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Sasol Sigma Defunct Colliery Surface Mitigation Project: Proposed River Diversion and Flood Protection Berms

Heritage Assessment: Notification of Intent to Develop

Project Number:

SAS5250

Prepared for:

Sasol Mining (Pty) Ltd

October 2018

Digby Wells and Associates (South Africa) (Pty) Ltd
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This document has been prepared by Digby Wells Environmental.

Report Type:	**Heritage Assessment: Notification of Intent to Develop**
Project Name:	**Sasol Sigma Defunct Colliery Surface Mitigation Project: Proposed River Diversion and Flood Protection Berms**
Project Code:	**SAS5250**

Name	Responsibility	Signature	Date
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1 Introduction

Sasol Mining (Pty) Ltd (hereinafter Sasol Mining) intends to implement mitigation measures in response to high risks of subsidence associated with the Sigma Colliery Defunct Mine (Sigma Defunct Colliery), as identified in the Risk Assessment Report compiled by Jones & Wagener (Pty) Ltd (J&W) in 2015 and updated in 2018 (refer to Section 3.3 for more detailed references). Sasol Mining is implementing these mitigations in two strategies: ash backfilling as an underground mitigation[1] measure and river diversions as a surface intervention ("the Project").

Sasol Mining appointed Digby Wells Environmental (hereinafter Digby Wells) to complete an Environmental Regulatory Process required to obtain Environmental Authorisation (EA) for the Project. The process is required to comply with the following South African national legislative framework:

- The National Environmental Management Act, 1998 (Act No. 107 of 1998) (NEMA);
- The NEMA EIA Regulations, 2014 (Government Notice Regulation [GN R] 982, as amended by GN R 326);
- The National Water Act, 1998 (Act No. 36 of 1998) (NWA); and
- Section 38 of the National Heritage Resources Act, 1999 (Act No. 25 of 1999) (NHRA).

This document serves as the Notification of Intent to Develop (NID) to comply with Section 38(1) of the NHRA specifically.

2 Project Details

2.1 Project Background

The Sigma Colliery can be considered to consist of two components, namely the operational complexes comprising Mooikraal and 3-Shaft, and the non-operational Sigma Defunct Colliery. This document only considers the Project as relevant to the Sigma Defunct Colliery that includes:

- The Sigma, Mohlolo North and Mohlolo South underground mining areas; and
- The Wonderwater open pit mining areas.

Table 2-1 presents a summary of the Life of Mine (LoM) of the Sigma Defunct Colliery and associated mining methodologies.

[1] Previously considered and submitted to the South African Heritage Resources Agency (SAHRA) as Case ID: 5053, available at http://www.sahra.org.za/sahris/cases/sasol-mining-sigma-colliery-ash-backfilling-project. This is not considered further in this document.

Table 2-1: Summary of mining operations at the Sigma Colliery

Mining Section	Start year	End Year	Summary of mining activities
Sigma	1952	1999	Three coal seams (2A, 2B and 3) were extracted through mechanised bord-and-pillar development, long-wall and high-extraction methods. High extraction included pillar extraction, herringbone and bottom coaling methodologies.
Mohlolo North	1999	2004	Mechanised bord-and-pillar development and pillar extraction methodologies.
Mohlolo South			
Wonderwater	1992	2005	Conventional truck and shovel methods.

The mining methodologies used at the underground mining section of the Sigma Defunct Colliery have increased the probability of pillar failure which can result in subsidence. To understand the magnitude of the risk, Sasol Mining commissioned a Risk Assessment Report, or Potential Failure Report (2012) that detailed the probability of incidents occurring at surface and highlighted high-risk areas. This report further considered the current remedial mitigation measures and immediate required actions to minimise the determined risk. Subsequent to this, Sasol Mining appointed J&W to assist Sasol Mining in the compilation of the Risk Assessment Report (2015, 2018) to identify significant risks and propose feasible interventions to reduce significant risks to an acceptable low risk level.

2.2 Project Description

Two rivers flow through the Sigma Defunct Colliery. These are the Leeuspruit River and Rietspruit River, both of which are at risk of being impacted upon due to the potential for pillar failure which can result in subsidence. Of the identified 37 panels with a high probability of pillar failure, 36 occur beneath the Leeuspruit River, and one beneath the Rietspruit River. To mitigate the identified risk, it is proposed that these watercourses be diverted away from areas of high-risk. The proposed mitigation measures include:

- Full stream diversion: a diversion canal redirects stream flow along a completely new route from the original watercourse. The stream joins the original watercourse downstream;
- Partial stream diversion: channels and/or flood protection berms confine the stream flow to avoid high-risk areas; and
- The afore-mentioned ash backfilling which has been dealt with as a separate project.

The Risk Assessment Report (J&W, 2018) groups high-risk panels into sections in the direction of flow, i.e. south to north. Table 2-2 summarises the proposed mitigation measures per defined high-risk panel sections[2]. This is graphically presented in Plan 2 .

Table 2-2: Proposed Mitigation Measures along the Affected Rivers

Significant Risk Area	Proposed Mitigation Measures
Leeuspruit Section 2	Partial river diversion with one flood protection berm with small diameter pipes installed along the berm at low points to enable the slow release of water accumulated behind the berms..
Leeuspruit Section 3	Full river diversion using a combination of a formalised canal and flood protection berms to divert the stream flow away from high-risk areas.
Leeuspruit Section 4	Two full stream diversions and one partial diversion, using two formalised canals and three flood protection berms.
Leeuspruit Section 5	No surface mitigations proposed.
Rietspruit Section 1	Partial stream diversion comprising of one small flood protection berm with small diameter pipes installed along the berm at low points to enable the slow release of water accumulated behind the berms.

No Project alternatives have been proposed in addition to the above-mentioned Project activities. The only Project alternative is the no-go alternative, which assumes that the proposed activity does not go ahead and implies the *status quo* remains unchanged. In this case, the no-go alternative refers to a situation in which the surface mitigations are not implemented. In this instance, there is a high probability of pillar failure, which will result in subsidence and changes to the watercourses of one or both rivers within the Project area. This could result in the loss of wetland soils and alterations to the flow regimes and water quality of both groundwater and surface water in the region.

2.3 Project Location

The Project is situated within the Metsimaholo Local Municipality (MLM), Free State Province. Table 2-3 presents a location summary. Table 2-4 lists identified landowner details as relevant to this Project. Plan 1 illustrates the geographical setting of the Project.

[2] Ash backfilling has also been proposed for Leeuspruit Sections 3, 4 and 5, some sections of Leeuspruit Section 5 have already been backfilled.

