropriate intervention and mitigation, the grave will be exposed through erosion.		
MITIGATION:				
Ensure sand mining in the vicinity of the site is halted Reinforce and stabilise the site initiate the Chapter XI Burial Grounds and Graves Consultation Process to identify <i>bona fide</i> NoK				
POST-MITIGATION				
Duration	Project Life (5)	The potential for change to the burial grounds will be present throughout the project life.	Consequence: Moderately detrimental (-12)	Significance: Minor - negative (-72)
Extent	Very limited (1)	The management of GY15 will be limited in its extent		
Intensity x type of impact	Very high - negative (-6)	Mitigation measures will ensure the retention and management of the tangible remains, although <i>in situ</i> management may still result in change to the intangible aspects of the resource.		
Probability	Highly probable (6)	If mitigation measures are implemented, it is still probable that change on both the tangible and intangible aspects of the burial ground may occur.		

At present the site is at risk of exposure. Digby Wells suggests that the following actions be undertaken to ensure the immediate conservation of the site:

- Ensure sand mining in the vicinity of the site is halted;
- Reinforce and stabilize the site; and
- Initiate the Chapter XI Burial Grounds and Graves Consultation (BGGC) Process to identify *bona fide* NoK.

The BGGC process must be conducted to discuss the *in situ* management and possible Grave Relocation Plan (GRP) of the burial ground in conjunction with identified NoK. The agreement between BECSA and NoK will be encapsulated within an Entitlement Framework.

Additionally, a Conservation Management Plan (CMP) must be drafted and presented to the NoK for their consideration.

5 Recommended Mitigation and Management Plans

Recommended mitigation and management plans are provided for project and heritage related mitigation measures. Project related mitigation measures refer to actions that can be taken at a project level to address potential impacts. An example of a project related mitigation measure is the adjustment of the project boundary to exclude heritage resources from the impact footprint and preserve them *in situ*. Where these types of mitigation measures are not feasible or possible, heritage related mitigation measures are recommended. An example of mitigation of heritage resources is the excavating and an archaeological site or relocating graves (so-called Phase 2 assessments).

The recommended project and heritage related mitigation measures for the burial grounds are discussed separately below.

5.1 Project Mitigation Measures

Burial grounds occur throughout the impact footprint of the project area. *In situ* preservation of the burial grounds and graves is the preferred form of mitigation. It is recommended that the project boundary be adjusted as far as is feasible to reduce the potential for both direct and indirect impacts on the burial grounds to preserve them *in situ*.

Irrespective of whether *in situ* preservation of the burial grounds is achievable, agreement regarding the future of the burial ground must be reached between BECSA and NoK. A Burial Grounds and Graves (BGG) Stakeholder Engagement Plan must be developed and implemented in accordance with Section 36 of the NHRA, Chapter XI of the NHRA Regulations, and other applicable legislation.

The BGGC process must be conducted to discuss the *in situ* management and possible GRP of the burial ground in conjunction with the identified NoK. The agreement between BECSA and NoK will be encapsulated within an Entitlement Framework. Additionally, a CMP must be drafted and presented to the NoK for their consideration.

5.2 Heritage Related Mitigation

Where *in situ* conservation of the burial grounds is not achievable and grave relocation is required, a GRP in accordance with Section 36 of the NHRA, Chapter IX of the NHRA Regulations, and other applicable legislation must be undertaken.

The Entitlement Framework will form the basis of agreement between the NoK and BECSA for the GRP. All information encapsulated within the Entitlement Framework and associated documentation must be submitted to SAHRA and MPRHA in support of the permit application. Issuing of exhumation permit will be completed with the following proviso:

- Exhumations must be supervised by a qualified archaeologist;

- Customs and beliefs of the NoK are respected;
- Arrangements for the re-internment of the human remains and the re-internment or curation of the contents of the burial have been finalised to the satisfaction of the consenting authority.

Once the required permits are issued, grave relocation by a registered funeral undertaker under the supervision of an archaeologist can take place.

Additionally, several built structures were identified within the KPSX: Weltevrede project area. Although not considered in the impact assessment as the cultural significance was negligible, structures older than 60 years are afforded general protection under Section 34 of the NHRA and require consideration here.

Identified built structures older than 60 years are listed in Table 4-1. Any proposed change to these resources require authorisation from MPRHA. The authorisation is regulated by Chapter III of the NHRA Regulations and will require:

1. Background Information Document (BID);
2. Placing of site notices for a 30 day commenting period;
3. Permit application with supporting documentation.

6 Conclusion

The proposed KPSX: Weltevrede Project is located in the Mpumalanga Province to the east of Ogies. A draft HIA was compiled by Cultmatrix cc (De Jong, 2009) in which the cultural landscape was described as a "Historical Farmland Context". A review of relevant literature and other reports for the study area confirm this classification when one considers the distribution of identified heritage resources.

An NID (du Piesanie, 2014) completed and submitted to SAHRA and MPHRA in terms of Section 38(8) of the NHRA presented a baseline of the cultural landscape that informed this report. Statutory Comment issued on 25 September 2014 required that an HIA and palaeontological desktop and field assessment be undertaken. This was completed and the findings are presented in Appendix B.

