



DIGBY WELLS
ENVIRONMENTAL



Sasol Sigma Mooikraal - Sasolburg Operations Pipelines Basic Assessment

Notification of Intent to Develop

Project Number:

SAS2622

Prepared for:

Sasol Mining (Pty) Ltd



October 2014

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Project Code:	SAS2622		
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DECLARATION OF INDEPENDENCE

Digby Wells and Associates (Pty) Ltd

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I, Justin du Piesanie as duly authorised representative of Digby Wells and Associates (Pty) Ltd., hereby confirm my independence (as well as that of Digby Wells and Associates (Pty) Ltd.) and declare that neither I nor Digby Wells and Associates (Pty) Ltd. have any interest, be it business, financial, personal or other, in any proposed activity, application or appeal in respect of Northern Coal (Pty) Ltd, other than fair remuneration for work performed, specifically in connection with the Notification of Intent to Develop (NID) for the proposed Mooikraal Operations Pipeline Project in the Fezile Dabi District Municipality, Free State Province.



Full name:	Justin du Piesanie
Title/ Position:	Heritage Management Consultant: Archaeologist
Qualification(s):	MSc in Archaeology
Experience (years):	5 years' experience
Registration:	Association of Southern African Professional Archaeologists (ASAPA) International Council on Monuments and Sites (ICOMOS) South Africa

Notification of Intent to Develop

Introduction

Digby Wells Environmental (hereafter Digby Wells) was requested by Sasol Mining (Pty) Ltd (Sasol Mining) to conduct a Basic Assessment (BA) for two new pipelines to manage underground mine water at the Sasol Mooikraal Operations in the Free State. These include:

- A 3 km water pipeline from the Mooikraal Ventilation Shaft on farm Kleinvlei to the Mooikraal North and South Dams; and
- A 20 km waste water pipeline between Mooikraal Shaft and Sasol Sigma Shaft 3 Complex.

The BA will be compiled in line with the requirements stipulated within the National Environmental Management Act, 1998 (Act No. 107 of 1998) (NEMA) and the National Water Act, 1998 (Act No. 36 of 1998) (NWA).

Project Location

Province	Free State
Metropolitan Municipality	Mangaung
District Municipality	Fezile Dabi
Local Municipality	Metsimaholo
Nearest Town	Sasolburg / Wolwehoek
Property Name and Number	Daniels Rust 320; Gysberthoek 315; Kleinvlei 66; Langverwacht 252; Mooikraal 355; Odin 93; Roseberry Plain 250; Saltberry Plain 422; Saltberry Plain 137; Willowdene 237; Wolwehoek 1795; Wonderheuvel 417; Zwanenberg 450
1:50 000 Map Sheet	2627DC; 2627DD
GPS Co-ordinates	26°54'41.3" S
(Relative centre point of study area)	27°48'35.7" E

Registered Owner/s of Property/ies

Farm	Ptn	Owner	Contact Person
Gysberthoek 315	2	EDWIN CLAASSEN BELEGGINGS TRUST	Edwin Claasen
	RE		
Odin 93	RE		
	1		
Langverwacht 252	RE	FANIE VAN RENSBURG INVESTMENT TRUST	Danie V/Rensburg
Mooikraal 355	1	GOVERNMENT	National Government of the Republic of South Africa
Daniels Rust 320	RE	JAAP SKAT TRUST	Hester Vd Westhuizen
Kleinvlei 66	RE		
Wolwehoek 1795	RE	L H CLAASSEN & SEUNS PTY LTD	Edwin Claasen
Saltberry Plain 422	RE	LISEKI FAMILY TRUST	Linda Cochrane
Willowdene 237	RE	O F S FEEDERS PTY LTD	John Straw
Zwanenberg 450	1	PRIVATE PERSON	John Robert Knoetze
	RE	PRIVATE PERSON	Linda Joy Cochrane
Mooikraal 355	RE	PRIVATE PERSON	Johannes Erasmus
Wonderheuvel 417	RE	RENSBURG STEFANUS LOUWRENS JANSE VAN-TRUSTEES	Danie V/Rensburg
Saltberry Plain 422	1	SALTBERRY PLAIN TRUST	Allan Peeters
Roseberry Plain 250	1	SASOL CHEMIESE NYWERHEDE LTD	Michiel Du Toit
Mooikraal 355	2	SASOL MYNBOU PTY LTD	Ampie Ptgieter
Wolwehoek 1795	1	EDWIN CLAASSEN BELEGGINGS TRUST	Edwin Claasen
Wolwehoek 1161	RE		Allan Peeters



Farm	Ptn	Owner	Contact Person
Saltberry Plain 137	RE		Allan Peeters

Project / Development Details

Sasol Mining intends to construct two new pipelines to manage underground mine water at its Mooikraal operations. The proposed Project entails one 7 megalitre (Ml) per day pipeline from the Mooikraal Kleinvlei Ventilation Shaft to the Mooikraal North and South Dams, as well as one 10 Ml per day pipeline from the Mooikraal North and South Dams to the vicinity of the Sasolburg Operations MK 4 East and West Dams, where it will be transferred to a future water treatment facility. The 7Ml pipeline will be approximately 3 km in length within an existing powerline servitude. The pipeline will have an internal diameter of 0.242 m and a peak throughput of 87l per second. The 10Ml pipeline will be approximately 18.5 km in length within existing Sasol servitude. The existing servitude is fenced off and consists of a road, coal conveyor, powerline and existing 5 Ml per day pipeline. The pipeline will have an internal diameter of 0.288 m and a peak throughput of 115l per second.

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.)
<input checked="" type="checkbox"/>	a	Any linear development or barrier >300 m	Waste Water Pipeline 20 km in extent
<input type="checkbox"/>	b	Any bridge or similar structure >50 m	
<input type="checkbox"/>	c	Any development or activity that will change the character of a site:	
	<input type="checkbox"/>	i $\geq 5\ 000\text{m}^2$ in extent	
	<input type="checkbox"/>	ii Involving ≥ 3 existing erven/ subdivisions	
	<input type="checkbox"/>	iii Involving ≥ 3 or more erven/ divisions consolidated within past 5 years.	
<input type="checkbox"/>	d	Rezoning of a site $\geq 10\ 000\text{m}^2$ in extent.	
<input checked="" type="checkbox"/>	e	Other triggers, e.g.: in terms of other legislation, (i.e.: National Environment Management Act, etc.)	NEMA, NWA

Activities

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

NEMA Activity No.	NHRA Trigger	Description	Expected duration/phase
	38(1)(a)	The construction of a road, wall, powerline, pipeline, canal or other similar form of linear development or barrier exceeding 300 m in length	Construction
GNR544 Activity 28		The expansion of or changes to existing facilities for any process or activity where such expansion or changes to will result in the need for a permit or license in terms of national or provincial legislation governing the release of emissions or pollution, excluding where the facility, process or activity is included in the list of waste management activities published in terms of section 19 of the National Environmental Management: Waste Act, 2008 (Act No. 59 of 2008) in which case that Act will apply	Construction Operation

Additional Impact Assessment Process

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

Legislation, i.e. NEMA, MPRDA, etc.	NEMA, NWA
Consenting Authority that has/will receive information	DWA
Present phase of process at Authority, e.g. Draft Scoping Report	Basic Assessment

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.

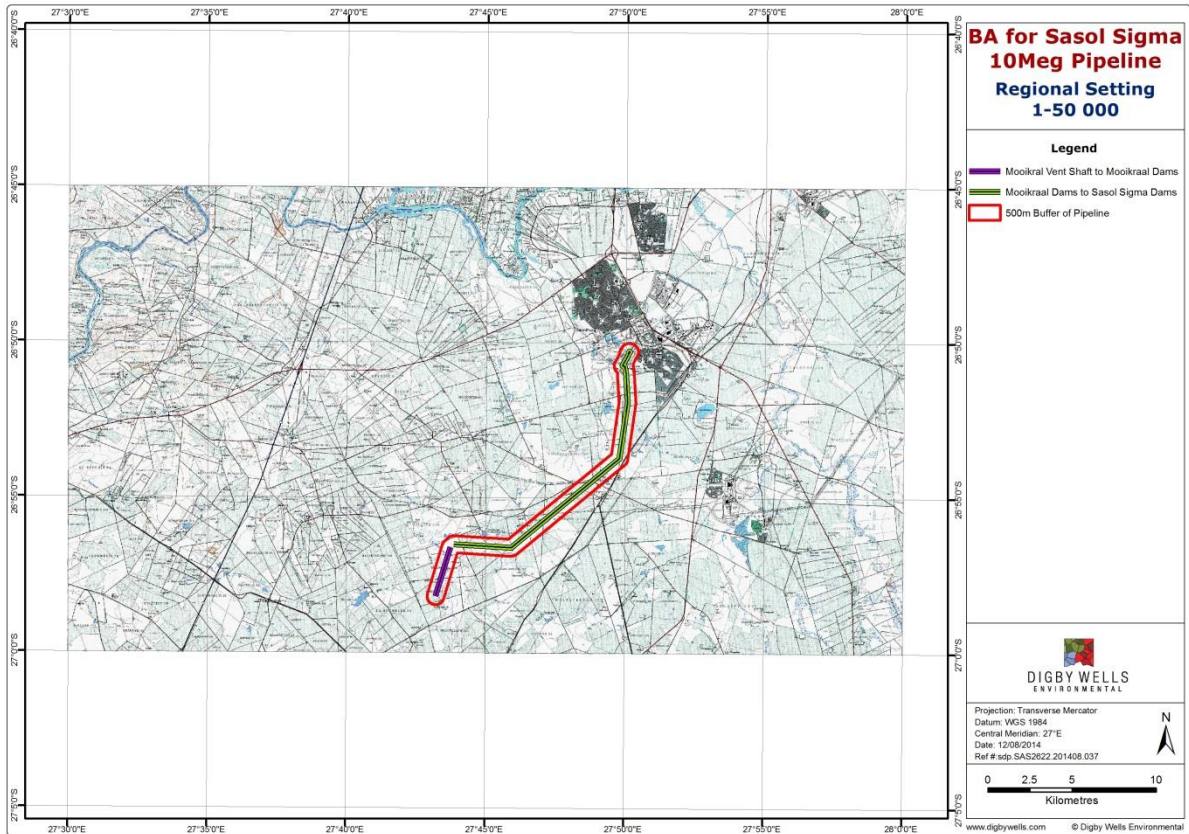
<input type="checkbox"/>	3(2)(a)	Places, buildings, structures and equipment of cultural significance
		Description of resource: None
		Potential impact: None



<input type="checkbox"/>	3(2)(b)	Places to which oral traditions are attached or which are associated with living heritage
		Description of resource: None
		Potential impact: None
<input type="checkbox"/>	3(2)(c)	Historical settlements and townscapes
		Description of resource: None
		Potential impact: None
<input type="checkbox"/>	3(2)(d)	Landscapes and natural features of cultural significance
		Description of resource: None
		Potential impact: None
<input checked="" type="checkbox"/>	3(2)(e)	Geological resources of scientific or cultural importance
		Description of resource: Vryheid Formation
		Potential impact: None
<input type="checkbox"/>	3(2)(f)	Archaeology and/or palaeontology (<i>Including archaeological sites and material, fossils, rock art, battlefields & wrecks</i>)
		Description of resource: None
		Potential impact: None
<input checked="" type="checkbox"/>	3(2)(g)	Graves and burial grounds (<i>e.g.: ancestral graves, graves of victims of conflict, historical graves & cemeteries</i>)
		Description of resource: Two burial grounds identified outside of servitude boundary
		Potential impact: None
<input type="checkbox"/>	3(2)(a)	Other human remains
		Description of resource: None
		Potential impact: None
<input type="checkbox"/>	3(2)(h)	Sites of significance relating to the history of slavery in South Africa
		Description of resource: None
		Potential impact: None

<input type="checkbox"/>	3(2)(i)	Movable objects
		Description of resource: None
		Potential impact: None

Illustrative Material



Recommendation

Is a Heritage Impact Assessment required?	<input type="checkbox"/> Yes	<input checked="" type="checkbox"/> No
<p>If NO, provide motivation:</p> <p>The proposed pipelines are located within a landscape that is dominated by agricultural and mining activity. Identified heritage resources within the study area were limited to Stone Age scatters, built structure, and burial grounds. No significant heritage resources were identified from the literature review.</p> <p>The project area is located in a region with high palaeontological sensitivity. However, in light of the proposed activities associated with the two pipelines, the potential to expose or damage palaeontological resources is negligible. It is therefore recommended that</p>		



exemption from any additional palaeontological assessments be granted for this project.

The proposed construction and operation of the 10 Mℓ pipeline will be confined within the boundaries of an existing servitude containing a conveyor belt, pipeline and transmission line owned by Sasol Mining. Based on the findings of this NID, it is recommended that activities associated with the proposed 10 Mℓ pipeline be exempt from any further heritage assessment.

The proposed construction and operation of the 7 Mℓ pipeline will occur along an existing transmission line servitude within which or in close proximity to, heritage resources were identified. Construction and operation activities may have a negative impact on heritage resources located at sub-surface levels along or in close proximity to the proposed routing.