Table 2-3: Project Location Details

Name of property/ies	Sigma Defunct Colliery
Street address or location (e.g.: Off R44)	Sigma Colliery, 137 Saltberry Plain, Sasolburg, Free State. North and south of the R59, west of Sasolburg and south of the Vaal River.
Erf or farm number/s	Alfresco 202 (Portion 1 and Remaining Extent [RE]) Zwanenberg 366 (Portion 1) Donkerhoek 323 (Portion 1 and RE) The Star 387 (Portion 1) Zwanenberg 450 (Portions 1) Roseberry Plain 250 (Portions 5 and 7) Wilgefontein 431 (Portion18) Wilgefontein 433 Herewarde 409 (Portion 6 and RE) Rand Water Board 7 300 Rand Water Board 8 312 ERF –A- 32 Boschbank 12 (RE) Erven BCD 33 Farm 468 Wonderwater 180 (Portion 9)
Coordinates of approximate centre of project area	26 50’02.26”S
	27 48’04.94”E
Town or District	Sasolburg
Responsible Municipality	MLM in the Fezile Dabi District Municipality (FDDM)
Maximum extent of proposed development	The Colliery covers 11 643 hectares (ha). The Project itself will cover 48.19 ha.
Current use	Mining (defunct), industrial
Predominant land use/s of surrounding properties	Agricultural, industrial, mining, residential

Table 2-4: Identified Landowner Details

Name	Property
AM Rossouw Eiendomme (Pty) Ltd	Boschbank 12 (RE)
DWS Representatives	Rand Water Board 7 300 Rand Water Board 8 312
F.C. Verway	Wilgefontein 431 (Portion18)
Interferon Trust	Alfresco 202 (Portion 1 and RE)
Lewies Trust	Donkerhoek 323 (RE)
Metsimaholo Local Municipality	Roseberry Plain 250 (Portion 5)
R. Knoetze	Zwanenberg 450 (Portions 1)
Riverbank Trust	Wonderfontein 350 (Portion 1)
Sasol Chemical Industries (Pty) Ltd	Donkerhoek 323 (Portion 1) Herewarde 409 (Portion 6) Roseberry Plain 250 (Portion 7)
Sasol Townships (Pty) Ltd	Herewarde 409 (RE) The Star 387 (Portion 1)
T.C. Johannes	Erven BCD 33
Sasol Mining (Pty) Ltd	Wonderwater 180 (Portion 9)

Plan 1

Sasol Sigma River Diversion

Regional Setting

27°40'0"E 27°50'0"E 28°0'0"E

26°40'0"S 26°50'0"S 27°0'0"S

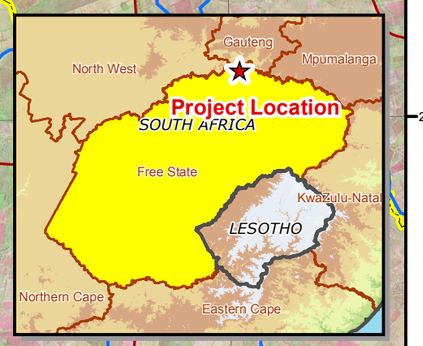
Westonaria Local Municipality (GT483)
West Rand District Municipality
Merafong City Local Municipality (GT484)
Emfuleni Local Municipality (GT421)
Sedibeng District Municipality
North West
Southern District Municipality
Fezile Dabi District Municipality
Free State
Ngwathe Local Municipality (FS203)
Metsimaholo Local Municipality (FS204)
Midvaal Local Municipality (GT422)
Gauteng

Vlakplaas
Patriotsfontein
Kluitfontein
Lindequesdrif
Lochvaal Barrage
Sharpeville
Leekuil Dam
Vanderbijlpark
Vereeniging
Viljoensdrif
Vaalpark
Coalbrook
Zamdela
Wolwehoek
Clydesdale
Dover

Rietspruit
Kromelmboogspruit
Taaibosspruit
Klip
Vaal

N1
R28
R553
R42
R59
R57
R82
R549

Leeuspruit Section 5
Leeuspruit Section 4
Leeuspruit Section 3
Leeuspruit Section 2
Rietspruit Section 1



Legend

- Defunct Sigma Mining Right Boundary
- Major Town
- Other Town
- Settlement
- Main Road
- National Road
- River
- River Diversion Sections
- Local Municipality
- District Municipality
- Dam
- Provincial Boundary

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Central Meridian: 27°E

Ref #: ajm.SAS5250.201808.010
Revision Number: 1
Date: 20/08/2018

N

0 2.5 5 10

Kilometres

1:200 000

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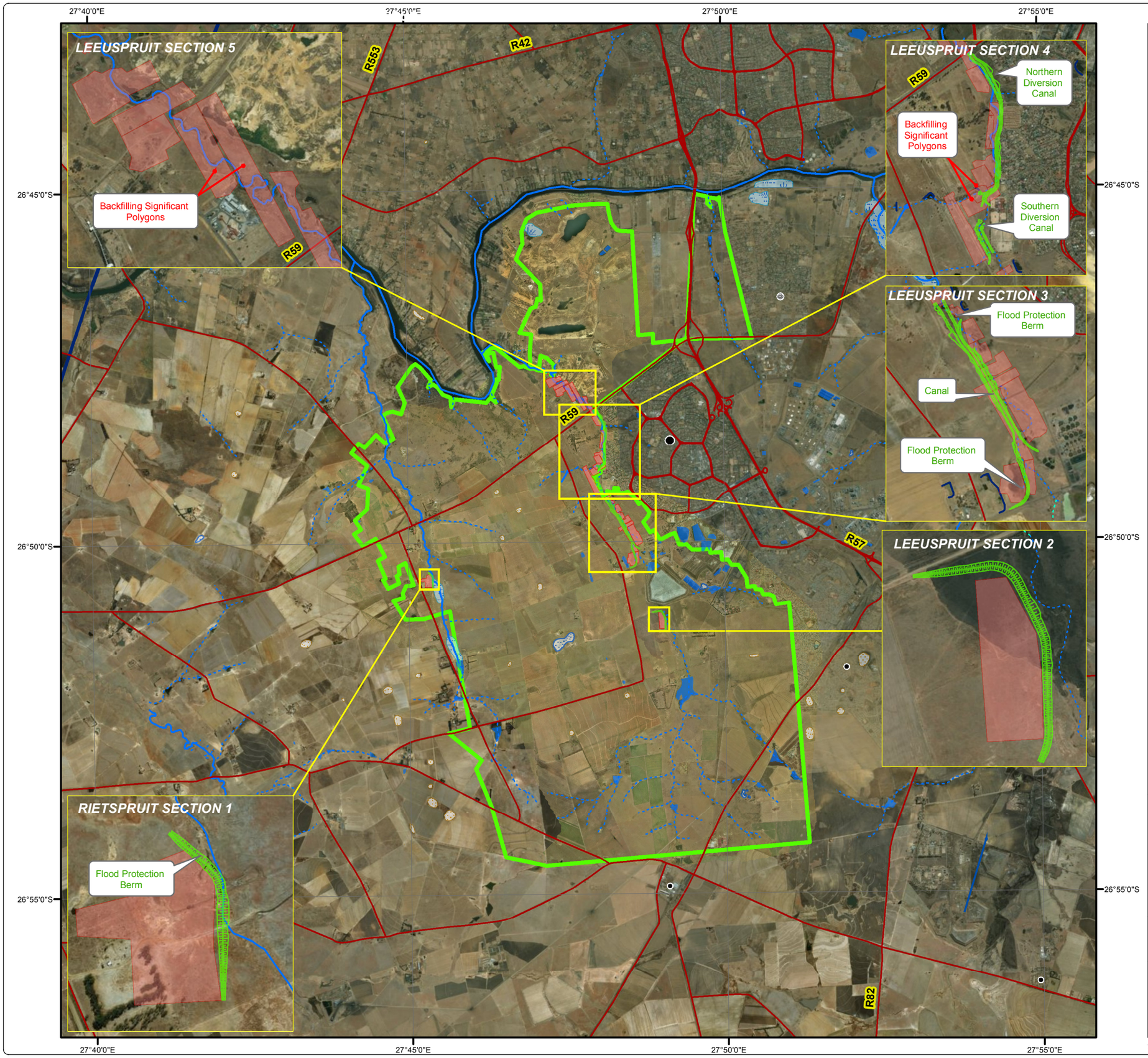
Plan 2