A total of 57 heritage resources (See Table 3-1) were identified within and surrounding the project boundaries. Heritage resources associated with the built environment were found to have negligible significance ratings. These were not included in the impact assessment, however structures older than 60 years (See Table 4-1) will require permitting for destruction. Burial grounds are universally considered to have cultural significance. An impact assessment was completed and discussed under Section 4.2 above. Recommendation to the mitigation and management of these resources was presented and discussed under section 5 above and summarised below.

Based on the findings of the NID and this report, Digby Wells recommend the following:



- There is no need for any further palaeontological assessment. If fossil plant material is discovered during mining operations, it is strongly recommended that a professional palaeontologist be called to assess the importance and rescue the fossils if necessary;
- A fossil monitoring programme as outlined below must be included in the EMP:
 - Photographs of fossil plants must be provided to the mine to assist in the identification of potential fossiliferous material in the shales and mudstone;
 - During the operational phase, shale and mudstones must be given a cursory inspection by the mine geologist or designated person before being added to the waste rock pile. Any identified fossiliferous material should be collected and stored in a suitable protected area to ensure mining operations are not disrupted;
 - On a regular basis, to be agreed upon by mine management and the qualified palaeobotanist sub-contractor, the palaeobotanist should visit the mine to inspect the selected material and waste rock dumps where feasible;
 - Fossil plants considered of good quality or scientific interest by the palaeobotanist must be removed, catalogued and housed in a suitable institution where they can be made available for further study. SAHRA permits will be required for this activity;
 - If no good quality fossiliferous material is recovered, site inspection by the palaeobotanist can be reduced to annual events until mine closure.
- Project related mitigation should aim to exclude burial grounds from the project impact footprint to remove potential direct impacts. Irrespective of whether the burial ground will be directly or indirectly affected, agreement regarding the future of the site must be reached between BECSA and NoK through the implementation of a BGGC process in accordance with Section 36 of the NHRA and Chapter XI of the Regulations. This process must include agreements in respect of a CMP and possible GRP.
- As per the interim comments issued by SAHRA, the assessor was mindful of the general protection of archaeological resources under Section 35 of the NHRA. However, no archaeological resources were identified during the field reconnaissance survey. It is recommended that project specific Chance Find Protocols (CFPs) be developed and included in the EMP for the KPSX: Weltevreden Project. This should include:
 - Proactive Archaeological Monitoring;
 - Proactive Palaeontological Monitoring;
 - Chance Find Protocols; and
 - Training module for the on-site Environmental Officer or relevant staff.

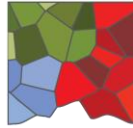


- An assessment of the significance of the resources presented in Table 3-1 indicated that the significance of the built structures was negligible and were therefore excluded from the impact assessment. Nevertheless, a review of the historical aerial imagery presented within the NID indicated that some of these sites pre-date 1954 and are therefore generally protected under Section 34 of the NHRA (See Table 4-1). Based on these findings, it is recommended that BECSA apply for a Section 34 Destruction Permit with MPHRA to ensure compliance with the NHRA.

7 Bibliography

- De Jong, R. C. (2009). *Draft Heritage Impact Report: Weltevreden RDP Project*. Unpublished report completed by: Cultmatrix CC.
- du Piesanie, J. (2014). *Notification of Intent to Develop: Environmental Authorisation for the Klipspruit Extension Weltevreden Project*. Digby Wells Environmental: Unpublished report (CaseID: 6397).

Appendix A: Specialist CV



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



Eskom Thohoyadou 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 Archaeological 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
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
Bathhako Mine Expansion	North-West Province, South Africa	2010 2010	Mapping of historical sites located within the Bathhako 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	Heritage Impact Assessment	Heritage Consultant	2 years	Randgold Resources	Completed Heritage Impact Assessment	Randgold Resources Charles Wells Charles.wells@randgoldresources.com
Everest North Mining Project	Steelpoort, Mpumalanga, South Africa	2012 2012	Heritage Impact Assessment on the farm Vygenhoek	Heritage Impact Assessment	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	Heritage Impact Assessment	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
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	Heritage Impact Assessment	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	On-going	Aureus Mining	Project is on-going	Aureus Mining
Falea Uranium Mine Environmental Assessment	Falea, Mali	2013 2013	Heritage Scoping for the proposed Falea Uranium Mine	Heritage Scoping	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	Heritage Impact Assessment	Heritage Consultant	6 months	Atkins Limited	Completed Heritage Impact Assessment and provided recommendations for further studies	Atkins Limited Irene Bopp Irene.Bopp@atkinglobal.com
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	On-going	Exxaro	Project is on-going	Exxaro Johan van der Bijl Johan.vanderbijl@exxaro.com