It is recommended that a Watching Brief be undertaken during construction activities for the proposed 7 Mℓ pipeline. The recommended procedure for the Watching Brief includes:

- An accredited archaeologist must be presented during ground clearing activities;
- Heritage resources will be identified, recorded and assessed if and as exposed;
- The archaeologist will provide the developer with specialist input into remedial action in the event of identification of significant heritage resources;
- A Watching Brief report is submitted to SAHRA and FS-PHRA for consideration.

If YES, provide suggested components that may be required or undertaken during HIA.

<input type="checkbox"/>	Archaeology	<input type="checkbox"/>	Architecture
<input type="checkbox"/>	Built Environment	<input type="checkbox"/>	Burial Grounds and Graves
<input type="checkbox"/>	Palaeontology	<input type="checkbox"/>	Public Participation
<input type="checkbox"/>	Townscapes	<input type="checkbox"/>	Visual Impact
<input type="checkbox"/>	Other:		

Recommendation made by:

Name: Justin du Piesanie

Capacity: Heritage Management Consultant: Archaeologist

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1 Project Background

1.1 Introduction

Digby Wells Environmental (hereafter Digby Wells) was requested by Sasol Mining (Pty) Ltd (Sasol Mining) to conduct a Basic Assessment (BA) for two new pipelines to manage underground mine water at the Sasol Mooikraal Operations in the Free State. These include:

- A 3 km 7 megalitre (Mℓ) water pipeline from the Mooikraal Ventilation Shaft on farm Kleinvlei to the Mooikraal North and South Dams; and
- A 20 km 10 Mℓ waste water pipeline between Mooikraal Shaft and Sasol Sigma Shaft 3 Complex.

The BA will be compiled in line with the requirements stipulated within the National Environmental Management Act, 1998 (Act No. 107 of 1998) (NEMA) and the National Water Act, 1998 (Act No. 36 of 1998) (NWA).

1.2 Terms of Reference

In order to complete the BA, a heritage specialist study in accordance with the following legislation was required:

- NEMA;
- National Heritage Resources Act, 1999 (Act No. 25 of 1999) (NHRA).

1.3 Scope of Work

Under section (s.) 38 of the NHRA, the construction of the new pipelines must be communicated to the relevant heritage resources authority (HRA) at the earliest possible stage. This notification must be given with sufficient detail to determine whether a Heritage Impact Assessment is deemed necessary. The Scope of Work (SoW) for completion of the Notification of Intent to Develop (NID) included:

- Review of relevant previous heritage studies;
- Conducting historical layering of the proposed pipeline routes;
- Screening survey of the proposed pipeline routes;
- Reporting; and
- Providing recommendations for further heritage assessments.

1.4 Project Details

Sasol Mining intends to construct two new pipelines to manage underground mine water at its Mooikraal operations. The proposed Project entails one 7 Mℓ per day pipeline from the Mooikraal Kleinvlei Ventilation Shaft to the Mooikraal North and South Dams, as well as one 10 Mℓ per day pipeline from the Mooikraal North and South Dams to the vicinity of the

Sasolburg Operations MK 4 East and West Dams, where it will be transferred to a future water treatment facility. The 7 Mℓ pipeline will be approximately 3 km in length within an existing transmission line servitude. The pipeline will have an internal diameter of 0.242 m and a peak throughput of 87 ℓ per second. The 10 Mℓ pipeline will be approximately 18.5 km in length within existing Sasol servitude. The existing servitude is fenced off and consists of a road, coal conveyor, transmission line and existing 5 Mℓ per day pipeline. The pipeline will have an internal diameter of 0.288 m and a peak throughput of 115 ℓ per second.

Table 1-1: Location Data

Province	Free State
Metropolitan Municipality	Mangaung
District Municipality	Fezile Dabi
Local Municipality	Metsimaholo
Nearest Town	Sasolburg / Wolwehoek
Property Name and Number	Daniels Rust 320; Gysberthoek 315; Kleinvlei 66; Langverwacht 252; Mooikraal 355; Odin 93; Roseberry Plain 250; Saltberry Plain 422; Saltberry Plain 137; Willowdene 237; Wolwehoek 1795; Wonderheувel 417; Zwanenberg 450
1:50 000 Map Sheet	2627DC; 2627DD
GPS Co-ordinates (Relative centre point of study area)	26°54'41.3" S 27°48'35.7" E

Table 1-2: List of proposed infrastructure

Planned infrastructure	Extent
Waste Water Pipeline	3 km
	20 km

1.5 Project Activities

Expected activities associated with the development and operation of the proposed pipeline is listed in Table 1-3 below.

Table 1-3: Expected project activities

Trigger	Description
NHRA	
s.38(1)(a)	The construction of a road, wall, powerline, pipeline, canal or other similar form of linear development or barrier exceeding 300 m in length
GN R 544	
Activity 28	The expansion of or changes to existing facilities for any process or activity where such expansion or changes to will result in the need for a permit or license in terms of national or provincial legislation governing the release of emissions or pollution, excluding where the facility, process or activity is included in the list of waste management activities published in terms of section 19 of the National Environmental Management: Waste Act, 2008 (Act No. 59 of 2008) in which case that Act will apply

1.6 Relevant Contact Details

The contact details of the Sasol Project Manager, Digby Wells and landowners are provided in Table 1-4, Table 1-5 and Table 1-6 respectively.

Table 1-4: Sasol Project Manager Contact Details

Company	Sasol Mining (Pty) Ltd
Contact Person	Lisa Groblar
Cell No	082 449 2920
Email address	lisa.groblar@sasol.com

Table 1-5: Digby Wells Project Manager Details

Company	Digby Wells Environmental
Contact Person	Duncan Pettit
Tel No	011 789 9495
Cell No	082 399 9315
Email address	danie.otto@digbywells.com
Postal address	Private Bag X10046, Randburg, 2125

Table 1-6: Landowner Contact Details

Farm Name	Farm Number	Farm Portion	Owner/Title Position	Contact Person	Telephone number	Email Address	Postal Address
Gysberthoek	315	2	EDWIN CLAASSEN BELEGGINGS TRUST	EDWIN CLASSESN	(082) 900 5104/ (082) 887 7302/(082) 808 0570	edwin@eac.co.za	
Gysberthoek	315	RE					
Odin	93	RE					
Odin	93	1					
Langverwacht	252	RE	FANIE VAN RENSBURG INVESTMENT TRUST	DANIE V/RENSBURG	(082) 654 4854	danie@wonderheuwel.co.za	

Mooikraal	355	1	GOVERNMENT	RYAN ROWLEN	(051) 403 0700	ryan@ruraldevelopment.gov.za	
Daniels Rust	320	RE	JAAP SKAT TRUST	HESTER VD WESTHUIZEN	(082) 494 9327	hestervdw@lantic.net	P O Box 548 PARYS 9585
Kleinvele	66	RE					
Wolwehoek	1795	RE	L H CLAASSEN & SEUNTS PTY LTD	EDWIN CLASSESN	(016) 972 1115	edwin@eac.co.za	No 1 orwel park Three rivers Emfubeni Sedibeng district Municipality Gauteng 1929
Saltberry Plain	422	RE	LISEKI FAMILY TRUST	LINDA COCHRANE	(016) 973 1226	lindacochrane1@gmail.com	
Willowdene	237	RE	O F S FEEDERS PTY LTD	JOHN STRAW	(016) 970 8400	john@strawlamb.co.za	
Zwanenberg	450	1	PRIVATE PERSON	KNOETZE ROBERT JOHN	(082) 745 7218	delrobk@hotmail.com	

Zwanenberg	450	RE	PRIVATE PERSON	COCHRANE LINDA JOY	(016) 973 1226	lindacochrane1@gmail.com	
Mooikraal	355	RE	PRIVATE PERSON	ERASMUS JOHANNES	(076) 024 5191	rooies.rooies18@gmail.com	
Wonderheuvel	417	RE	RENSBURG STEFANUS LOUWRENS JANSE VAN-TRUSTEES	DANIE V/RENSBURG	(082) 654 4854	danie@wonderheuvel.co.za	
Saltberry Plain	422	1	SALTBERRY PLAIN TRUST	ALLAN PEETERS	(083) 468 2471	louise@perfectgas.co.za	
Roseberry Plain	250	1	SASOL CHEMIESE NYWERHEDE LTD	MICHIEL DU TOIT	(016) 960 2229	michieldutoit@sasol.com	1 Sturdeenlaan Avenue Johannesburg GAUTENG 2196
Mooikraal	355	2	SASOL MYNBOU PTY LTD	AMPIE PTGIETER	(017) 614 8000	ampie.potgieter@sasol.com	C1 Gate Sasol Compound Secunda MPUMALANGA 2302
Wolwehoek	1795	1	EDWIN CLAASSEN BELEGGINGS TRUST	EDWIN CLASSESN	(082) 900 5104	edwin@eac.co.za	

Notification of Intent to Develop

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SAS2622



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ENVIRONMENTAL

Wolwehoek	1161	RE	ALLAN PEETERS	ALLAN PEETERS	(083) 468 2471	louise@perfectgas.co.za	
Saltberry Plain	137	RE	ALLAN PEETERS	ALLAN PEETERS	(083) 468 2471	louise@perfectgas.co.za	



1.7 Expertise of Specialist

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

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

The curricula vita of the specialist is attached as Appendix A.

2 Policy and Legal Framework

2.1 Introduction

The NID considered a legal framework that includes the NHRA and NEMA, and the application of these Acts. These are discussed separately below.

2.2 NHRA

The NHRA is the overarching legislation that protects and regulates the management of heritage resources. The HRM process completed for this BA and NID was done in accordance with s. 38 where:

- 38(1)(a) - Any person who intends to undertake a development characterised as... the construction of a... pipeline... exceeding 300 m in length must notify the responsible HRA at the earliest stages of initiating the development;
- 38(8) - To give effect to the requirement that the consenting authority – in this case the Free State Department of Economic Development, Tourism and Environmental Affairs (FSDETEA) – consider any comments and recommendations of the relevant HRA prior to the granting of consent.

2.3 NEMA

The NEMA stipulates under s. 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.

Under s.23(2)(b) it is required to "identify, predict and evaluate the actual and potential impact on the ... cultural heritage... the risks and consequences and alternatives and options for mitigation of activities, with a view to minimizing negative impacts, maximising

benefits and promoting compliance with the principles of environmental management set out in s. 2”.

S. 24(1)(c) and 24(7)(b) state “the potential impact on... cultural heritage of the 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.”

3 NID Methodology

3.1 Definitions

Sources of risk to heritage resources can, essentially, be divided into three broad categories, as follows:

- **Direct or primary effects** on heritage resources occur at the same time and in the same space as the activity, e.g. loss of historical fabric through demolition work.
- **Indirect, induced or secondary effects** on heritage resources occur later in time or at a different place from the causal activity, or as a result of a complex pathway, e.g. restriction of access to a heritage resource resulting in the gradual erosion of its significance, which is dependent on ritual patterns of access.
- **Cumulative effects** on heritage resources result from in-combination effects on heritage resources acting with a host of processes that are insignificant when seen in isolation, but which collectively have a significant effect. Cumulative effects can be:
 - **Additive:** the simple sum of all the effects, e.g. the total number of new buildings within a historical rural landscape
 - **Synergistic:** effects interact to produce a total effect greater than the sum of the individual effects, e.g. the visual effect of the increase of new buildings within a historical rural landscape.
 - **Time crowding:** frequent, repetitive impacts on a particular resource at the same time, e.g. the high rate of increase of new buildings within a historical rural landscape.
 - **Neutralizing:** where the effects may counteract each other to reduce the overall effect, e.g. the effect of changes in patterns of cultivation could reduce the overall visual impact of additional new buildings within a historical rural landscape.
 - **Space crowding:** high spatial density of impacts on a heritage resource, e.g. density of new buildings resulting in suburbanisation of a historical rural landscape.

(Winter & Bauman 2005: 36)

Given that no individual identified heritage resource can exist in isolation to the wider natural, social, cultural and heritage landscape, three concentric study areas were defined for the purposes of this study. Defining these 'zones of influence' had a two-fold purpose:

- First, it provided the context within which identified heritage resources need to be interpreted and understood to determine cultural significance; and
- Second, assessing the significance of impacts on heritage resources corresponding to the three impact categories listed above.




