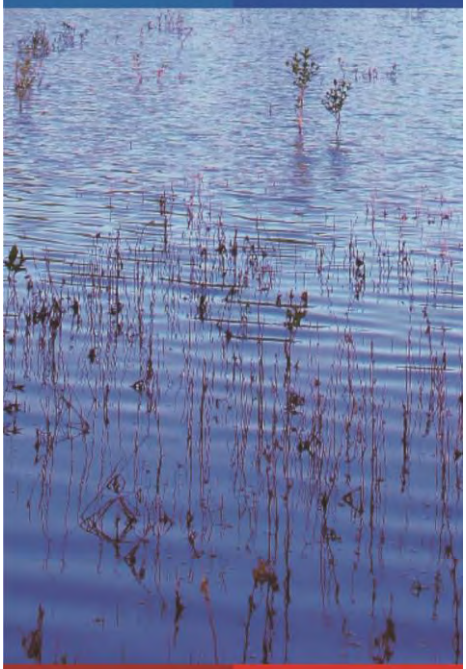

DIGBY WELLS
ENVIRONMENTAL

Mining Right Application for Reclamation of the Soweto Cluster Dumps, Roodepoort, Gauteng Province

Heritage Impact Assessment

DMR Ref Number: GP 30/5/1/2/2(10020) MR

Project Number:

ERG2613

Prepared for:

Ergo Mining (Pty) Ltd

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

This document has been prepared by Digby Wells Environmental.

Report Type:	**Heritage Impact Assessment**
Project Name:	**Mining Right Application for Reclamation of the Soweto Cluster Dumps, Roodepoort, Gauteng Province**
Project Code:	**ERG2613**

Name	Responsibility	Signature	Date
Justin du Piesanie *Heritage Management Consultant* *ASAPA Member: 270*	Research Field Survey Impact Assessments Report Compilation Recommendations		May 2014
Johan Nel *HRM Unit Manager* *ASAPA Member: 095*	Report Reviewer		May 2014

EXECUTIVE SUMMARY

Ergo Mining (Pty) Ltd enlisted the services of Digby Wells Environmental to conduct an Environmental Impact Assessment (EIA) and Environmental Management Programme (EMPR) Report for a Mining Right Application (MRA) (Ref No. GP10007MR) in accordance with the Minerals and Petroleum Resources Development Act, 2002 (Act No. 28 of 2002) (MPRDA). A Notification of Intent to Develop (NID) was submitted to the South African Heritage Resources Agency (SAHRA) and the Gauteng Provincial Heritage Resources Authority (PHRA-G) for Statutory Comment to comply with the requirements of the MRA.

SAHRA issued interim comment on 24 February 2014 (Case ID 4700) that stipulated that a Heritage Impact Assessment (HIA) is required. The HIA needed to include:

- Specific focus on the historical landscape; and
- An inventory of historical structures, monuments and memorials within the project area.

Identified heritage resources, and a Statement of Significance are presented in the table below:

Resource ID	Resource Category	Description	VALUE	Designation	Recommended Mitigation Guideline
Wits 2627BB25 4700/S.34-001	2.a & 2.c	Location of the historic Rand Leases Mine and Dumps	4	Negligible	Sufficiently recorded, no mitigation required
4700/S.34-002	2.a & 2.c	Head Gear for the Durban Roodepoort Deep Mine	12	Medium	Mitigation of resource to include detailed recording and mapping, and limited sampling, e.g. STPs.
4700/S.34-003	2.a & 2.c	Durban Roodepoort Deep Mining Village	7	Low	Resource must be recorded before destruction, including detailed site mapping, surface sampling may be required
DRD/S.36-001 4700/S.36-004	2.g	Burial grounds	20	Very High	Project design must change to avoid all change to resource; Conserved in entirety, CMP
0097/VLK	2.a, 2.c, 2.d	Jameson Raid Surrender Site and Memorial	15	High	Project design must aim to avoid change to resource; Partly conserved, CMP
Historic Landscape	2.c & 2.d	A significant historical landscape in the history of Johannesburg and South Africa	14	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.

In general, project related mitigation measures, such as adjusting the impact footprint is unfeasible as the reclamation of the Soweto Cluster Dumps is dependent on their present location.

The alignment of the proposed pipeline primarily occurs within existing servitudes and does not impact any identified heritage resources. In the event that previously unknown heritage resources are identified within the present alignment, it is recommended that the pipeline route be adjusted to avoid change to the heritage resource.

No mitigation will be required for S.34-001 as this resource has a negligible heritage value, and has been sufficiently recorded. General heritage related mitigation measures for identified heritage resources with low – very high heritage significance include:

- Demarcation of the heritage resource to minimise potential for accidental damage; and
- Recording of the heritage resource through mapping and photographs to ensure, as a minimum, preservation by record.

For the burial ground S.36-001, monitoring of the site must be included in the EMPR to assess any cumulative or indirect impacts on the resource over time. In the event that impacts are identified through the monitoring programme, appropriate mitigation measures can be implemented to reduce or rectify the negative change to the resource.

In order to mitigate the historic landscape, it is recommended that the Durban Roodepoort Deep mining complex, inclusive of the mining village and head gear, be retained as a tangible remnant of the mining heritage associated with the development of the Johannesburg. To ensure its sustainability, it is recommended that the complex be restored with the intent to be utilised by the communities for community services and trade, in line with the objectives of the CoJ IDP.

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LIST OF ABBREVIATIONS AND TERMS

CBD	Central Business District
CoJ	City of Johannesburg
CR	Comments and Response
Digby Wells	Digby Wells Environmental
DRC	Democratic Republic of Congo
EIA	Environmental Impact Assessment
EMPR	Environmental Management Programme
Ergo	Ergo Mining (Pty) Ltd
GIfA	Gauteng Institute for Architects
GIS	Geographic Information System
GSSA	The Genealogical Society of South Africa
HIA	Heritage Impact Assessment
IDP	Integrated Development Plan
MPRDA	Minerals and Petroleum Resources Development Act
MRA	Mining Right Application
NASA	The National Archives of South Africa
NHRA	National Heritage Resources Act, 1999 (Act No 25 of 1999)
NID	Notification of Intent to Develop
PDP	Professional Development Programme
PHRA-G	Gauteng Provincial Heritage Resources Authority
SAHRA	South African Heritage Resources Agency
SAHRIS	South African Heritage Resources Information System
WITS	The University of the Witwatersrand Archaeological Site Database
ZAR	Zuid Afrikaanse Republiek

1 Introduction

Ergo Mining (Pty) Ltd (hereafter Ergo) enlisted the services of Digby Wells Environmental (hereafter Digby Wells) to conduct an Environmental Impact Assessment (EIA) and Environmental Management Programme (EMPR) Report for a Mining Right Application (MRA) (Ref No. GP10007MR) in accordance with the Minerals and Petroleum Resources Development Act, 2002 (Act No. 28 of 2002) (MPRDA). A Notification of Intent to Develop (NID) was submitted to the South African Heritage Resources Agency (SAHRA) and the Gauteng Provincial Heritage Resources Authority (PHRA-G) for Statutory Comment to comply with the requirements of the MRA.

1.1 Terms of Reference

SAHRA issued interim comment on 24 February 2014 (Case ID 4700) that stipulated that a Heritage Impact Assessment (HIA) is required. The HIA needed to include:

- Specific focus on the historical landscape; and
- An inventory of historical structures, monuments and memorials within the project area.

1.2 Scope of Work

The Scope of Work for the Soweto Cluster Dump Reclamations HIA was based on comment issued by SAHRA and included:

- Updating baseline information collated for the NID, where necessary;
- A site visit to identify heritage resources present in the project area as well as to contribute to the inventory of historical structures, monuments and memorials; and
- A description and assessment of the historical landscape.

2 Restrictions, Limitations, and Knowledge Gaps

The following restrictions, limitations and knowledge gaps were identified for this study:

- Heavy rainfall limited accessibility on dirt roads within and surrounding the project area;
- Access to private property within the project area was restricted as permission to enter was denied; and
- The presence of illegal miners posed a safety risk and limited the extent of the pedestrian survey.

3 Project Background Information

Contact details of the developer, consultant and landowners were provided in the NID, attached as Appendix D.

4 Development / Planning Context

The proposed Soweto Cluster Project is located in the Gauteng Province on the farms Vogelstuisfontein 231 IQ; Roodepoort 237 IQ; and Vlakfontein 238 IQ. The project area is situated adjacent to several suburbs of greater Soweto, approximately 20 km from the Johannesburg Central Business District (CBD). Detailed geographical information was provided in the NID, attached as Appendix D, as well as mapped on the South African Heritage Resources Information System (SAHRIS) (http://www.sahra.org.za/cases/mining-right-application-reclamation-soweto-cluster-dumps).

The development and planning context within which the Soweto Project will operate was summarised from the following relevant sources:

- Statistics South Africa (Statistics SA, 2013);
- City of Johannesburg Draft Annual Performance Report (City of Johannesburg, 2012); and
- City of Johannesburg Integrated Development Plan (IDP) (City of Johannesburg District Municipality, 2013)

Socio-economic data were inferred from Statistics SA information provided for the City of Johannesburg (CoJ) and the CoJs IDP. The CoJ covers an area of 1 645 km^2 with a total population of 4 434 827, contributing approximately 17% to the South African economy (City of Johannesburg, 2012). At a regional level, Region D, within which the project is located, is the most densely populated region of Johannesburg comprising 24.4% of the population (City of Johannesburg District Municipality, 2013).

Average annual household income for Region D, depicted in Table 4-1, range from no income (19%) to greater than R 307 601.00 (3%), with the majority (36%) of household averaging R 19 601.00 to R 76 401.00 (Statistics SA, 2013).

Table 4-1: Summary of annual household income (Adapted from Statistics SA, 2013)

Annual Household Income	Region D
No income	19%
R 1 - R 19 600	23%
R 19 601 - R 76 400	36%
R 76 401 - R 307 600	19%
R 307 601 - or more	3%

Economic activity within the CoJ is driven primarily by four economic sectors, which are:

- Finance and business services;
- Community services;
- Manufacturing; and
- Trade.

These sectors account for the highest levels of both formal and informal employment, collectively comprising more than 82% of the city's economic activity (City of Johannesburg District Municipality, 2013).

Table 4-2: Employment distribution for Region D (Adapted from Statistics SA, 2013)

Employment Sector	Percentage
Do not know	0.62%
In the formal sector	23.15%
In the informal sector	2.69%
Not applicable	70.46%
Private household	3.08%
Grand Total	**100.00%**

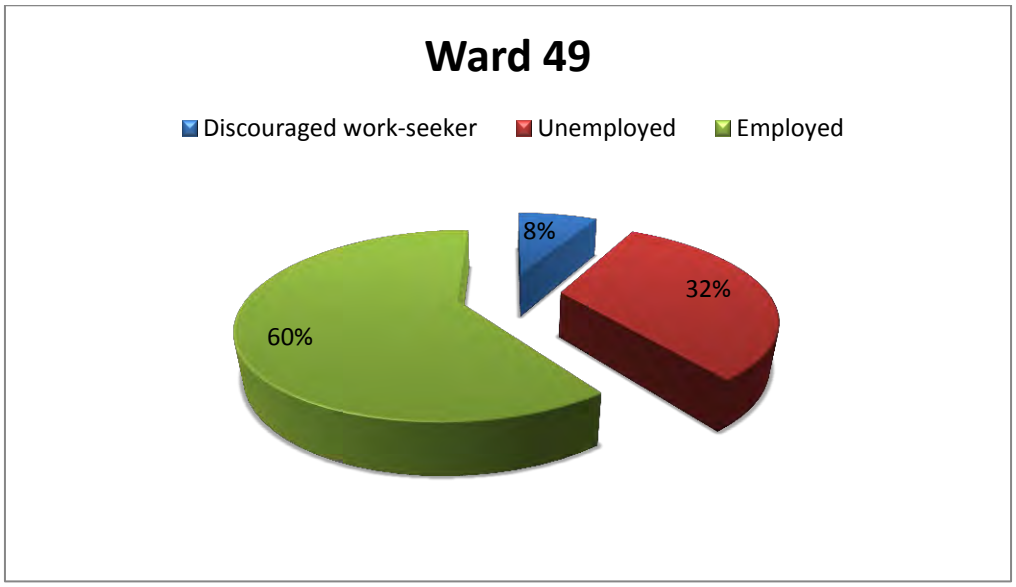

Figure 4-1: Employment statistics for Ward 49 of Region D (Adapted from Statistics SA, 2013)

Although financial services remain the primary contributor to the CoJ's economy, other sectors that will absorb skills and provide employment opportunities have been identified as key economic developments (City of Johannesburg District Municipality, 2013). The CoJ IDP identified ten priorities to achieve economic development, one of which was 'resource resilience'. Here, economic growth is strongly inter-related with the demand for water, electricity, liquid fuel and *mining*. The CoJ IDP identified management of limited natural resources as important, emphasising sustainable use principles of "reduce, reuse and recycle". Significantly, the CoJ IDP considers mine dumps in the context of limited resources. (City of Johannesburg District Municipality, 2013).

The planning context within which the Ergo Soweto Cluster Project is situated encourages resource resilience, i.e. in this case the reclamation of the mine dumps, to achieve economic development within the CoJ.

Another priority identified in the 2013/16 IDP is infrastructure development. The Spatial Development Framework (SDF) defines the principles of sustainability where one of the desired outcomes is the responsible use, protection and conservation of the city's cultural heritage resources (City of Johannesburg District Municipality, 2013). If the desired outcomes of the 2013/16 IDP are achieved, consideration of the cumulative impacts on diverse heritage resources within the CoJ must be made to ensure the sustainable use, protection and conservation of the city's cultural heritage resources.

5 Expertise of the Specialists

Justin du Piesanie is employed as a Heritage Management Consultant specialising in the Southern African Iron Age. He attained his Master of Science (MSc) degree in 2008 from the University of the Witwatersrand. In 2013, he attended a Continuing Professional

Development Programme (PDP) for Architectural and Urban Conservation presented by the University of Cape Town in conjunction with the Gauteng Institute of Architects (GIfA). He has conducted several heritage assessments throughout South Africa, including Gauteng, and has worked in the Democratic Republic of Congo (DRC), Burkina Faso, Liberia and Mali.

6 Methodology

The main purpose of a HIA is to identify and map heritage resources that may occur in an affected area to enable an evaluation of their significance and assessment of project related impacts on them. Identification of heritage resources can be done through various means, discussed below. For the purpose of this HIA report, identified resources have been categorised in accordance with section 3(2) of the National Heritage Resources Act, 1999 (Act No. 25 of 1999) (NHRA). This not only facilitates evaluation of cultural significance and impact assessment, but also recommended mitigation and management measures as diverse resources require different management approaches. Table 6-1 lists and describes the categories used in this report.

Table 6-1: Categories defined under section 3(2) of the NHRA

Category	Description	
2.a	places, buildings, structures and equipment of cultural significance	
2.b	places to which oral traditions are attached or which are associated with living heritage	
2.c	historical settlements and townscapes	
2.d	landscapes and natural features of cultural significance	
2.e	geological sites of scientific or cultural importance	
2.f	archaeological and palaeontological sites	
2.g	graves and burial grounds, including—	
	2.g.i	ancestral graves
	2.g.ii	royal graves and graves of traditional leaders
	2.g.iii	graves of victims of conflict
	2.g.iv	graves of individuals designated by the Minister by notice in the *Gazette*
	2.g.v	historical graves and cemeteries and

Category	Description	
	2.g.vi	other human remains which are not covered in terms of the Human Tissue Act, 1983 (Act No. 65 of 1983
2.h	sites of significance relating to the history of slavery in South Africa	
2.i	movable objects	
	2.i.i	objects recovered from the soil or waters of South Africa, including archaeological and palaeontological objects and material, meteorites and rare geological specimens
	2.i.ii	objects to which oral traditions are attached or which are associated with living heritage
	2.i.iii	ethnographic art and objects
	2.i.iv	military objects
	2.i.v	objects of decorative or fine art
	2.i.vi	objects of scientific or technological interest
	2.i.vii	books, records, documents, photographic positives and negatives, graphic, film or video material or sound recordings, excluding those that are public records as defined in section 1 of the National Archives of South Africa Act, 1996 (Act No. 43 of 1996)

6.1 Background Information / Data Collection

Background information was identified and reviewed (analysed) in support of the NID, where salient information was collated that enabled the cultural landscape to be characterised. Where required, additional information sources were consulted, listed in Section **Error! Reference source not found.**: **Error! Reference source not found.**. It included text-based and cartographic sources, and database information.

6.1.1 Published Literature

Published literature that was found relevant to this study included:

- Bonner & Segal, 1998;
- Brodie, 2008;
- Hall, 1987;
- Huffman, 2007

- Huffman, Hall, & Steel, 1991;
- Lombard, et al., 2012; and
- von Ketelhodt, 2007.

6.1.2 Reviewed Heritage Reports

Previously completed heritage studies were reviewed to expand on the background described above. The findings provide evidence-based inferences to be made with regard to the potential for, and description of, heritage resources that are likely to occur in the project area. The following heritage cases and reports were found to be relevant:

- Leslie, M. 2001. Bram Fischerville Ext 7 – Heritage Impact Assessment. Unpublished report prepared by CEM Africa cc kept on file at SAHRA under 2001-SAHRA-0111
- Van Schalkwyk, J. 2003. A Survey of Heritage Resources in the Proposed Dobsonville X9 Development, Dobsonville, Soweto. Unpublished report prepared by the National Cultural History Museum kept on file at SAHRA under 2003-SAHRA-0130
- Van Schalkwyk, J. 2004. Heritage Impact Assessment for the Proposed Waste Blending Platform Project, Roodepoort District, Gauteng. Unpublished report prepared by the National Cultural History Museum kept on file at SAHRA under 2004-SAHRA-0111
- Birkholtz, P.D. 2006. Phase 1 Heritage Impact Assessment for the Proposed Jameson Field Extension 1 Residential Township Development, Gauteng Province. Unpublished report prepared by Archaeology Africa cc kept on file at SAHRA under 2006-SAHRA-0097
- Van Vollenhoven, A.C. and Pelser, A.J. 2007. A Report on a Cultural Heritage Impact Assessment on Erf 85, Chamdor, Krugersdorp for the William Tell Particle Boards and Medium Density Manufacturing Plant. Unpublished report prepared by Archaetnos Culture and Cultural Resources Consultants kept on file at SAHRA under 2007-SAHRA-0407
- Van Schalkwyk, J. 2013. Basic Cultural Heritage Assessment for the Proposed Construction of a New Bulk Water Pipeline in the Fleurhof Region of the City of Johannesburg Local Municipality. Unpublished report prepared by J. van Schalkwyk kept on file at SAHRA under 2001-SAHRA-0111

6.1.3 Databases

A review of relevant databases was completed to identify potential heritage resources within the project area. These included:

- The National Archives of South Africa (NASA);
- The Genealogical Society of South Africa (GSSA);

- The University of the Witwatersrand Archaeological Site Database (WITS);
- SAHRIS ; and
- The Artefacts Architectural Online Database.

6.1.4 Historical Layering

Historical layering is a process whereby diverse cartographic sources from various time periods are layered chronologically using GIS. The rationale behind historical layering is threefold, as it:

- Enables a virtual representation of changes in the land use of a particular area over time;
- Provides relative dates based on the presence/absence of visible features; and
- Identifies potential locations where heritage resources may exist within an area.

The cartographic sources used in this study included:

- Jeppe's 1899 Map of the Transvaal.