Nzoro 2 Hydro Power Project	Oriental 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	On-going	Randgold Resources	Completed introductory meetings – project on-going	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	Heritage Impact Assessment	Heritage Consultant	On-going	AECOM	Project is on-going	AECOM
Soweto Cluster Reclamation Project	Soweto, Gauteng, South Africa	2014 2014	Heritage Impact Assessment for reclamation activities associated with the Soweto Cluster Dumps	Heritage Impact Assessment	Heritage Consultant	On-going	ERGO	Project is on-going	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	NID	Heritage Consultant	On-going	BHP Billiton	Project is on-going	BHP Billiton
Klipspruit Extension: Weltevreden Project	Ogies, Mpumalanga, South Africa	2014 2014	NID and Heritage Statement for the expansion of the Klipspruit Mine	NID	Heritage Consultant	On-going	BHP Billiton	Project is on-going	BHP Billiton
Ergo Rondebult Pipeline Basic Assessment	Johannesburg, South Africa	2014 2014	NID and Heritage Statement for the construction of the Rondebult Pipeline	NID	Heritage Consultant	1 Week	ERGO	Completed screening assessment and NID	ERGO
Kibali ESIA Update Project	Oriental Province, Democratic Republic of Congo	2014 2014	Update of the Kibali ESIA for the inclusion of new open-cast pit areas	Heritage Impact Assessment	Heritage Consultant	On-going	Randgold Resources	Project is on-going	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	On-going	Gold One International	Project is on-going	Gold One International



DIGBY WELLS
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Marion K Bamford, PhD

May 2014

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Education

1983: BSc University of the Witwatersrand; majors in Botany and Microbiology.
1984: BSc Honours, University of the Witwatersrand; Botany and Palaeobotany.
1986: MSc University of the Witwatersrand; Palaeobotany. Graduated with Distinction
1990: PhD University of the Witwatersrand; Palaeobotany..
1994 - Service d'Anatomie des Bois, Musée Royal de l'Afrique Centrale, Tervuren, Belgium, by Roger Dechamps – training in wood anatomy
1997 - Université Pierre et Marie Curie, Paris, France, ditto by Dr Jean-Claude Koeniguer

Professional experience

1989: Research Officer, Geological Survey, Pretoria
1991-1992: Research Associate, BPI, University of the Witwatersrand (external funding)
1993-2000: Research Officer, BPI, University of the Witwatersrand (includes teaching)
1999: Professeur Invitée, Université Claude Bernard, Lyon, France.
2001-2006: Senior Research Officer, BPI, University of the Witwatersrand
2007 – Associate Professor, BPI, University of the Witwatersrand
2014 – Personal Professor, ESI, University of the Witwatersrand
Research Rating (South African NRF international and peer review): B3
Fellow of the Royal Society of South Africa – 2007 onwards

Field Experience

1982-present: Karoo palaeobotany, P-Tr boundary, Lower Cretaceous deposits; modern ecology in southern Africa
1986-1989: Kimberlite pipes, Botswana
1991-present: Tertiary fluvial deposits on west coast, Namibia, Botswana
1998-present: palaeobotany: eastern Australia, Argentina, Brazil, China, New Zealand
2000- present: East African hominin sites: Olduvai Gorge, Laetoli, Koobi Fora, Rusinga Island

Field of expertise

Palaeobotany: wood anatomy, charcoal, leaves, seeds, palynology, phytoliths (Palaeozoic to Cenozoic); Palaeoecology based on plants;
Palaeontological Impact Assessments 2004-2014: approx 25 projects.

Publications

Chapters in books: 5; Scientific peer-reviewed Journal articles: 83; Conference presentations: 45

Other experience/duties/professional societies

Post graduate Student Supervision: Honours completed: 4; Masters completed: 3. Masters current: 0. PhD completed: 3. PhD current: 8. Post docs completed: 3. Post docs current 4.
Lecturing 2001 to present: Geology II – Palaeontology; Biology III – Palaeontology; Honours – Palaeobotany module, Palynology module, Evolution of Terrestrial ecosystems module.
Geosciences representative on Graduate Studies Committee: 2008 – present
Editor – *Palaeontologia africana*: 2002-2013; associate editor: 2014 – present
SASQUA (Southern African Society for Quaternary Research): Vice president 2013-2015
PSSA (Palaeontological Society of southern Africa): Vice President 2012-2014
INQUA ICSU – Chairman South African section: 2014-2016
PAST (Palaeontological Scientific Trust): Chairman of Scientific Advisory Committee: 2010 +

Heritage Impact Assessment

Environmental Authorisation for the KPSX: Weltevreden Project

BHP2690



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Appendix B: Palaeontological Impact Assessment

Palaeontological Impact Assessment for the proposed Klipspruit Coal Mine, near Ogies, Mpumalanga

Desktop Study

**For
Digby Wells Environmental**

30 October 2014

Prof Marion Bamford
Evolutionary Studies Institute
University of the Witwatersrand
P Bag 3, WITS 2050
Johannesburg, South Africa
Marion.bamford@wits.ac.za

Palaeontological Impact Assessment for the proposed Klipspruit Coal Mine, near Ogies, Mpumalanga

Background

As requested by Mr Justin du Piesanie of Digby Wells Environmental, on behalf of their client, BECSA, a desktop palaeontological impact assessment has been completed for the proposed extension to the existing mine: Background information from Digby Wells for Klipspruit South (KPSX: South)

Klipspruit Colliery lies within the Springs-Witbank Coalfield and produces both high and low quality coal. It received authorisation in 2003 in terms of section 39 of the Minerals Act (Act No. 50 of 1991) (Ref: OT6/2/2/495 EM). In 2009 the existing environmental documentation with amendments was consolidated into one EIA and Environmental Management Plan Report (EMP) to meet the requirements of the MPRDA. There are two sections under consideration for the PIA.