The three zones of influence are as follows:

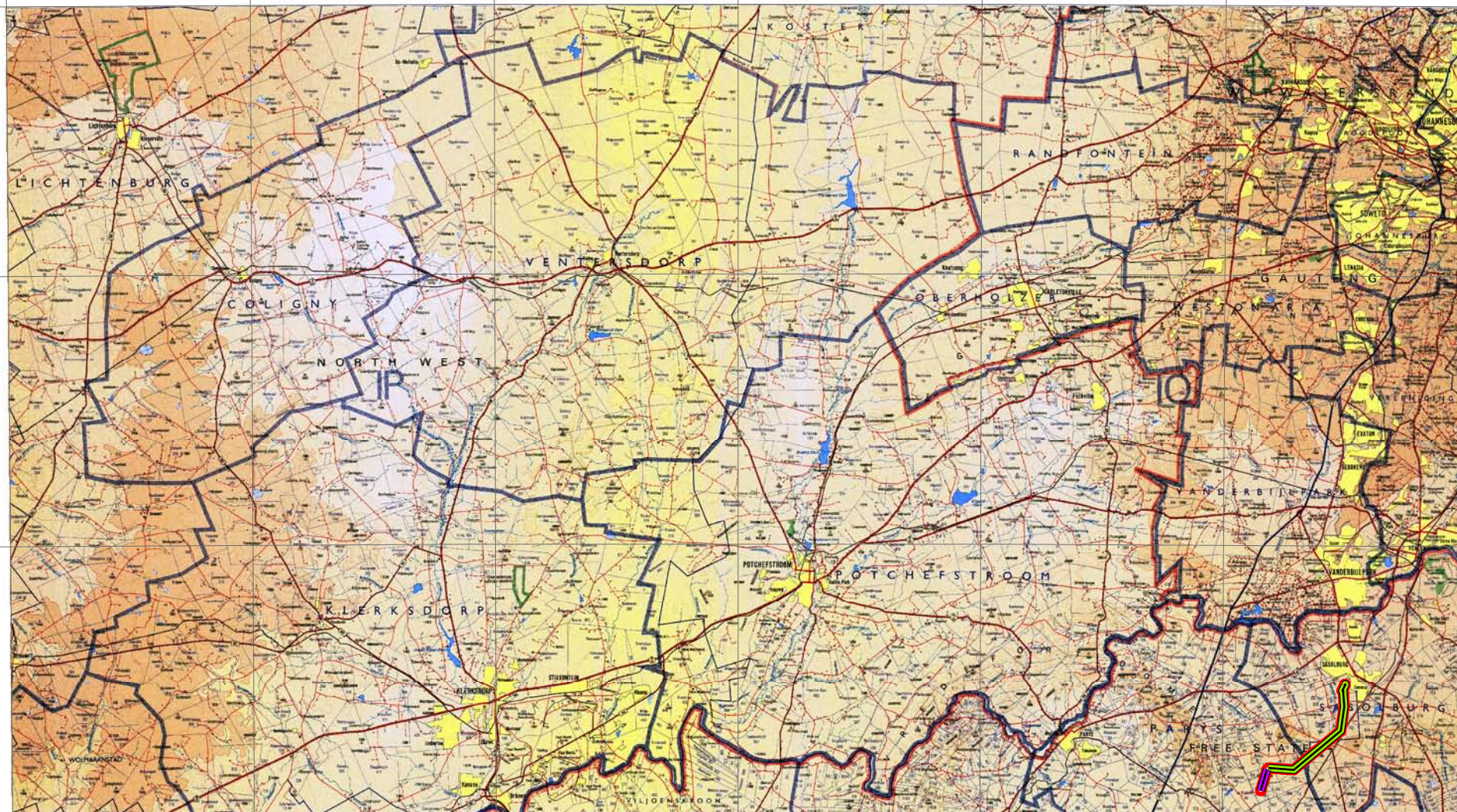
- **Primary Zone of Influence** (also referred to as the *site-specific* study area): This area was defined as the bounded project area i.e. the farm portions, within which the development will physically intrude through the construction of project infrastructure and project-related activities. The affected farm portions are listed in Table 1-1 and the site-specific study area depicted in Figure 3-3.
- **The Secondary Zone of Influence** (also referred to as *local* study area): This area was defined as the immediate surrounding properties / farms, as well as the affected local municipality. The local study area was specifically examined to provide a backdrop to the socio-economic conditions within which the proposed development will occur. The local study area furthermore provided the local development and planning context that may contribute to cumulative impacts. The local study area is depicted in Figure 3-2.
- **The Tertiary Zone of Influence** (also referred to as the *regional* study area): This area was defined as the district municipality. Where necessary, the regional study area was extended outside the boundaries of the district municipality to include much wider regional expressions of specific types of heritage resources and historical events. The regional study area, depicted in Figure 3-1, also provided the regional development and planning context that may contribute to cumulative impacts.

Sasol Sigma Mooikraal Infrachem Pipelines

Regional Setting 1-250 000

Legend

-  Mooikraal Vent Shaft to Mooikraal Dams
-  Mooikraal Dams to Sasol Sigma Dams
-  500m Buffer of Pipeline



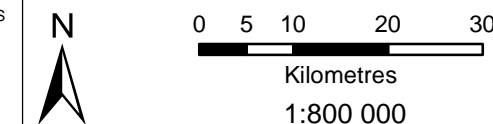
2626 Wes - Rand



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Projection: Transverse Mercator	Ref #:sdp.SAS2622.201408.036
Datum: WGS84	Revision Number: 1
Central Meridian: 27°E	Date: 12/08/2014

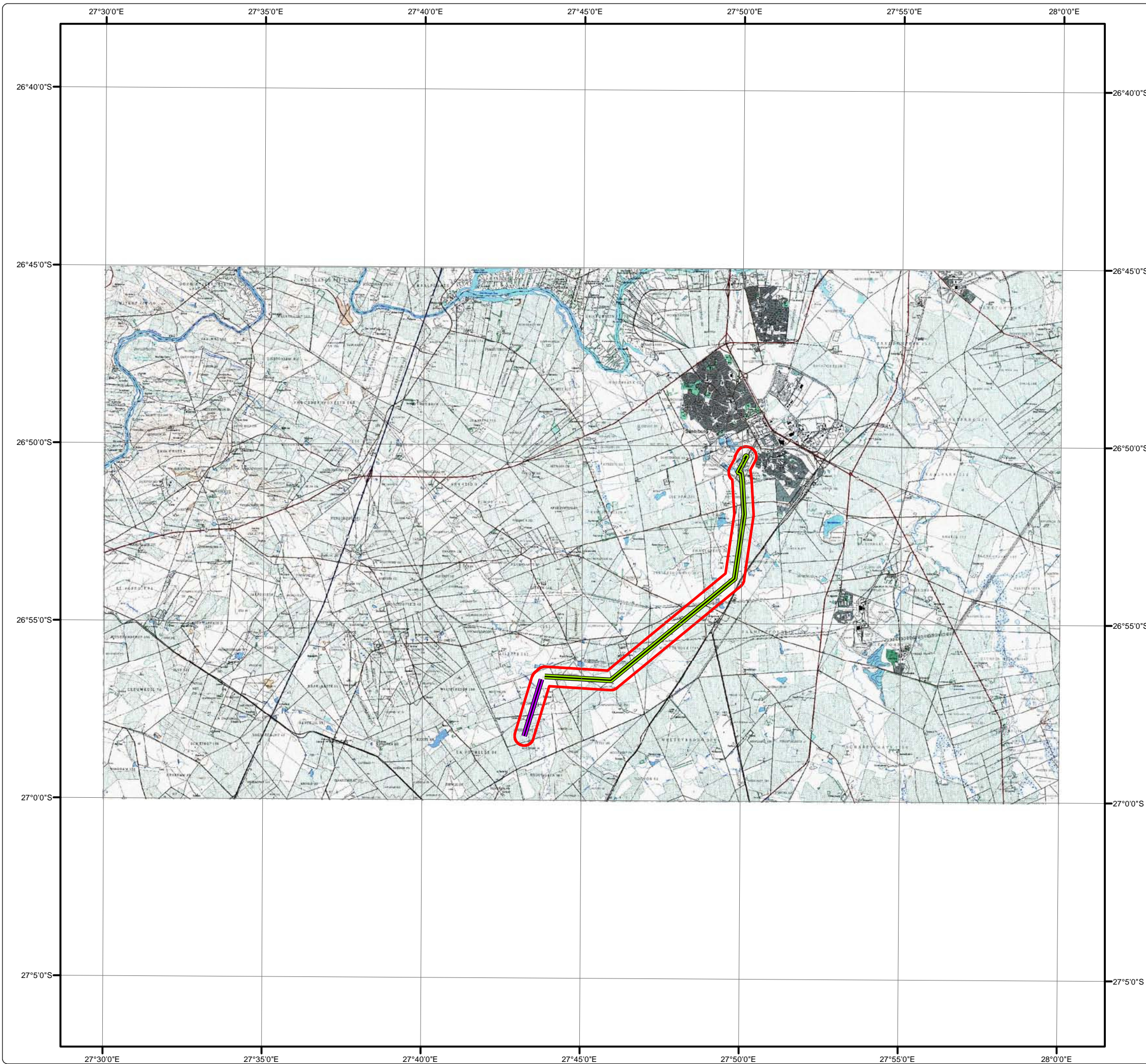


Sasol Sigma Mooikraal Infrachem Pipelines

Regional Setting 1-50 000

Legend

-  Mooikraal Vent Shaft to Mooikraal Dams
-  Mooikraal Dams to Sasol Sigma Dams
-  500m Buffer of Pipeline



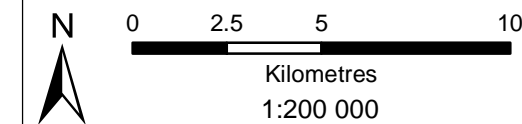
**2627DC Weiveld
2627DD Sasolburg**



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Projection: Transverse Mercator	Ref #:.sdp.SAS2622.201408.037
Datum: WGS84	Revision Number: 1
Central Meridian: 27°E	Date: 12/08/2014



Sasol Sigma Mooikraal Infrachem Pipelines

Regional Setting
1-10 000

Legend

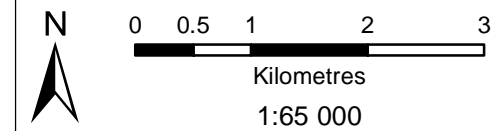
-  Mooikraal Vent Shaft to Mooikraal Dams
-  Mooikraal Dams to Sasol Sigma Dams
-  500m Buffer of Pipeline

2627DC Weiveld
2627DD Sasolburg



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Projection: Transverse Mercator Ref #: sdp.SAS2622.201408.035
 Datum: WGS84 Revision Number: 1
 Central Meridian: 27°E Date: 12/08/2014



3.2 Data Collection

3.2.1 Desktop and text based data collection

Data collection was aimed at information gathering relating to known heritage resources within and surrounding the proposed pipeline route. Information was obtained through intensive research using a variety of primary and secondary sources such as peer reviewed journals, textbooks and records, maps, photographs and plans.

Published literature was collated and analysed to determine relevance to this NID. Sources used to inform the findings are fully referenced under Section 7 of this report and are briefly listed below.

Table 3-1: Relevant reviewed published sources

Stone Age	<ul style="list-style-type: none"> ■ Deacon & Deacon, 1999 ■ Lombard, et al., 2012
Iron Age	<ul style="list-style-type: none"> ■ Chirikure, Hall, & Maggs, 2008 ■ Huffman, 2007 ■ Makhura, 2007 ■ Maggs, 1974 ■ Maggs, 1976
Planning documents	<ul style="list-style-type: none"> ■ Fezile Dabi District Municipality, 2013 ■ Statistics SA, 2013
General	<ul style="list-style-type: none"> ■ Seward, 1903

Previously completed heritage studies that were conducted in the surrounding areas were reviewed to expand on the background information discussed. 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 region. Heritage cases and reports found to be relevant are listed in Table 3-2 below, and fully referenced under Section 7.

Table 3-2: Relevant reviewed studies

Author	Report type	Area / property / project
Birkholtz & James, 2008	Heritage Impact Assessment (HIA)	Leitrim 926
Dreyer, 2005a	HIA	Heron Banks Golf and River Estate HIA

Author	Report type	Area / property / project
Dreyer, 2005b	HIA	Amelia 518
Du Piesanie, 2014	NID	Bankfontein 9
Nel, 2013	Heritage Statement Report (HSR)	Sigma Ash Backfilling Project
Pistorius, 2008	HIA	Secunda Sasolburg Pipeline
Rubidge, 2008	Palaeontological Assessment (PIA) Impact	Secunda Sasolburg Pipeline
Van Ryneveld, 2007	Archaeological Impact Assessment (AIA)	Mooibraai 44
Van der Walt, 2005	AIA	New Vaal Colliery
Van der Walt, 2008a	AIA	Erina 121
Van der Walt, 2008b	AIA	Erina 121
Van der Walt, 2009	AIA	Boschbank 12
Van der Walt, 2011	AIA	Rietfontein 251
Van der Walt & Birkholtz, 2005	AIA	New Vaal Colliery
Van Schalkwyk J. , 2006	HIA	Waterford Golf and River Estate
Van Schalkwyk & Naude, 1996	Heritage Survey Report	Sigma Colliery North West Strip Mine

In addition, an archive and database survey was conducted by consulting the following repositories:

- South African Heritage Resources Information System (SAHRIS); and
- University of the Witwatersrand Archaeology Site Database

3.2.2 Integration of other specialist studies

In-house Digby Wells specialist studies were reviewed and integrated where applicable. Findings from additional specialist studies that contributed to the NID and understanding of the cultural landscape are listed in Table 3-3

Table 3-3: In-house specialist studies integrated into HIA

Author	Specialist study	Contribution to HIA
Greffrath, 2013	Fauna and Flora Impact Assessment	Current cultural landscape
Van Tonder, 1997	Environmental Management Program Report (EMPR)	

3.3 Historical Layering

Historical layering is a process whereby diverse cartographic sources from various time periods are layered chronologically using Geographic Information System (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.

Cartographic sources referred to in this report are listed in Table 3-4.