Sasol Sigma River Diversion

Proposed Infrastructure



Legend

- Defunct Sigma Mining Right Boundary
- Major Town
- Other Town
- Settlement
- Proposed River Diversion Infrastructure
- Main Road
- National Road
- Perennial River
- Non-Perennial River
- Dam
- Wetland
- Perennial Pan
- Non-Perennial Pan
- Significant Area

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Datum: WGS 1984	Revision Number: 1
Central Meridian: 27°E	Date: 20/08/2018

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0 1.25 2.5 5

Kilometres

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3 Baseline Description[3][4]

Anthropogenic activities have largely disturbed the site-specific study area through time. These include the establishment of historic farmsteads, development of Sasolburg Town, and operation of the Sigma Colliery, of which the Sigma Defunct Colliery forms a component. The subsequent cultural landscape baseline description must be read within this context.

The site-specific study area is underlain by the *Vryheid Formation* comprising lithologies of shale, sandstone and coal. The uppermost layers associated with the formation generally occur between 15 and 45 m below the surface. Although coal was formed from thick accumulations of plants in a swampy environment during the Permian, the coal itself is of no palaeontological interest because the plant matter has been compressed and altered by heat to such an extent that no material is distinguishable. In some settings fossil leaf impressions are preserved in the carbonaceous shales between the coal seams but these tend to be rare and very difficult to find (Bamford 2018). This notwithstanding, the importance of the *Vryheid Formation* is well established, and has been prescribed with a high palaeontological sensitivity (refer to Bamford, 2014, 2016, 2018).

While Digby Wells acknowledges the importance of the *Vryheid Formation*, the sparse distribution of *Glossopteris* flora and the nature of the Project suggest the potential for impacts to any potential fossil heritage is negligible. Furthermore, the review of relevant data sources did not yield any records for palaeontological resources within the site-specific study area.

The site records demonstrate the cultural landscape primarily comprises resources attributed to the historic built environment (*46.9% of the identified resources*) and burial grounds and graves (*25% of the identified resources*). Archaeological resources affiliated with Middle Stone Age (MSA), Later Stone Age (LSA) and Late Farming Community (LFC) periods are minimally represented in the records (*18.7% of the identified resources*). Figure 3-1 presents a summary of the heritage resource types identified within the greater study area.

The remainder of this chapter will present an abbreviated description of the cultural landscape as relevant to the known heritage resources primarily sourced from du Piesanie &

[3] This section makes reference to site-specific, local and regional study areas. The regional study area refers to the area bounded by the district municipality demarcation, in this case the FDDM. The local study area refers to the area bounded by the local municipality, in this case, the MLM. The local and regional study areas offer a backdrop to the socio-economic conditions and planning context within with the proposed development will occur. The site-specific study area refers to the farm portions associated with the development footprint, including a 500 m buffer.

[4] The palaeontology baseline description has been reviewed and accepted by a qualified and accredited palaeontologist.

Nel (2014[5]), the outcomes of the pre-disturbance survey, the results of historical layering, and the data sources used in the development of this document.

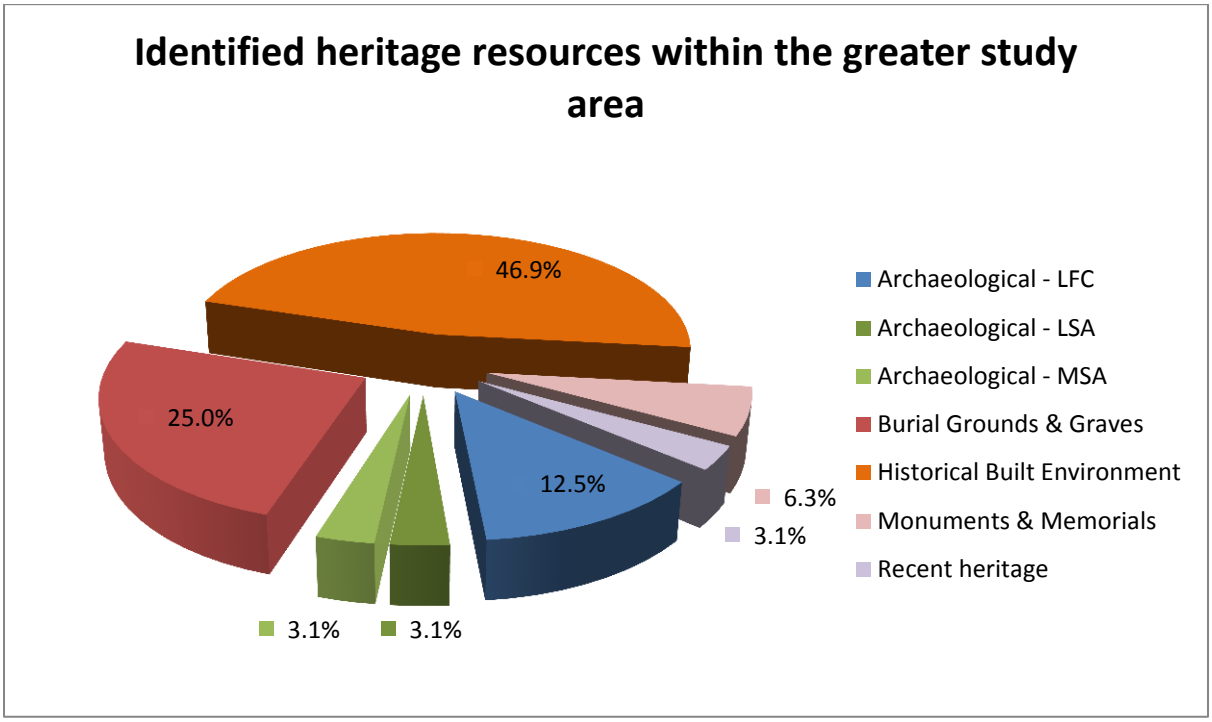

Figure 3-1: Heritage Resources Identified within the Greater Study Area

The Stone Age is the earliest archaeological period and is divided into three phases:

- The Early Stone Age (ESA), from 2 million years ago (mya) to approximately 200 thousand years ago (kya);
- The MSA, between 250 kya to 20 kya; and
- The LSA, between 20 kya to 500 Common Era (CE[6]) (Esterhuysen & Smith 2007).

No material associated with the ESA was identified within the greater research area, and is therefore not considered further. The MSA is characterised by the presence of blades and points, which are created from good-quality raw materials. In some instances, MSA deposits produce bone tools, shell beads, pendants and evidence of ochre use. The LSA is characterised by microlithic technology. Microlithic tools are produced from very fine-grained material, such as chert or hornfels, and are often used as composite tools. Composite tools comprise of microliths which have been hafted to wooden implements. Rock art is often

[5] Case ID 5035. Available at: http://www.sahra.org.za/sahris/cases/sasol-mining-sigma-colliery-ash-backfilling-project

[6] Common Era (CE) refers to the same period as Anno Domini ("In the year of our Lord", referred to as AD): i.e. the time after the accepted year of the birth of Jesus Christ and which forms the basis of the Julian and Gregorian calendars. Years before this time are referred to as 'Before Christ' (BC) or, here, BCE (Before Common Era).

associated with the LSA (Deacon & Deacon 1999). No records of rock art have been identified within the site-specific study area.