Table 6-2: Historical aerial photographs used for the Soweto Cluster Project area

Aerial photographs						
Job no.	**Flight plan**	**Photo no.**	**Map ref.**	**Area**	**Date**	**Reference**
129	15	54525	2627	Johannesburg / Potchefstroom	1938	129/1938
	16	74026				
158	10	56865	2627	Krugersdorp / Roodepoort	1941	158/1941
314	05	44489	2627, 2628	Johannesburg / Vereeniging	1952	314/1952

6.2 Field Survey

Primary data was collected through an HIA reconnaissance survey undertaken by Justin du Piesanie on 02 April 2014 on the properties Vogelstuisfontein 231 IQ; Roodepoort 237 IQ; and Vlakfontein 238 IQ. The aim of the survey was to visually record the current state of the environment through photographs, verify select information identified in the background information, and record any additional heritage resources that may occur within the project area.

The survey and identified sites / resources were recorded by GPS waypoints and track logs, depicted in Appendix B.

6.3 Site Naming

The site naming conventions employed in this report are summarised below:

- Sites identified in previous assessments were referred to by their respective report site names and prefixed with the relevant SAHRA Case ID or report reference number;
- Sites identified in previous assessments without SAHRA references were referred to by their respective report site and prefixed with the report author and date;
- All newly identified sites were named using this heritage Case ID, followed by the map sheet number and reference to the relevant NHRA section suffixed with the site number; and
- Reference to sites and resources that have been formally declared are made using the official gazetted names.

Sites discussed in the text of this report are summarised using only the site number, e.g. Site s.35-001.

6.4 Statement of Significance/Heritage Value

To recommend appropriate mitigation and management measures, the cultural significance[1] of identified heritage resources was determined. Cultural significance takes into account the importance of a resource in terms of section 3(3) of the NHRA, based on credible sources as well as its integrity. Sources are cited in the NID and this HIA, and listed in the bibliographies of these reports. This methodology – detailed in Appendix C - to determine heritage value fulfils the requirements stipulated in section 3 of the NHRA.

Table 6-3: Proposed grading based on NHRA Section 7(1) and SAHRA Minimum Standards

FR/Grade	Significance	Mitigation Recommendation Guideline
National and Provincial Protection, NHRA 7(1)(a, b)		
I	National SAHRA responsibility High significance	Heritage resource conserved/preserved; No mitigation as part of development recommended
II	Provincial SAHRA responsibility	Heritage resource conserved/preserved; No mitigation as part of development recommended

[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.

	High significance	
Local Protection, NHRA 7(1)(c)		
IIIA	Local PHRA responsibility High significance	Retained as heritage register site; Mitigation as part of development not advised
IIIB	Local PHRA responsibility High significance	Could be mitigated and part retained as heritage register site
General Protection, NHRA 7(1)(c)		
IV A	Local PHRA responsibility High/Medium significance	Heritage resource should be mitigated before destruction
IV B	Local PHRA responsibility Medium significance	Heritage resource should be recorded before destruction
IV C	Local PHRA responsibility Low significance	Heritage resource has been sufficiently recorded Phase 1 requiring no further recording before destruction

The Statement of Significance has direct bearing in assessing the intensity of potential of impacts on identified heritage resources.

6.5 Impact Assessment

Assessing impacts on heritage resources are based on the value of a resource and how that value may change due to the identified impacts. In order to rate impacts, the following criteria were considered:

- Spatial scale;
- Duration;
- Severity;
- Consequence;
- Probability; and
- Value of the heritage resource.

Impact significance = Value x Magnitude

Where

Value =Importance + Credibility + Integrity

And

Magnitude = Consequence x Probability

And

Consequence = Spatial scale + Duration + Severity

The impact rating was applied to pre- and post-mitigation with the ideal to remove all impacts to a heritage resource. Where this was not achieved, the recommended mitigation guidelines described in Table 6-3 were considered.

7 Summary of Stakeholder Engagement

Information pertaining to the project was communicated to stakeholders as part of the EIA / EMP process governed under Section 22 of the MPRDA. Public meetings were held at Ruimsig Golf View Manor and the Braamfischerville Multipurpose Hall on the 14th of February 2014. Stakeholders that attended included the public, landowners, local government representatives , non-profit organisations and community-based organisations.

Comments from stakeholders were documented and recorded in a Comments and Response Report (CRR) for inclusion into the EIA Scoping Report.

8 Discussion

8.1 Summary of NID baseline

As noted in the NID, the study area was sparsely populated prior to the 1886 discovery of gold on the Witwatersrand (von Ketelhodt, 2007). This discovery prompted the establishment of Johannesburg, and the mining boom that contributed to its historical landscape.

The wealth generated by the Witwatersrand gold rush was controlled by the *Zuid Afrikaanse Republiek* (ZAR) who imposed restrictions on *Uitlanders*[2]. Consequently, the British government through Cecil John Rhodes initiated plans to overthrow President Paul Kruger's ZAR government. This would involve an *Uitlander* revolt against the government that would have enabled the presence of British armed forces and the British High Commissioner in Pretoria to ensure the "protection" of British citizens in the ZAR (Birkholtz, 2006). The outcome of this scheme culminated in the unsuccessful 1895 Jameson Raid on the farm Vlakfontein.

8.2 Updated / additional background information

The farms Roodepoort, Vlakfontein and Volgelstruisfontein were all declared 'public diggings' shortly after the discovery of gold on the Witwatersrand in 1886 (von Ketelhodt, 2007). As the exposed surface reef was exploited by gold diggers, it became evident that the payable deposit dipped below the surface and would soon be out of their reach (See Figure 8-1). Rather, larger mining houses such as Eckstein & Co. (later Rand Mines), the Gold Field Group and the Johannesburg Consolidated Investment Co. Ltd, with the capability and finances to establish larger industrialised mines, would be required to exploit the deeper deposits (von Ketelhodt, 2007; Brodie, 2008).

[2] The name used by the ZAR and its citizens to describe the recent arrival of foreigners, especially the British. These people were mostly associated with the Rand Gold Rush and lived in Johannesburg.

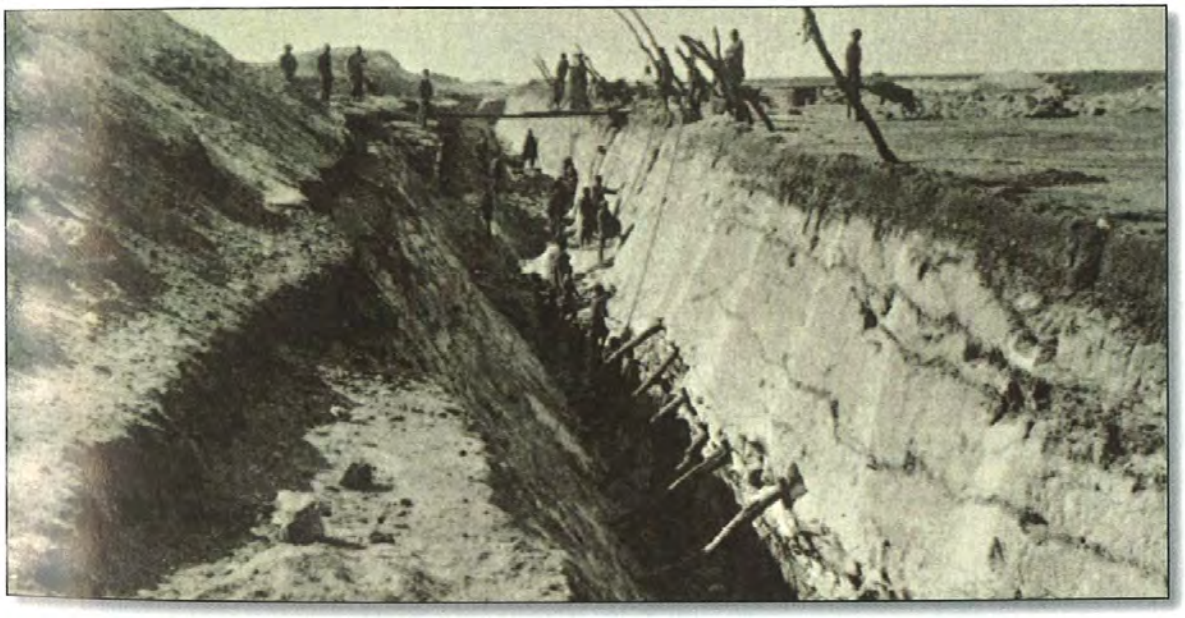

Figure 8-1: Open cutting of the Main Reef in 1888 (von Ketelhodt, 2007)

Durban Roodepoort Deep Mine and Rand Leases (Vogelstruisfontein) Gold Mine were established in the 1890's to exploit the deeper levels in the West Rand. These two mines and the wider Johannesburg mining industry were well-established by 1899, clearly indicated in the 1899 Jeppe's Map of the Transvaal depicted in Figure 8-2. The Durban Roodepoort Deep Mine was administered by Rand Lease Gold Mining Co Ltd (Rand Mines) from approximately 1897, after the Rand Mines shareholder began a systematic acquisition of the deep levels of many of the mines that started on the Central Rand (Anonymous, n.d.).

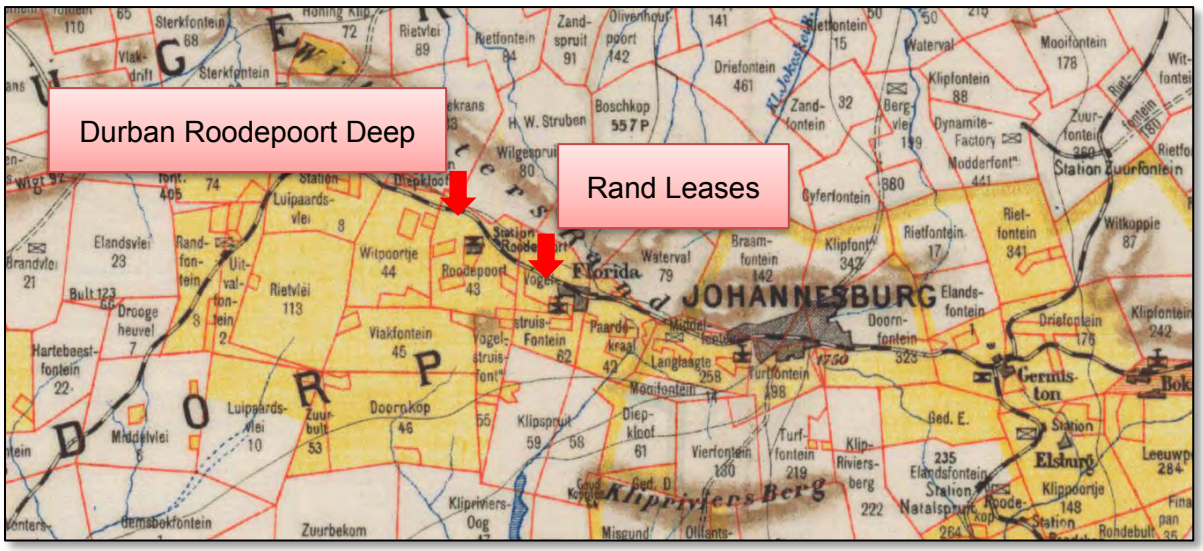

Figure 8-2: Extract from the 1899 Jeppes Map of the Transvaal.

Figure 8-3: Historical layering of Durban Roodepoort Deep Mine, dumps 2A5, 2L20 and 2L21 (129/1938). Historic mining village demarcated in red.

Figure 8-4: Historical layering of Rand Leases Mine, dumps 2A6, 2L16, 2L17 and 2L18 (129/1938). Historic Rand Leases Mine demarcated in red.

Mining houses required a large labour force to sustain operations, and recruited both white and black labourers. White miners were encouraged to marry and settle in the suburbs surrounding Johannesburg. Black miners were forced into short-term contracts, had to leave their families behind, and were relegated to tightly controlled single sex barracks surrounded by high compound walls (Bonner & Segal, 1998). Ultimately, this would manifest into the hostel system for migrant labourers for which Soweto became characterised.

Extensive gold mining operations at both the Durban Roodepoort Deep Mine and Rand Leases Mine were established by 1938, evident in a 1938 aerial photograph depicted in Figure 8-3. This historical image shows infrastructure such as mining villages and several dumps. Importantly, the dumps that are the subject of this report were already established, including 2A5, 2L20 and 2L21 at the Durban Roodepoort Deep Mine.

Mining at Durban Roodepoort Deep Mine was discontinued in 1993, two years short of 100 years of operation. During the mine's life, 21 million ounces of gold were produced (Anonymous, n.d.). Rand Leases Mine was closed in the 1971 by the Anglovaal Mining House. After its closure in 1971 it underwent a series of ownership changes. In 1985 Severing Mining announced its re-opening, however operations discontinued in the late 1990s due to decreasing gold prices and unfavourable market conditions, rendering the mine uneconomic (Anonymous, n.d.).

8.3 Summary of Discussion

The study area is predominantly associated with the historical landscape of Johannesburg, as evident in the identified heritage resources (See Figure 8-5). Mining of the Witwatersrand is the primary catalyst for occupation of the study area, and identified heritage resources are intrinsically intertwined with it.

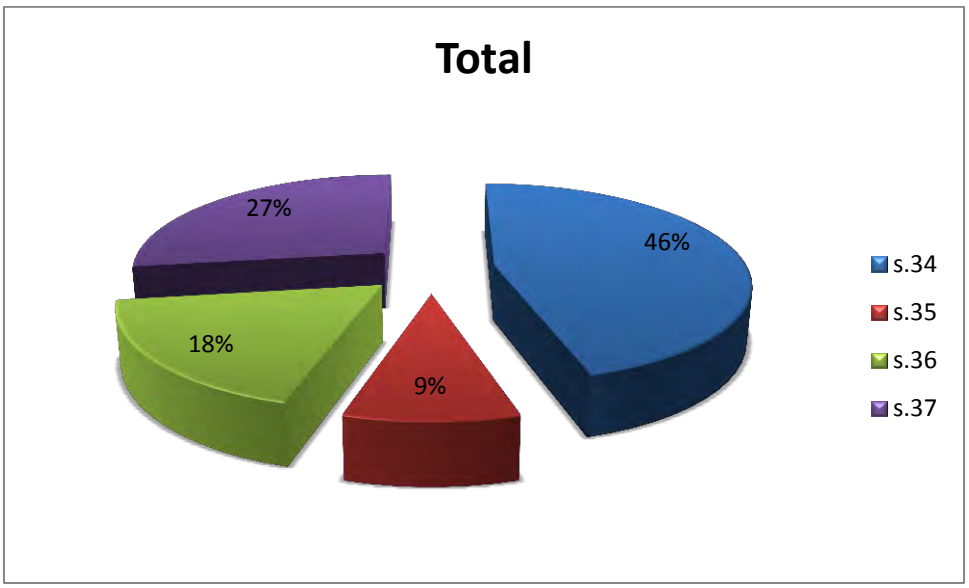

Figure 8-5: Percentage of heritage resources per NHRA section

Tangible heritage resources, such as the Durban Roodepoort Deep mining complex inclusive of the mine dumps, mining gear head, village and cemetery, surrounding hostels, and the Jameson Raid surrender site, are all visual reminders of the developmental history of the region. These resources ultimately contribute to the historical townscape of Johannesburg.

From the socio-economic data discussed under Section 4 above, urban development within Region D arguably poses the greatest risk to tangible heritage sites. Risk to tangible heritage resources due to reclaiming the Soweto Cluster Mine Dumps is low. However, these dumps need to be acknowledged as an integral aspect of the historical Johannesburg townscape where the removal will diminish the visual townscape. Considering the positive cumulative impacts, heritage management practices could contribute to sustainable employment in the tourism and heritage sectors, which could include conservation plans for historical settings such as the identified Jameson Raid surrender site. Here, skills development within the local communities for the monitoring and management of these types of resources could contribute to tourism development. Please refer to Section 12 for feasible recommendations.

9 Sources of Risk

Sources of risk were considered with regard to development activities defined in s. 2(viii) of the NHRA that may be triggered. Sources of risk from the Soweto Cluster Project are summarised in Table 7.1 of the NID. Relevant activities are discussed as issues and listed in Table 9-1. These issues formed the basis of the impact assessment described in Section 11.

Table 9-1: Identified issues for the Soweto Cluster Project

Issue	Description	Potential Impact
Issue 1: Removal of Vegetation	Vegetation removal for site preparation and the construction of temporary infrastructure, pump stations and access roads will occur	Destruction of and/or damage to heritage resources with low – very high value
Issue 2: Construction of Pipelines	Slurry and water lines will be constructed to join the existing Crown Ergo pipeline infrastructure.	
Issue 3: Operation of Construction Machinery and Vehicles	Construction machinery and vehicles will be utilised for construction purposes and to transport equipment on site	
Issue 4: Temporary Storage of Construction Materials and	Construction and hazardous material will be temporarily	

Issue	Description	Potential Impact
Hazardous Material	stored on site	
Issue 5: Reclamation Activities	2L24 will be reclaimed first, followed by the other 11 dumps changing the existing condition and topography of the landscape.	Change to the historical landscape

9.1 Alternatives Considered

The only alternative considered as part of the heritage assessment was 'No Reclamation'. In terms of identified heritage resources, identified heritage resources and the 'sense-of-place' will remain uninhibited by the project activities. Potential sources of risk to *in situ* heritage resources for this consideration include:

- Continuation of neglect and enhancement of state of decay;
- Enhanced potential for encroachment from development; and
- Increased exposure to acts of vandalism.

10 Statement of Significance

The values assigned to the identified heritage resources are presented in Table 10-1. A detailed description of the identified heritage resources is provided in Appendix B.

Table 10-1: Summary of Statements of Significance for identified heritage resources

Resource ID	Resource Category	Description	VALUE	Designation	Recommended Mitigation Guideline
Wits 2627BB25 4700/S.34-001	2.a & 2.c	Location of the historic Rand Leases Mine and Dumps	4	Negligible	Sufficiently recorded, no mitigation required
4700/S.34-002	2.a & 2.c	Head Gear for the Durban Roodepoort Deep Mine	12	Medium	Mitigation of resource to include detailed recording and mapping, and limited sampling, e.g. STPs.

Resource ID	Resource Category	Description	VALUE	Designation	Recommended Mitigation Guideline
4700/S.34-003	2.a & 2.c	Durban Roodepoort Deep Mining Village	7	Low	Resource must be recorded before destruction, including detailed site mapping, surface sampling may be required
DRD/S.36-001 4700/S.36-004	2.g	Burial grounds	20	Very High	Project design must change to avoid all change to resource; Conserved in entirety, CMP
0097/VLK	2.a, 2.c, 2.d	Jameson Raid Surrender Site and Memorial	15	High	Project design must aim to avoid change to resource; Partly conserved, CMP
Historic Landscape	2.c & 2.d	A significant historical landscape in the history of Johannesburg and South Africa	14	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.

11 Impact Assessment

The impact assessments below considered changes to:

- Category 2.a, b, and d (Historical buildings, places, structures and equipment) resources with low – high heritage value;
- Category 2.g resources (Burial grounds and graves) with a very high heritage value; and
- Category 2.c (historical landscape) with a medium-high heritage value.