Table 3-4: Cartographic sources relevant to the project

Cartographic Sources and Aerial Imagery						
Map series		Name / number			Date	
Jeppe		Map of the Transvaal			1899	
Transvaal Degree Sheets		25_Potchestroom			1902-1909	
Orange Free State GSGS		37B_Vereeniging			1905-1911	
Transvaal GSGS		03_Vereeniging_Extension			1910-1911	
Aerial photographs						
Job no.	Flight plan	Photo no.	Map ref.	Area	Date	Reference
129	1	53843	2626	Wes Rand	1938	129/1938
		53924				



Cartographic Sources and Aerial Imagery						
		83141				
		54233				
		54270				
		53841				
		54328				
		54330				
		54385				
		54387				
438	1	4383	2527, 2627, 2628	Rustenburg, Pretoria, Wes Rand, East Rand, Kroonstad, Frankfort	1961	438/1961
		3378				
		3380				
		3311				
221	1	94943	2626, 2628	Wes Rand, East Rand	1948	221/1948
		94911				
		94852				
		94854				
		94856				
881	1	344	2526, 2528, 2530, 2626, 2628, 2630	Rustenburg, Pretoria, Barbeton, West Rand, East Rand, Mbabane	1973	881/1973
698	1	3040	2626, 2628, 2726, 2728	Wes - Rand, East - Rand, Kroonstad, Frankfort	1973	698/1973
		3098				
		33				
		34				

Cartographic Sources and Aerial Imagery						
952	1	6162	2629	Wes - Rand, East Rand, Mbababe	1991	952/1991
		2130				
		2024				

3.4 Field Based Data Collection

Field based data collection was undertaken over two (2) days on the 23rd of July 2014 and 11 September 2014. Quantitative data collection was completed through reconnaissance survey of the project area. The adopted approach was completed through a vehicular survey of the proposed servitude.

3.5 Site Naming

Sites identified during field surveys are prefixed by the SAHRIS case number assigned to the study followed by the map sheet number, relevant period / feature code and site number, i.e. **6525/2627DC/BGG-001**.

This number may be shortened on any plans or maps to the period / feature code with the site number used in that report. For example: **BGG-001**

Table 3-5: Period codes used in this NID

Period / Feature	Period / Feature Code
Burial / grave	BGG
Structure	Ste

4 Cultural Heritage Baseline Description

4.1 Introduction

A report for the Sasol Mining Sigma Colliery Ash Backfilling Project (Nel, 2014) was completed and submitted to SAHRA and FS-PHRA (Case ID: 5035) in March 2014. The description of the cultural heritage baseline was utilised and where necessary updated for inclusion into this NID.



4.2 Regional study area

4.2.1 Regional Geology and Palaeontological Potential

The Karoo Basin is divided into the Dwyka, Ecca and Beaufort Groups. Geologically, the region associated with the project is underlain primarily by sedimentary lithologies associated with the Ecca Group.

The composition of sediments includes shale (often carbonaceous), mudstone, siltstone, sandstone and the economically important coal seams. These sedimentary rocks are invaded by post-Karoo (younger) dolerite intrusions (van Tonder, 1997). The Palaeo-Sensitivity Map (PSM) for the region indicates that the area surrounding Sasolburg is of high sensitivity (SAHRIS, 2014).

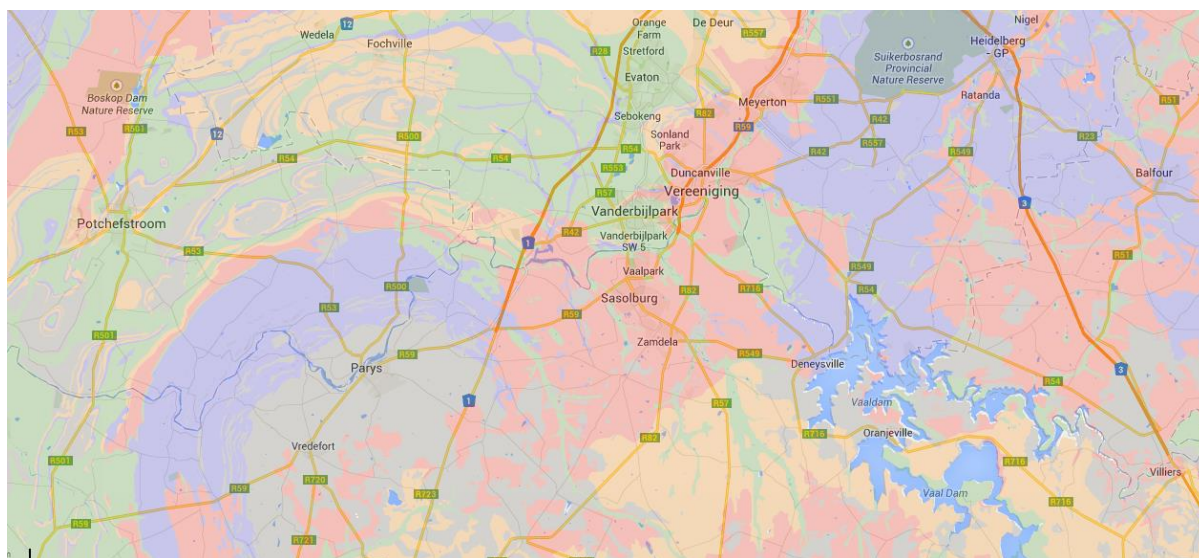


Figure 4-1: The PSM for the region (SAHRIS, 2014). Note the high sensitivity indicated in red around Sasolburg.

4.2.2 The Stone Age

Evidence for the three phases of the Stone Age (i.e. Early (ESA), Middle (MSA) and Late (LSA)) has previously been recorded in the Free State Province. The majority of identified Stone Age sites have been limited to lithic scatters dating to the MSA ($\pm 250\ 000$ to $20\ 000$ year ago (ka) (CE)) and LSA. The MSA can be defined by the occurrence of blades and points produced from good quality raw material. Bone tools, shell beads and pendants, as well as the use of ochre are also present in the MSA (Deacon & Deacon, 1999).

The LSA is dated to approximately $20\ 000$ years CE and can be characterized by the presence of microlithic technology and strong signs of ritual practises and complex societies, as well as rock art. Microlithics are produced from very fine-grained material such as quartz or chert, and often used as composite tools where they are hafted onto sticks for arrows.

Herders or pastoralists emerge towards the end of the LSA, with ceramics and domesticated stock (Deacon & Deacon, 1999).

Table 4-1: The South African and Lesotho Stone Age sequence (Lombard, et al., 2012)

Period	Technocomplex	Also known as (including regional variants)
Later Stone Age <40 ka	ceramic final LSA <2 ka	Ceramic post-classic Wilton, Late Holocene with pottery (Doornfontein, Swartkop)
	final LSA 0.1-4 ka	Post-classic Wilton, Holocene microlithic (Smithfield, Kabeljous, Wilton)
	Wilton 4-8 ka	Holocene microlithic
	Oakhurst 7-1 ka	Terminal Pleistocene / early Holocene non-microlithic (Albany, Lockshoek, Kuruman)
	Robberg 12-18 ka	Late Pleistocene microlithic
	early LSA 18-40 ka	(informal designation) Late Pleistocene microlithic
Middle Stone Age >20 ka - <300 ka	final MSA 20-40 ka	(informal designation) MSA IV at Klasies River, MSA 4 generally
	Sibudu 45-58 ka	late MSA / post-Howieson's Poort or MSA III at Klasies and MSA 3 generally (all informal designations)
	Howieson's Poort 58-66 ka	
	Still Bay 70-77 ka	
	pre-Still Bay 72-96 ka	(informal designation)
	Mossel Bay 77-105 ka	MSA II at Klasies River, MSA 2b generally (Pietersburg, Orangian)
	Klasies River 105-130 ka	MSA I at Klasies River, MSA 2a generally (Pietersburg)
	early MSA 130-300 ka	(informal designation)
Early Stone Age >200 ka	ESA-MSA transition >200-600 ka	(informal designation) (Fauresmith, Sangoan)
	Acheulean 300-1.5 Ma	
	Oldowan 1.5-2 Ma	



4.2.3 The Iron Age

The LSA, associated with San hunter-gatherers in southern Africa, is followed by the Iron Age (Makhura, 2007). This period is associated with the spread of Bantu speakers into southern Africa, who for the first time lived in settled communities, cultivated crops and herded livestock. This period too is divided into the Early, Middle (MIA) and Late Iron Age (LIA) (Huffman, Handbook to the Iron Age: The Archaeology of Pre-Colonial Farming Societies in Southern Africa, 2007).

General among archaeologists is that the southern Highveld was only settled relatively late in time when compared to other regions in the country (Chirikure, Hall, & Maggs, 2008; Huffman, Handbook to the Iron Age: The Archaeology of Pre-Colonial Farming Societies in Southern Africa, 2007; Maggs, 1974; Maggs, 1976). Historically, the landscape would not have been hospitable to early farmers as it is devoid of trees and subject to sour grass in winters (Greffrath, 2013). This would have impacted heavily on early farmers who were reliant on firewood for domestic activities, construction and metal working (Nel, 2014).

Key identifiers for these inhabitants include material culture, most commonly ceramics, and stonewalling. Huffman (1980) demonstrates that by considering three dimensions of ceramics, i.e. (1) profile; (2) design layout; and (3) motif categories, one could reliably recognise groups. It is further argued that these stylistic groups could be used to recognise Iron Age entities (Huffman, 2007, p. 111). Guided by this process of ceramic analysis, the most common ceramic facies identified in the Free State are summarised in Table 4-2.

Table 4-2: Possible ceramic traditions in the Mooikraal project area (adapted from Huffman, 2007)

Facies	Likely date range	Associated settlement type
Ntsuanatsatsi	1450 to 1650	Type N
Uitkomst	1650 to 1820	Klipriviersberg
Makgwareng	1700 to 1820	Type V
Olifantspoort	1500 to 1700	N/A
Thabeng	1700 to 1840	Type Z
Buispoort	1700 to 1840	N/A

The most visible evidence of the 15th century farmer groups in the general region are various stonewalled settlement types. The most common of these Maggs (1976) has termed 'Type V' settlements. These settlements occur in the north-eastern part of the Free State into southern Mpumalanga as far as Bethal and Ermelo. They were first described by Van Riet



Lowe in 1927 at Vegkop. Based on Maggs' aerial surveys, it is evident that Type V settlements 'cluster around main river systems' such as the upper Vaal River.

4.2.4 The Colonial and Historical Period

Coal was discovered in the region as early as 1879 by George William Stow (Pistorius J. C., 2008). The Jeppe's Map of the Transvaal (1899) indicates mines to the northeast of the project area near Vereeniging and to the south at Wolvenhoek (See Figure 4-2).

Historically, the town of Vereeniging was established in 1882 and proclaimed in 1889. It is significant as it played host to several prominent figures and events. Prior to the Anglo-Boer War, President Kruger of the *Zuid Afrikaanse Republiek* (ZAR) and President Reitz of the Orange Free State met for the official opening of the first railway crossing of the Vaal River in 1892. This is seen in the 1899 Map in which the station at Viljoensdrift and railway is clearly depicted. The railway line also runs adjacent to the project area and is potentially indicative of an increase in human settlement and the establishment of industrial activity. The town of Vereeniging also hosted Boer Generals Botha, Hertzog, Smuts, de la Rey and Lord Milner and General Kitchener in May 1902 to negotiate the Peace Treaty with Great Britain after the Anglo-Boer War (Fourie, 2007). The site is indicated today by a sawn-off tree trunk near the Vereeniging Refractories' Recreation Hall.

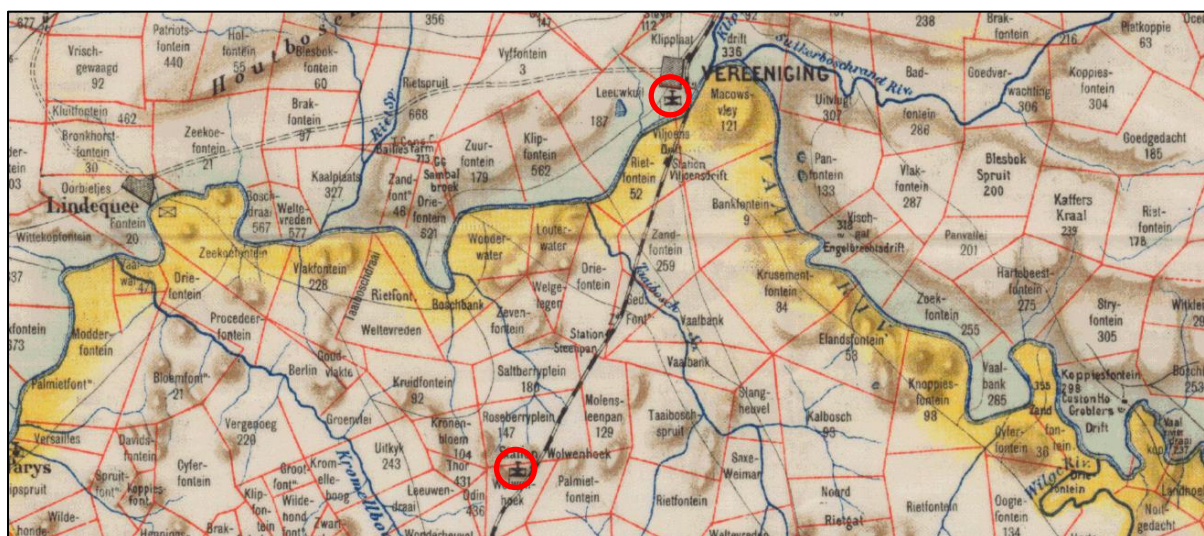


Figure 4-2: Extract from Jeppe's 1899 Map of the Transvaal with the mines at Vereeniging and Wolvenhoek indicated.