The Stone Age within the regional study area primarily comprises representation of MSA and LSA low-density surface scatters (Van Schalkwyk *et al* 1996; du Piesanie & Nel 2014; Higgitt & du Piesanie 2015).

The Farming Community period follows the LSA. This period is characterised by the arrival of Bantu-speaking agro-pastoralists in southern Africa. These peoples lived in settled communities and cultivated crops and herded livestock (Huffman 2007). The Farming Community period is divided into two phases:

- Early Farming Community (EFC) which dates between 500 and 1400 CE; and
- Late Farming Community (LFC) which dates between 1100 and 1800 CE (Esterhuysen & Smith 2007).

No representations of the EFC were recorded within the regional study area. LFC settlements are identified through stonewalling or secondary tangible surface indicators such as ceramics (Huffman 2007). Stonewalling is the most visible indicator of LFC settlements and can attest to the complex processes of development and decline over several years (see for example Delius *et al* 2014). Different categories of stonewalling have been described through differences in the construction technique, coursing, height, shape and internal divisions. In this region, the most common stonewalling type is 'Type V' as described by Maggs (1976). Van Schalkwyk *et al* (1996) and Pelser and Van Vollenhoven (2008) recorded stonewalling within the broader study area. These resources account for 12.5% of the heritage resources identified in the region.

Historically, George William Stow had discovered coal in this area by 1879 (Pistorius 2008). This discovery resulted in a boom of mining, infrastructure and other development as populations flocked to the area (du Piesanie & Nel 2014). In particular, the road and rail networks expanded dramatically in the early 1900s, as mines were established in the area. Very little infrastructure had been developed in the site-specific study area at this stage. The closest areas of development at this time were Viljoendrift and Wolwenhoek. Viljoendrift included the Cornelia Coal Mine, court house, post office and railway station. Wolwenhoek included a railway station, post office and school.

The historical built environment and burial grounds and graves account for the majority of the heritage resources within the region (46.9% and 25 % respectively). Burial grounds and graves range from including ten or fewer graves to over one hundred graves (Van Schalkwyk *et al.* 1996; Dreyer 2005; Mngomezule 2016; Beater 2017; Marais-Botes 2017). The historical built environment is represented by structural remains, structural complexes (including *werwe*), industrial structures, functional structures and buildings (Dreyer 2005; Birkholtz 2008; Pelser & Van Vollenhoven 2008; Van Ryneveld 2008; du Piesanie & Nel 2014; Higgit & du Piesanie 2015; Beater 2017; Marais-Botes 2017; Hardwick & du Piesanie 2018).

3.1 Pre-disturbance Survey

3.1.1 Methodology

Shannon Hardwick completed a pre-disturbance survey of the Leeuspruit Sections 1 to 5, and Rietspruit Section 1 on 23 July 2018. The pre-disturbance survey comprised both vehicular and pedestrian methodologies that were non-intrusive, i.e. no sampling was undertaken, to identify any heritage resources that may be impacted upon by the proposed Project.

Identified heritage resources were recorded through GPS waypoints, photographs and detailed notes that have been collated in this report. The area subject to the pre-disturbance survey has been recorded as track-logs[7] and are presented in Plan 3.

3.1.2 Informal Consultation

The landowners of the farm Saltberry 422 (Portion 1 and 2 and RE) informed the geomorphology specialist that their house was constructed in 1903. The landowners said their house had been described in records written by Reitz (1929). This document is an autobiography of Reitz's time in the South African War (referred to as the Boer War). Reitz (1929) describes structures in this area which were used to supply and refresh horses during the South African War. This structure was not assessed by the heritage specialist as it is situated outside of the development footprint. The structure is shown in green in Figure 4-3 and is labelled "Historic House'.

3.1.3 Results of the Pre-disturbance Survey

No outcrops of palaeontological material were identified in the field. Four burial grounds and one historical structure were identified during the pre-disturbance survey. Table 3-1 provides a description of these resources (refer to Figure 4-2 for photographs of these heritage resources).

[7] The site-specific study area was surveyed by various specialists over the period of 23 – 24 July 2018, recorded track-logs. All specialists were briefed on the type of heritage resources known to occur within the site-specific study area, specifically burial grounds and graves, and historical structures. No heritage resources were recorded by these specialists.

Table 3-1: Summary of Identified Heritage Resources

Site ID	Type	Description	Distance from Development	Potential Impact
BGG-001	Burial Grounds and Graves	Three graves inside a fenced-off area in the garden of a farmhouse. The graves each have legible headstones.	250 m	None
BGG-002		Burial ground including fewer than 10 graves. Graves are marked with either an upright stone or a ring of small stones, or both. Burial ground is not demarcated.	790 m	
BGG-003		Burial ground including fewer than 10 graves. Graves are marked with an upright stone. Burial ground is not demarcated.	750 m	
BGG-004		Burial ground of more than 100 graves. Most graves have headstones, but not all are legible. Graveyard is overgrown and not demarcated.	670 m	
STE-001	Historic Built Environment	Foundations and ruins of a large square structure with internal divisions. Built of stone and some of the remaining portions of wall have been plastered.	240 m	

Plan 3

Sasol Sigma River Diversion

Heritage Results

27°46'0"E 27°48'0"E 27°50'0"E

26°48'0"S 26°50'0"S 26°52'0"S

VAALRMIER
LEEUSPRUIT
RIETSPRUIT
R59
R57
Sasolburg
Backfilling Significant Areas
Northern Canal
Southern Canal
Canal
Flood Protection Berm
Flood Protection Berm
Flood Protection Berm
STE-001
STE-001
BGG-001
BGG-001
BGG-002
BGG-003
BGG-004
0 50 100 200 300 Metres
0 50 100 200 300 Metres

Legend

- Defunct Sigma Mining Right Boundary
- Heritage Point
- Major Town
- Site Visit Track (Heritage)
- Site Visit Track (Soil)
- Site Visit Track (Wetland)
- Main Road
- Perennial River
- Non-Perennial River
- Dam
- Wetland
- Perennial Pan
- Non-Perennial Pan
- Significant Area

Existing Infrastructure

- Existing Road

Proposed Infrastructure

- New Road
- Surface Mitigation Infrastructure
- Batching Plant

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N

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3.2 Historical Layering

Several structures[8] were identified on the historical imagery, including Peeters Dam. These are presented in Figure 4-3. These structures are prescribed a relative age of at least 57 years through the aerial imagery, but have a high likelihood of being older than 60 years. To ensure compliance with the NHRA, these structures are considered to be generally protected under Section 34 of the Act.