The results of the impact assessment is summarised in Table 11-1

Table 11-1Summary of impact assessment

Code	Impact	Pre-mitigation:						Post-mitigation:					
		Duration	Extent	Intensity	Conse-quence	Probability	Signifi-cance	Duration	Extent	Intensity	Conse-quence	Probability	Signifi-cance
Low-SoS	Destruction of and/or damage to category 2.a, 2.c and /or 2.d resources with Low Significance	Permanent	Local	Very low - negative	Moderately detrimental	Highly probable	Minor - negative	Immediate	Very limited	Very low - negative	Negligible	Improbable	Negligible - negative
Med-SoS	Destruction of and/or damage to category 2.a, 2.c and /or 2.d resources with Medium Significance	Permanent	Municipal Area	Moderately high - negative	Highly detrimental	Highly probable	Moderate - negative	Immediate	Very limited	Very low - positive	Negligible	Improbable	Negligible - positive
V.Hi-SoS	Destruction of and/or damage to category 2.g resources with Very High Significance	Permanent	International	Extremely high - negative	Extremely detrimental	Highly probable	Major - negative	Short term	Very limited	High - positive	Slightly beneficial	Unlikely	Negligible - positive
Med-Hi-SoS	Change to category 2.c and 2.d resource	Permanent	Municipal Area	Moderately high - negative	Highly detrimental	Certain	Moderate - negative	Beyond project life	Limited	Moderate - positive	Moderately beneficial	Unlikely	Negligible - positive

11.1 Impact Assessment of Heritage Resources: Low Heritage Value

This includes site S.34-003 – Durban Roodepoort Deep mining village. This site contains aspects that fall within the following categories:

Category	Description
2.a	places, buildings, structures and equipment of cultural significance
2.b	places to which oral traditions are attached or which are associated with living heritage
2.d	landscapes and natural features of cultural significance

The original mining village is in a dilapidated state at present, with several squatters utilising the remaining structures. The envisaged impact to the mining village is presented and summarised in Table 11-2.

Table 11-2: Impact table for heritage resources with a low significance

IMPACT DESCRIPTION: Destruction of and/or damage to Historical Resources with Low Significance				
Predicted for project phase:	Pre-construction	Construction	Operation	Decommissioning
Dimension	**Rating**	**Motivation**		
PRE-MITIGATION				
Duration	Permanent (7)	Changes to Durban Roodepoort Deep Mining Village will be permanent.	Consequence: Moderately detrimental (-11)	Significance: Minor - negative (-66)
Extent	Local (3)	Loss will be contribute to the degradation of the historical landscape		
Intensity x type of impact	Very low - negative (-1)	The intensity of the impact will be low based on the value of the resources		
Probability	Highly probable (6)	There is a high probability that Durban Roodepoort Deep Mining Village will be damaged and/or destroyed by activities associated with the project through the various phases		
MITIGATION: - Clearly demarcate structures and extent of village to limit the potential for damage; - Restore and conserve, as far as is feasible, structures within the Mining Village; - Develop aspects of the Mining Village for community development, e.g. Training Centre as described in the Social Assessment				
POST-MITIGATION				
Duration	Immediate (1)	Impacts will sporadic and accidental	Consequence: Negligible (-3)	Significance: Negligible - negative (-6)
Extent	Very limited (1)	Only limited aspects of the Mining Village may be impacted		
Intensity x type of impact	Very low - negative (-1)	The intensity of the impact will be low based on the value of the resources		
Probability	Improbable (2)	If mitigation measures are implemented, it is improbable that the impact will occur		

Figure 11-1: Entrance to Durban Roodepoort Deep Mining Village

Figure 11-2: Example of remaining house at the Durban Roodepoort Deep Mining Village

11.2 Impact Assessment of Heritage Resources: Medium Heritage Value

This includes the site S.34-002 – Durban Roodepoort Deep Mining Head Gear. This site contains aspects that fall within the following category:

Category	Description
2.a	places, buildings, structures and equipment of cultural significance

The head gear is the only remaining infrastructure associated with the mine, and is one of the few original head gears intact on the Witwatersrand. The envisaged impact on the heritage resources is summarised in Table 11-3.

Table 11-3: Impact table for heritage resource with a medium significance

IMPACT DESCRIPTION: Destruction of and/or damage to Historical Resources with Medium Significance				
Predicted for project phase:	Pre-construction	Construction	Operation	Decommissioning
Dimension	**Rating**	**Motivation**		
PRE-MITIGATION				
Duration	Permanent (7)	Durban Roodepoort Deep Mining Head Gear could be permanently damaged by activities associated with the project, or its removal may be required	Consequence: Highly detrimental (-15)	Significance: Moderate - negative (-90)
Extent	Municipal Area (4)	The physical impact will be limited to the structure, but the impact will extend to the municipal area as it is one of the few remaining mining head gears in the region.		
Intensity x type of impact	Moderately high - negative (-4)	Loss of site with a medium heritage value.		
Probability	Highly probable (6)	There is a high probability that the structure will be damaged or destroyed		

MITIGATION: - Clearly demarcate the heritage resource to minimise potential for accidental damage - Maintain the Durban Roodepoort Deep Mining Head Gear *in situ* - Where preservation / conservation of the Head Gear *in situ* is not possible, the structure must be recorded in detail and a destruction permit will be required.				
POST-MITIGATION				
Duration	Immediate (1)	Demarcation will be immediate, limiting the potential for accidental damage or destruction	Consequence: Negligible (3)	Significance: Negligible - positive (6)
Extent	Very limited (1)	Potential impacts will be accidental and very limited to specific aspects of the head gear		
Intensity x type of impact	Very low - positive (1)	Mitigation is likely to minimise intensity of impacts associated with reclamation and contribute to preservation of the historic landscape		
Probability	Improbable (2)	Mitigation measures are likely to minimise potential impacts		

Figure 11-3: Head gear for the Durban Roodepoort Deep Mine

11.3 Impact Assessment of Heritage Resources: Very High Heritage Value

This includes the site S.36-001 – Burial ground. This site contains aspects that fall within the following categories:

Category	Description
2.a	places, buildings, structures and equipment of cultural significance
2.b	places to which oral traditions are attached or which are associated with living heritage
2.g	graves and burial grounds

The burial ground is situated to the west of the Durban Roodepoort Deep mining village and at the time of the survey was overgrown. Visible on aerial imagery, the extent of the burial ground was demarcated. The envisaged impacts for the burial ground is summarised in Table 11-4.

Table 11-4: Impact table for heritage resources with a very high significance

IMPACT DESCRIPTION: Destruction of and/or damage to Burial Grounds with Very High Significance				
Predicted for project phase:	Pre-construction	Construction	Operation	Decommissioning
Dimension	**Rating**	**Motivation**		
PRE-MITIGATION				
Duration	Permanent (7)	Damage or destruction of the burial ground will be permanent	Consequence: Extremely detrimental (-21)	Significance: Major - negative (-126)
Extent	International (7)	Potential for next-of-kin to reside outside of South Africa. Reputational risk to Ergo will be international.		
Intensity x type of impact	Extremely high - negative (-7)	Universally accepted to have high value, where any impact will have a high intensity		
Probability	Highly probable (6)	Without mitigation measures, it is highly probable that the burial ground will be impacted		
MITIGATION: - Demarcate burial ground to make it clearly visible - Record through mapping and photographs - Include burial ground in monitoring programme for reclamation of mine dumps				
POST-MITIGATION				
Duration	Short term (2)	Demarcation will minimise the potential for impacts on the burial ground	Consequence: Slightly detrimental (-8)	Significance: Negligible - positive (24)
Extent	Very limited (1)	Where impacts may accidentally occur, these will be limited		
Intensity x type of impact	High - positive (5)	Mitigation will result in minor change to a heritage resource with a very high value		
Probability	Unlikely (3)	Mitigation will minimise potential damage or destruction of burial grounds		

11.4 Impact Assessment of the Historical Landscape

The identified heritage resources contribute to the significance of the historical landscape of the project area and Johannesburg as a whole. This resource contains aspects that fall within the following categories:

Category	Description
2.a	places, buildings, structures and equipment of cultural significance
2.b	places to which oral traditions are attached or which are associated with living heritage
2.c	historical settlements and townscapes
2.d	landscapes and natural features of cultural significance

The impacts on the historical landscape from the proposed reclamation activities associated with the Soweto Cluster Dumps are summarised in Table 11-5.

Table 11-5: Impact table for the historical landscape

IMPACT DESCRIPTION: Change to the Historical Landscape				
Predicted for project phase:	Pre-construction	Construction	Operation	Decommissioning
Dimension	**Rating**	**Motivation**		
PRE-MITIGATION				
Duration	Permanent (7)	Reclamation of the mine dumps will permanently alter the historic landscape	Consequence: Highly detrimental (-15)	Significance: Moderate - negative (-105)
Extent	Municipal Area (4)	The landscape is intrinsically associated with the development of Johannesburg		
Intensity x type of impact	Moderately high - negative (-4)	Major change to a resource with medium significance		
Probability	Certain (7)	This change will occur with the reclamation of the mine dumps		
MITIGATION: - Maintain the historic Durban Roodepoort Deep mining complex as tangible remnant of the historic landscape - Restore aspects of the Durban Roodepoort Deep mining village for community development- i.e. Training Centre - Encourage economic development through using existing infrastructure for community services and trade				
POST-MITIGATION				
Duration	Beyond project life (6)	As for pre-mitigation	Consequence: Moderately detrimental (-11)	Significance: Negligible - positive (33)
Extent	Limited (2)	The extent will be limited to the mine dumps		
Intensity x type of impact	Moderate - positive (3)	Mitigation measures will create a potential for job creation and economic development in line with the City of Johannesburg IDP		
Probability	Unlikely (3)	If mitigation measures are implemented it is unlikely that the historic landscape will be altered to the degree that the mining history is lost.		

12 Recommendation for a Heritage Management Plan

Recommendations were made taking into consideration the significance of resources, the identified risks and the impact assessment discussed in Section 11 above. These are discussed for both project and heritage related mitigation.

12.1 Project Related Mitigation

In general, project related mitigation measures, such as adjusting the impact footprint is unfeasible as the reclamation of the Soweto Cluster Dumps is dependent on their present location.

The alignment of the proposed pipeline primarily occurs within existing servitudes and does not impact any identified heritage resources. In the event that previously unknown heritage resources are identified within the present alignment, it is recommended that the pipeline route be adjusted to avoid change to the heritage resource.

12.2 Heritage Related Mitigation

No mitigation will be required for S.34-001 as this resource has a negligible heritage value, and has been sufficiently recorded. General heritage related mitigation measures for identified heritage resources with low – very high heritage significance include:

- Demarcation of the heritage resource to minimise potential for accidental damage; and
- Recording of the heritage resource through mapping and photographs to ensure, as a minimum, preservation by record.

For the burial ground S.36-001, monitoring of the site must be included in the EMPR to assess any cumulative or indirect impacts on the resource over time. In the event that impacts are identified through the monitoring programme, appropriate mitigation measures can be implemented to reduce or rectify the negative change to the resource.

In order to mitigate the historic landscape, it is recommended that the Durban Roodepoort Deep mining complex, inclusive of the mining village and head gear, be retained as a tangible remnant of the mining heritage associated with the development of the Johannesburg. To ensure its sustainability, it is recommended that the complex be restored with the intent to be utilised by the communities for community services and trade, in line with the objectives of the CoJ IDP.

13 Conclusion

The proposed Soweto Cluster Project is located within Gauteng Province. The project will entail the recovery of slimes by hydraulic monitoring and sands to be reclaimed by mechanical means resulting in slurry that will be pumped by way of pipelines to the Ergo beneficiation plant for gold recovery. This report presents the findings of an HIA undertaken in terms of s.38(8) of the NHRA as required in the statutory comments received from SAHRA (CaseID 4700) on 24 February 2014.

The identified heritage resources relate to the historical period and range from negligible to very high significance, and contribute to the historical landscape of the study area. The landscape – as a heritage resource – was determined to be of medium significance.

Issues associated with the proposed Soweto Cluster Project range from moderately – highly negative impacts. These impacts, if properly mitigated through the implementation of heritage related mitigation measures described in Section 12.2 above will be reduced to negligible positive in terms of their contribution to the retention of the historical landscape and potential economic development.

14 Bibliography

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Huffman, T. N., Hall, S. L. & Steel, R. H., 1991. *Archaeological Survey of the Rietfontein Housing Scheme, Southern Transvaal,* Gauteng: Unpublished report.

Lombard, M. et al., 2012. South African and Lesotho Stone Age Sequence Updated (I). *South African Archaeological Bulletin,* 67(195), pp. 123-144.

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Appendix A: CV

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

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 incompliance 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 work 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 Thohoyandou SEA Project	Limpopo Province, South Africa	2008 2008	Heritage Statement defining the cultural landscape of the Limpopo Province to assist in establishing sensitive receptors for the Eskom Thohoyadou SEA Project	Heritage Statement	Archaeologist	2 months	Eskom	Completed Heritage Statement	Heritage Contracts Unit Jaco van der Walt jaco.heritage@gmail.com
Wenzelrust Excavations	Shoshanguve, Gauteng, South Africa	2009 2009	Contracted by the Heritage Contracts Unit to help facilitate the Phase 2 excavations of a Late Iron Age / historical site identified in Shoshanguve	Excavation and Mapping	Archaeologist	1 week	Heritage Contracts Unit	Completed excavations	Heritage Contracts Unit Jaco van der Walt jaco.heritage@gmail.com
University of the Witwatersrand Parys LIA Shelter Project	Parys, Free State, South Africa	2009 2009	Mapping of a Late Iron Age rock shelter being studied by the Archaeology Department of the University of the Witwatersrand	Mapping	Archaeologist	1 day	University of the Witwatersrand	Completed mapping of the shelter	University of the Witwatersrand Karim Sadr karim.sadr@wits.ac.za
Transnet NMPP Line	Kwa-Zulu Natal, South Africa	2010 2010	Heritage Survey of the Anglo-Boer War Vaalkrans Battlefield where the servitude of the NMP pipeline	Heritage Impact Assessment	Archaeologist	1 week	Umlando Consultants	Completed survey	Umlando Consultants Gavin Anderson umlando@gmail.com
Archaeological Impact Assessment – Witpoortjie Project	Johannesburg, Gauteng, South Africa	2010 2010	Heritage survey of Witpoortjie 254 IQ, Mindale Ext 7 and Nooitgedacht 534 IQ for residential development project	Archaeological Impact Assessment	Archaeologist	1 week	ARM	Completed survey for the AIA	Archaeological Resources Management (ARM) Prof T.N. Huffman thomas.huffman@wits.ac.za
Der Brochen 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 Booysendal 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 Booysendal	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
Batlhako Mine Expansion	North-West Province, South Africa	2010	2010	Mapping of historical sites located within the Batlhako 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	Orientale 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	Orientale 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@randgoldreources.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@atkinsglobal.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	Orientale 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	Orientale 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

JOHAN NEL

Mr Johan Nel

Unit manager: Heritage Resources Management

Social Sciences

Digby Wells Environmental

1 EDUCATION

Date	Degree(s) or Diploma(s) obtained	Institution
2014	Integrated Heritage Resources Management Certificate, NQF Level 6	Rhodes University
2002	BA (Honours) (Archaeology)	University of Pretoria
2001	BA	University of Pretoria
1997	Matric with exemption	Brandwag Hoërskool

2 LANGUAGE SKILLS

Language	Speaking	Writing	Reading
English	Excellent	Excellent	Excellent
Afrikaans	Excellent	Excellent	Excellent

3 EMPLOYMENT

Period	Company	Title/position
09/2011 to present	Digby Wells Environmental	Manager: Heritage Resources Management unit
05/2010-2011	Digby Wells Environmental	Archaeologist
10/2005-05/2010	Archaic Heritage Project Management	Manager and co-owner
2003-2007		Freelance archaeologist
	Rock Art Mapping Project	Resident archaeologist

2002-2003	Department of Anatomy, University of Pretoria	Special assistant: Anthropology
2001-2002	Department of Anatomy, University of Pretoria	Technical assistant
1999-2001	National Cultural History Museum & Department of Anthropology and Archaeology, UP	Assistant: Mapungubwe Project,

4 EXPERIENCE

Johan Nel has 13 years of combined experience in the field of cultural heritage resources management (HRM) including archaeological and heritage assessments, grave relocation, social consultation and mitigation of archaeological sites. I have gained experience both within urban settings and remote rural landscapes. Since 2010 I have been actively involved in environmental management that has allowed me to investigate and implement the integration of heritage resources management into environmental impact assessments (EIA). Many of the projects since have required compliance with International Finance Corporation (IFC) requirements and other World Bank standards. This exposure has allowed me to develop and implement a HRM approach that is founded on international best practice and leading international conservation bodies such as UNESCO and ICOMOS. I have worked in most South African Provinces, as well as Swaziland, the Democratic Republic of the Congo, Liberia and Sierra Leone. I am fluent in English and Afrikaans, with excellent writing and research skills.

5 PROFESSIONAL REGISTRATION

Position	Professional Body	Registration Number
Council member	Association for Southern African Professional Archaeologists (ASAPA); ASAPA Cultural Resources Management (CRM) section	095
Member	International Association of Impact Assessors (IAIA)	N/A
Member	International Council on Monuments and Sites (ICOMOS)	
Member	Society for Africanist Archaeologists (SAfA)	N/A

6 PUBLICATIONS AND CONFERENCE PAPERS

Authors and Year	Title	Published in/presented at

Nel, J. (2001)	Cycles of Initiation in Traditional South African Cultures.	South African Encyclopaedia (MWEB).
Nel, J. 2001..	Social Consultation: Networking Human Remains and a Social Consultation Case Study	Research poster presentations at the. Bi-annual Conference (SA3) Association of Southern African Professional Archaeologists the National Museum, Cape Town
Nel, J. 2002.	Collections policy for the WG de Haas Anatomy museum and associated Collections.	Unpublished. Department of Anatomy, School of Medicine: University of Pretoria.
Nel, J. 2004..	Research and design of exhibition for Eloff Belting and Equipment CC	Institute of Quarrying 35th Conference and Exhibition on 24 – 27 March 2004
Nel, J. 2004.	Ritual and Symbolism in Archaeology, Does it exist?	Research paper presented at the Bi-annual Conference (SA3) Association of Southern African Professional Archaeologists: Kimberley
Nel, J & Tiley, S. 2004.	The Archaeology of Mapungubwe: a World Heritage Site in the Central Limpopo Valley, Republic of South Africa.	Archaeology World Report, (1) United Kingdom p.14-22.
Nel, J. 2007.	The Railway Code: Gautrain, NZASM and Heritage.	Public lecture for the South African Archaeological Society, Transvaal Branch: Roedean School, Parktown.
Nel, J. 2009.	Un-archaeologically speaking: the use, abuse and misuse of archaeology in popular culture.	The Digging Stick. April 2009. 26(1): 11-13: Johannesburg: The South African Archaeological Society.
Nel, J. 2011.	'Gods, Graves and Scholars' returning Mapungubwe human remains to their resting place.' In: Mapungubwe Remembered.	University of Pretoria commemorative publication: Johannesburg: Chris van Rensburg Publishers.
Nel, J. 2012	HIAs for EAPs.	. Paper presented at IAIA annual conference: Somerset West.

Nel, J. 2013.	The Matrix: A proposed method to evaluate significance of, and change to, heritage resources.	Paper presented at the 2013 ASAPA Biennial conference: Gaborone, Botswana.
Nel, J. 2013	HRM and EMS: Uncomfortable fit or separate process.	. Paper presented at the 2013 ASAPA Biennial conference: Gaborone, Botswana.