4.3 Local study area

4.3.1 Local Geology and Palaeontological Potential

The lithologies of the Ecca Group in the study area are associated with the Vryheid Formation. The Vryheid Formation consists of sandstone, shale, mudstone and coal, and is



renowned for its wealth of plant fossils, specifically the Gondwana *Glossopteris* flora. These fossils have been described from Permian aged rocks (Rubidge, 2008).

Important plant fossil localities have previously found in areas close to Vereeniging. Seward (Fossil floras of Cape Colony, 1903), for example, described impression fossils of the plant *Bothrodendron leslii*. Similarly, Rayner (The Permian Lycopod *Cyclodendron Lesilii* from South Africa, 1985) also described lycopods such as *Cyclodendron leslii* found close to Vereeniging.

4.3.2 The Stone Age

Included in the LSA 'package' of tools is rock art (Deacon & Deacon, 1999). Directly of current operations, the rock engraving site of Leeuwkuil is located. Hollmann (1999) described the sites as being located on a small island in the Vaal River where engravings are concentrated on the south-eastern part of the peninsula. Eland and other antelope dominated the images depicted, which appeared to be in the San hunter-gatherer engraving tradition (Hollman, 1999). Pistorius (2007) discusses the Redan rock engraving site which contains as many as 244 rock engravings depicting animals, geometric designs and in some instances San weapons.

4.3.3 The Iron Age

Based on Maggs' 1974 settlement distribution map (Maggs, Iron Age Communities of the Southern Highveld, 1976, pp. 38 - 39), no Type V sites have been recorded in the project area, but two 'Vredefort Dome/Type Z' sites are recorded nearby (Van Schalkwyk & Naude, 1996). No additional sites associated with the southern African Iron Age have been identified in the region in any of the reports reviewed for this project. This can be attributed to the reasonably unfavourable natural environment. No sites associated with the southern African Iron Age have been identified in the region in any of the reports reviewed for this project. This can be attributed to the reasonably unfavourable natural environment.

4.3.4 The Colonial and Historical Period

From the reviewed historical maps, it is evident that that infrastructure development increased in the local study area. Most notable in the 1902-1909 and 1910-1911 maps are the expansion of the railroad and road network (See Figure 4-3 to Figure 4-5).

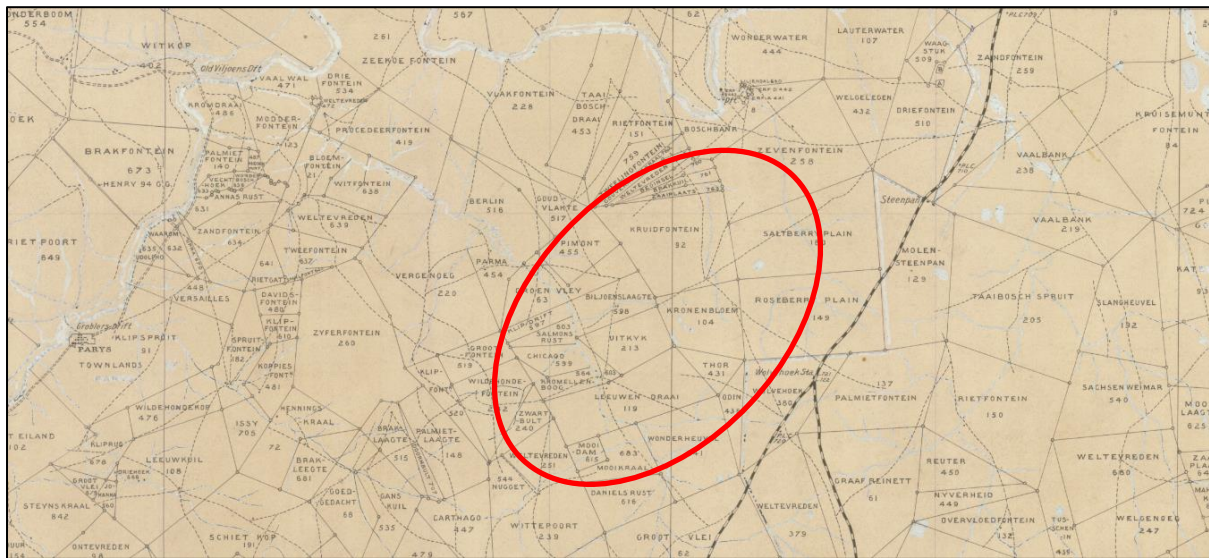


Figure 4-3: Extract from the 1902-1909 Transvaal Degree Sheet. Approximate project area indicated.

Having noted this, no major nodes are established in the local study area. During this time, it would appear that Viljoendrift (Figure 4-4) is the primary node based on the several features evident on the maps such as a post office, court house, railway station, and the Cornelia Coal Mine. The closest area of development in close proximity to the proposed pipelines was the establishment of a railway station, post office and school at Wolvenhoek (See Figure 4-4 and Figure 4-5).

From the reviewed reports (See Table 3-2), heritage resources associated with the colonial and historical period are limited to built structures and burial grounds. The common agreement amongst the authors is that the identified built structures are of low significance.

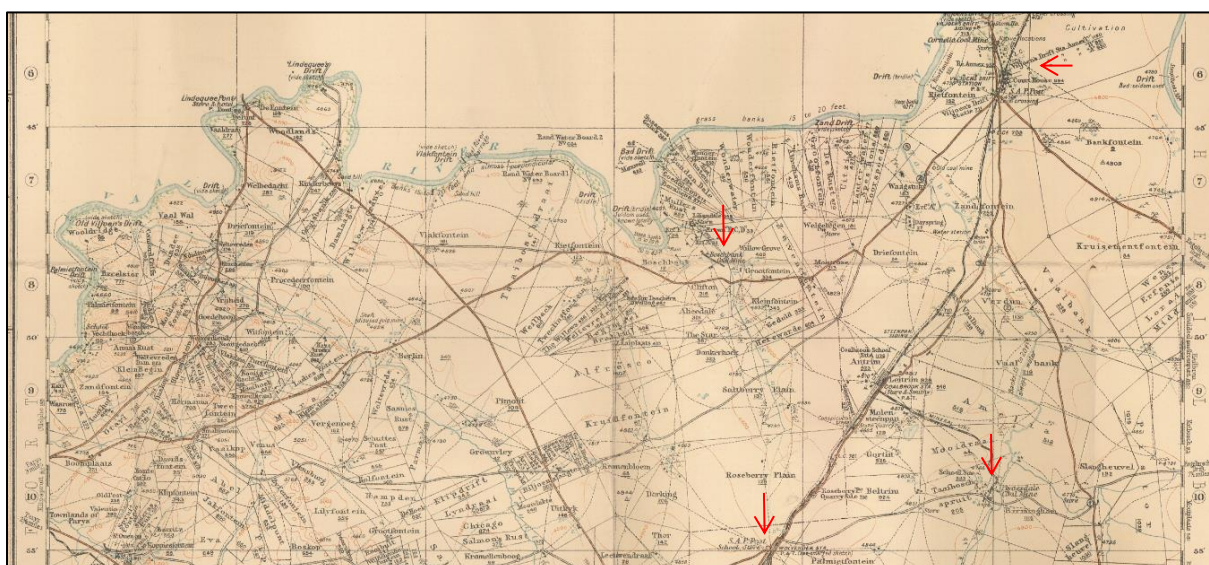


Figure 4-4: Extract from the Free State GSGS 1905-1911 Series. Note Viljoendriffs in the north, established coal mines, and station and school at Wolvenhoek

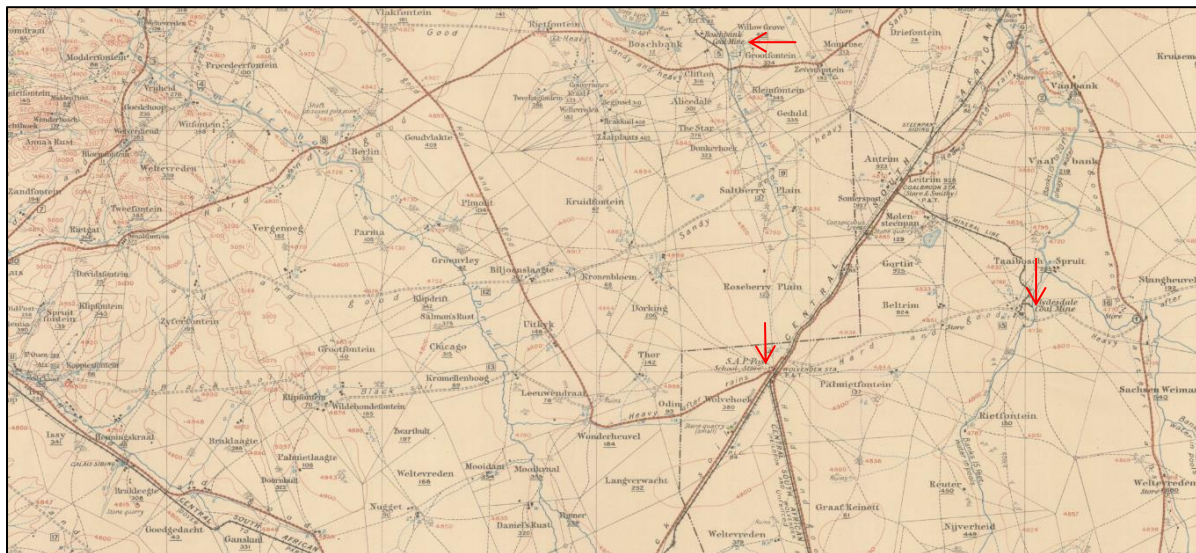


Figure 4-5: Extract from the Transvaal GSGS 1910-1911 Map. Note the expansion of infrastructure and the established mines indicated.

4.3.5 Development Context

The proposed pipelines are located within the Mangaung Metropolitan, Fezile Dabi District (FDDM) and Metsimaholo Local Municipalities (MLM) of the Free State Province. The development and planning context of these municipalities are summarised from:

- Statistics South Africa (Statistics SA, 2013);
- Fezile Dabi Integrated Development Plan (FD-IDP) (Fezile Dabi District Municipality, 2013).

At the time of the 2011 census the MLM had a total population of 149 108 people. Out of the total population, 69.3% of people are of working age (15-64) of which 32.1% are unemployed. The household income ratio for the working group within the MLM is low with 59% receiving less than R 3200.00 per month.

The FD-IDP states that the primary industry and land-use is associated with agriculture, with Sasol dominating the private manufacturing sector. Greffrath (Flora and Fauna Report for the Sasol Sigma Ash Backfill Project, 2013) states that much of the grassland biome has been transformed by crop farming, afforestation, and dense human settlement.

In order to diversify economic opportunity the FD-IDP focusses on service delivery and developing industries to facilitate such delivery.

One consideration to diversify the economy is to develop the self-drive 'Riemland route' which includes sites such as the Vechkop Battlefield, the Riemland Museum and the Vredefort Dome World Heritage Site. In addition, key performance areas (KPAs) related to heritage are also identified within the FD-IDP and summarised in Table 4-3.

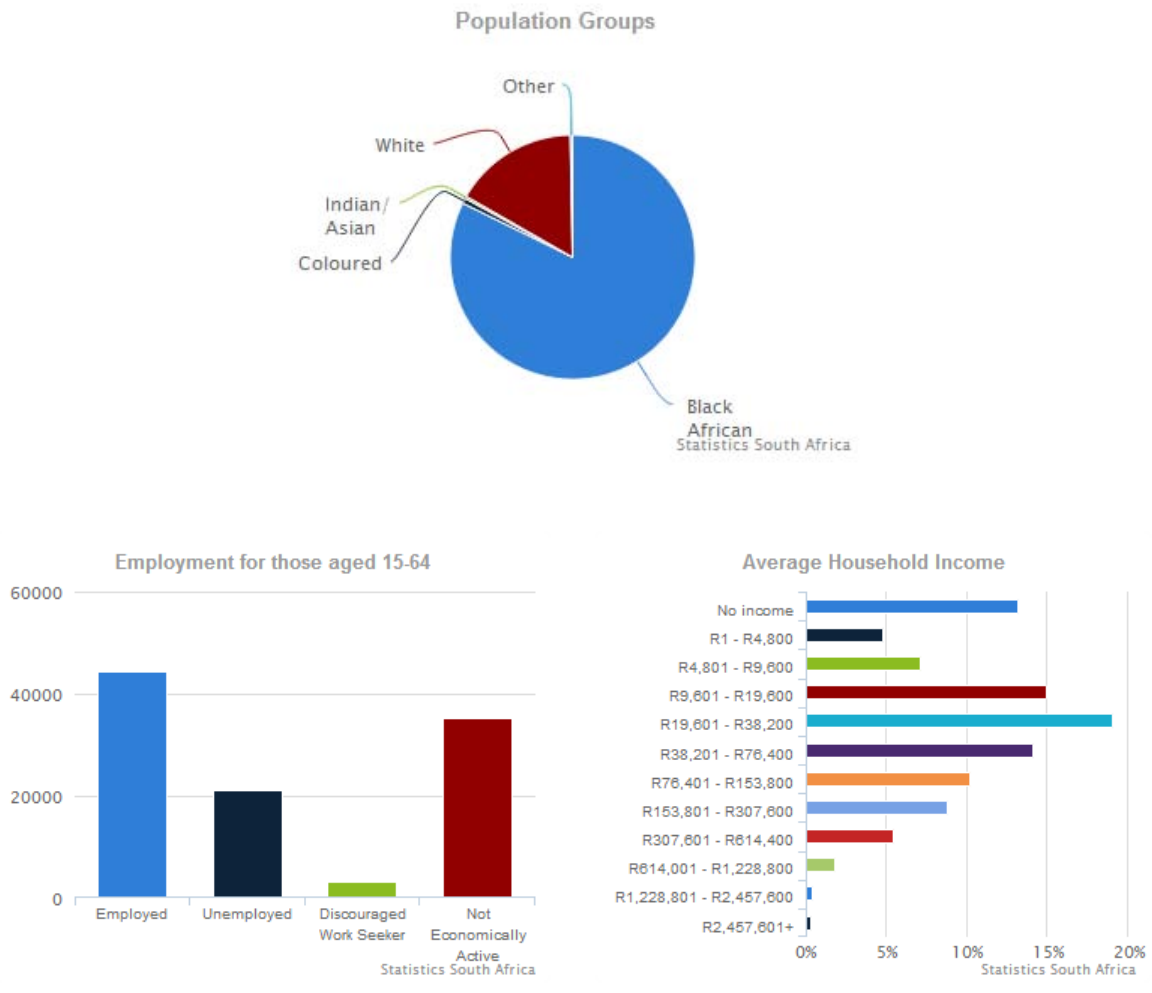


Figure 4-6: Population, employment and income information for the MLM (Statistics SA, 2013)