3.3 Data sources

The following unpublished sources informed this report:

- Author unknown. 2012. Potential Failure Report;
- Bamford, M. 2014. Best Practice for Palaeontological Chance Finds: proposed extension into adjacent Block 4 reserve of Syferfontein Mine (Sasol), Mpumalanga. Unpublished report prepared for Sasol Mining;
- Bamford, M. 2016. Environmental Authorisation for the proposed Imvula Mine: Palaeontological Impact Assessment addendum to the Heritage Impact Assessment. Unpublished report;
- Bamford, M. 2018. Palaeontological Impact Assessment for the proposed Mbali-Glencore pipeline, Mpumalanga Province. Unpublished report prepared for HCI;
- Beater, J. 2017. Phase 1 Heritage Impact Assessment: proposed development of Makalu B substation and associated transmission loop-in lines, Sasolburg, Free State Province. Unpublished report;
- Birkholtz, P. 2008. Phase 1 Heritage Impact Assessment: proposed Lefapha Housing Development situated on the remaining extent of the Farm Leitrim 926, Metsimaholo Local Municipality, Free State Province. Archaeology Africa: unpublished report;
- Dreyer, C. 2005. First Phase Archaeological and Cultural Heritage Assessment of the proposed residential development at Amelia 518, Sasolburg. Unpublished report;
- Du Piesanie, J. & Nel, J. 2014. Notification of Intent to Develop: Sasol Sigma Mooikraal: Sasolburg Operations Pipelines Basic Assessment. Digby Wells Environmental: Unpublished report prepared for Sasol Mining;
- Hardwick, S. & Du Piesanie, J. 2018. Notification of Intent to Develop: Basic Assessment for the Sasol Mooikraal Conveyor Project. Digby Wells Environmental: unpublished report prepared for Sasol Mining;
- Higgitt, N. & du Piesanie, J. 2015. Heritage Watching Brief Report: Sasol Sigma Mooikraal 7Ml Pipeline. Digby Wells Environmental: unpublished report prepared for Sasol Mining;

[8] Not all structures within the site-specific study area were ground-truthed during the pre-disturbance survey

- Jones & Wagener (Pty) Ltd. 2015. Sigma Colliery Defunct Mine: Phase 1 – Closure Risk Assessment. Unpublished report prepared for Sasol Mining (Report No: JW247/14/D992 – Rev. 2);
- Jones & Wagener (Pty) Ltd. 2018. Sigma Defunct Mine Closure Update of Risk Rating (March 2018). Unpublished report prepared for Sasol Mining (Report No: JW056/17/F903 – Rev. 1);
- Marais-Botes, L. 2017. Phase 1 Heritage Impact Assessment (HIA) for the Environmental Impact Assessment (EIA) and Water Use Licence Application Process for a Mining Right on an existing Prospect Right, Ref. FS 30/5/1/1/2/10158 PR to be known as LEFA Colliery. Unpublished report;
- Mngomezula, M. 2016. Application for permit to exhume and relocate two graves of the Lengana family, Oranjeville, North West Province. Permit application report;
- Pistorius, J.C. 2008. A Phase 1 Heritage Impact Assessment (HIA) Study for Sasol's proposed new gas and liquid pipelines (along a corridor) from Sasol Synfuels in Secunda (Mpumalanga) to Sasol Infrachem near Natref in Sasolburg (Free State) on the Highveld, South Africa. Unpublished report;
- Pelser, A.J. & Van Vollenhoven, A.C. 2008. A report on a Cultural Heritage Impact Assessment on various portions on the Farm Vaaldam Settlements 1777, District Heilbron, Free State. Archaeotnos Culture & Cultural Resource Consultants: unpublished report;
- Van Ryneveld, K. 2008. Phase 1 Archaeological Impact Assessment: Mooidraai Township Establishment (Zamdela Ext. 17), Portions of Portion 1 and Remainder of the Farm Mooidraai 44, Sasolburg, Free State, South Africa. Archaeomaps: unpublished report; and
- Van Schalkwyk, J., Naude, M. & Smith, S. 1996. A Survey of Cultural Resources in the proposed Sigma Colliery North West Strip Mine, Sasolburg District, Free State Province. National Cultural History Museum: Unpublished report prepared for Sasol Mining.

The following published sources informed this report:

- Deacon, H. & Deacon, J. 1999. *Human Beginnings in South Africa*. Cape Town: David Phillip;
- Delius, P., Maggs, T. & Schoeman, A. 2014. *Forgotten Worlds: the Stone-Walled Settlements of the Mpumalanga Escarpment*. First ed. Johannesburg: Wits University Press;
- Esterhuysen, A. & Smith, J. 2007. Stories in Stone. In: Delius, P (ed) *Mpumalanga: History and Heritage. Reclaiming the past, defining the future*. Pietermaritzburg: University of KwaZulu-Natal Press, pp. 41-67;

- Huffman, T. 2007. *Handbook to the Iron Age: the archaeology of Pre-colonial Farming Societies in Southern Africa.* Pietermaritzburg: University of KwaZulu-Natal Press;
- Maggs, T. 1976. *Iron Age Communities of the Southern Highveld*. Pietermaritzburg: University of KwaZulu-Natal Press; and
- Reitz, D. 1929. *Commando: a Boer journal of the Boer War.* London: Faber.

Table 3-2 presents the sources used in the historical layering. Aerial imagery was limited to one data set as close as possible to 60 years.

Table 3-2: References for Aerial Photography

Job no.	Flight plan	Photo no.	Map ref.	Area	Date	Ref.
438	Row 24	03273	2527 2627 2628	Brits/Rand/Vereeniging	1961	438/1961
438	Row 24	03274	2527 2627 2628	Brits/Rand/Vereeniging	1961	438/1961
438	Row 25	03311	2527 2627 2628	Brits/Rand/Vereeniging	1961	438/1961
438	Row 25	03312	2527 2627 2628	Brits/Rand/Vereeniging	1961	438/1961
438	Row 25	03313	2527 2627 2628	Brits/Rand/Vereeniging	1961	438/1961
438	Row 26	04381	2527 2627 2628	Brits/Rand/Vereeniging	1961	438/1961
438	Row 26	04382	2527 2627 2628	Brits/Rand/Vereeniging	1961	438/1961

4 Illustrative material

Figure 4-1 presents an overview of the current environment within the Project area. As described above, the area has a lengthy history of disturbance through anthropogenic activity, including activities associated with the mining and agricultural industry of the region. Figure 4-2 presents a sample of the heritage resources identified during the pre-disturbance survey. Figure 4-3 below illustrates the distribution of the historical resources identified through the aerial imagery.