7 PROJECT EXPERIENCE

- 2003-2004. Freelance consulting archaeologist. Archaeological Impact Assessment. Roodt&Roodt. RSA. Limpopo, Mpumalanga, Northwest. Project manager/specialist
- 2004-2005. Resident archaeologist Rock Art Mapping Project. Archaeological surveys. UKZN. RSA. Didima, KZN. Specialist
- 2006. Exploratory excavation of an unknown cemetery at Du Preezhoek, Fountains Valley, Portion 383 of the farm Elandspoort 357 JR, Pretoria, Gauteng. Section 36 Grave relocation. Bombela Civil Joint Venture. RSA. Pretoria, Gauteng. Specialist
- 2006. Report on exhumation, relocation and re-internment of 49 graves on Portion 10 of the farm Tygervallei 334 JR, Kungwini Municipality, Gauteng. Section 36 Grave relocation. D. Georgiades East Farm (Pty) Ltd. RSA. Kungwini, Gauteng. Specialist
- 2006. Social consultation for Elawini Lifestyle Estate Grave Relocation. Section 36 Consultation. PGS (Pty) Ltd. RSA. Nelspruit, Mpumalanga. Project manager/specialist
- 2007-2008. Research report on the remains of kings Mampuru I and Nyabela. Research report. National Department of Arts and Culture. RSA. Graafwater, Western Cape. Specialist
- 2007. Summary report: Old dump on premises of the new Head Offices, Department of Foreign Affairs, Pretoria, Gauteng. Archaeological Impact Assessment. Imbumba-Aganang D & C Joint Venture. RSA. Pretoria, Gauteng. Project manager/specialist
- 2007. Final consolidated Heritage Impact Assessment report: Proposed development of high-cost housing and filling station, Portion of the farm Mooiplaats 147 JT. Heritage Impact Assessment. Go-Enviroscience. RSA. Schoemanskloof, Mpumalanga. Project manager/specialist
- 2007. Final consolidated report: Watching Brief on Soutpansberg Road Site for the new Head Offices of the Department of Foreign Affairs, Pretoria Gauteng. Section 35 Phase 2 Archaeological Mitigation. Imbumba-Aganang D & C Joint Venture. RSA. Pretoria, Gauteng. Project manager/specialist
- 2007. Recommendation of Exemption: Above ground SASOL fuel storage tanks located at grain silos in localities in the Eastern Free State. Request for Exemption. SASOL (Pty) Ltd. RSA. Eastern Free State. Project manager/specialist

- 2007. Final consolidated report: Phase 2 test excavations ascertaining the existence of alleged mass graves, Tlhabane West, Extension 2, Rustenburg, Northwest Province. Section 36 Test excavations. Bigen Africa Consulting Engineers. RSA. Rustenburg, Northwest. Project manager/specialist
- 2007. Archaeological investigation of Old Johannesburg Fort. Section 35 Phase 2 Archaeological Mitigation. JDA. RSA. Johannesburg, Gauteng. Project manager/specialist
- 2007. Social consultation for Motaganeng Residential Development Grave Relocation. Section 36 Consultation. PGS (Pty) Ltd. RSA. Burgersfort, Limpopo. Project manager/specialist
- 2007. Repatriation of Mapungubwe Human Remains. Repatriation. DEAT. RSA. Mapungubwe, Limpopo. Project manager/specialist
- 2007. Research report on cultural symbols. Research report. Ministery of Intelligence Services. RSA. Graafwater, Western Cape. Project manager/specialist
- 2008. Phase 1 Heritage and Archaeological Impact Assessment: Proposed establsihement of an access road between Sapekoe Drive and Koedoe Street, Erf 3366 (Extension 22) and the Remainder of Erf 430 (Extension 4). Archaeological Impact Assessment. AGES (Polokwane). RSA. Tzaneen, Limpopo. Specialist
- 2008. Heritage Impact Assessment for proposed water pipeline routes, Mogalakwena District, Limpopo Province. Heritage Statement. AGES (Polokwane). RSA. Mogalakwena District Municipality, Limpopo. Specialist
- 2008. Final report: Heritage resources Scoping survey and preliminary assessment for the Transnet Freight Line EIA, Eastern Cape and Northern Cape. Heritage Statement. Transnet. RSA. Eastern Cape; Northern Cape. Specialist
- 2008. Heritage resources scoping survey and preliminary assessment: Proposed establishment of township on Portion 28 of the farm Kennedy's Vale 362 KT, Steelpoort, Limpopo Province. Heritage Statement. AGES (Polokwane). RSA. Steelpoort, Limpopo. Specialist
- 2008. Report on skeletal material found at Pier 30, R21 Jones Street offramp, Kempton Park. Heritage Statement. Bombela Civil Joint Venture. RSA. Kempton Park, Gauteng. Specialist
- 2008. Social consultation for Smoky Hills Platinum Mine Grave Relocation. Section 36 Consultation. PGS (Pty) Ltd. RSA. Maandagshoek, Limpopo. Specialist
- 2008. Southstock Collieries Grave Relocation. Section 36 Grave relocation. Doves Funerals, Witbank. RSA. Southstock, Mpumalanga. Specialist
- 2008. Social consultation for Zondagskraal Coal Mine Grave Relocation. Section 36 Consultation. PGS (Pty) Ltd. RSA. Zondagskraal, Mpumalanga. Specialist

- 2009. Proposed road upgrade of existing, and construction of newroads in Burgersfort, Limpopo Province. Archaeological Impact Assessment. AGES (Polokwane). RSA. Burgersfort, Limpopo. Specialist
- 2009. Randwater Vlakfontein-Mamelodi water pipeline survey. Heritage Impact Assessment. Archaeology Africa cc. RSA. Pretoria, Gauteng. Specialist
- 2009. Van Reenen Eco-Agri Development Project. Heritage Impact Assessment. Go-Enviroscience. RSA. Vanreenen, Freestate/KwaZulu-Natal. Specialist
- 2009. Social consultation for Zonkezizwe Grave Relocation. Section 36 Consultation. PGS (Pty) Ltd. RSA. Midrand, Gauteng. Specialist
- 2009. Heritage Impact Assessment for conversion of PR to MRA. Heritage Impact Assessment. Georock Environmental. RSA. Musina, Limpopo. Specialist
- 2010-2012. Kibali Gold Mine Grave Relocation. International grave relocation project. Randgold Resources. DRC. Watsa, Province Orientale. Specialist
- 2010. Archaeological Impact Assessment for Galaxy Gold Mine Tailings Dam Extension, Barberton, Mpumalanga Province. Archaeological Impact Assessment. Galaxy Gold. RSA. Barberton, Mpumalanga. Specialist
- 2010. Archaeological Impact Assessment for the HCI Khusela Coal: Palesa Extension ESIA Update on portions of the farm Roodepoort 349 JR, Thembisile Local Municipality (Mpumalanga) and Kungwini Municipality (Gauteng). Archaeological Impact Assessment. HCI Khusela. RSA. Mpumalanga; Gauteng. Specialist
- 2010. Heritage scoping survey for the amendment of the existing City Deep EMP for the reclamation of Slimes Dam 3/L/42 and 3/L/40. Heritage Statement. Crown Gold Recoveries. RSA. Johannesburg, Gauteng. Specialist
- 2010. Letter of Recommendation of Exemption for the proposed Crown Gold Recoveries (Pty) Litd Pipeline Project. Request for Exemption. Crown Gold Recoveries. RSA. Johannesburg, Gauteng. Specialist
- 2010. Mitigation of an archaeological metalworking site for Kibali Gold Mine. Archaeological mitigation. Randgold Resources. DRC. Watsa, Province Orientale. Specialist
- 2010. Heritage Impact Assessment for Nzoro Hydropower Station. Heritage Impact Assessment. Randgold Resources. DRC. Watsa, Province Orientale. Specialist
- 2010. Heritage Impact Assessment for Temo Coal EIA. Heritage Impact Assessment. Temo Coal. RSA. Steenbokpan, Limpopo. Specialist
- 2011-2012. Platreef Platinum Mine Burial Grounds and Graves Census. Burial Grounds and Graves Census. Platreef (Pty) Ltd. RSA. Mokopane, Limpopo. Project manager/specialist
- 2011. Addendum to Phase 1 Archaeological Impact Assessment for the Boikarabelo Coal Mine (proposed railway link from the farm Kruishout to the farm Buffelsjagt). Archaeological Impact Assessment. Resources Generation. RSA. Lephalale, Limpopo. Project manager/specialist

- 2011. Heritage Impact Assesment for Koidu Diamond Mine. Heritage Impact Assessment. Koidu . Sierra Leone. Koidu, . Project manager/specialist
- 2011. Mitigation of an archaeological metalworking site for Koidu Diamond Mine. Archaeological mitigation. Koidu . Sierra Leone. Koidu, . Project manager/specialist
- 2011. Nzoro hydropower station ESIA. Heritage Impact Assessment. Randgold Resources. DRC. Watsa, Province Orientale. Project manager/specialist
- 2011. Specialist review of Heritage Impact Assessment report for Zod Gold Mine, Armenia. Review report. Zod Gold Mine. Armenia. Desktop review. Project manager/specialist
- 2012. Phase 1 Archaeological Impact Assessment for MBET Pipeline. Archaeological Impact Assessment. Resources Generation. RSA. Lephalale, Limpopo. Project manager/specialist
- 2012. Heritage Impact Assessment for the Witwatersrand Goldfields Acid Mine Drainage Project (Western Basin). Heritage Impact Assessment. BKS (PTY) LTD. RSA. Johannesburg, Gauteng. Project manager/specialist
- 2012. Phase 1 Heritage Impact Assessment of the proposed Geluksdal Tailings Storage Facility and Pipeline Infrastructure. Heritage Impact Assessment. Gold One. RSA. Johannesburg, Gauteng. Project manager/specialist
- 2012. Heritage Statement for the Central Basin, Witwatersrand AMD Project. Heritage Statement. BKS (PTY) LTD. RSA. Johannesburg, Gauteng. Project manager/specialist
- 2012. Heritage Statement for Rhodium Reefs Ltd Platinum Operation, 2430CA & CC, De Goedeverwachting 332 KT; Boschkloof 331 KT; Belvedere 362 KT; Kennedy's Vale 361 KT; and Tweefontein 360 KT, Limpopo. Heritage Statement. Eastplats Group. RSA. Steelpoort, Limpopo. Project manager/specialist
- 2012. Notification of Intent to Develop: Proposed Aggeneys Photo-voltaic soal power plant on Portion 1 of the farm Aroams 57 RD, Northern Cape (DEA ref: 12/12/20/2630). Heritage Statement. Orlight Solar. RSA. Aggeneys, Northern Cape. Specialist
- 2012. Notification of Intent to Develop: Proposed Kenhardt Photo-voltaic soal power plant on RE of the farm Klein Zwartbast 188 RD, Northern Cape (DEA ref: 12/12/20/2631). Heritage Statement. Orlight Solar. RSA. Kenhardt, Northern Cape. Project manager/specialist
- 2012. Notification of Intent to Develop: Proposed Loeriesfontein Photo-voltaic soal power plant on Portion 1 of the farm Klein Rooiberg 227 RD, Northern Cape (DEA ref: 12/12/20/2632). Heritage Statement. Orlight Solar. RSA. Loeriesfontein, Northern Cape. Specialist
- 2012. Notification of Intent to Develop: Proposed Vanrhynsdorp Photo-voltaic soal power plant on RE of the farm Paddock 257 RD, Western Cape (DEA ref: 12/12/20/2633). Heritage Statement. Orlight Solar. RSA. Vanrhynsdorp, Western Cape. Project manager/specialist
- 2012. Notification of Intent to Develop: Proposed Graafwater Photo-voltaic soal power plant on Portion 1 of the farm Graafwater 97 RD amd RE of Bueroskraal 220 RD, Western Cape

(DEA ref: 12/12/20/2636). Heritage Statement. Orlight Solar. RSA. Graafwater, Western Cape. Specialist

- 2012. Phase 2 archaeological impact assessment mitigation for Boikarabelo Coal Mine (SAHRA Permit No: 80/11/07/015/51). . Section 35 Phase 2 Archaeological Mitigation. Resources Generation. RSA. Steenbokpan, Limpopo. Project manager/specialist
- 2012. Final Phase 2 archaeological impact assessment mitigation report for Boikarabelo Coal Mine, Limpopo (SAHRA Permit No: 80/11/07/015/51). . Section 35 Phase 2 Archaeological Mitigation. Resources Generation. RSA. Steenbokpan, Limpopo. Specialist
- 2012. Holder of Destruction Permit No. 84 for archaeological sites at Boikarabelo Coal Mine. Section 35 Destruction permit. Resources Generation. RSA. Steenbokpan, Limpopo. Project manager/specialist
- 2012. Specialist review of Heritage Impact Assessment report for Mkuju Uraniam Mine. Review report. Uranex . Zambia. Desktop review. Project manager/specialist
- 2013. Heritage Impact Assessment for the proposed Consbrey Colliery Project, 2629BB and 2629BD, Mpumalanga Province. Heritage Impact Assessment. Msobo Coal. RSA. Breyten, Mpumalanga. Project manager/specialist
- 2013. Heritage Impact Assessment for Rhodium Reef Limited Platinum Operation, 2430CC Kennedys Vale, De Goedeverwachting 332 KT, Limpopo Province. Heritage Impact Assessment. Rhodium Reefs Limited. RSA. Steelpoort, Limpopo. Project manager/specialist
- 2013. Heritage Statement for the Consbrey Colliery. Heritage Statement. Msobo Coal. RSA. Chrissiesmeer, Mpumalanga. Project manager/specialist
- 2013. Heritage Statement for the Harwar Colliery. Heritage Statement. Msobo Coal. RSA. Chrissiesmeer, Mpumalanga. Project manager/specialist
- 2013. Heritage Statement for the Waterberg Prospecting Rights Application, Blouberg, Limpopo Province. Heritage Statement. Platinum Group Metals Ltd. RSA. Breyten, Mpumalanga. Specialist
- 2013. Destruction Permit Application Report for Kangala Coal Project. Section 34 Built Environment Permit. Universal Coal (Pty) Ltd. RSA. Delmas, Mpumalanga. Specialist
- 2013. Holder of Destruction Permit No. 399 for archaeological sites at Boikarabelo Coal Mine. Section 35 Destruction permit. Resources Generation. RSA. Steenbokpan, Limpopo. Project manager/specialist
- 2013. Relocation of graves in Kinjor and Larjor for Aureus New Liberty Gold Mine. International grave relocation project. Aureus Mining. Liberia. Kinjor. Specialist
- 2013. New Liberty Gold Mine Grave Relocation Plan. International grave relocation project. Aureus Mining. Liberia. Kinjor. Project manager/specialist
- 2013. Thabametsi Coal Mine Burial Grounds and Graves Census. Burial Grounds and Graves Census. Exxaro Coal. RSA. Lephalale, Limpopo. Specialist

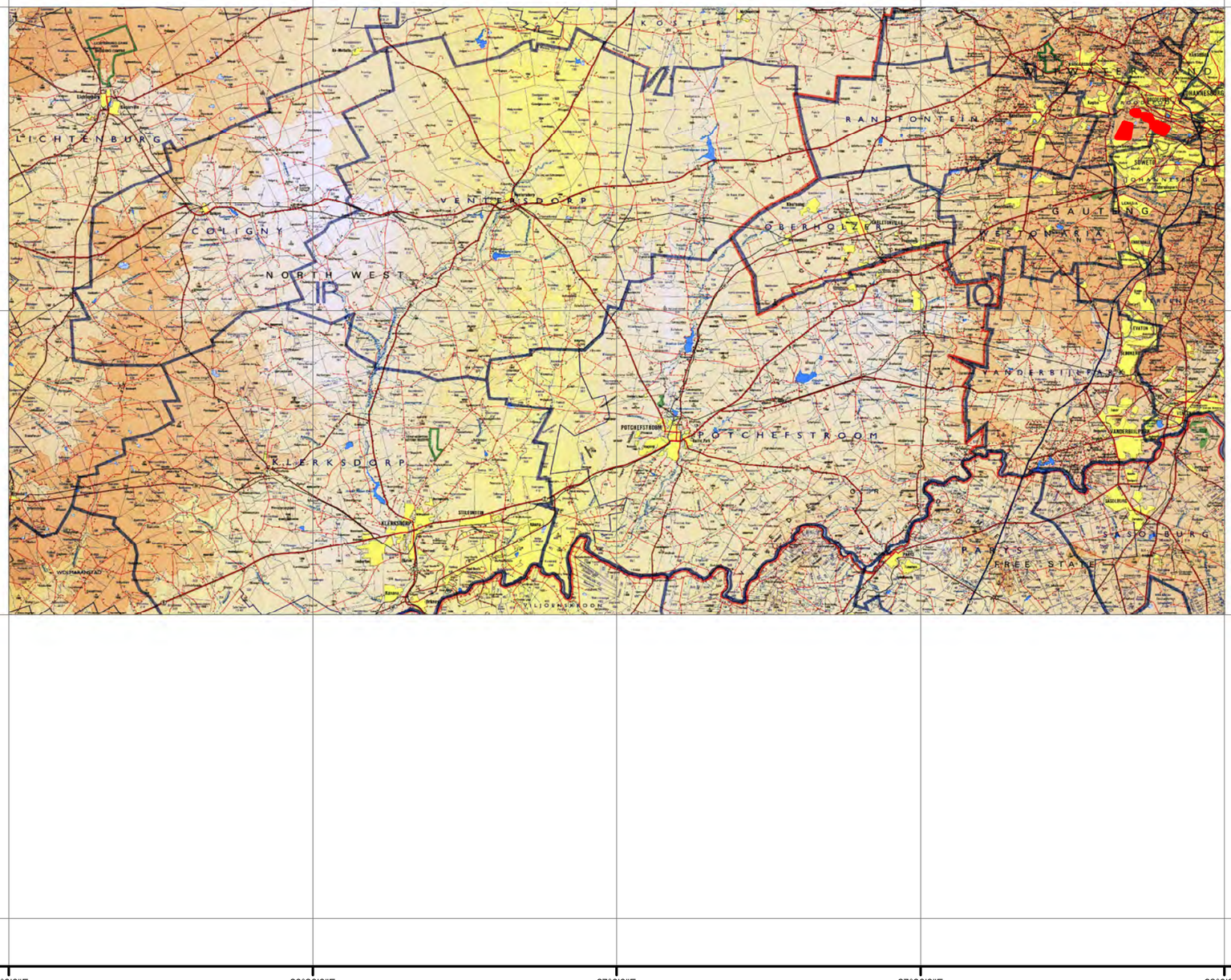
- 2013. Bokoni Platinum Mine Burial Grounds and Graves Census. Burial Grounds and Graves Census. Bokoni Platinum. RSA. Atok, Limpopo. Specialist
- 2013. Specialist review of Heritage Impacts Assessment for Songwe REE project. Review report. Mkango Resources. Malawi. Desktop review. Project manager/specialist
- 2013: Heritage Impact Assessment for the Platreef Platinum Mine EIA project. Platreef Resources. RSA. Mokopane, Limpopo. Specialist project manager.