Klipspruit South (KPSX: South)

The KPSX: South Project is a brown field's project focusing on the mining of the KPSX: South pit as part of the overall mining sequencing at BECSA's existing Klipspruit Colliery. Presently, the main pit is supplemented by coal from the neighbouring Smaldeel mini pit, which is due to be mined out. The KPSX: South pit is estimated to produce 26 million tons (Mt) of coal.

The approved EIA, EMP and Integrated Water Use Licence (IWUL) specify the KPSX: South reserve as an underground mining area, however, economic conditions now favour an opencast development for KPSX: South.

Klipspruit Weltevreden (KPSX: Weltevreden)

Currently, BECSA is the owner operator (90%) of the Klipspruit Mine. It lies within the Springs-Witbank Coalfield and produces a nominal 8 million ton per annum (Mtpa) Run of Mine (RoM) of both high and low quality coal. Authorisation for the Klipspruit Mine was received in 2003 in terms of section (s.) 39 of the Minerals Act (Act No. 50 of 1991) (Ref: OT6/2/2/495 EM), with an expected Life of Mine (LoM) to the year 2020.

BECSA is a 50% shareholder with Anglo American Thermal Coal in the Phola Coal Processing Plant (PCPP) Joint Venture (JV) in a take-or-pay agreement until 2028. Here, RoM coal from the Klipspruit Mine is processed and transported along the Richards Bay Coal Terminal (RBCT) railway line for export to international markets.

Currently, the life of asset plan has a sharp decline in export tonnes as the operations at the Klipspruit Mine ramp down. To maintain the current export volume profile and fulfil the take-or-pay agreement at PCPP JV, BECSA intend to implement the KPSX: Weltevreden Project.

BECSA is the holder of three prospecting rights in close proximity to the existing Klipspruit operations, containing coal resources of approximately 500 million ton (Mt). The KPSX: Weltevreden Project is positioned to leverage off the existing export infrastructure, and extend the LoM by 20 years or more.

Methods and Terms of Reference

The National Heritage Resources Act (Act 25 of 1999) and the National Environmental Management Act (Act 107 of 1998) protect the archaeological and palaeontological heritage of South Africa.

1. In order to determine the likelihood of fossils occurring in the affected area geological maps, literature, palaeontological databases and published and unpublished records must be consulted.
2. If fossils are likely to occur then a site visit must be made by a qualified palaeontologist to locate and assess the fossils and their importance.
3. Unique or rare fossils should either be collected (with the relevant SAHRA permit) and removed to a suitable storage and curation facility, for example a Museum or University palaeontology department or protected on site.
4. Common fossils can be sacrificed if they are of minimal or no scientific importance but a representative collection could be made if deemed necessary.

The published geological and palaeontological literature, unpublished records and databases were consulted to determine if there are any records of fossils from the sites and the likelihood of any fossils occurring there.

Geology and Palaeontology

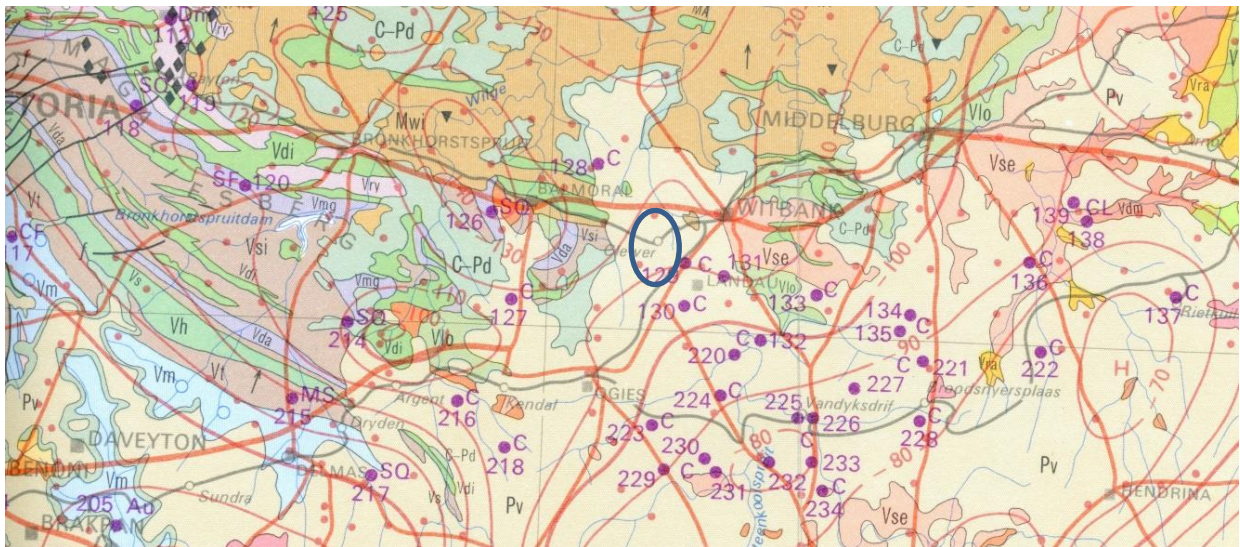


Figure 1. Geological map of the area with the Klipspruit complex falling within the blue outline. Abbreviations of the rock types are explained in Table 1. Map enlarged from the Geological Survey 1: 1 000 000 map 1984.