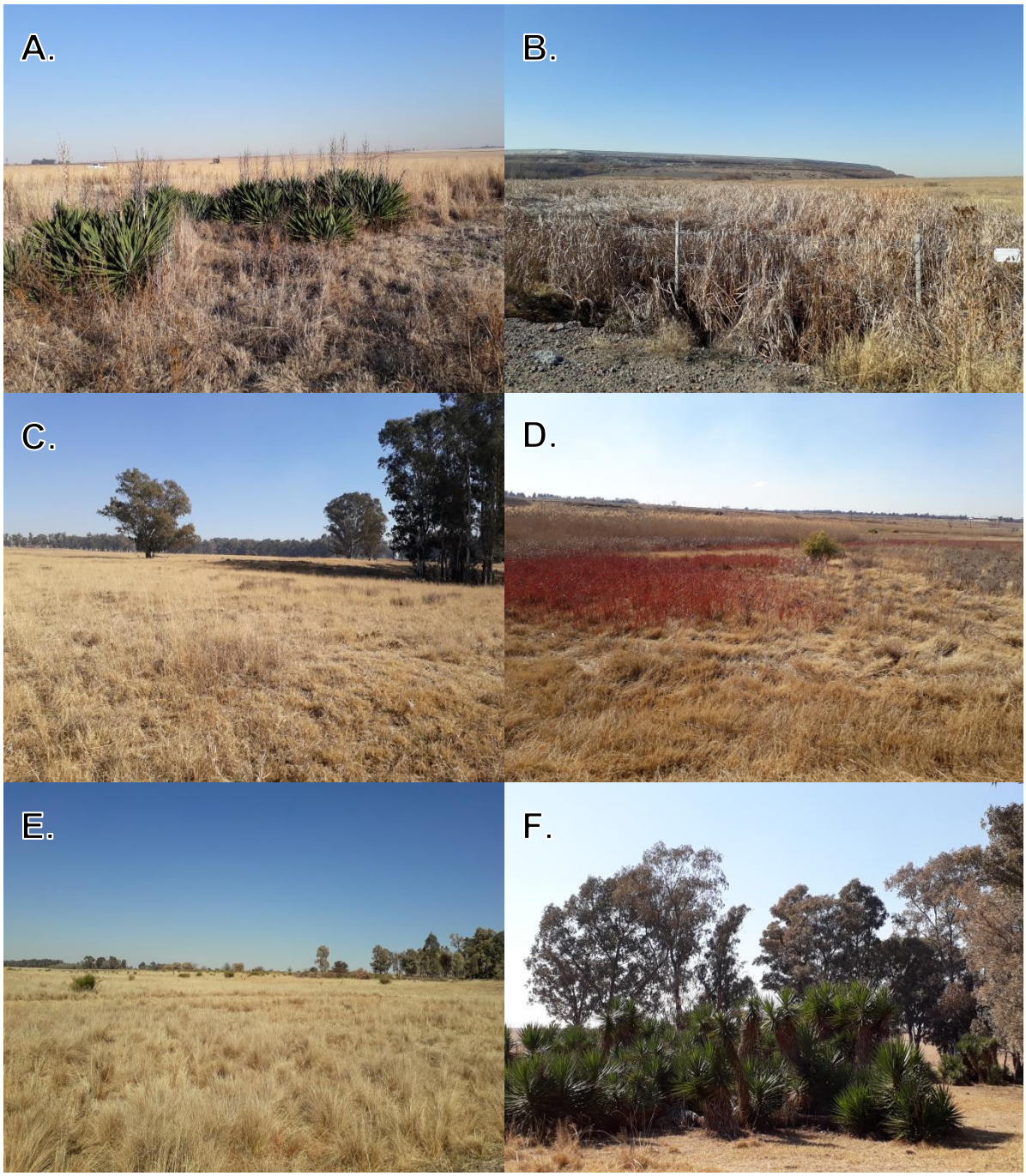

Figure 4-1: Photographs illustrating the current environment

A.) Environment above Leeuspruit Section 2; B.) near the river in Leeuspruit Section 3; C.) In the game-farm in Leeuspruit Sections 3 and 4; D.) near the more disturbed area of Leeuspruit Section 5; E.) at Rietspruit Section 1 and F.) exotics at Rietspruit Section 1.

Figure 4-2: Photographs illustrating the heritage resources identified in the Project area

A.) BGG-002; B.) BGG-003; C.) STE-001; and D.) BGG-004

Figure 4-3: Historical imagery for the site-specific study area, showing potential heritage sites

5 Assessment process

Table 5-1 presents the EA processes that are currently being conducted for the proposed Project.

Table 5-1: Current assessment processes

Legislation (E.g. NEMA, MPRDA, etc.)	Current phase of assessment process (E.g. Scoping, EIA, etc.)	Authorities who has / will receive information	Capacity of Authorities
NEMA	Pre-application	Department of Mineral Resources (DMR)	Licencing
NWA	Pre-application	Department of Water and Sanitation (DWS)	Licencing
NHRA	NID and RfE	South African Heritage Resources Agency (SAHRA)	Commenting
	NID and RfE	Heritage Free State (HFS)	Commenting

These assessments are required in terms of legislated and/or regulated activities outlined in Sections 5.1 to 5.3 below.

5.1 EIA Regulations listed activities

Table 5-2 presents the activities listed in the EIA Regulations which generally require impact assessments.

Table 5-2: Identified listed activities

NEMA Activity No.	NHRA Trigger	Description	Expected duration/phase
Listing Notice 1 Activity 9	38(1)(e)	It is proposed that the canals to divert the water will exceed 1000 metres in length and will have a width of 12.5 - 30 metres	Construction, operation
Listing Notice 1 Activity 12	38(1)(e)	The canals to be constructed to divert the water will exceed 100 square metres which are proposed to be located within a water course	Construction
Listing Notice 1 Activity 19	38(1)(e)	Movement of soil of more than 10 cubic metres within a watercourse;	Construction

NEMA Activity No.	NHRA Trigger	Description	Expected duration/phase
Listing Notice 1 Activity 24	38(1)(e)	Development of a road with a reserve wider than 13.5 m or where no reserve exists but where the road is wider than 8 m.	Construction
Listing Notice 1 Activity 27	38(1)(e)	The clearing of vegetation of more than 1 ha but less than 20 ha	Construction

5.2 NHRA Section 38(1) activities

The proposed development will include the following activities listed in Section 38(1) of the NHRA, which generally require heritage assessments be undertaken.

Table 5-3: NHRA Section 38 triggers

	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		River diversion in excess of 300 m
☐	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	
	☐	**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.)		NEMA

5.3 Identified / known heritage resources and potential impacts

Certain categories of heritage resource, if existing and identified, generally require heritage assessments to be completed before any development may take place. These categories may be formally or generally protected in terms of the NHRA. Table 5-4 presents an overview of such heritage resources identified within the Project area.

Table 5-4: Identified heritage resources in terms of Section 3 of the NHRA

	Section	Description
☒	3(2)(a)	**Places, buildings, structures and equipment of cultural significance**
		Description of resource: Several built heritage resources were identified within the Sigma Defunct Colliery MRA through the pre-disturbance survey and through the use of historical imagery. These resources are at least 240 m away from all Project activities.
		Potential impact: None identified
☐	3(2)(b)	**Places to which oral traditions are attached or which are associated with living heritage**
		Description of resource: None identified
		Potential impact: None
☐	3(2)(c)	**Historical settlements and townscapes**
		Description of resource: None identified
		Potential impact: None
☐	3(2)(d)	**Landscapes and natural features of cultural significance**
		Description of resource: None identified
		Potential impact: None
☐	3(2)(e)	**Geological resources of scientific or cultural importance**
		Description of resource: The *Vryheid Formation* underlies the site-specific study area. This geological feature has the potential to include fossils of scientific value and is considered to have high palaeontological sensitivity.
		Potential impact: None
☐	3(2)(f)	**Archaeology and/or palaeontology *(Including archaeological sites and material, fossils, rock art, battlefields & wrecks)***
		Description of resource: None identified
		Potential impact: None
☐	3(2)(g)	**Graves and burial grounds *(e.g. ancestral graves, graves of victims of conflict, historical graves & cemeteries)***
		Description of resource: Four burial grounds were identified within the Sigma Defunct Colliery MRA. These are at least 250 m away from all Project activities and therefore no impact is envisaged.
		Potential impact: None identified

	Section	Description
☐	3(2)(h)	**Other human remains**
		Description of resource: None identified
		Potential impact: None
☐	3(2)(i)	**Sites of significance relating to the history of slavery in South Africa**
		Description of resource: None identified
		Potential impact: None
☐	3(2)(j)	**Movable objects**
		Description of resource: None identified
		Potential impact: None

6 Recommendation

Table 6-1 presents a summary and motivation of the specialist recommendations.