Appendix B: Plans and Site List

Plan 1

Ergo Soweto Cluster

Regional Setting 1:250 000



Legend

Prospecting Right Area

2626 Wes-Rand

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Kilometres
1:900 000

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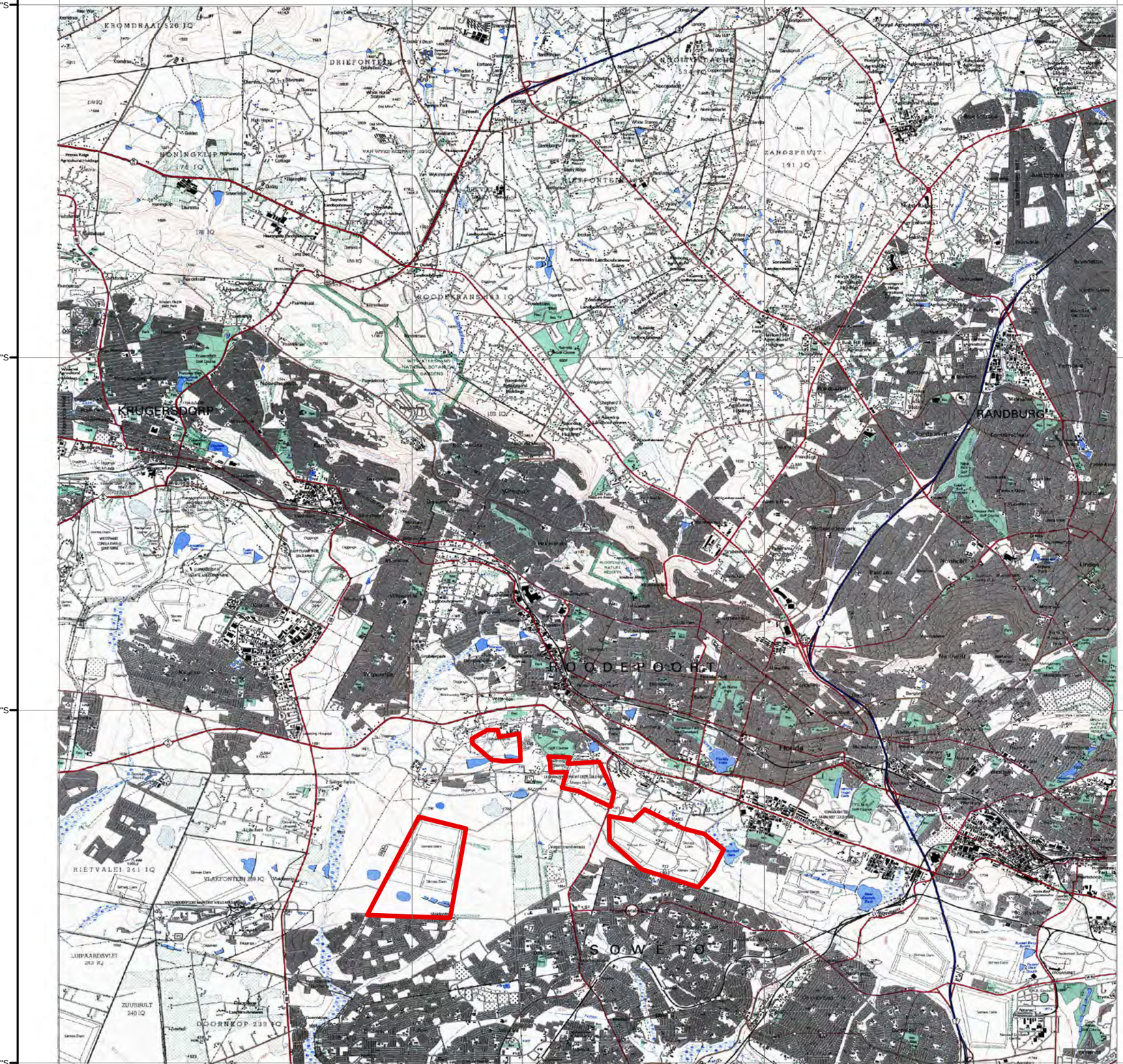
Plan 2

Ergo Soweto Cluster

Regional Setting 1:50 000

27°45'0"E 27°50'0"E 27°55'0"E 28°0'0"E

26°0'0"S 26°5'0"S 26°10'0"S 26°15'0"S



Legend

Project Rights Area

2627BB Roodepoort

DIGBY WELLS ENVIRONMENTAL

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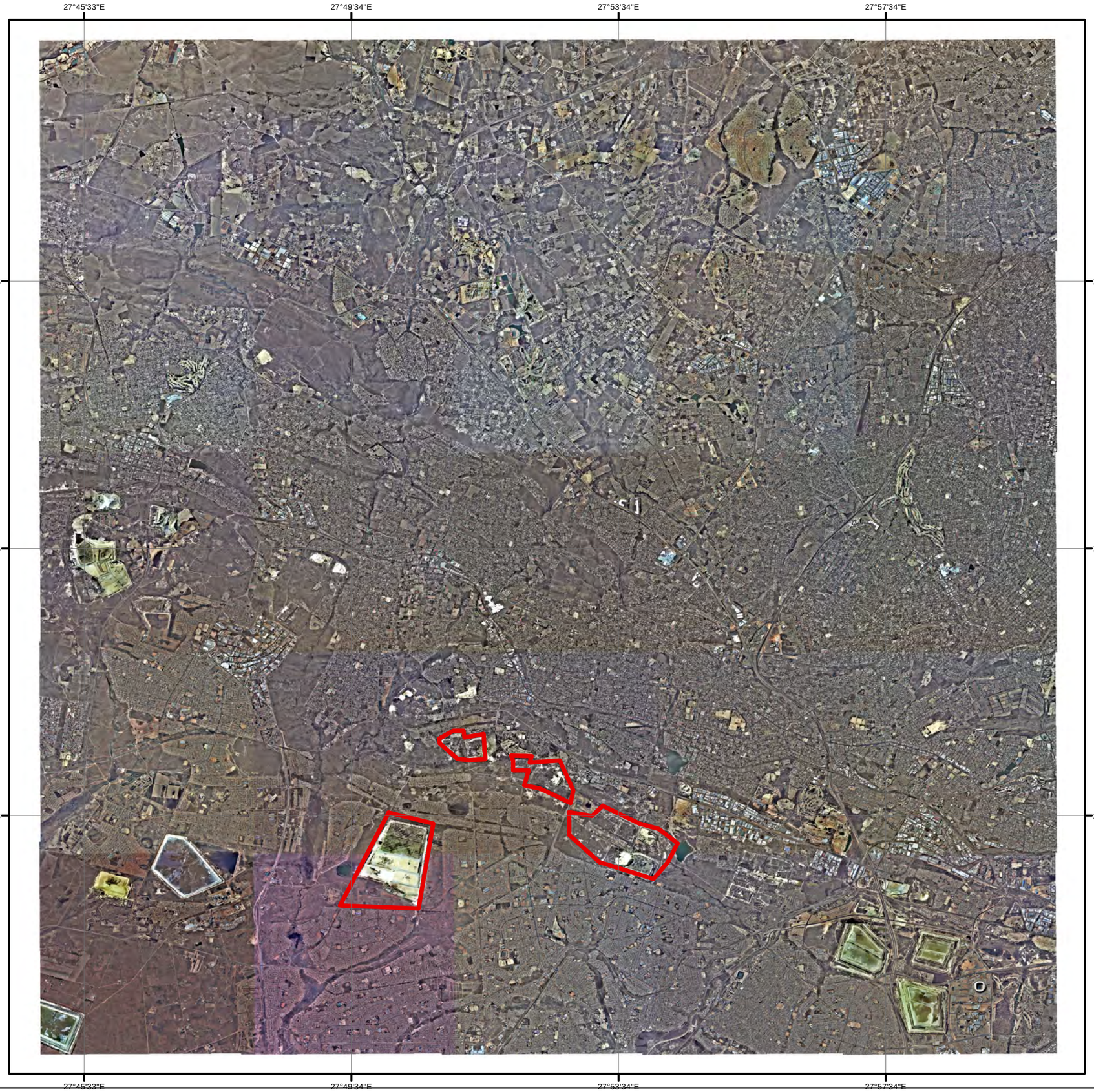

Plan 3

Ergo Soweto Cluster

Regional Setting 1:10 000

Legend

Prospecting Right Area

2627BB

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Central Meridian: 27°E

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Revision Number: 1
Date: 15/01/2014

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Kilometres
1:110 000

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Plan 4

Ergo Soweto Cluster

Regional Geology

27°45'0"E 27°50'0"E 27°55'0"E

26°5'0"S 26°10'0"S 26°15'0"S

Krugersdorp
Honeydew
Luipaardsvlei
Roodepoort
Florida
Soweto
Eldorado Park

R28 PAARDEKRAAL
R24
R24 LUIPAARD
M18 VOORTREKKER
M47 HENDRIK POTGIETER
M67 DOREEN
M67 C.R. SWART
WILGESPRUIT
M6 JOHN VORSTER
M5 BEYERS NAUDE
M6 YSTERHOUT
KLEINJUKSKEIRIVIER
M13 REPUBLIC
R24 MAIN REEF
M18 ONTDEKKERS
M8 PENDORING
M8 14th
M8 WILLIAM NICOL
R24 HOOF
R41 RANDFONTEIN
R24 HAMBERG
R41 MAIN REEF ROAD EAST
R24 LOLA
R24 9th
M18 MAIN
M10 FUEL
R24 MARAISBURG
NUWESTERN BYPASS
R41 NADINE
M77 DOBSONVILLE
M70 VAN ONSELEN
M70 MODISE
M10 CANADA
M10 KLIPSPRUIT VALLEY
M70 SOWETO HIGHWAY
M79 MAHALEFELE
M79 PELA
M79 MASUPHA
M83 IMMINK
M79 RAND SHOW
BAILEY SPRUIT
DIEPKLOOFSPRUIT
N12
M77 ROODEPOORT
M72 KOMA
M68 MAIN
M68 POTCHEFSTROOM
N1
R28
M13
R41
KLIPRIVIER
N12

Hospital Hill Sbgrp, West Rand Grp
Johannesburg Sbgrp, Central Rand Grp
Government Sbgrp, West Rand Grp
Halfway House Granite
Swazian Erathem
Jeppestown Sbgrp, West Rand Grp
Dwyka Grp, Karoo Spgrp
Turffontein Sbgrp, Central Rand Gr
Black Reef Fm, Transvaal Spgrp
Klipriviersberg Grp, Ventersdorp Spgrp
Malmani Sbgrp, Chuniespoort Grp
Ecca Grp, Karoo Spgrp

Legend

- Prospecting Right Area
- Major Town
- Other Town
- Settlement
- National Route
- Main Road
- Minor Road
- Railway
- Non-Perennial Stream
- Perennial Stream
- Dam
- Wetland
- Non-Perennial Pan
- Perennial Pan

Geology

- Black Reef Fm, Transvaal Spgrp
- Dwyka Grp, Karoo Spgrp
- Ecca Grp, Karoo Spgrp
- Government Sbgrp, West Rand Grp
- Halfway House Granite
- Hospital Hill Sbgrp, West Rand Grp
- Jeppestown Sbgrp, West Rand Grp
- Johannesburg Sbgrp, Central Rand Grp
- Klipriviersberg Grp, Ventersdorp Spgrp
- Malmani Sbgrp, Chuniespoort Grp
- Swazian Erathem
- Turffontein Sbgrp, Central Rand Gr

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Revision Number: 1
Date: 15/01/2014

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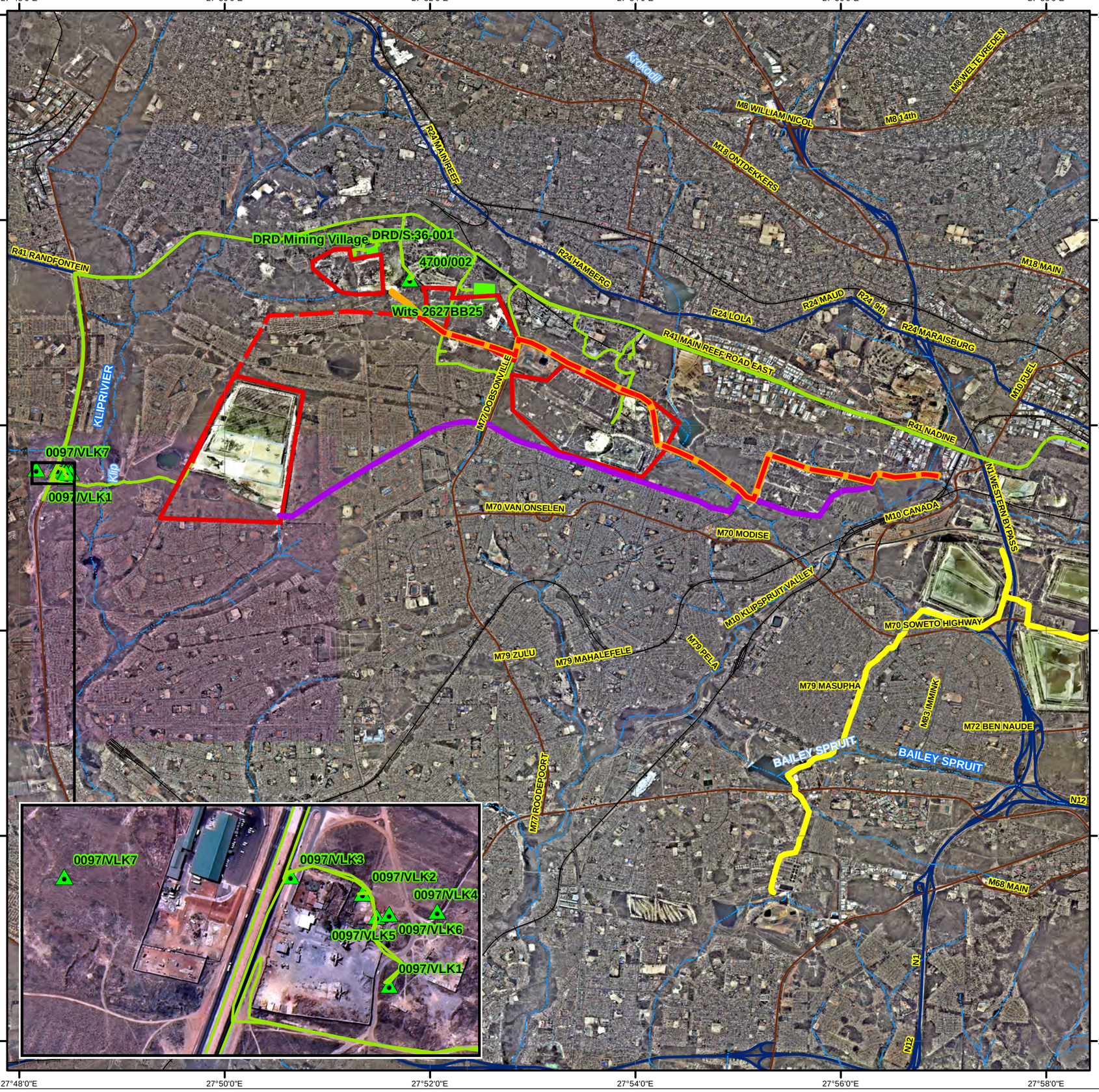
Kilometres
1:100 000

Plan 5a

Ergo Soweto Cluster

Heritage Sites



Legend

- Prospecting Right Area
- Identified Heritage Points
- Identified Heritage Tracks
- Identified Heritage Areas
- National Route
- Main Road
- Minor Road
- Railway
- Non-Perennial Stream
- Perennial Stream

Proposed Pipeline

- Alternative Route 1
- Alternative Route 2
- Preferred Route
- Existing Goudkoppies Pipeline

DIGBY WELLS ENVIRONMENTAL

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

Projection: Transverse Mercator
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Central Meridian: 27°E

Ref #: pks.ERG2613.201401.072
Revision Number: 1
Date: 15/01/2014

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Kilometres

1:72 000

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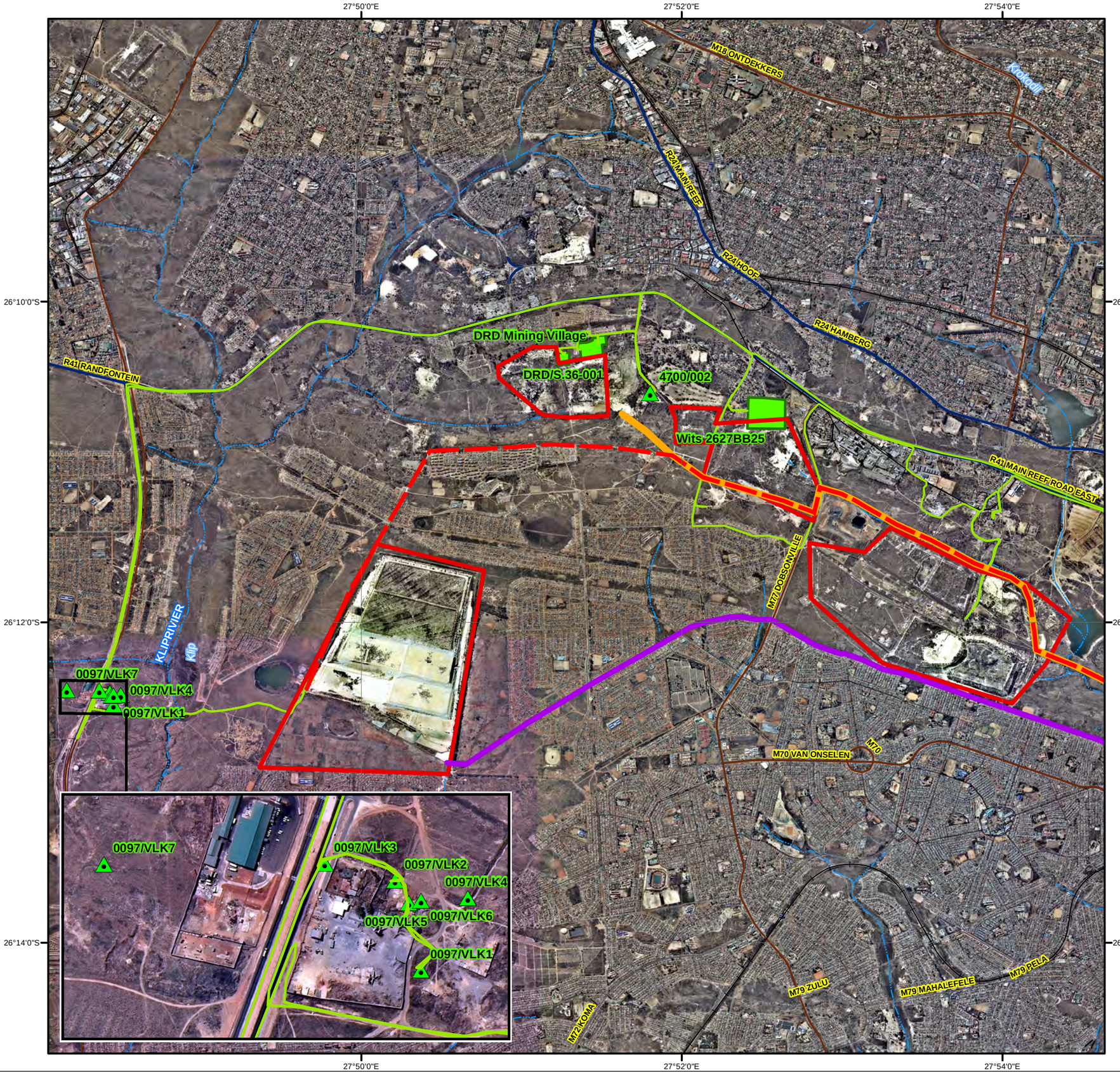
Plan 5b

Ergo Soweto Cluster

Heritage Sites



Legend

- Prospecting Right Area
- Identified Heritage Points
- Identified Heritage Tracks
- Identified Heritage Areas
- National Route
- Main Road
- Minor Road
- Railway
- Non-Perennial Stream
- Perennial Stream
- Existing Goudkoppies Pipeline

Proposed Pipeline

- Alternative Route 1
- Alternative Route 2
- Preferred Route

DIGBY WELLS ENVIRONMENTAL

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

Projection: Transverse Mercator	Ref #: pks.ERG2613.201401.072
Datum: WGS84	Revision Number: 1
Central Meridian: 27°E	Date: 15/01/2014

N

0 0.5 1 2

Kilometres

1:45 000

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Site Name	NHRA Section	x	y	Description
2001-SAHRA-0111/Site 1	s.35	-26.18875	27.851639	2 Stone Age lithics near pan (Also reference on the Wits Database as 2627BB33
2006-SAHRA-0097/VLK1	s.37	-26.20857	27.807573	S.37 - Vlakfontein Monument
2006-SAHRA-0097/VLK2	s.37	-26.20732	27.807187	S.37 - Jameson Surrender
2006-SAHRA-0097/VLK3	s.37	-26.20707	27.806102	S.37 - Jameson Raid Memorial
2006-SAHRA-0097/VLK4	s.34	-26.20757	27.808309	Waenhuis / Stables
2006-SAHRA-0097/VLK5	s.34	-26.20763	27.807397	Historic house possibly older than 60 years
2006-SAHRA-0097/VLK6	s.34	-26.2076	27.807584	Historic house possibly older than 60 years
2006-SAHRA-0097/VLK7	s.36	-26.20705	27.802694	Burial ground for farm workers on Vlakfontein
2007-SAHRA-0407/Site 1	s.34	-26.18875	27.851639	Historic buildings
2627BB25	s.34	-26.182892	27.875488	Rand Leases
DRD/S.36-001	s.36	-26.172321	27.854679	DRD Cemetery

Appendix C: Impact Matrix Methodology

DIGBY WELLS ENVIRONMENTAL
HERITAGE IMPACT MATRIX
METHODOLOGY

HRM UNIT MANAGER: JOHAN NEL

FEBRUARY 2014

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

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1 INTRODUCTION

The impact assessment stage includes several steps aimed to evaluate the way in which environmental aspects will/may interact with the cultural landscape (the environment) resulting in environmental impacts to heritage resources. Environmental aspects and impacts are defined as:

- *Environmental aspects*: an element of an organisation's activities or products or services that can interact with the environment' (ISO 14001: 2004 - 3.6); and
- *Environmental impacts*: any change to the environment, whether adverse or beneficial, wholly or partially resulting from an organization's environmental aspects (ISO 14001: 2004 - 3.7).