Symbol	Group/Formation	Lithology	Approximate Age
Pv	Vryheid	Shales, sandstone, coal	Lower Permian, Middle Ecca
C-Pd	Dwyka Fm	Tillite, sandstone, mudstone, shale	Upper Carboniferous-Early Permian
Vdi	Diabase	diabase	
Vsi	Silverton Fm, Pretoria Gr	Shale	Ca 2224 Ma
Vda	Daspoort Fm, Pretoria Gr	quartzite	Ca 2224 Ma

Table 1: Explanation of symbols for the geological map and approximate ages (Johnson et al 2006; Snyman 1998).

Both the southern extension (KPSX: South) and the northern extension (KPSX: Weltevreden) fall in the Vryheid Formation which has coal seams 1-5 of the Middle Ecca Group, the thickness and height of which is influenced by the basal topography of the Karoo Basin. Dykes and sills of dolerite are very common in the region with the most significant one being the Ogies Dyke which is about 15m thick and runs for 100 km. not only do the dykes and sills devolatilize the coals but they destroy the fossil plant material in the associated shales. This means that preservation of fossil plants is very patchy and usually very poor. Any surface exposures weather very rapidly and destroy the fossil material.

Because of the extreme patchiness of any potential fossil occurrence and the very small chance of finding good fossils, a meaningful Palaeontological Impact Assessment or site visit would only be feasible once mining activity has begun and the coal shales are accessible.

Recommendation

Based on the above observations there is no need for any further palaeontological assessment until excavation and mining activities have commenced. It is also highly unlikely that good fossil material will be extracted as such operations crush the coals.

If fossil plant material is discovered during mining operations, then it is strongly recommended that a professional palaeontologist be called to assess the importance and rescue them if necessary (with the relevant SAHRA permit).

If the fossil material is deemed to be of scientific interest then further visits by a professional palaeontologist would be required to collect more material. Given the shortage of such qualified people in South Africa and the stringent safety laws for underground access by the mining companies, any long term monitoring of the fossils is impractical. Nonetheless a monitoring programme is outline below.

As far as the palaeontology is concerned the proposed development can go ahead. Any further palaeontological assessment would only be required AFTER mining has commenced and IF fossils are found by the geologist or environmental personnel.

Monitoring Programme for Palaeontology –to commence once the two mine pits are operational.

1. The following procedure is only required if and when mining commences. The surface activities would not impact on the fossil heritage as the coals and any associated shales with fossil plants would be weathered and unrecognisable.
2. When mining operations commence the shales and mudstones (of no economic value) must be given a cursory inspection by the mine geologist or designated person before being added to the dumps used by the mine. Any fossiliferous material should be put aside in a suitably protected place. This way the mining activities will not be interrupted.
3. Photographs of similar fossil plants must be provided to the mine to assist in recognizing the fossil plants in the shales and mudstones.
4. On a regular basis, to be agreed upon by the mine management and the qualified palaeobotanist sub-contracted for this project, the palaeobotanist should visit the mine to inspect the selected material and check the dumps where feasible. The frequency of

inspections should be monthly. If the geologist/deputy is diligent and extracts the fossil material then inspections can be less frequent.

5. Fossil plants considered to be of good quality or scientific interest by the palaeobotanist must be removed, catalogued and housed in a suitable institution where they can be made available for further study. Before the fossils are removed from the mine a SAHRA permit must be obtained. Annual reports must be submitted to SAHRA.
6. If any underground inspection is deemed necessary then the normal safety procedures that the mine management endorses, must be followed by the palaeobotanist and associated mine employees.
7. If no good fossil material is recovered then the site inspections by the palaeobotanist can be reduced to annual events until mining operations cease. Annual reports by the palaeobotanist must be sent to SAHRA.

References

Cadle, A.B., Cairncross, B., Christie, A.D.M., Roberts, D.L., 1993. The Karoo basin of South Africa: the type basin for the coal bearing deposits of southern Africa. *International Journal of Coal Geology* 23, 117-157.

Johnson, M.R., van Vuuren, C.J., Visser, J.N.J., Cole, D.I., Wickens, H.deV., Christie, A.D.M., Roberts, D.L., Brandl, G., 2006. Sedimentary rocks of the Karoo Supergroup. In: Johnson, M.R., Anhaeusser, C.R. and Thomas, R.J., (Eds). *The Geology of South Africa*. Geological Society of South Africa, Johannesburg / Council for Geoscience, Pretoria. Pp 461 – 499.

Snyman, C.P., 1998. Coal. In: Wilson, M.G.C., and Anhaeusser, C.P., (Eds). *The Mineral Resources of South Africa: Handbook*, Council for Geosciences 16, 136-205.