Table 6-1: Specialist heritage recommendations

Is a Heritage Impact Assessment required?	☐ Yes	☒ No

If NO, provide motivation:

The baseline description as presented in Section 3 above demonstrates that the greater study area comprises a cultural landscape predominantly associated with the historical built environment and burial grounds and graves. With the exception of the burial grounds and graves, which carry a high cultural significance, much of the archaeology in the greater study area is of low significance as determined in previously-completed heritage studies (Van Schalkwyk et al 1996; Dreyer, 2005; Birkholtz, 2008; Pelser & Van Vollenhoven 2008; Pistorius 2008; Van Ryneveld 2008; du Piesanie & Nel 2014; Higgit & du Piesanie 2015; Mngomezulu, 2016; Beater, 2017; Marais-Botes 2017; Hardwick & du Piesanie 2018).

No geological outcrops or palaeontological resources were identified during the pre-disturbance survey, and only one historical structure and four burial grounds were recorded. Additional potential historical structures were identified through aerial imagery and shown in Figure 4-3.

The identified resources occur in excess of 250 m distance from the proposed Project activities and development footprint. Considering the nature of the Project, the cultural landscape baseline, and distribution of known heritage resources, Digby Wells recommends and requests exemption from further heritage assessment in terms of Section 38 of the NHRA.

This recommendation and request is made on condition that:

- Sasol Mining establishes and maintains a buffer zone of at least 50 m around the identified heritage resources. The buffers must be clearly demarcated and appropriate signage be placed during the construction phase. Where such a buffer cannot be maintained, Digby

Wells proposes a Heritage Watching Brief be undertaken by a qualified and accredited archaeologist to ensure the identified heritage resources are not impacted upon;

- Sasol Mining must develop a project-specific Chance Finds Protocol (CFP) and Fossil Finds Protocol (FFP) for implementation during the establishment and construction phase of the Project. These must be included in the Environmental Management Programme (EMPr); and
- The proponent immediately informs SAHRA of any chance finds identified and enlists the services of a qualified and accredited archaeologist to assess and recommend appropriate mitigation measures.

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:		

Recommendation made by:

Name: Shannon Hardwick

Capacity: Assistant Heritage Resources Management Consultant

Name: Justin du Piesanie

Capacity: Divisional Manager: Social and Heritage Services

Appendix A: Specialist CV

Miss Shannon Hardwick

Assistant Heritage Resources Management Consultant

Social and Heritage Services Department

Digby Wells Environmental

1 Education

Date	Degree(s) or Diploma(s) obtained	Institution
2013	MSc (Archaeology)	University of the Witwatersrand
2010	BSc (Honours) (Archaeology)	University of the Witwatersrand
2009	BSc	University of the Witwatersrand
2006	Matric	Rand Park High School

2 Language Skills

Language	Written	Spoken
English	Excellent	Excellent
Afrikaans	Basic	Basic

3 Employment

Period	Company	Title/position
2018 to present	Digby Wells Environmental	Assistant Heritage Resources Management Consultant
2017-2018	Digby Wells Environmental	Intern: Heritage Resources Management
2016-2017	Tarsus Academy	Facilitator
2011-2016	University of the Witwatersrand	Teaching Assistant
2011	University of the Witwatersrand	Collections Assistant

4 Experience

Shannon joined the Digby Wells team in May 2017 as a Heritage Management Intern, and has subsequently been appointed as an Assistant Heritage Resources Management Consultant. Shannon is an archaeologist who obtained a Master of Science (MSc) degree from the University of the Witwatersrand in 2013, specialising in historical archaeobotany in the Limpopo Province. She is a published co-author of one paper in *Journal of Ethnobiology*. Since joining Digby Wells, Shannon has gained generalist experience through the compilation of Notification of Intent to Develop (NID) applications as well as Heritage Basic Assessment Reports (HBARs), Heritage Scoping Reports (HSRs) and Heritage Impact Assessment (HIA) reports. Her other experience includes compiling a Community Health, Safety and Security Management Plan (CHSSMP) and researching Artisanal and Small-Scale Mining for input into a Livelihood Restoration Framework (LRF). Shannon's experience in the field includes pre-disturbance surveys in South Africa and fieldwork in Malawi.

5 Project Experience

My project experience is listed in the table below:

Project Title	Project Location	Date:	Description of the Project	Name of Client
Kilbarchan Colliery Environmental Authorisations and Closure Study	Newcastle, KwaZulu-Natal, South Africa	Ongoing	Heritage Impact Assessment	Eskom Holdings SOC Limited

Project Title	Project Location	Date:	Description of the Project	Name of Client
Belfast Implementation Project	Mpumalanga Province, South Africa	Ongoing	Section 34 Permit Application	Exxaro Coal Mpumalanga (Pty) Ltd
The South African Radio Astronomy Observatory Square Kilometre Array Heritage Impact Assessment and Conservation Management Plan Project	Northern Cape Province, South Africa	Ongoing	Heritage Impact Assessment and Conservation Management Plan	The South African Radio Astronomy Observatory (SARAO)
Heritage Resources Management Process for the Exxaro Matla Mine	Mpumalanga Province, South Africa	January 2018	Heritage Impact Assessment	Exxaro Coal Mpumalanga (Pty) Ltd
Newcastle Landfill Project	Newcastle, KwaZulu-Natal, South Africa	March 2018	Heritage Impact Assessment	GCS Water and Environmental Consultants
Tharisa Apollo (UG1) Plant	Marikana, North-West Province, South Africa	Ongoing	Heritage Impact Assessment	GCS Water and Environmental Consultants
National Heritage Resources Act, 1999 (Act No. 25 of 1999) Section 34 Permit Application Process for the Davin and Queens Court Buildings on Erf 173 and 174, West Germiston, Gauteng Province	Johannesburg, Gauteng, South Africa	April 2018	Section 34 Permit Application	IDC Architects
Environmental Impact Assessment for the proposed Future Developments within the Sun City Resort Complex	North West Province, South Africa	Ongoing	Heritage Impact Assessment	Sun International (Pty) Ltd
Basic Assessment and Environmental Management Plan for the Proposed pipeline from the Mbali Colliery to the Tweefontein Water Reclamation Plant, Mpumalanga Province	Mpumalanga Province, South Africa	January 2018	Heritage Basic Assessment Report	HCI Coal (Pty) Ltd (Mbali Colliery)

Project Title	Project Location	Date:	Description of the Project	Name of Client
Environmental Fatal Flaw Analysis for the Mabula Filling Station	Waterberg, Limpopo Province, South Africa	November 2017	Fatal Flaw Analysis	Mr van den Bergh
Zuurfontein NID	Ekurhuleni, Johannesburg, South Africa	July 2017	Notification of Intent to Develop	Shuma Africa Projects
Liwonde Additional Studies	Liwonde, Southern Region, Malawi	Ongoing	Resettlement Action Plan, Community Health, Safety and Security Management Plan	Mota-Engil Africa
National Heritage Resources Act, 1999 (Act No. 25 of 1999) Section 35 Archaeological Investigations, Lanxess Chrome Mine, North-West Province	Rustenburg, North West Province, South Africa	July 2017	Phase 2 Mitigation Assessment	Lanxess Chrome Mines (Pty) Ltd
Environmental and Social Input for the Pre-Feasibility Study	Bougouni, southern Mali	July 2017	Pre-Feasibility Study	Birimium Gold

6 Professional Registrations

Position	Professional Body	Registration Number
Member	Association for Southern African Professional Archaeologists (ASAPA)	451

7 Publications

Esterhuysen, A.B. & Hardwick, S.K. 2017. Plant remains recovered from the 1854 siege of the Kekana Ndebele, Historic Cave, Makapan Valley, South Africa. *Journal of Ethnobiology* 37(1): 97-119.