However, in terms of cultural heritage resources, environmental impacts should be assessed relative to the heritage value or significance of a resource. The methodology employed in the various stages of the impact assessment process is described in more detail below.

2 STATEMENT OF SIGNIFICANCE OR VALUE

Heritage resources – both cultural and natural – are finite, non-renewable and irreplaceable. They characterise community identity and cultures and are therefore are intrinsic to the history and beliefs of communities. As sources of information, heritage resources have inherent potential to contribute significantly to research, education and tourism, as well as allowing capacity for reconciliation, understanding and mutual respect.

Considering the innate value of heritage resources, the foundation of heritage resources management (HRM) is the acknowledgement that heritage resources have lasting worth as evidence of the origins of life, humanity and society. Every generation is therefore morally obligated to act as trustees of heritage for future generations through conservation, preservation and protection.

Accordingly, HRM must take into account rights of affected communities to be consulted and to participate. Where heritage resources are developed and presented the dignity and respect of diverse cultural values must be ensured. In addition, heritage in its broadest sense must never be used for sectarian purposed or political gain.

Notwithstanding the fundamental value ascribed to heritage, significance of individual resources needs to be determined to allow implementation of appropriate management measures. This is achieved through assessing a heritage resource's value relative to certain prescribed criteria, encapsulated in international conventions as well as national legislation. This is addressed in Section 2.1 below.

The significance/value is established by determining the level of importance taking and assessing the degree of integrity of cultural heritage resources. A resource's value thus influences the intensity of environmental impacts. As a result, environmental impacts that are rated low may cause severe change in a heritage resources rated as highly significant. Vice versa, severe impacts may cause negligible change to an insignificant resource.

The steps involved in determining the value of a heritage resource is described in more detail below.

2.1 Importance

The importance of a heritage resource is determined on four dimensions – aesthetic, historic, scientific, and social. In turn, each dimension is measured against one or more descriptive attributes, defined in national legislation and international convention: NHRA (1999), UNESCO World Heritage Convention (1972), ICOMOS Guidance on Heritage Impact Assessments for Cultural World Heritage Properties and the Australian ICOMOS Charter for Places of Cultural Significance (1999) (Burra Charter). These attributes, or criteria, are aimed to provide a guide as to whether a resource should be included in the national estate as defined in these documents and presented in Table 2-1 below.

Importance of each dimension and subsequent attributes must be considered in relation to the resource's authenticity. Notions of authenticity are addressed under Section 2.1.1. Importance ratings must be informed and motivated by certain information sources. The credibility of information sources must therefore be evaluated and referred to when importance is discussed. Credibility is addressed under Section 2.1.2.

Table 2-1: Summary of dimensions and attributes

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

2.1.1 Authenticity

Authenticity is an integral concept in cultural heritage resources management and must be considered when determining significance/value of cultural landscapes and heritage resources. The Nara Document on Authenticity (Nara Document) (1993) forms the basis of determining authenticity. Authenticity can refer to design, material, workmanship and setting of a resource. Aesthetic and historical aspects of a landscape or site including its physical, social and historical context, use and function are also covered (Winter & Baumann, 2005, p. 4).

Determining authenticity of a resource requires a sound knowledge of the type of heritage resource as well as the context within which occurs – the cultural landscape. This knowledge can only be gained through a detailed baseline accessing credible information sources.

2.1.2 Credibility

The Nara Document (1993) accepts that understanding authenticity and thus determining importance attributed to heritage resources rely on credible information sources. Information sources are defined as all physical, written, oral, and figurative sources, which make it possible to know the authenticity – nature, specificities, meaning, and history – of cultural heritage resources. This requires knowledge and understanding of information sources employed in relation to original and subsequent characteristics of heritage resources, and their meaning.

Information that should be considered are published, peer reviewed literature, archival research, popular publications, and any other information source that may be relevant (Nara Document on Authenticity, 1993).

Information sources need to be assessed as credible and truthful and referenced when determining importance of a resource and in motivation of its authenticity. Credibility of information sources forms the basis in determining the importance of heritage resources. The importance rating per dimension and attribute discussed above is thus intrinsically linked to the credibility of information sources used.

2.2 Integrity

Integrity is determined by examining the physical condition of a heritage resource – as witnessed at the time of assessment – compared to an ideal or other existing example. Integrity ought to be assessed only after the resource's authenticity has been determined, as the information source/s used should provide comparative examples against which its present condition may be measured. Thresholds and definitions for integrity are described in Table 2-2 below.

Table 2-2: Integrity definitions

Integrity	
0	Resource degraded to extent where no information potential exists; resource cannot be restored; single, isolated find, without any site context;
1	Poor condition, active decay visible; excessive restoration required; little information potential
2	Fabric is preserved, some information potential (quality questionable) and meaning evident, some encroachment on setting
3	Fair to good condition; well preserved; some decay present; can be easily restored/conserved/preserved; good information potential
4	Excellent/pristine; extremely well preserved; little to no decay present; little restoration required/restoration will greatly enhance resource; excellent information potential

3 IMPACT ASSESSMENT

Assessing environmental impacts on heritage resources are based first on the value of a resource and second how that value may change due to environmental aspects. Environmental management systems employ relative standard terminology that characterises impacts. This terminology has been adapted to provide a well-defined descriptive terminology for use in assessing environmental impacts on heritage resources summarised in Table 3-1.

Table 3-1: Impact characteristic terminology

Characteristic	Description	Designation
Type	Relationship of an assumed impact to a heritage resource (in terms of cause and effect)	Direct Indirect Induced
Scale of change	The physical area (size) of a heritage resource that may change	None Isolated parts / aspects will change Large parts / aspects will change Most or entire resource will change

Characteristic	Description	Designation
Duration	Time period over which resource will change	Immediate, non-permanent and fully reversible Long-term, non-permanent and reversible Long-term, permanent and irreversible Immediate, permanent and irreversible
Intensity	How an impact could change the authenticity and integrity, thus importance, of a resource	None Change in integrity without affecting authenticity Change in integrity will affect aspects of authenticity Change in integrity will affect overall authenticity
Probability	Likelihood of change occurring	None Project-related mitigation will remove change Project-related mitigation will reduce change Project-related mitigation will not reduce change

The rating takes into account the following criteria:

- Spatial scale of impact;
- Expected duration of impact; and
- Severity of impact;
- Consequence of impact;
- Probability of impact occurring; and
- Value of heritage resource

Impact significance = Value x Magnitude

Where

Value =Importance + Credibility + Integrity

And

Magnitude = Consequence x Probability

And

Consequence = Spatial scale + Duration + Severity

The impact rating is applied to pre- and post-mitigation scenarios. The ideal is to remove all impacts to a heritage resource. Where post mitigation significance is not zero, the recommended field rating (heritage) mitigation must be undertaken. The tables below provide the various descriptions and thresholds applicable to the impact assessment ratings.

Table 3-2: Description of magnitude ratings

Magnitude	Description
Major	Complete / total change to meaning, fabric, quality, setting and association of heritage resource. Permanent change to heritage resource
Moderate	Partial change to meaning, fabric, quality, setting and association of heritage resource. Permanent change to heritage resource
Minor	Limited change to meaning, fabric, quality, setting and association of heritage resource. Reversible change to heritage resource

Magnitude

Significance	Consequence (severity + scale + duration)								
Probability / Likelihood	1	3	6	7	9	12	15	18	21
1	1	3	6	7	9	12	15	18	21
2	2	6	12	14	18	24	30	36	42
3	3	9	18	21	27	36	45	54	63
4	4	12	24	28	36	48	60	72	84
5	5	15	30	35	45	60	75	90	105
6	6	18	36	42	54	72	90	108	126
7	7	21	42	49	63	84	105	126	147

Magnitude = Consequence x Probability

where

Consequence = scale + duration + severity

Table 3-3: Scores, descriptions and ratings determining consequence of impact

Scale		
Score	**Exposure**	**Description**
1	Very Limited	Isolated aspects of individual heritage resource
2	Limited	One or more heritage resource will be changed
3	Local	Most or all heritage resources change
4	Municipal area	Heritage resources outside project area changed
5	Region	Heritage resources within region
6	National	Will affect the entire country
7	International	The effect will occur across international borders
Duration		
Score	**Time period**	**Description**
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
2	Short Term	Impact will remain for <10% of Project Life
3	Permanent	Impact will remain for >10% - 50% of Project Life
4	Beyond Project Life	Impact will permanently alter or change the heritage resource and/or value (Complete loss of information)
5	Project Life	Impact will reduce over time after project life (Mainly renewable resources and indirect impacts)
6	Long Term	The impact will cease after project life.
7	Medium Term	Impact will remain for >50% - Project Life
Severity		
Score	**Scale of change**	**Description**
1	Minor (Low Value)	No change to Heritage Resource with values medium or higher, or Any change to Heritage Resource with Low Value
2	Minor (Medium –	Minor change to Heritage Resource with Medium - Medium High

	High Value)	Value
3	Moderate (Medium – High Value)	Moderate change to Heritage Resource with Medium - Medium High Value
4	Major (Medium – High Value)	Major change to Heritage Resource with Medium-Medium High Value
5	Minor (High – Very High Value)	Minor change to Heritage Resource with High-Very High Value
6	Moderate (High – Very High Value)	Moderate change to Heritage Resource with High-Very High Value
7	Major (High – Very High Value)	Major change to Heritage Resource with High-Very High Value
Probability		
Score	**Probability**	**Description**
1	Highly Unlikely /None	Expected never to happen, impact will not 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
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
4	Probable	Could happen, has occurred here or elsewhere
5	Likely	Could easily happen, the impact may occur
6	High probability	Happens often, it is most likely that the impact will occur
7	Certain/Definite	Happens frequently, the impact will occur regardless of the implementation of any preventative or corrective actions

Table 3-4: Significance of impact on categories of heritage resources

Score	Magnitude of Impact			
	Rating	**Archaeology, Palaeontology**	**Built Environment/Structures**	**Historic Landscape**
1-37	**No change**	No change	No change to fabric or setting	No changes to landscape elements, parcels or components; no visual or audible changes; no changes in amenity or community factors.
38-74	**Minor**	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 or sound quality; very slight changes to use or access; resulting in very small change to historic landscape character.
75-110	**Moderate**	Changes to key archaeological materials, such that the resource is slightly altered; slight changes to the setting.	Change to key historic building elements, such that the resource 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 the historic landscape; limited changes in noise or sound quality; slight changes to use or access; resulting in limited changes to historic landscape character.

Score	Magnitude of Impact			
	Rating	Archaeology, Palaeontology	Built Environment/Structures	Historic Landscape
111-147	Major	Changes to many key archaeological materials, such that the resource is clearly modified; changes to the setting that affect the character of the asset	Change to many key historic building elements, such that the resource is significantly modified; change to setting of an historic building, such that it is significantly modified.	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.
		Changes to attributes that convey outstanding national value of national estate; Most or all key archaeological materials, including those that contribute to ONV such that the resource is totally altered; comprehensive changes to setting	Change to key historic building that contributes to outstanding national value of national estate such that the resource is totally altered; Comprehensive changes to setting.	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 on outstanding national value.

4 REFERENCES

Nara Document on Authenticity, 1993. *ICOMOS: The Nara Document on Authenticity,* United Nations Educational, Scientific and Cultural Organisation: International Council on Monuments and Sites.

Winter, S. & Baumann, N., 2005. *Guideline for Involving Heritage Specialist in EIA Process Edition 1: CSIR Report No ENV-S-C 2005 E ,* Cape Town: Republic of South Africa, Provincial Government of the Western Cape, Department of Environmental Affairs & Development Planning.

Appendix D: NID

NOTIFICATION OF INTENT TO DEVELOP AND HERITAGE STATEMENT FOR THE MINING RIGHT APPLICATION FOR THE RECLAMATION OF THE SOWETO CLUSTER DUMPS, ROODEPOORT, GAUTENG PROVINCE

ERGO MINING (PTY) LIMITED

FEBRUARY 2014

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, LF Koeslag, PD Tanner (British)*, AJ Reynolds (Chairman) (British)*, J Leaver*, GE Trusler (C.E.O)
*Non-Executive

This document has been prepared by **Digby Wells Environmental**.

Report Title: **Notification of Intent to Develop and Heritage Statement for the Mining Right Application for the Reclamation of the Soweto Cluster Dumps, Roodepoort, Gauteng Province**

Project Number: **ERG2613**

Name	Responsibility	Signature	Date
Justin du Piesanie	Report Compiler		February 2014
Johan Nel	HRM Unit Manager and Reviewer		February 2014

EXECUTIVE SUMMARY AND NOTICE OF INTENT TO DEVELOP

Introduction

Digby Wells Environmental (hereafter Digby Wells) was requested by Ergo Mining (Pty) Ltd (Ergo) to conduct an Environmental Impact Assessment (EIA) study and Environmental Management Programme (EMP) Report, inclusive of specialist studies, for a Mining Right Application (MRA) (Ref No. GP10007MR) in accordance with the Minerals and Petroleum Resources Development Act, 2002 (Act No. 28 of 2002) (MPRDA).

Project Location

Name of property/ies	Roodepoort, Vlakfontein and Vogelstruisfontein
Street address or location (e.g.: Off R44)	Off the R41, M77 and R558
Erf or farm number/s	Roodepoort 237 IQ Portions 1, 5 and 14; Vlakfontein 238 IQ Portions 1; Vogelstruisfontein 231 IQ Portions 17, 18 and 161
Coordinates of approximate centre of project area	S 26° 11' 54.5"
	E 27° 51' 40.1"
Town or District	City of Johannesburg District Municipality
Responsible Municipality	City of Johannesburg Metropolitan Municipality
Current use	Industrial and Residential
Predominant land use/s of surrounding properties	Industrial and Residential

Registered Owners of Properties

Property	Title Deed Owner	Contact Information	Notification Method
Roodepoort 237 IQ Portion 1	Dino Prop (Pty) Ltd	381 Ontdekkers Road, Florida Park, Ext 3. Roodepoort, 1709 P. O. Box 268 Florida Hills, 1716	Advertisement, Site Notice and Letter
Roodepoort 237 IQ Portion 5			
Roodepoort 237 IQ Portion 14	Living Africa Dev (Pty) Ltd	No Information	Advertisement and Site Notice
Vlakfontein 238 IQ Portion 1	DRD Gold Ltd	Quadrum Office Park 1st Floor, Building 1 50 Constantia Boulevard	Advertisement, Site Notice and Letter

Property	Title Deed Owner	Contact Information	Notification Method
		Constantia Kloof Ext 28 Roodepoort 1709 P.O. Box 390 Maraisburg 1700 (011) 470 2600	
Vogelstruisfontein 231 IQ Portion 17	Suid-Afrikaanse Spoorpendel Korporasie Ltd	No Information	Advertisement and Site Notice
Vogelstruisfontein 231 IQ Portion 18	Fleurhof Extension 2 (Pty) Ltd	Cedarwood House Ballywoods Office Park Bryanston, 2196 (011) 472 4325	Advertisement, Site Notice and Letter
Vogelstruisfontein 231 IQ Portion 161	Rand Leases Securitisation (Pty) Ltd	Rand Leases House, Peter Place Office Park 54 Peter Place 2191, P.O. Box 1 Florida, Johannesburg 1710	Advertisement, Site Notice and Letter

Project / development details

Ergo is currently conducting gold bearing tailings reclamation operations from sand dumps and slimes dams (dumps), created from historic gold mining located on the Witwatersrand, Gauteng. An MRA was submitted to the Department of Mineral Resources (DMR) by Ergo in terms of Section 22 of the MPRDA for the various tailings dumps as part of the Soweto Cluster in the District of Roodepoort, Gauteng Province.

It is the intention that the mining operation will make use of the infrastructure owned by Crown Gold Recoveries (Pty) Ltd (CGR) and the other assets held by Ergo. New reclamation plant and equipment will be constructed at the Soweto Cluster to enable slimes to be recovered by hydraulic monitoring and sands to be reclaimed by mechanical means. The resulting slurry will be pumped by way of new pipelines via the CGR assets to the Ergo beneficiation plant for gold recovery. Tailings will be deposited on the Brakpan/Withok TSF.

NHRA Section 38 Triggers

The following aspects of Section 38 of the NHRA may be triggered by the proposed project.

	NHRA Section 38 (1) Activities / Triggers	Summary description (e.g. 500 m conveyor belt, open cast pit, etc.)

	NHRA Section 38 (1) Activities / Triggers			Summary description (e.g. 500 m conveyor belt, open cast pit, etc.)
☒	a	Any linear development or barrier >300 m		The project will require the construction of a pipeline for the transportation of slimes to the beneficiation plant for gold recovery
☐	b	Any bridge or similar structure >50 m		
☒	c	Any development or activity that will change the character of a site:		
	☒	**i**	≥5 000m^2 in extent	Reclamation activities of the dumps will change the character of the site.
	☐	**ii**	Involving ≥3 existing erven/ subdivisions	
	☐	**iii**	Involving ≥3 or more erven/ divisions consolidated within past 5 years.	
☐	d	Rezoning of a site ≥10 000m^2 in extent.		
☒	e	Other triggers, e.g.: in terms of other legislation, (i.e.: National Environment Management Act, etc.)		Environmental authorisation as part of an MRA application in accordance with Section 22 of the MPRDA

Activities

The following activities will take place during the lifespan of the proposed project.