Appendix C: Site Table

Site Name	Site Type	Latitude	Longitude
FD 1	Built Environment	-25.950452	29.055509
FD 2	Built Environment	-25.966203	29.117187
FD 3	Built Environment	-25.960409	29.062031
FD 4	Built Environment	-25.977077	29.084095
FD 5	Built Environment	-26.00264	29.06819
FD 6	Built Environment	-26.003755	29.073009
FD 7	Built Environment	-26.018402	29.073814
FD 8	Built Environment	-26.023305	29.071455
FD 9	Built Environment	-26.020296	29.096997
FH 1	Built Environment	-25.953961	29.055799
FH 10	Built Environment	-25.95903	29.074823
FH 11	Built Environment	-25.976372	29.091664
FH 12	Built Environment	-26.001856	29.068417
FH 13	Built Environment	-26.005902	29.067061
FH 14	Built Environment	-26.016263	29.058341
FH 15	Built Environment	-26.014858	29.038355
FH 16	Built Environment	-26.03039	29.093705
FH 2	Built Environment	-25.954291	29.055927
FH 3	Built Environment	-25.954932	29.055916
FH 4	Built Environment	-25.956072	29.055648
FH 5	Built Environment	-25.956471	29.056129
FH 6	Built Environment	-25.949074	29.096237
FH 7	Built Environment	-25.952101	29.095885
FH 8	Built Environment	-25.964164	29.119429
FH 9	Built Environment	-25.965676	29.119238
FR 1	Built Environment	-25.947857	29.094047
FR 2	Built Environment	-25.987072	29.057045
FR 3	Built Environment	-25.982936	29.058627
FR 4	Built Environment	-26.013794	29.057293
FR 5	Built Environment	-26.016032	29.056709
FR 6	Built Environment	-26.013999	29.048484
FR 7	Built Environment	-26.017258	29.050101
FR 8	Built Environment	-26.028842	29.110431
H	Built Environment	-26.020957	29.094715
L	Built Environment	-26.019712	29.107965
M	Built Environment	-26.022992	29.10125
S.34-005	Built Environment	-26.024572	29.057122
S.34-007	Built Environment	-25.996575	29.064993
S5	Built Environment	-25.963417	29.107309
GY 1	Burial Grounds and Graves	-25.965391	29.119774
GY 10	Burial Grounds and Graves	-25.991111	29.043982
GY 11	Burial Grounds and Graves	-26.01883	29.037021
GY 12	Burial Grounds and Graves	-25.945075	29.04577

Site Name	Site Type	Latitude	Longitude
GY 13	Burial Grounds and Graves	-25.948137	29.055754
GY 14	Burial Grounds and Graves	-25.954162	29.05355
GY 15	Burial Grounds and Graves	-25.937423	29.081207
GY 16	Burial Grounds and Graves	-26.019699	29.104259
GY 17	Burial Grounds and Graves	-26.056986	29.070243
GY 18	Burial Grounds and Graves	-26.003486	29.073796
GY 19	Burial Grounds and Graves	-26.015276	29.058363
GY 2	Burial Grounds and Graves	-25.99531	29.05887
GY 3	Burial Grounds and Graves	-26.000326	29.069322
GY 4	Burial Grounds and Graves	-26.00396	29.06865
GY 5	Burial Grounds and Graves	-26.0283	29.07182
GY 6	Burial Grounds and Graves	-26.02481	29.0768
GY 7	Burial Grounds and Graves	-26.029	29.0676
GY 8	Burial Grounds and Graves	-26.014662	29.050559
GY 9	Burial Grounds and Graves	-25.984239	29.053192
S.36-001	Burial Grounds and Graves	-26.032583	29.054461
S.36-002	Burial Grounds and Graves	-26.020361	29.040904
S.36-003	Burial Grounds and Graves	-25.968925	29.130751
S.36-004	Burial Grounds and Graves	-26.032001	29.057468
S.36-008	Burial Grounds and Graves	-25.996234	29.06349
S.35-006	Palaeontology	-25.963009	29.054656

Heritage Impact Assessment

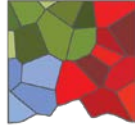
Environmental Authorisation for the KPSX: Weltevreden Project

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Appendix D: GY15 Memo



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To:	BECSA	Date:	November 2014
From:	Digby Wells Environmental	Proj #:	BHP2690
RE:	Burial Ground, GY15 - Recommended Procedure		

1 Introduction

Digby Wells Environmental (hereafter Digby Wells) was requested by BHP Billiton Energy Coal South Africa (hereafter BECSA) to serve as the independent Environmental Assessment Practitioner (EAP) for the Klipspruit Extension: Weltevreden (KPSX: Weltevreden) project, inclusive of an Environmental Impact Assessment, public consultation and specialist studies.

During the field assessment for the specialist heritage study between 30 September 2014 and 02 October 2014, it was noted that the burial ground, GY15 (the "Site") on Hartebeestlaagte 325 JR currently owned by BECSA, was at risk of exposure. Following due process, BECSA and the South African Heritage Resources Agency (SAHRA) Burial Grounds and Graves (BGG) Unit was informed via email of 03 October 2014.

The developer of the Site, Lonerock Quarries, has undertaken sand mining on the property that has resulted in an increased risk of exposure of the site. Although BECSA has not been responsible for any development of the Site, it does have a responsibility to ensure continued protection and management thereof in its capacity as landowner.