Table 4-3: KPAs with specific reference / relevance to HRM

IDP Goal / objective	Strategies	Key Performance Outcome	Key Performance Indicator	Specific project / programme	Relevance to heritage resources management
KPA 3		Local economic development			
Community development					
Promoting community development programs	Arts and crafts development in communities	Capacitated/ skilled Artists and Crafters	Number of Artists and Crafters assisted	Provision of training; equipment; production and exposure to markets for performing and visual arts	Living heritage – traditional crafts, oral traditions, IKS
Sustaining Arts and Culture	Supporting municipal theatres	Ensuring theatres are functional and active	Annual funding allocation	Municipal Theatre Support	Living heritage – performances, oral history
	Develop and implement programmes to assist amateurs to reach professional level	Professional performing artists	Number of enrolled local performing artists in academic institutions	Empowerment of local artists	
	Regional Performing Arts development	Developed and resourced performing artists	Number of groups to be assisted	Financial assistance to identified performing groups	
Tourism					
Establish tourism market	Annual Tourism and Heritage Awareness Campaign	Tourism conscious communities	Mobilization of communities; Presentations at schools to encourage tourism as a	Tourism Month celebration	Intangible heritage – sense of place, Living heritage – arts; Tangible heritage – sites;

IDP Goal / objective	Strategies	Key Performance Outcome	Key Performance Indicator	Specific project / programme	Relevance to heritage resources management
			subject		and Presentation of heritage.
KPA 5		Good governance and public participation			
Celebrating historical heritage, commemorate Maokeng day; and Tumahole day.	Forming task teams with concerned local municipalities to plan and implement intended programmes	Create awareness about historic days regarding democracy and success hosting of the event within certain communities	Number of people in attendance	Hosting of commemorative days	Liberation heritage Tangible – sites Intangible - associations
Celebrate general historical heritage	Form a task team with Officials from all local municipalities	Implement awareness campaign	Better understanding of our heritage and our rich history	Proudly South African campaign	General, integrated heritage management

4.4 Site specific study area

The proposed routing for the pipelines was compared against historical aerial imagery from 1938 through to 1991. What is evident is that the primary activity in the area is agriculture until the establishment of the present day Sigma Colliery area clearly visible in the 1973 aerial imagery onwards (Figure 4-10).

Identified potential infrastructure in earlier imagery appears to be associated with agricultural activities and associated farmsteads in the area. Although a fluctuation in the number of potential structures is recorded through time, no major developments in the site specific study area are recorded.

Structures generally appear to be absent from the pipeline routes, with a few exceptions in the earlier aerial imagery. A screening survey of the servitude did not reveal any remnants of historic structures, although potential burial grounds were recorded outside of the fence boundary and the approximate locations are presented in Plan 5.