	Activity	Description	Source of Risk
Construction Phase			
1.	Employment of workers	Preparation for reclamation activities	None
2.	Removal of Vegetation	Vegetation will be removed on the dump, and clearing for the construction of temporary infrastructure, pump stations and access roads.	This activity constitutes development as defined in terms of Section 2(viii) (f) where 'any physical intervention …result in a change to the nature, appearance or physical

	Activity	Description	Source of Risk
			nature of a place including any removal or destruction of trees, or removal of vegetation or topsoil.' The identified risk is therefore changes in the character of the site described in Sections 34 (1) and 38(1) (c) of the NHRA.
3.	Construction of pipelines	A slurry and water line will be constructed and will meet up with the existing Crown-Ergo pipeline	This activity constitutes development as defined in terms of Section 2(viii) (a) and (b) where 'any physical intervention …result in a change to the nature, appearance or physical nature of a place including construction, alteration, demolition, removal or change of use of a place or a structure at a place [and] carrying out any works on or over or under a place.' The identified risk is therefore changes in the character of the site described in Sections 34 (1) and 38(1) (a) of the NHRA.
4.	Operation of construction machinery and vehicles	Construction machinery and vehicles will be utilised to construct the temporary infrastructure, pump station and access roads. Vehicles will be used to transport equipment on site.	This activity constitutes development as defined in terms of Section 2(viii) (b) where 'any physical intervention …result in a change to the nature, appearance or physical nature of a place including carrying out any works on or over or under a place.' The identified risk is therefore changes to resources that are

	Activity	Description	Source of Risk
			generally protected in terms of Sections 27, 28, 31, 32, 34, 35, 36 and 37 that may occur in the proposed project area.
5.	Temporary storage of construction materials and hazardous material such as contaminated soil	Construction and hazardous material will be temporarily stored on site.	This activity constitutes development as defined in terms of Section 2(viii) (a) where 'any physical intervention …result in a change to the nature, appearance or physical nature of a place including construction, alteration, demolition, removal or change of use of a place or a structure at a place.' The identified risk is therefore changes to resources that are generally protected in terms of Sections 27, 28, 31, 32, 34, 35, 36 and 37 that may occur in the proposed project area. The identified risk is therefore change of use of a place or structure.
Operational Phase			
1.	Reclamation Activities	2L24 will be reclaimed first, followed by the other 11 dumps	Reclamation activities will result in the destruction of dumps (structures) older than 60 years. This activity constitutes development as defined in terms of Section 2(viii) (a), (b) and (c) where 'any physical intervention …result in a change to the nature, appearance or physical nature of a place including

	Activity	Description	Source of Risk
			construction, alteration, demolition, removal or change of use of a place or a structure at a place [and] carrying out any works on or over or under a place [and] any change to the natural or existing condition or topography of land.' The identified risk is therefore changes in the character of the site described in Sections 34 (1) and 38(1) (c) of the NHRA, in addition to consideration should be given to the possible protected status of the land covered by the dumps as described in Section 28(1) (c) of the NHRA.
2.	Operation of pipes	Slurry will be transported to one of the Ergo Plants.	None
3.	Operation of Pump Station	Operation of pump station.	None
Decommissioning Phase			
1.	Decommissioning activities	Decommissioning Activities.	None
2.	Rehabilitation of site	The project area will be rehabilitated.	None
Post-closure Phase			
1.	Groundwater	Potential for acid mine drainage.	Although this is not an activity as such, acid mine drainage may result in changes to the 'natural or existing condition or topography of land' as defined

	Activity	Description	Source of Risk
			in terms of terms of Section 2(viii) (e). The identified risk is therefore potential changes to the character of the sites described in Sections 27, 28, 31, 32, 34, 35, 36 and 37 of the NHRA.

Additional Impact Assessment Process

The following impact assessment processes are currently being undertaken for the proposed project.

Legislation, i.e. NEMA, MPRDA, etc.	MPRDA
Consenting Authority that has/will receive information	Department of Mineral Resources (DMR)
Present phase of process at Authority, e.g. Draft Scoping Report	Draft Scoping Report

Identified/known heritage resources and potential impacts

The following categories of heritage resources as defined in Section 3 of the NHRA are known to occur within the proposed project area.

☒	**3(2)(a)**	**Places, buildings, structures and equipment of cultural significance**
		Description of resource: Historic mining infrastructure associated with the Durban Roodepoort Deep and Rand Leases Mines
		Potential impact: Damage to or destruction of infrastructure associated with vegetation clearing, storage facility construction and reclamation activities
☐	**3(2)(b)**	**Places to which oral traditions are attached or which are associated with living heritage**
		Description of resource:
		Potential impact:
☒	**3(2)(c)**	**Historical settlements and townscapes**
		Description of resource: Johannesburg Townscape & Soweto Township

		Potential impact: Alteration to visual aspect and possibly sense of place through the reclamation of the mine dumps, removal of the tangible aspects of the mining heritage of Johannesburg
☐	**3(2)(d)**	**Landscapes and natural features of cultural significance**
		Description of resource:
		Potential impact:
☐	**3(2)(e)**	**Geological resources of scientific or cultural importance**
		Description of resource:
		Potential impact:
☐	**3(2)(f)**	**Archaeology and/or palaeontology *(Including archaeological sites and material, fossils, rock art, battlefields & wrecks)***
		Description of resource:
		Potential impact:
☒	**3(2)(g)**	**Graves and burial grounds *(eg: ancestral graves, graves of victims of conflict, historical graves & cemeteries)***
		Description of resource: Cemeteries
		Potential impact: Potential damage to burial grounds and graves through activities associated with the clearing of vegetation, construction of the pipeline and reclamation of dumps.
☐	**3(2)(a)**	**Other human remains**
		Description of resource:
		Potential impact:
☐	**3(2)(h)**	**Sites of significance relating to the history of slavery in South Africa**
		Description of resource:
		Potential impact:
☐	**3(2)(i)**	**Movable objects**
		Description of resource:
		Potential impact:

Recommendations

Is a Heritage Impact Assessment required?		☒ Yes	☐ No
If NO, provide motivation:			
If YES, provide suggested components that may be required or undertaken during HIA.			
☐	Archaeology	☐	Architecture
☐	Built Environment	☐	Burial Grounds and Graves
☐	Palaeontology	☐	Public Participation
☐	Townscapes	☒	Visual Impact
☒	Other:		

- A specific focus on the historical landscape including an inventory of historical structures, monuments and memorials within the project area; and
- Exemption from archaeological, palaeontological and burial ground components, provided that Chance Find Procedures are in place and implemented when required.

GLOSSARY OF ABBREVIATIONS AND TERMS

CGR	Crown Gold Recoveries (Pty) Ltd
Digby Wells	Digby Wells Environmental
DMR	Department of Mineral Resources
EIA	Environmental Impact Assessment
EMP	Environmental Management Programme
Ergo	Ergo Mining (Pty) Ltd
HIA	Heritage Impact Assessment
HRA	Heritage Resources Authority
IDP	Integrated Development Plan
MJS	Major Jackson Series
MPRDA	Minerals and Petroleum Resources Development Act, 2002 (Act No. 28 of 2002)
MRA	Mining Right Application
NEM:WA	National Environmental Management : Waste Act, 2009 (Act No. 59 of 2009)
NEMA	National Environmental Management Act, 1998 (Act No. 107 of 1998)
NHRA	National Heritage Resources Act, 1999 (Act No. 25 of 1999)
NID	Notice of Intent to Develop
PHRA-G	Provincial Heritage Resources Authority - Gauteng
SAHRA	South African Heritage Resources Authority
SCF	Statutory Comment Feedback
SDF	Spatial Development Framework
SEP	Stakeholder Engagement Plan

TSF	Tailings Storage Facility
ZAR	Zuid Afrikaanse Republiek

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1 INTRODUCTION

Digby Wells Environmental (hereafter Digby Wells) was requested by Ergo Mining (Pty) Ltd (Ergo) to conduct an Environmental Impact Assessment (EIA) study and Environmental Management Programme (EMP) Report, inclusive of specialist studies, for a Mining Right Application (MRA) in accordance with the Minerals and Petroleum Resources Development Act, 2002 (Act No. 28 of 2002) (MPRDA). This heritage statement serves as the heritage component for the scoping phase as required under Section 39(3)(b)(iii) of the MPRDA and Section 38 of the National Heritage Resources Act, 1999 (Act No. 25 of 1999) (NHRA).

2 BACKGROUND INFORMATION OF PROJECT

2.1 Project Details

Ergo is currently conducting gold bearing tailings reclamation operations from sand dumps and slimes dams (dumps), created from historic gold mining located on the Witwatersrand, Gauteng. An MRA was submitted to the Department of Mineral Resources (DMR) by Ergo in terms of Section 22 of the MPRDA for the various tailings dumps as part of the Soweto Cluster in the District of Roodepoort, Gauteng Province (See Table 2-1).

Table 2-1: Tailings dumps included in the MRA and the associated farms

Tailings Dump	Farm
2/L/8; 2/L/9(2); and 2/L/12	Portions 17, 18 and 161 of the Farm Vogelstruisfontein 231 IQ
2/L/20; and 2/L/21	Portions 1 and 14 of the Farm Roodepoort 237 IQ
2/L/17; 2/L/18; 2/L/16; 2/A/5; and 2/A/6	Portions 1, 5 and 14 of the Farm Roodepoort 237 IQ
2/L/24	Portion of Portion 1 of the Farm Vlakfontein 238 IQ

It is the intention that the mining operation will make use of the infrastructure owned by Crown Gold Recoveries (Pty) Ltd (CGR) and the other assets held by Ergo. New reclamation plant and equipment will be constructed at the Soweto Cluster to enable slimes to be recovered by hydraulic monitoring and sands to be reclaimed by mechanical means. The

resulting slurry will be pumped by way of new pipelines via the CGR assets to the Ergo beneficiation plant for gold recovery. Tailings will be deposited on the Brakpan/Withok Tailings Storage Facility (TSF).

2.2 Description of Property and/or Affected Environment

The Soweto Cluster mine dumps neighbour the suburbs of Bram Fischerville, Meadowlands and Dobsonville of Soweto. They constitute a total mining footprint of approximately 887.5 ha. The surrounding environment is characterised by residential and industrial areas interspersed with numerous old tailings facilities from historical gold mining activities associated with the Durban Roodepoort Deep and Rand Leases Mines. The receiving environment of the proposed reclamation of the Soweto Cluster has been disturbed and thus has little aesthetic value.

2.2.1 Location Data

Table 2-2: Location data for the Ergo Soweto Cluster Project

Province	Gauteng Province
Magisterial district	Roodepoort Magisterial district
District municipality	City of Johannesburg District Municipality
Local municipality	City of Johannesburg Metropolitan Municipality
Town	Johannesburg
Farm name/s and number/s:	Vogelstuisfontein 231 IQ; Roodepoort 237 IQ; and Vlakfontein 238 IQ
Map reference	2627 BB
Co-ordinates for the centre of the project area	Latitude: S 26˚ 11’ 54.5” Longitude: E 27˚ 51’ 40.1
Location maps	The regional settings of the project area are depicted in Plans 1 – 3 in Appendix B

2.3 Relevant Contact Details

The contact details of the developer, consultant and landowners are provided in Table 2-3, Table 2-4 and Table 2-5 respectively.

Table 2-3: Client contact details

ITEM	COMPANY CONTACT DETAILS
Company	Ergo Mining (Pty) Ltd
Contact person	Greg Ovens
Tel no	011 470 2600
E-mail address	greg.ovens@drdgold.com
Postal address	P.O. Box 390 Maraisburg 1700

Table 2-4: Consultant contact details

ITEM	COMPANY CONTACT DETAILS
Company	Digby Wells Environmental
Contact person	Grant Beringer
Tel no	011 789 9495
Fax no	011 789 9498
E-mail address	grant.beringer@digbywells.com
Postal address	Private Bag X10046, Randburg, 2125

Table 2-5: Land owner contact details

Property	Title Deed Owner	Contact Information	Notification Method
Roodepoort 237 IQ Portion 1	Dino Prop (Pty) Ltd	381 Ontdekkers Road, Florida Park, Ext 3. Roodepoort, 1709 P. O. Box 268 Florida Hills, 1716	Advertisement, Site Notice and Letter
Roodepoort 237 IQ Portion 5			
Roodepoort 237 IQ Portion 14	Living Africa Dev (Pty) Ltd	No Information	Advertisement and Site Notice
Vlakfontein 238 IQ Portion 1	DRD Gold Ltd	Quadrum Office Park 1st Floor, Building 1 50 Constantia Boulevard Constantia Kloof Ext 28 Roodepoort 1709 P.O. Box 390 Maraisburg 1700	Advertisement, Site Notice and Letter

Property	Title Deed Owner	Contact Information	Notification Method
		(011) 470 2600	
Vogelstruisfontein 231 IQ Portion 17	Suid-Afrikaanse Spoorpendel Korporasie Ltd	No Information	Advertisement and Site Notice
Vogelstruisfontein 231 IQ Portion 18	Fleurhof Extension 2 (Pty) Ltd	Cedarwood House Ballywoods Office Park Bryanston, 2196 (011) 472 4325	Advertisement, Site Notice and Letter
Vogelstruisfontein 231 IQ Portion 161	Rand Leases Securitisation (Pty) Ltd	Rand Leases House, Peter Place Office Park 54 Peter Place 2191, P.O. Box 1 Florida, Johannesburg 1710	Advertisement, Site Notice and Letter

2.4 Legislative Framework

2.4.1 Minerals and Petroleum Resources Development Act, 2002 (Act No. 28 of 2002) (MPRDA)

The requirements for a MRA are embodied under Section 22. Within this section of the MPRDA, it stipulates that (4) if an application is accepted by the Regional Manager, (a) an EIA must be conducted and EMP be submitted in terms of Section 39.

Section 39(3) stipulates that in preparation of an EMP – (b) the applicant must investigate, assess and evaluate the impact of the operation on – (iii) any national estate referred to in Section 3(2) of the NHRA with exception of the national estate contemplated in Section 3(2)(i)(vi) and (vii) of that Act.

2.4.2 National Environmental Management Act, 1998 (Act No. 107 of 1998) (NEMA)

The NEMA stipulates under Section 2(4)(a) that sustainable development requires the consideration of all relevant factors including (iii) the disturbance of landscapes and sites that constitute the nation's cultural heritage must be avoided, or where it cannot be altogether avoided, is minimised and remedied. Section 24(1) stipulates that in order to give effect to the general objectives of integrated environmental management laid down… the potential impact on - (c) the cultural heritage, of activities that require authorisation or permission by law and which may significantly affect the environment, must be considered, investigated and assessed prior to their implementation and reported to the organ of state

charged by law with authorising, permitting or otherwise allowing the implementation of an activity.

2.4.3 National Environmental Management: Waste Act, 2009 (Act No. 59 of 2009) (NEMWA)

The NEM:WA requires in terms of Section 48(b) that the likely effect of pollution on existing cultural heritage be taken into account. Section 48(c)(ii) requires that cultural heritage be protected from adverse change due to pollution.

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

Section 38(8) of the NHRA requires that heritage resources management be implemented if impact assessments are required in terms other legislation – the MPRDA, NEMA and NEM:WA in this case.- Where studies are undertaken in terms of Section 38(8) the heritage authorities are *commenting* authorities, provided that the *consenting* authority (for example the DMR) ensures that the study complies with fulfils the requirements of the relevant heritage resources authority in terms of Section 38(3). The consenting authority furthermore needs to take into account all statutory comment issued by the relevant heritage resources authority in terms of Section 38(8) prior to granting authorisation for activities and/or developments.

2.5 Summary of Stakeholder Engagement Plan (SEP)

Stakeholder engagement is required by the MPRDA under Section 22(4)(b) where it states that interested and affected parties must be notified and consulted with regards to the proposed project. This requirement is reiterated in the NHRA, Section 5(4) acknowledging the right of affected communities to be consulted and to participate in the management of heritage resources.

Please refer to the Draft Scoping Report for detailed records of the SEP for the Soweto Cluster Project.

2.6 Terms of Reference

Ergo has enlisted the services of Digby Wells to conduct an EIA and EMP in support of the MRA inclusive of relevant specialist studies in accordance with the MPRDA for the reclamation of the Soweto Cluster Dumps near Soweto and Roodepoort, Gauteng. In order to comply with the agreed Terms of Reference, a heritage study was required as one of the requisite studies.

2.7 Scope of Work

In order to comply with the legislated requirements, a Heritage Statement was compiled to inform the Notice of Intent to Develop (NID) required under Section 38 of the NHRA. The Heritage Statement includes appropriate information regarding existing and potential

heritage resources that may occur in the project location. The nature of the development was also described in sufficient detail to enable the South African Heritage Resources Agency (SAHRA) and Provincial Heritage Resources Authority – Gauteng (PHRA-G) to determine whether a Heritage Impact Assessment (HIA) is required.

Official comment from the relevant Heritage Resources Authority (HRA) will be summarised in a Statutory Comment Feedback (SCF) report and submitted to Ergo.

3 METHODOLOGY

In order to compile the Heritage Statement, a number of tasks were required to be completed. This study employed qualitative text-based research methodologies to aid in assessing the cultural landscape within which the Soweto Cluster Project is situated. These methodologies are discussed separately below.

3.1 Literature review

A literature review of relevant and available published works was completed to provide a baseline characterisation of the cultural landscape discussed under Section 5 below. Sources used to inform this baseline included peer reviewed academic publications, unpublished reports, relevant heritage assessments previously conducted and where applicable, relevant databases and authoritative websites. Sources that were consulted and cited in this report are listed under Section 10.

Due to the nature of the project and landscape, the literature review was focussed on the historical period. Due to the extensive development and alteration of the landscape over time, it is expected that little to no archaeological resources are likely to occur, therefore detailed review and discussion of prehistoric periods is irrelevant.

3.2 Historical layering

A review of historical cartographic information was undertaken to conduct historical layering. Historical layering is a process whereby diverse cartographic sources from various time periods are layered chronologically to:

- Enable the virtual representation of changes in the land use over time;
- Provide relative dates based on the presence or absence of features; and
- Identify potential locations where heritage resources may exist.

Historical maps, such as Jeppes 1899 Map Series of the Transvaal, the Major Jackson Series (MJS) and previous 1:50 000 topographic maps were reviewed. In addition, historical aerial imagery was reviewed, dating from 1938 to 1952.

The results from the historical layering contributed to the characterisation of the cultural landscape and are discussed under Section 5.4 below.

3.3 Site Naming

3.3.1 Confirmed sites identified during desktop study

Sites that were identified in previous assessment reports are named and numbered according to the system used in the respective reports but are prefixed with the relevant report or case number if available. For example, a heritage resource identified by Roodt (1999) described as an archaeological site and numbered Site 1 in that report will be:

1999-SAHRA-0021/1

Where the report or case numbers do not exist, the site names and / or numbering will be used, but prefixed with the relevant author. For example, a heritage resources identified by Van Schalkwyk (2007) described as an archaeological site and numbered '1' in that report will be:

Van Schalkwyk-2007/1

3.3.2 Unconfirmed sites identified during desktop study

Sites not previously recorded, but identified through historical layering, desktop studies or during field surveys were named using the SAHRIS case ID 4700, followed by the map sheet number and reference to the relevant NHRA section suffixed with the site number:

4700/2627BB/S.35-001

3.3.3 Sites identified during screening assessment

Sites identified during the screening assessment were named using the site naming format described in Section 3.3.2 above.

4 RESTRICTIONS AND LIMITIATIONS

During the course of this study, the following restrictions and limitations were encountered:

- Heritage Screening Survey was not possible due to the time constraints and safety concerns. Therefore, sites identified during the literature review could not be verified; and
- Due to the change in land use through time, and associated alterations to the landscape, the potential for identifying any archaeological resources is limited, and has as such not been comprehensively included in the report.

5 STATE OF THE RECEIVING ENVIRONMENT/CULTURAL LANDSCAPE

5.1 Development context of Study Area

The Integrated Development Plan (IDP) deals with issues pertaining to the greater Johannesburg area. Region D, within which the Soweto Cluster Dumps are situated, is the most densely populated region of the City of Johannesburg District Municipality. Aspects within the IDP that are given high-priority status include skills development in dealing with unemployment, lack of education, and infrastructure development. Cultural development, tourism and conservation of heritage resources do not feature within the 2013/16 IDP as a priority but is listed as one of the functions under community development and within the Spatial Development Framework (SDF). Within the SDF under the principle of sustainability, one of the desired outcomes is the responsible use, protection and conservation of the city's cultural heritage resources (City of Johannesburg District Municipality, 2013).

5.2 Literature Review

The current landscape is dominated by historical industrial development associated with the Durban Roodepoort Deep and Rand Leases Mines and the established suburbs of Soweto. The resultant impact from these activities is the creation of the distinctly characteristic city scape of Johannesburg as well as the alteration of the landscape through time from undisturbed Highveld through to its current state.