This memo aims to inform and guide BECSA as to the appropriate procedure required to implement measures to ensure the continued conservation and prevent further degradation of the cultural significance of the Site in line with the relevant legislative framework.

2 Description

As stated above, sand mining activities have removed soil adjacent to the burial. This removal of soil has led to the exacerbation of erosion which may through time lead to the exposure of the remains.



Tombstone indicated in red

Figure 2-1: Side profile of GY15 at risk of exposure through erosion

3 Definitions

It is pertinent at this point that BECSA take note of the following definitions as per the National Heritage Resources Act, 1999 (Act No. 25 of 1999) (NHRA) in respect of Heritage Resources Management (HRM) as it applies to burial grounds and graves:

NHRA Ref.	Term	Explanation in relation a burial ground	Cross ref.
(i)	Alter	Any action affecting the structure, appearance or physical properties of a <i>place</i> (burial ground), whether by way of structural or other works, or any other means.	2(viii), 5(7)(b), 36(3)
(iii)	Conservation	The protection, maintenance, preservation and sustainable use of <i>places</i> (burial grounds) to safeguard their <i>cultural significance</i> .	2(vi), 2(xvi), 5(4), 5(7)(c), 36(1)
(vi)	Cultural significance	The possible aesthetic, historical, social, or spiritual value or <i>significance</i> attached to the <i>site</i> by people.	2(iii)
(viii)	Development	Any physical intervention, excavation, or action, other than those caused by natural forces, which may in any way result in a change to the nature, appearance or physical nature of a <i>place</i> , or influence its stability and future well-being, including:	2(i), 36(3)



NHRA Ref.	Term	Explanation in relation a burial ground	Cross ref.
		(a) construction, alteration, demolition, removal or change of use of a <i>place</i> or a <i>structure</i> at a <i>place</i> ;	
		(b) carrying out any works on or over or under a <i>place</i> ;	
		(e) any change to the natural or existing condition or topography of land; and	
		(f) any removal or destruction of trees, or removal of vegetation or topsoil.	
(xiii)	Grave	The <i>place</i> of interment (burial ground) and includes the contents, headstone or other marker of such a <i>place</i> , and any other <i>structure</i> on or associated with such <i>place</i> .	2(xvi), 2(xxxii), 2(xiii), 2(xiv)
(xvi)	Heritage resource	Any <i>place</i> of <i>cultural significance</i> .	2(xiii), 2(xxxii), 2(xiii), 2(xiv)
(xix)	Improvement	Includes the repair, restoration and rehabilitation of a <i>place</i> protected in terms of the NHRA.	36
(xxiii)	Management	Includes the <i>conservation</i> , presentation and <i>improvement</i> of a <i>place</i> protected in terms of the NHRA.	2(i), 2(iii), 36
(xxx)	Owner	Includes the owner's (BECSA) authorised agent and any person with a real interest in the property (SAND MINER)	
(xxxii)	Place	In relation to a burial ground includes	
		(a) the <i>site</i> ;	2(iii), 2(xiii),
		(b) a <i>structure</i> such as a headstone;	2(xvi), 2(xxiii),
		(c) a <i>group of structures</i> such as headstones and perimeter fences or walls;	2(xiii), 2(xiv)
		(e) in relation to the <i>management</i> of a <i>place</i> , includes the immediate surroundings of a <i>place</i>	
(xiii)	Site	Any area of land, including land covered by water, and including any <i>structures</i> thereon.	2(xvi), 2(xiii),

NHRA Ref.	Term	Explanation in relation a burial ground	Cross ref.
			2(xxxii), 2(xivl)
(xiv)	Structure	Any works, device or other facility made by people and which is fixed to land, and includes any fixtures, fittings and equipment associated therewith.	2(xvi), 2(xiii), 2(xxxii), 2(xiil)

4 National Heritage Resources Act, 1999 (Act No. 25 of 1999)

Burial grounds and graves are afforded general protection in terms of Section 36 of the NHRA. In general, SAHRA is the responsible authority mandated to ensure continued conservation of burial grounds and graves not administered by any other authority. This implies that SAHRA can require certain arrangements to be made by the owner and / or developer of land on which burial grounds are located. In addition, SAHRA can also impose certain fines and penalties in the event that such conditions are not met, or if the owner and / or developer have contravened certain aspects of Section 36.

It is therefore important to note that *any* alteration (as defined above) of a protected burial ground is a permitted activity for which a permit must be applied for from, and issued by the SAHRA BGG unit. Section 36(3) of the Act states the following:

“No person may, without a permit issued by SAHRA...”

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

(c) bring onto or use at a burial ground ... any excavation equipment...”

SAHRA will not issue a permit unless it is assured that the Applicant (owner or developer) has consulted with any affected communities who may be associated with, or have an interest in, the burial ground. Section 5(4) of the NHRA is explicit in the regard, noting:

“[h]eritage resources form an important part of the history and beliefs of communities and must be managed in a way that acknowledges the right of affected communities to be consulted and to participate in their management.”