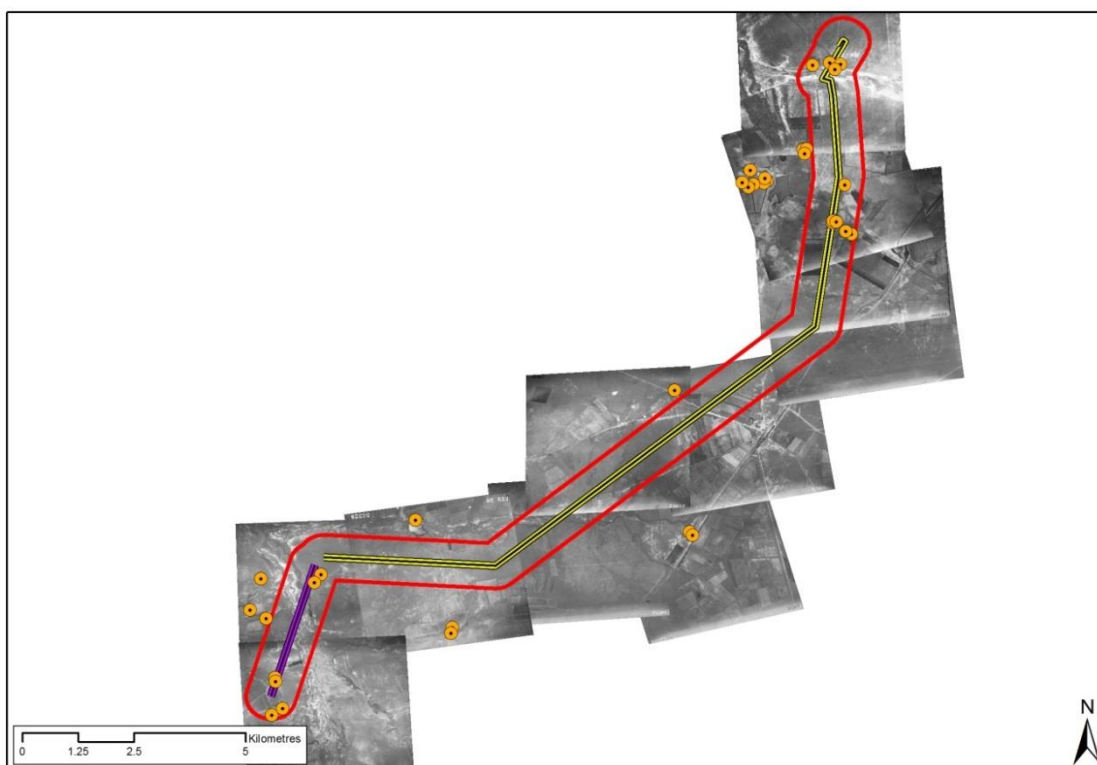


Figure 4-7: Historical imagery dated 1938¹

¹ Orange Points = Potential built structures

Yellow and Purple Line = Proposed 10 M ℓ and 7 M ℓ pipeline respectively

Red Line = 100 m buffer around pipelines

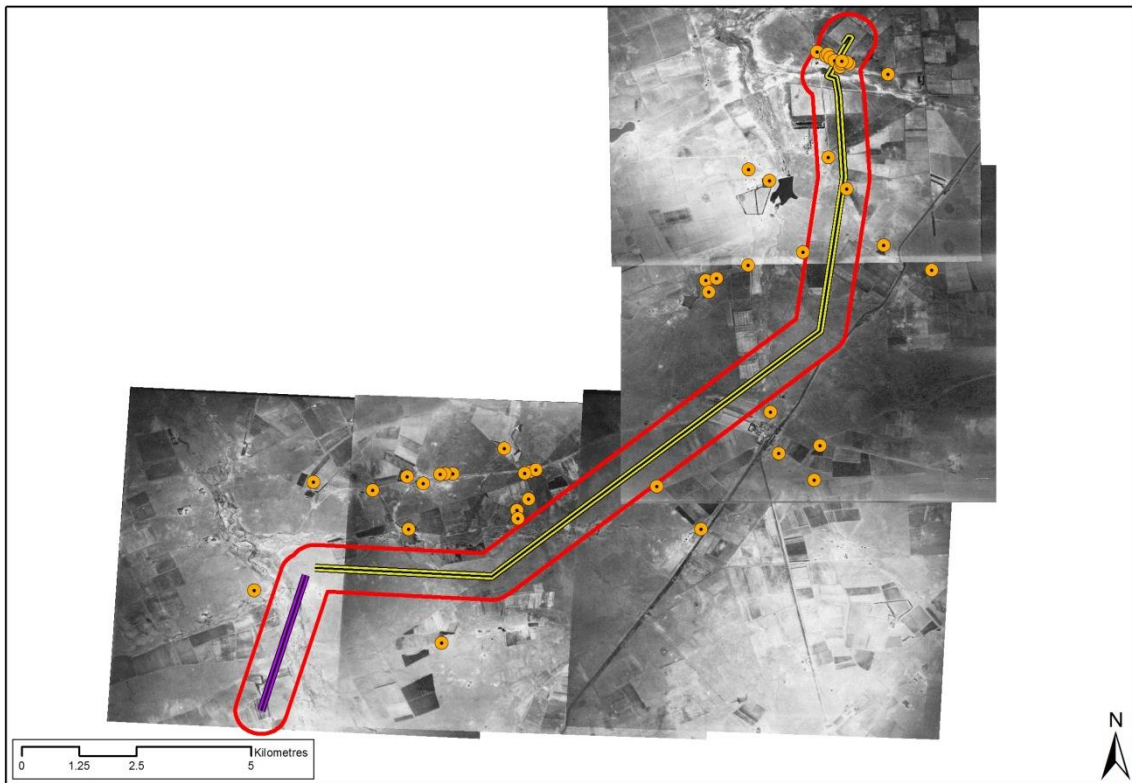


Figure 4-8: Historical imagery dated to 1948

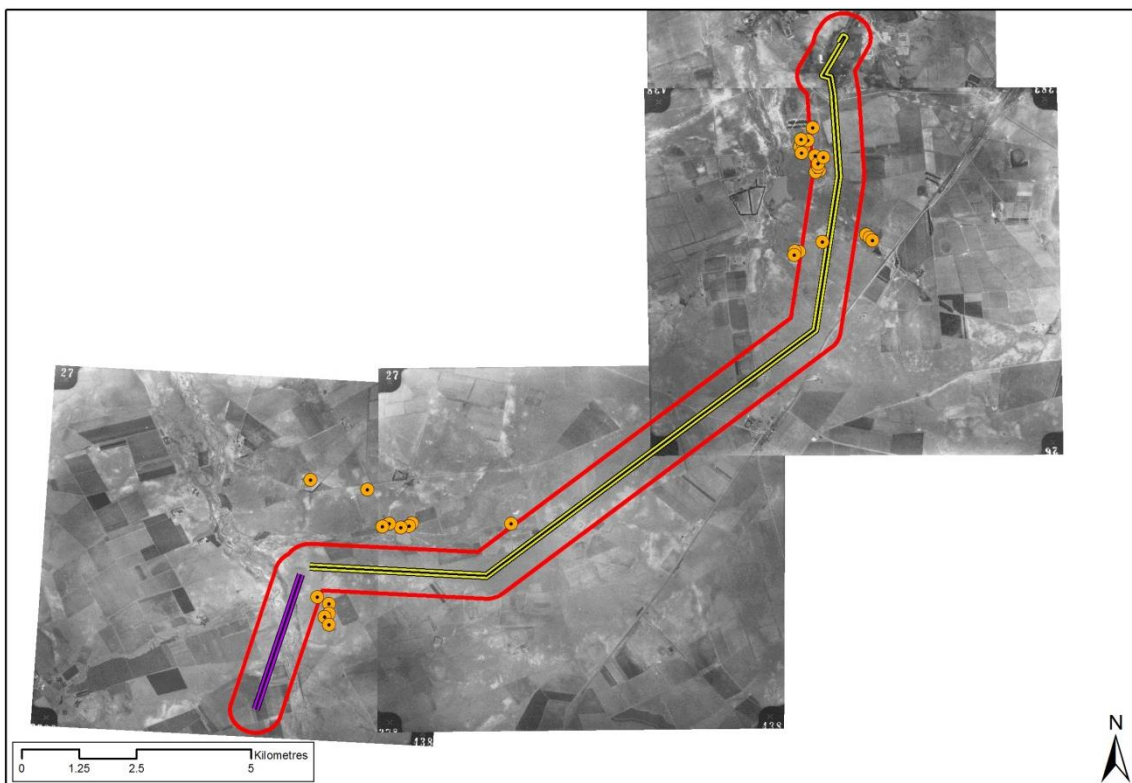


Figure 4-9: Historical imagery dated to 1961

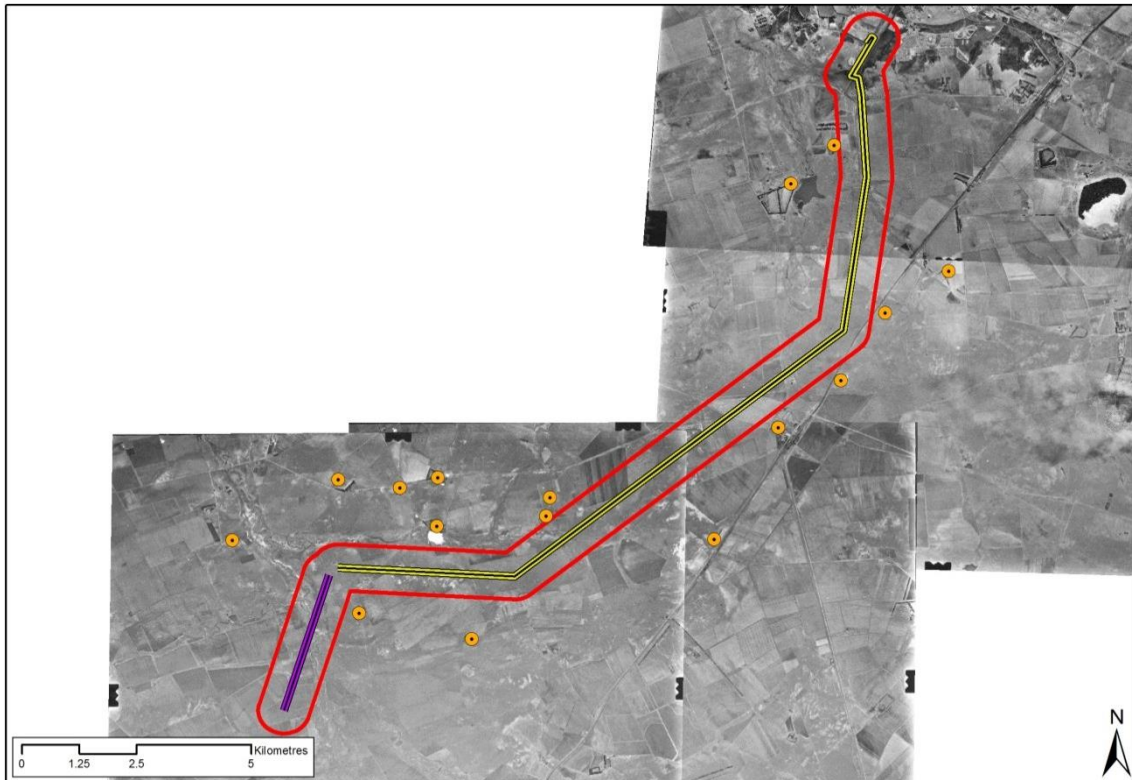


Figure 4-10: Historical imagery dated 1973

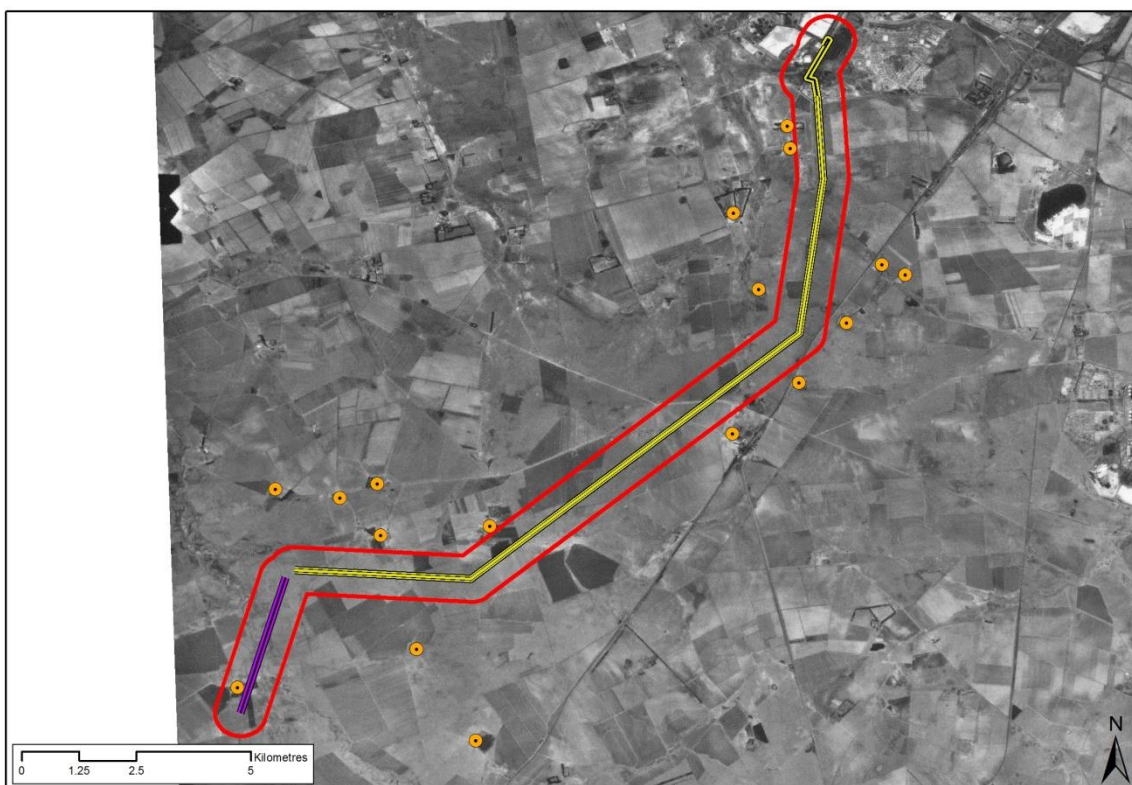


Figure 4-11: Historical imagery dated 1986



The proposed routing for the 7 Ml pipeline is along an existing transmission line servitude. During the field screening survey, a historical werf and Stone Age scatters were identified within or in close proximity to the proposed routing. On review of the historical imagery presented in Figure 4-7 to Figure 4-11, built structures in the 1938 aerial imagery were identified in the general location of the historic werf (Wf001). However, the werf is currently in a derelict state, and no heritage significance has been attributed to the site.

Although no burial grounds and graves were identified during the screening survey, the potential for burial grounds associated with the werf to occur is high.



Figure 4-12: Foundations of structures at Wf001



Figure 4-14: Silos associated with Wf001



Figure 4-13: Rubble remains of built structure at Wf001



Figure 4-15: Rubble remains of built structures at Wf001

Stone Age scatters were identified along the existing transmission line servitude. The finds were located on the surface, removed from the original context. No diagnostic formal tools were identified in the surface scatter, but from the lithics identified it suggests that the assemblage is associated with the MSA.

It appears that the lithics were exposed during the installation of the transmission line suggesting the presence of an archaeological deposit occurring at sub-surface levels along the proposed routing.



Figure 4-16: Identified Stone Age Flakes along the proposed routing of the 7 Mℓ pipeline

Presently, the proposed routing of the 10 Mℓ pipeline is located within an existing servitude for a conveyor belt, pipeline and transmission line. This servitude is contained within a fenced boundary and access is restricted.



Figure 4-17: Typical landscape in the study area



Figure 4-19: Potential burial ground located outside of servitude



Figure 4-18: Existing servitude for the proposed pipeline. Note visible conveyor, road and transmission line within fence boundary



Figure 4-20: Historic built environment in relation to existing servitude



5 Sources of Risk

5.1 7 Mℓ Pipeline

The sources of risk for the proposed 7 Mℓ pipeline are primarily associated with the construction and operational phases of the project. These are discussed individually below.

5.1.1 Construction Phase

During construction, clearing of vegetation and topsoil, as well as earth moving activities may potentially disturb *in situ* heritage resources occurring at sub-surface levels. These activities may permanently alter, damage or destroy the heritage resource.

5.1.2 Operational Phase

Potential spillage and/or pipe burst may have a direct negative impact on heritage resources that occur within close proximity to the proposed 7 Mℓ pipeline. The result could lead to the permanent alteration, damage to or destruction of heritage resources.

5.2 10 Mℓ Pipeline

No sources of risk to heritage resources were identified for the proposed activities. The construction and operation of the proposed pipeline is to occur within an existing servitude that is confined within a fenced boundary.

No notable heritage resources were recorded within the 100 m buffer, therefore it is not envisaged that potential spillage or bursts will negatively impact on heritage resources that may be located within the study area.

6 Conclusion and Recommendations

The proposed pipelines are located within a landscape that is dominated by agricultural and mining activity. Identified heritage resources within the study area were limited to Stone Age scatters, built structure, and burial grounds. No significant heritage resources were identified from the literature review.

The project area is located in a region with high palaeontological sensitivity. However, in light of the proposed activities associated with the two pipelines, the potential to expose or damage palaeontological resources is negligible. It is therefore recommended that exemption from any additional palaeontological assessments be granted for this project.

The proposed construction and operation of the 10 Mℓ pipeline will be confined within the boundaries of an existing servitude containing a conveyor belt, pipeline and transmission line owned by Sasol Mining. Based on the findings of this NID, it is recommended that activities associated with the proposed 10 Mℓ pipeline be exempt from any further heritage assessment.

The proposed construction and operation of the 7 Mℓ pipeline will occur along an existing transmission line servitude within which or in close proximity to, heritage resources were identified. Construction and operation activities may have a negative impact on heritage resources located at sub-surface levels along or in close proximity to the proposed routing.

It is recommended that a Watching Brief be undertaken during construction activities for the proposed 7 Mℓ pipeline. The recommended procedure for the Watching Brief includes:

- An accredited archaeologist must be presented during ground clearing activities;
- Heritage resources will be identified, recorded and assessed if and as exposed;
- The archaeologist will provide the developer with specialist input into remedial action in the event of identification of significant heritage resources;
- A Watching Brief report is submitted to SAHRA and FS-PHRA for consideration.



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Notification of Intent to Develop

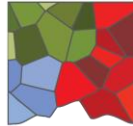
Sasol Sigma Mookraal - Sasolburg Operations Pipelines Basic Assessment

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Appendix A: Specialist CV



DIGBY WELLS

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

1 Education

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

2 Language Skills

Language	Written	Spoken
English	Excellent	Excellent
Afrikaans	Proficient	Good

3 Employment

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

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

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

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

4 Professional Affiliations

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

5 Publications

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

6 Experience

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

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

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

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

7 Project Experience

Please see the following table for relevant project experience:



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



Eskom Thohoyadou SEA Project	Limpopo Province, South Africa	2008 2008	Heritage Statement defining the cultural landscape of the Limpopo Province to assist in establishing sensitive receptors for the Eskom Thohoyadou SEA Project	Heritage Statement	Archaeologist	2 months	Eskom	Completed Heritage Statement	Heritage Contracts Unit Jaco van der Walt jaco.heritage@gmail.com
Wenzelrust Excavations	Shoshanguve, Gauteng, South Africa	2009 2009	Contracted by the Heritage Contracts Unit to help facilitate the Phase 2 excavations of a Late Iron Age / historical site identified in Shoshanguve	Excavation and Mapping	Archaeologist	1 week	Heritage Contracts Unit	Completed excavations	Heritage Contracts Unit Jaco van der Walt jaco.heritage@gmail.com
University of the Witwatersrand Parys LIA Shelter Project	Parys, Free State, South Africa	2009 2009	Mapping of a Late Iron Age rock shelter being studied by the Archaeology Department of the University of the Witwatersrand	Mapping	Archaeologist	1 day	University of the Witwatersrand	Completed mapping of the shelter	University of the Witwatersrand Karim Sadr karim.sadr@wits.ac.za
Transnet NMPP Line	Kwa-Zulu Natal, South Africa	2010 2010	Heritage Survey of the Anglo-Boer War Vaalkrans Battlefield where the servitude of the NMP pipeline	Heritage Impact Assessment	Archaeologist	1 week	Umlando Consultants	Completed survey	Umlando Consultants Gavin Anderson umlando@gmail.com
Archaeological Impact Assessment – Witpoortjie Project	Johannesburg, Gauteng, South Africa	2010 2010	Heritage survey of Witpoortjie 254 IQ, Mindale Ext 7 and Nooitgedacht 534 IQ for residential development project	Archaeological Impact Assessment	Archaeologist	1 week	ARM	Completed survey for the AIA	Archaeological Resources Management (ARM) Prof T.N. Huffman thomas.huffman@wits.ac.za
Der Brochen Archaeological Excavations	Steelpoort, Mpumalanga, South Africa	2010 2010	Phase 2 archaeological excavations of Late Iron Age Site	Archaeological Excavation	Archaeologist	2 weeks	Heritage Contracts Unit	Completed excavations	Heritage Contracts Unit Jaco van der Walt jaco.heritage@gmail.com
De Brochen and Booyensdal Archaeology Project	Steelpoort, Mpumalanga, South Africa	2010 2010	Mapping of archaeological sites 23, 26, 27, 28a & b on the Anglo Platinum Mines De Brochen and Booyensdal	Mapping	Archaeologist	1 week	Heritage Contracts Unit	Completed Mapping	Heritage Contracts Unit Jaco van der Walt jaco.heritage@gmail.com