The study area has evidence for occupation over an extensive period of time, spanning from the Stone Age through to the historical period. Briefly, the Stone Age is associated with the manipulation of lithics to create tools. These date from as early as 2.5 million years ago through to less than 150 years ago (Lombard, et al., 2012). This period overlaps with the migration of Bantu speakers into southern Africa bringing with them agricultural technologies, herding and a settled way of life manifested through stone walling (Huffman, 2007).For the purposes of this study, the literature review was primarily focused on the historical period as activities associated with the project would be limited to the dump cluster and associated pipelines.

European settlers first arrived on the Highveld as Voortrekkers associated with the Great Trek of 1838, seeking land outside of British rule. During this period farms were established (Brodie, 2008), but the Highveld was to a large extent sparsely inhabited as attested by J.B Taylor who wrote in 1885 (von Ketelhodt, 2007, p. 4) while camping on the farm Langlaagte:

> *"For miles there was no sign of habitation".*

Under the Zuid Afrikaanse Republiek (ZAR) Government, immigrant burghers were allotted 2 farms, a freehold farm and loan farm (Brodie, 2008). In 1886 Gold was discovered on the Witwatersrand by George Harrison on the farm Langlaagte, owned by G. C. Oosthuizen. After the discovery, prospecting rights on the portion of Langlaagte where the reef was

identified was granted, and as word spread, the explosive development of the Witwatersrand was set in motion (von Ketelhodt, 2007). The land on which the project area is situated includes Roodepoort, Vlakfrontein and Volgelstruisfontein farms, all of which were declared public diggings.

Shortly after the discovery of gold, it became evident that the gold deposit was in fact payable and in time, would not be suited to being worked by individual diggers. Rather, a different sort of effort, energy and finance would be required. This was accomplished through the backing of large companies (Brodie, 2008), including the more prestigious H. Eckstein & Co (later Rand Mines), The Gold Fields Group, and the Johannesburg Consolidated Investment Co Ltd (von Ketelhodt, 2007). The Durban Roodepoort Deep Mine was administered by Rand Lease Gold Mining Co Ltd (Rand Mines) from approximately 1897, after the Rand Mines shareholder began a systematic acquisition of the deep levels of many of the mines that started on the Central Rand (Anonymous, n.d.). The historic Rand Lease Mine was opened in the late 1800's by the Rand Leases (Vogelstuisfontein) Gold Mining Company Limited (Anonymous, n.d.). Rand Mines continued with the process of amalgamation of 17 different mining companies that involved acquisition of claims, water area rights and a complex exercise involving assets of various syndicates (von Ketelhodt, 2007).

With all the wealth in the Witwatersrand under the control of the ZAR and the restriction imposed on *Uitlanders*[1], Rhodes started to develop a plan to overthrow the ZAR government which would involve a revolt against the government of Paul Kruger, armed British forces to protect British citizens and the British High Commissioner travelling to Pretoria to ensure British "protection" of the Transvaal (Birkholtz, 2006). This plan ultimately culminated in the unsuccessful Jameson Raid of 1895. With all plan in place, the Reform Committee and Rhodes himself delayed the plan and even suggested it be dropped. Dr. Leander Starr Jameson, responsible for leading the armed force, continued with the plans despite these concerns. As the armed forces entered the Transvaal, the element of surprise was lost due to not severing the telegraphs lines properly, and after several skirmishes with Boer forces, surrendered on the farm Vlakfontein (Birkholtz, 2006).

An integral part of the mining industry was the use of a cheap labour force, initially associated with migrant African population, and later the addition of Chinese labour. These groups were housed in the many mining compounds either on or adjacent to the mine property, reducing transport costs and increase savings for the mines who would deduct communal eating and living costs from the workers' wages (Brodie, 2008). As Johannesburg grew, more people migrated into the town to work as domestic workers, shop workers, brick makers, washer men and so on although their employers had no interest in housing them. These groups found accommodation in either one of the three locations near the city centre

[1] The name used by the ZAR and its citizens to describe the recent arrival of foreigners, especially the British. These people were mostly associated with the Rand Gold Rush and lived in Johannesburg.

established in the 1890's for Africans, Indians or Muslims, or in the slums of the inner city. Following the Anglo-Boer War in 1902, the population grew rapidly with the influx of over 10 000 poor white Afrikaners who lost their farms through the 'scorched earth policy' of the British, taking up residence in increasingly crowded and racially mixed slums (Bonner & Segal, 1998). These groups were known as 'bywoners', a name given to poor white families settling on the Highveld after the war (Huffman, Hall, & Steel, 1991).

In 1905, the town of Klipspruit (present day Pimville) was established in reaction to the supposed outbreak of the bubonic plague in the Brickfields slums (present day Newtown) and was one of the first African townships, and the first suburb of Soweto. From the date of the establishment of Klipspruit, no Africans were permitted by law to reside in the city except as domestic servants residing in their employers' gardens, or as workers housed in industrial compounds. In 1907, Klipspruit started to receive waste as part of the Klipspruit Sewage Disposal Works although it did not even have a proper treatment plant until 1910. By 1919 some 105 000 Africans resided in Johannesburg, with only 4 000 living in municipal compounds such as Klipspruit. Most resisted these townships opting rather for the slums of the city (Bonner & Segal, 1998; Brodie, 2008).

To address the increasing populations in the Johannesburg slums, the Johannesburg City Council bought land on the farm Klipspruit Number 8 in 1930 to establish Orlando, or what they termed the 'biggest and finest township in the Union of South Africa'. Though this was the official stance, the conditions in Orlando were poor and there was a lack of facilities that could only be found in the city. By 1936, 12 000 people lived in Orlando and with the 'slum clearance programme' initiated by the Johannesburg City Council, the numbers were growing resulting in squatters. By 1946, squatters from Orlando forcibly occupied the construction site of the new Orlando West Township as a protest to what was said to be housing for black resident from areas the government wanted to declare 'white areas'. On 28 January 1947, the council conceded that the housing shortage and squatters was a serious problem that could no longer be controlled by force and established a new emergency camp called Moroko (Bonner & Segal, 1998).

With the establishment of the Apartheid Government, Soweto became the centre of political resistance for African communities. At the centre were grievances against the pass laws with forced removals and unaffordable rents also at the forefront of contention and thereby instigating the defiance campaign. Meadowlands was established in 1953 as the site for the relocation of Sophiatown residents and in 1955 the forced removals were carried out. A second major event in the history of Soweto in 1955 was the Congress of the People held at Kliptown between 26 and 27 June 1955. The congress was a culmination of a two year campaign aimed at drawing up a charter of demands on behalf of the disenfranchised black population (Bonner & Segal, 1998).

5.3 Review of Previous Heritage Reports

A total of seven heritage assessment reports surrounding the Soweto cluster were reviewed to aid in the identification of potential heritage resources that may be impacted upon through activities associated with the reclamation of the Soweto cluster dumps. These include:

- Leslie, M. 2001. Bram Fischerville Ext 7 – Heritage Impact Assessment. Unpublished report prepared by CEM Africa cc kept on file at SAHRA under 2001-SAHRA-0111
- Van Schalkwyk, J. 2003. A Survey of Heritage Resources in the Proposed Dobsonville X9 Development, Dobsonville, Soweto. Unpublished report prepared by the National Cultural History Museum kept on file at SAHRA under 2003-SAHRA-0130
- Van Schalkwyk, J. 2004. Heritage Impact Assessment for the Proposed Waste Blending Platform Project, Roodepoort District, Gauteng. Unpublished report prepared by the National Cultural History Museum kept on file at SAHRA under 2004-SAHRA-0111
- Birkholtz, P.D. 2006. Phase 1 Heritage Impact Assessment for the Proposed Jameson Field Extension 1 Residential Township Development, Gauteng Province. Unpublished report prepared by Archaeology Africa cc kept on file at SAHRA under 2006-SAHRA-0097
- Van Vollenhoven, A.C. and Pelser, A.J. 2007. A Report on a Cultural Heritage Impact Assessment on Erf 85, Chamdor, Krugersdorp for the William Tell Particle Boards and Medium Density Manufacturing Plant. Unpublished report prepared by Archaetnos Culture and Cultural Resources Consultants kept on file at SAHRA under 2007-SAHRA-0407
- Van Schalkwyk, J. 2013. Basic Cultural Heritage Assessment for the Proposed Construction of a New Bulk Water Pipeline in the Fleurhof Region of the City of Johannesburg Local Municipality. Unpublished report prepared by J. van Schalkwyk kept on file at SAHRA under 2001-SAHRA-0111

5.4 Historical Layering

In order to understand the development of the area within which the Soweto cluster is situated, a survey of available historic cartographic information and aerial imagery was conducted. The earliest cartographic information was from the 1899 Jeppes Map of the Transvaal. Clearly depicted on this map are the farms Roodepoort 43, Vlakfontein 45 and Vogelstruisfontein 55 and 52 with the railway, Roodepoort Stations, and the mines situated on Roodepoort and Vogelstruisfontein (See Figure 5-1). What this clearly indicates is that the Witwatersrand was heavily industrialised only some 13 years after the discovery of gold in 1886.

The earlist record of aerial imagery for the study area dates to 1938. A review of the flights plans indicated that two different flight paths from that year covered the project area, these include:

- Flight Path – 129_15; and
- Flight Path – 129_16

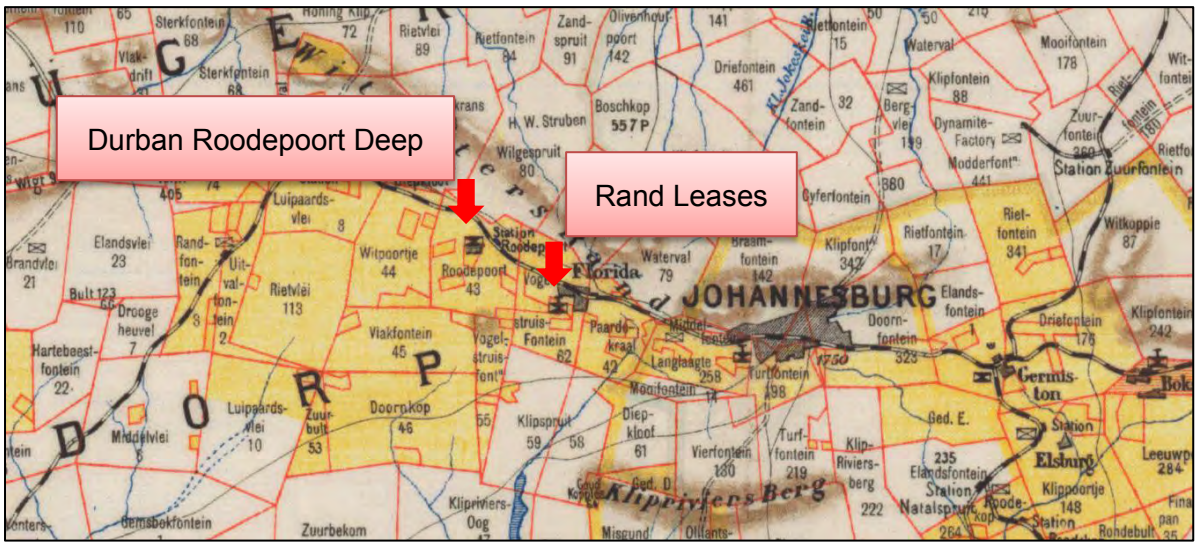

Figure 5-1: 1899 Jeppes Map of the Transvaal with farms, railway and mines depicted

A survey of these aerial images indicated that both the Durban Roodepoort Deep and Rand Leases mines were fully operational and deposition on the slimes and sand dumps was well underway, as illustrated in Figure 5-2 below.

Figure 5-2: Aerial imagery dating to 1938 of Durban Roodepoort Deep and Rand Leases respectively

Aerial imagery dating from 1952 clearly indicates that the mines dumps adjacent to Durban Roodepoort Deep and Rand Leases Mines were established, and the construction of 2/L/24 on Vlakfontein was underway.

Figure 5-3: Aerial imagery dating to 1952. Note the footprint of 2/L/24 in the southern portion of the photograph

At this time, the predominant use of the land as seen in Figure 5-3 is for mining related purposes, with some small sections of land being utilised for what appears to be agricultural purposes. As discussed under Section 5 above, this area was later developed for settlement. When compared to contemporary satellite imagery as depicted in Figure 5-4 below, it is evident that expansive urbanisation of the area had taken place over the last 60 years, resulting in a change of land use from predominantly industrial to suburban.

Figure 5-4: Contemporary satellite imagery of the Soweto Cluster Project

6 IDENTIFIED HERITAGE RESOURCES

Heritage resources identified during the desktop study are summarised in Table 6-1 below.

Table 6-1: Identified heritage resources within and surrounding the Soweto Cluster Project

Map ID	Longitude	Latitude	Description	Distance from Project Area (m)	Direction from Project Area
Wits 2627BB25	-26.182892	27.875488	S.34 - Labelled as Rand Leases on the Wits Database. Actually location of Durban Roodepoort Deep.	Within Project Boundary	
VLK6	-26.2076	27.807584	S.34 - Historic house possibly older than 60 years	1 900	West
0407/Site 1	-26.150278	27.803333	S.34 – Industrial era buildings	5 121	North West
DRD/S.36-001	-26.172321	27.854679	S.36 - Burial ground identified in the DRD EIA / EMP	97	North
VLK7	-26.20705	27.802694	S.36 - Burial ground for farm workers on Vlakfontein	2 392	West

Map ID	Longitude	Latitude	Description	Distance from Project Area (m)	Direction from Project Area
VLK5	-26.20763	27.807397	S.34 - Historic house possibly older than 60 years	1 934	West
VLK4	-26.20757	27.808309	S.34 - Waenhuis / Stables	1 844	West
VLK3	-26.20707	27.806102	S.37 - Jameson Raid Memorial	2 100	West
0111/Site 1	-26.18875	27.851639	S.35 - 2 Stone Age lithics near pan (Also reference on the Wits Database as 2627BB33	1 145	South
VLK2	-26.20732	27.807187	S.37 - Jameson Surrender	1 947	West
VLK1	-26.20857	27.807573	S.37 - Vlakfontein Monument	1 847	West

Figure 6-1: Identified heritage sites during the desktop study.

7 SOURCES OF RISK

The activities associated with the reclamation of the dumps, as described in Table 7-1 could potentially pose a risk to identified heritage resources. The potential risks are discussed according to the various phases of the project below.

Table 7-1: List of activities associated with the reclamation of the Soweto cluster dumps

	Activity	Description	Source of Risk
Construction Phase			
1.	Employment of workers	Preparation for reclamation activities	None
2.	Removal of Vegetation	Vegetation will be removed on the dump, and clearing for the construction of temporary infrastructure, pump stations and access roads.	This activity constitutes development as defined in terms of Section 2(viii) (f) where 'any physical intervention …result in a change to the nature, appearance or physical nature of a place including any removal or destruction of trees, or removal of vegetation or topsoil.' The identified risk is therefore changes in the character of the site described in Sections 34 (1) and 38(1) (c) of the NHRA.
3.	Construction of pipelines	A slurry and water line will be constructed and will meet up with the existing Crown-Ergo pipeline	This activity constitutes development as defined in terms of Section 2(viii) (a) and (b) where 'any physical intervention …result in a change to the nature, appearance or physical nature of a place including construction, alteration, demolition, removal or change of use of a place or a structure at a place [and] carrying out any

	Activity	Description	Source of Risk
			works on or over or under a place.' The identified risk is therefore changes in the character of the site described in Sections 34 (1) and 38(1) (a) of the NHRA.
4.	Operation of construction machinery and vehicles	Construction machinery and vehicles will be utilised to construct the temporary infrastructure, pump station and access roads. Vehicles will be used to transport equipment on site.	This activity constitutes development as defined in terms of Section 2(viii) (b) where 'any physical intervention …result in a change to the nature, appearance or physical nature of a place including carrying out any works on or over or under a place.' The identified risk is therefore changes to resources that are generally protected in terms of Sections 27, 28, 31, 32, 34, 35, 36 and 37 that may occur in the proposed project area.
5.	Temporary storage of construction materials and hazardous material such as contaminated soil	Construction and hazardous material will be temporarily stored on site.	This activity constitutes development as defined in terms of Section 2(viii) (a) where 'any physical intervention …result in a change to the nature, appearance or physical nature of a place including construction, alteration, demolition, removal or change of use of a place or a structure at a place.' The identified risk is therefore changes to resources that are generally protected in terms of Sections 27, 28, 31, 32, 34, 35, 36 and 37 that may occur in the

	Activity	Description	Source of Risk
			proposed project area. The identified risk is therefore change of use of a place or structure.
Operational Phase			
1.	Reclamation Activities	2L24 will be reclaimed first, followed by the other 11 dumps	Reclamation activities will result in the destruction of dumps (structures) older than 60 years. This activity constitutes development as defined in terms of Section 2(viii) (a), (b) and (c) where 'any physical intervention …result in a change to the nature, appearance or physical nature of a place including construction, alteration, demolition, removal or change of use of a place or a structure at a place [and] carrying out any works on or over or under a place [and] any change to the natural or existing condition or topography of land.' The identified risk is therefore changes in the character of the site described in Sections 34 (1) and 38(1) (c) of the NHRA, in addition to consideration should be given to the possible protected status of the land covered by the dumps as described in Section 28(1) (c) of the NHRA.
2.	Operation of pipes	Slurry will be transported to one of the Ergo Plants.	None

	Activity	Description	Source of Risk
3.	Operation of Pump Station	Operation of pump station.	None
Decommissioning Phase			
1.	Decommissioning activities	Decommissioning Activities.	None
2.	Rehabilitation of site	The project area will be rehabilitated.	None
Post-closure Phase			
1.	Groundwater	Potential for acid mine drainage.	Although this is not an activity as such, acid mine drainage may result in changes to the 'natural or existing condition or topography of land' as defined in terms of terms of Section 2(viii) (e). The identified risk is therefore potential changes to the character of the sites described in Sections 27, 28, 31, 32, 34, 35, 36 and 37 of the NHRA.

8 DISCUSSION OF FINDINGS

As is evidenced by the desktop study, the project is located within a predominantly historical and industrial and associated with the historical period. The Soweto Cluster Dumps are the result of mining activities associated with the Durban Roodepoort Deep and Rand Leases Mines. These mines are some of the earliest established mines on the Witwatersrand, and are intrinsically valuable in the mining history of the Witwatersrand and the city of Johannesburg. The resultant tailings dams and sand dumps are integrated elements in the history, heritage and identity of Johannesburg.

Other notable historic events in the surrounding areas include the culmination of the 1895 Jameson Raid on the farm Vlakfontein. It is in this location that the botched attempt to overthrow the ZAR government ended with the surrender of Jameson and the arrest and trial of many prominent British figures associated with the Reform Committee.

Later in time the Township of Soweto was established. Meadowlands specifically, being declared in 1953 to accommodate for the forced removals of residents from Sophiatown in 1955 has a direct association with the history of the Apartheid regime.

The sources of risk posed to heritage resources (See Table 7-1 above) are limited to the construction and operational phase of the project. Potential sources of risk include the removal of vegetation, construction of a pipeline, operation of construction machinery and vehicles, and reclamation of the dumps. When one considers the historic context of the project area, consideration must be given to the potential levels of change the project activities may have on tangible heritage resources, such as the dumps and mining infrastructure, as well as the intangible aspects, for example the contribution to the sense of place of the historical landscape.

9 RECOMMENDATIONS AND CONCLUSION

Based on the description of activities associated with the Soweto Cluster Dumps, including clearing of vegetation, construction of pipeline, and reclamation of dumps, it is recommended that a Heritage Impact Assessment be conducted with:

- A specific focus on the historical landscape including an inventory of historical structures, monuments and memorials within the project area; and
- Exemption from archaeological and palaeontological components.

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