With specific reference to burial grounds, section 36(3) requires that the Applicant has:

- Made concerted efforts to contact and consult communities and individuals who by tradition have interests in a burial ground; and
- Reached agreements with the identified communities and individuals regarding the future of a burial ground.

The above does not only apply the actual exhumation and relocation of the contents of a grave, but also to *in situ* management and possible restoration or rehabilitation of the site.

5 Penalties

Where a burial ground has been altered or affected by development (as defined above) without the necessary permits issued by the SAHRA BGG Unit, certain penalties may be imposed on the owner and / or developer whose actions have affected, or may affect, the burial ground. These are briefly discussed below.

5.1 Compulsory Repair Order (Section 45)

SAHRA or any other Heritage Resources Authority (HRA) may consider that the site has been allowed to fall into disrepair for various reasons, or has been neglected to such an extent that it will lose its potential for conservation. In this event, SAHRA can serve on the owner and / or developer a compulsory repair order. This order obliges the owner / developer to repair or maintain the site to SAHRA's satisfaction.

Failure to comply with a compulsory repair order may result in SAHRA implementing the repairs or maintenance, and recover the costs from the owner / developer.

5.2 Offences & Penalties (Section 51)

The NHRA makes provision for fines and penalties in the event that any person has contravened sections of the Act. In terms of burial grounds a person who had contravened section 36(3), i.e. caused damage or alteration to a site is guilty of an offence and liable to a fine, imprisonment or both. It must be noted that any person may lay a charge with the South African Police Services or notify a heritage resources authority, if such person believes that any parts of the NHRA have been contravened or offences committed.

The magistrate court may then order the offending party to repair / put right the result of the act of which he or she was found guilty. If the offender fails to comply, the court may order that he or she pays the sum required to repair or put right the offence. The court may also order the forfeiture of any vehicles, craft, equipment or any other thing used or otherwise involved in the committing of the offence. Items will be forfeited to SAHRA or the relevant HRA who may sell or dispose of the items as it sees fit.

In addition to these court orders, the Minister may, on advice from SAHRA or the MEC, furthermore issue a no development order. Such an order implies that no other development of a place may take place, other than to generally care and maintain the heritage resources, for period up to 10 years. A no development order attaches to the land and will be binding on not only on the current owner, but also on subsequent persons / entities who become owners while the order remains in force.

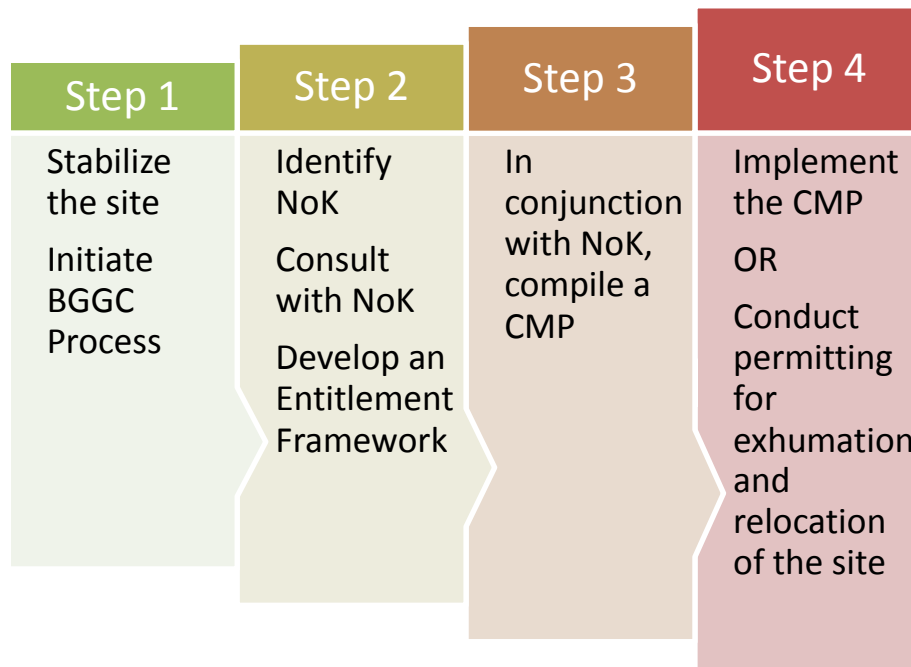
6 Recommendation

At present the Site is at risk of exposure. Digby Wells suggests that the following actions be undertaken to ensure the immediate conservation of the Site:

- Ensure sand mining in the vicinity of the Site is halted;
- Reinforce and stabilize the Site; and
- Initiate the Chapter XI Burial Grounds and Graves Consultation (BGGC) Process to identify *bona fide* Next-of-Kin (NoK).

The BGGC process must be conducted to discuss the *in situ* management and possible Grave Relocation Plan (GRP) of the burial ground in conjunction with identified NoK. The agreement between BECSA and NoK will be encapsulated within an Entitlement Framework. Additionally, a Conservation Management Plan (CMP) must be drafted and presented to the NoK for their consideration.

If the NoK require the relocation of the Site, the permitting process as regulated by Chapter IX of the NHRA Regulations must be completed.



Regards,



Justin du Piesanie

Heritage Management Consultant: Archaeologist