Eskom Thohoyandou Electricity Master Network	Limpopo Province, South Africa	2010 2010	Desktop study to identify heritage sensitivity of the Limpopo Province	Desktop Study	Archaeologist	1 Month	Strategic Environmental Focus	Completed Report	Strategic Environmental Focus (SEF) Vici Napier vici@sefsa.co.za
Bathhako Mine Expansion	North-West Province, South Africa	2010 2010	Mapping of historical sites located within the Bathhako Mine Expansion Area	Mapping	Archaeologist	1 week	Heritage Contracts Unit	Completed Mapping	Heritage Contracts Unit Jaco van der Walt jaco.heritage@gmail.com
Kibali Gold Project Grave Relocation Plan	Oriental Province, Democratic Republic of Congo	2011 2013	Implementation of the Grave Relocation Project for the Randgold Kibali Gold Project	Grave Relocation	Archaeologist	2 years	Randgold Resources	Successful relocation of approximately 3000 graves	Kibali Gold Mine Cyrille Mutombo Cyrille.c.mutombo@kibaligold.com
Kibali Gold Hydro-Power Project	Oriental Province, Democratic Republic of Congo	2012 2014	Assessment of 7 proposed hydro-power stations along the Kibali River	Heritage Impact Assessment	Heritage Consultant	2 years	Randgold Resources	Completed Heritage Impact Assessment	Randgold Resources Charles Wells Charles.wells@randgoldresources.com
Everest North Mining Project	Steelpoort, Mpumalanga, South Africa	2012 2012	Heritage Impact Assessment on the farm Vygenhoek	Heritage Impact Assessment	Heritage Consultant	6 months	Aquarius Resources	Completed Heritage Impact Assessment	Aquarius Resources
Environmental Authorisation for the Gold One Geluksdal TSF and Pipeline	Gauteng, South Africa	2012 2012	Heritage impact Assessment for the proposed TSF and Pipeline of Geluksdal Mine	Heritage Impact Assessment	Heritage Consultant	4 months	Gold One International	Completed Heritage Impact Assessment	Gold One International
Platreef Burial Grounds and Graves Survey	Mokopane, Limpopo Province, South Africa	2012 2012	Survey for Burial Grounds and Graves	Burial Grounds and Graves Management Plan	Heritage Consultant	4 months	Platreef Resources	Project closed by client due to safety risks	Platreef Resources Gerick Mouton
Resgen Boikarabelo Coal Mine	Limpopo Province, South Africa	2012 2012	Archaeological Excavation of identified sites	Archaeological Excavation	Heritage Consultant	4 months	Resources Generation	Completed excavation and reporting, destruction permits approved	Resources Generation Louise Nicolai
Bokoni Platinum Road Watching Brief	Burgersfort, Limpopo Province, South Africa	2012 2012	Watching brief for construction of new road	Watching Brief	Heritage Consultant	1 week	Bokoni Platinum Mine	Completed watching brief, reviewed report	Bokoni Platinum Mines (Pty) Ltd



SEGA Gold Mining Project	Burkina Faso	2012 2013	Socio Economic and Asset Survey	RAP	Social Consultant	3 months	Cluff Gold PLC	Completed field survey and data collection	Cluff Gold PLC
SEGA Gold Mining Project	Burkina Faso	2013 2013	Specialist Review of Heritage Impact Assessment	Reviewer	Heritage Consultant	1 week	Cluff Gold PLC	Reviewed specialist report and made appropriate recommendations	Cluff Gold PLC
Consbrey and Harwar Collieries Project	Breyton, Mpumalanga, South Africa	2013 2013	Heritage Impact Assessment for the proposed Consbrey and Harwar Collieries	Heritage Impact Assessment	Heritage Consultant	2 months	Msobo	Completed Heritage Impact Assessments	Msobo
New Liberty Gold Project	Liberia	2013 2014	Implementation of the Grave Relocation Project for the New Liberty Gold Project	Grave Relocation	Heritage Consultant	On-going	Aureus Mining	Project is on-going	Aureus Mining
Falea Uranium Mine Environmental Assessment	Falea, Mali	2013 2013	Heritage Scoping for the proposed Falea Uranium Mine	Heritage Scoping	Heritage Consultant	2 months	Rockgate Capital	Completed scoping report and recommended further studies	Rockgate Capital
Putu Iron Ore Mine Project	Petroken, Liberia	2013 2014	Heritage impact Assessment for the proposed Putu Iron Ore Mine, road extension and railway line	Heritage Impact Assessment	Heritage Consultant	6 months	Atkins Limited	Completed Heritage Impact Assessment and provided recommendations for further studies	Atkins Limited Irene Bopp Irene.Bopp@atkinglobal.com
Sasol Twistdraai Project	Secunda, Mpumalanga, South Africa	2013 2014	Notification of intent to Develop and Heritage Statement for the Sasol Twistdraai Expansion	NID	Heritage Consultant	2 months	ERM Southern Africa	Completed NID and Heritage Statement	ERM Southern Africa Alan Cochran Alan.Cochran@erm.com
Daleside Acetylene Gas Production Facility	Gauteng, South Africa	2013 2013	Project Management of the heritage study	NID	Project Manager	3 months	ERM Southern Africa	Project completed	ERM Southern Africa Kasantha Moodley Kasantha.Moodley@erm.com
Exxaro Belfast, Paardeplaats and Eerstelingsfontein GRP	Belfast, Mpumalanga, South Africa	2013 2014	Grave Relocation Plan for the Belfast, Paardeplaats and Eerstelingsfontein Projects	GRP	Project Manager, Heritage Consultant	On-going	Exxaro	Project is on-going	Exxaro Johan van der Bijl Johan.vanderbijl@exxaro.com



Nzoro 2 Hydro Power Project	Oriental Province, Democratic Republic of Congo	2014 2014	Social consultation for the Relocation Action Plan component of the Nzoro 2 Hydro Power Station	RAP	Social Consultant	On-going	Randgold Resources	Completed introductory meetings – project on-going	Kibali Gold Mine Cyrille Mutombo Cyrille.c.mutombo@kibaligold.com
Eastern Basin AMD Project	Springs, Gauteng, South Africa	2014 2014	Heritage Impact Assessment for the proposed new sludge storage facility and pipeline	Heritage Impact Assessment	Heritage Consultant	On-going	AECOM	Project is on-going	AECOM
Soweto Cluster Reclamation Project	Soweto, Gauteng, South Africa	2014 2014	Heritage Impact Assessment for reclamation activities associated with the Soweto Cluster Dumps	Heritage Impact Assessment	Heritage Consultant	On-going	ERGO	Project is on-going	ERGO Greg Ovens Greg.ovens@drdgold.com
Klipspruit South Project	Ogies, Mpumalanga, South Africa	2014 2014	NID and Heritage Statement for the Section 102 Amendment of the Klipspruit Mine EMP	NID	Heritage Consultant	On-going	BHP Billiton	Project is on-going	BHP Billiton
Klipspruit Extension: Weltevreden Project	Ogies, Mpumalanga, South Africa	2014 2014	NID and Heritage Statement for the expansion of the Klipspruit Mine	NID	Heritage Consultant	On-going	BHP Billiton	Project is on-going	BHP Billiton
Ergo Rondebult Pipeline Basic Assessment	Johannesburg, South Africa	2014 2014	NID and Heritage Statement for the construction of the Rondebult Pipeline	NID	Heritage Consultant	1 Week	ERGO	Completed screening assessment and NID	ERGO
Kibali ESIA Update Project	Oriental Province, Democratic Republic of Congo	2014 2014	Update of the Kibali ESIA for the inclusion of new open-cast pit areas	Heritage Impact Assessment	Heritage Consultant	On-going	Randgold Resources	Project is on-going	Randgold Resources Charles Wells Charles.wells@randgoldresources.com
GoldOne EMP Consolidation	Westonaria, Gauteng, South Africa	2014 2014	Gap analysis for the EMP consolidation of operations west of Johannesburg	Gap Analysis	Heritage Consultant	On-going	Gold One International	Project is on-going	Gold One International



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Sasol Sigma Mookraal - Sasolburg Operations Pipelines Basic Assessment

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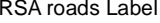












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Appendix B: Plans

Sasol Sigma Mooikraal Infrachem Pipelines

Geology

Legend

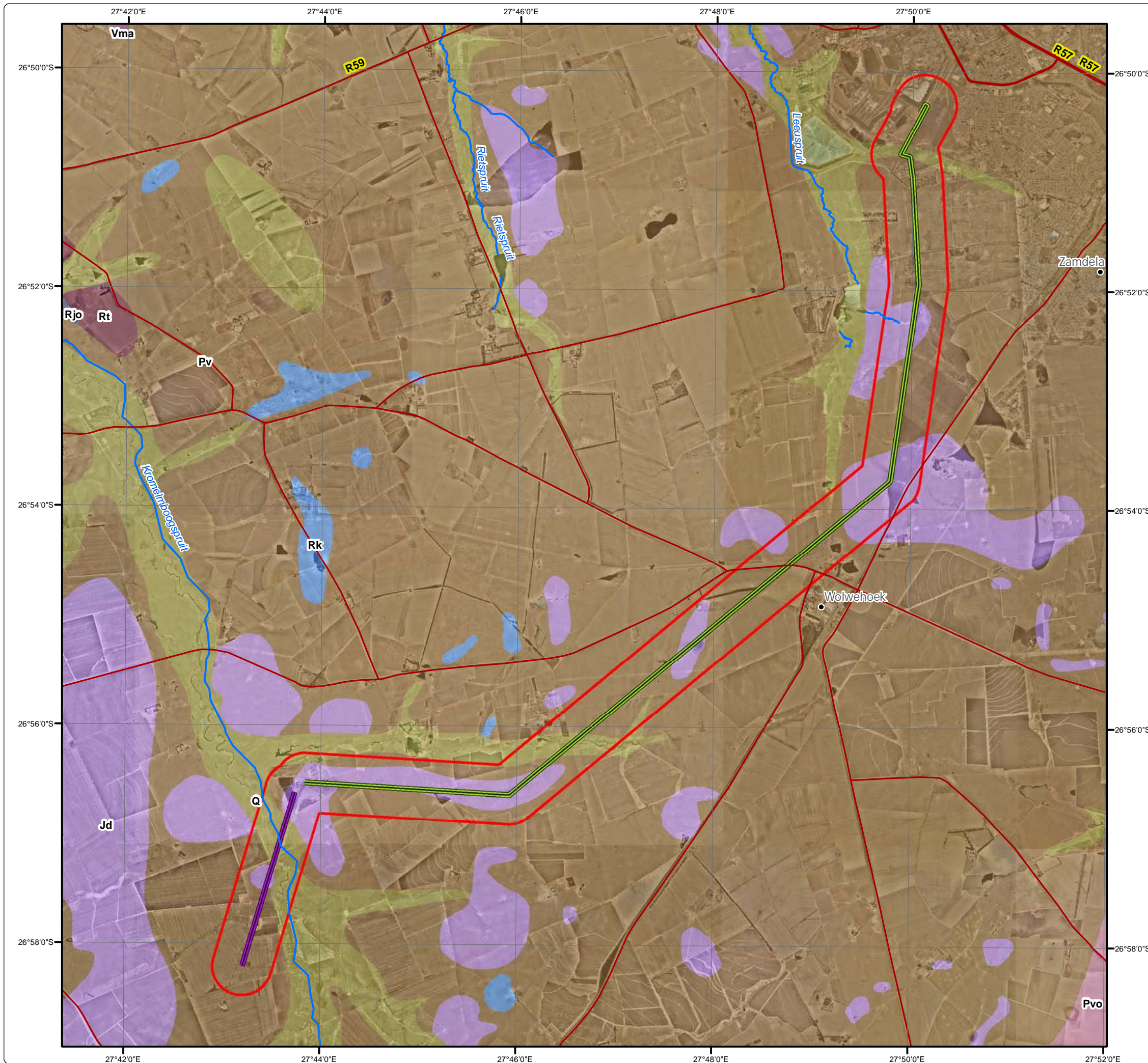
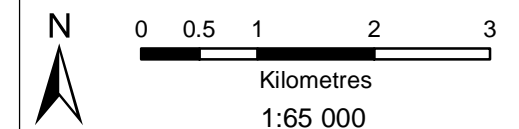
-  Mooikraal Vent Shaft to Mooikraal Dams
 -  Mooikraal Dams to Sasol Sigma Dams
 -  500m Buffer of Pipeline
 -  Settlement
 -  RSA roads Label
 -  Main Road
 -  National Road
 -  Rivers
 -  Dam
- #### Lithology
-  Q
 -  JOHANNESBURG, Rjo
 -  KAROO DOLERITE, Jd
 -  KLIPRIVIERSBERG, Rk
 -  MALMANI, Vma
 -  TURFFONTEIN, Rt
 -  VOLKSRUST, Pvo
 -  VRYHEID, Pv

2627DC Weiveld
2627DD Sasolburg



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







Projection: Transverse Mercator Ref #: sdp.SAS2622.201408.035
 Datum: WGS84 Revision Number: 1
 Central Meridian: 27°E Date: 12/08/2014



Sasol Sigma Mooikraal Infrachem Pipelines

Identified Grave Locations

Legend

-  Heritage Resources
-  Grave Locations
-  Heritage Tracks
-  Mooikraal Vent Shaft to Mooikraal Dams
-  Mooikraal Dams to Sasol Sigma Dams
-  500m Buffer of Pipeline
-  Arterial / National Route
-  Main Road
-  Minor Road
-  Railway Line
-  Non - Perennial Stream
-  Perennial Stream
-  Dam Wall
-  Dam / Lake
-  Perennial Pan
-  Non - Perennial Pan
-  Wetland

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