Mr. Justin du Piesanie

Manager: Heritage Resources Management

Social and Heritage Services Department

Digby Wells Environmental

1 Education

Date	Degree(s) or Diploma(s) obtained	Institution
2015	Continued Professional Development, Intermediate Project Management Course	PM.Ideas: A division of the Mindset Group
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
2016 to present	Digby Wells Environmental	Unit Manager: Heritage Resources Management
2011-2016	Digby Wells Environmental	Heritage Management Consultant: Archaeologist
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 Experience

I joined the company in August 2011 as an archaeologist and was subsequently made unit manager in the Social and Heritage Services Department in 2016. I obtained my Master of Science (MSc) degree in Archaeology from the University of the Witwatersrand in 2008, specialising in the Southern African Iron Age. I further attended courses in architectural and urban conservation through the University of Cape Town's Faculty of Engineering and the Built Environment Continuing Professional Development Programme in 2013. I am a professional member of the Association of Southern African Professional Archaeologists (ASAPA), and accredited by the association's Cultural Resources Management (CRM) section. I am also a member of the International Council on Monuments and Sites (ICOMOS), an advisory body to the UNESCO World Heritage Convention. I have over 10 years combined experience in HRM in South Africa, including heritage assessments, archaeological mitigation, grave relocation, and NHRA Section 34 application processes. I gained further generalist experience since my appointment at Digby Wells in Botswana, Burkina Faso, the Democratic Republic of Congo, Liberia and Mali on projects that have required compliance with IFC requirements such as Performance Standard 8: Cultural Heritage. Furthermore, I have acted as a technical expert reviewer of HRM projects undertaken in Cameroon and Senegal. My current focus at Digby Wells is to develop the HRM process as an integrated discipline following international HRM principles and standards. This approach aims to provide clients with comprehensive, project-specific solutions that promote ethical heritage management and assist in achieving strategic objectives.

5 Project Experience

Please see the following table for relevant project experience:

Project Title	Project Location	Date:		Description of the Project	Name of Client
Klipriviersberg Archaeological Survey	Meyersdal, Gauteng, South Africa	2005	2006	Archaeological surveys	ARM
Sun City Archaeological Site Mapping	Sun City, Pilanesberg, North West Province, South Africa	2006	2006	Phase 2 Mapping	Sun International
Witbank Dam Archaeological Impact Assessment	Witbank, Mpumalanga, South Africa	2007	2007	Archaeological survey	ARM
Archaeological Assessment of Modderfontein AH Holdings	Johannesburg, Gauteng, South Africa	2008	2008	Heritage Basic Assessment	ARM
Heritage Assessment of Rhino Mines	Thabazimbi, Limpopo Province, South Africa	2008	2008	Heritage Impact Assessment	Rhino Mines
Cronimet Project	Thabazimbi, Limpopo Province, South Africa	2008	2008	Archaeological surveys	Cronimet
Eskom Thohoyandou SEA Project	Limpopo Province, South Africa	2008	2008	Heritage Statement	Eskom
Wenzelrust Excavations	Shoshanguve, Gauteng, South Africa	2009	2009	Phase 2 Excavations	Heritage Contracts Unit
University of the Witwatersrand Parys LIA Shelter Project	Parys, Free State, South Africa	2009	2009	Phase 2 Mapping	University of the Witwatersrand
Transnet NMPP Line	Kwa-Zulu Natal, South Africa	2010	2010	Heritage survey	Umlando Consultants
Archaeological Impact Assessment – Witpoortjie Project	Johannesburg, Gauteng, South Africa	2010	2010	Archaeological Impact Assessment	ARM
Der Brochen Archaeological Excavations	Steelpoort, Mpumalanga, South Africa	2010	2010	Phase 2 Excavations	Heritage Contracts Unit
De Brochen and Booysendal Archaeology Project	Steelpoort, Mpumalanga, South Africa	2010	2010	Phase 2 Mapping	Heritage Contracts Unit
Eskom Thohoyandou Electricity Master Network	Limpopo Province, South Africa	2010	2010	Heritage Statement	Strategic Environmental Focus
Batlhako Mine Expansion	North-West Province, South Africa	2010	2010	Phase 2 Mapping	Heritage Contracts Unit
Kibali Gold Project Grave Relocation Plan	Orientale Province, Democratic Republic of Congo	2011	2013	Grave Relocation	Randgold Resources Limited

Project Title	Project Location	Date:		Description of the Project	Name of Client
Kibali Gold Hydro-Power Project	Orientale Province, Democratic Republic of Congo	2012	2014	Heritage Impact Assessment	Randgold Resources Limited
Everest North Mining Project	Steelpoort, Mpumalanga, South Africa	2012	2012	Heritage Impact Assessment	Aquarius Resources
Environmental Authorisation for the Gold One Geluksdal TSF and Pipeline	Gauteng, South Africa	2012	2012	Heritage Impact Assessment	Gold One International
Platreef Burial Grounds and Graves Survey	Mokopane, Limpopo Province, South Africa	2012	2012	Burial Grounds and Graves Survey	Platreef Resources
Resgen Boikarabelo Coal Mine	Limpopo Province, South Africa	2012	2012	Phase 2 Excavations	Resources Generation
Bokoni Platinum Road Watching Brief	Burgersfort, Limpopo Province, South Africa	2012	2012	Watching Brief	Bokoni Platinum Mine
SEGA Gold Mining Project	Burkina Faso	2012	2013	Socio Economic and Asset Survey	Cluff Gold PLC
Everest North Mining Project	Steelpoort, Mpumalanga, South Africa	2012	2015	Heritage Impact Assessment	Aquarius Resources
SEGA Gold Mining Project	Burkina Faso	2013	2013	Technical Reviewer	Cluff Gold PLC
Consbrey and Harwar Collieries Project	Breyton, Mpumalanga, South Africa	2013	2013	Heritage Impact Assessment	Msobo
New Liberty Gold Project	Liberia	2013	2014	Grave Relocation	Aureus Mining
Falea Uranium Mine Environmental Assessment	Falea, Mali	2013	2013	Heritage Scoping	Rockgate Capital
Putu Iron Ore Mine Project	Petroken, Liberia	2013	2014	Heritage Impact Assessment	Atkins Limited
Sasol Twistdraai Project	Secunda, Mpumalanga, South Africa	2013	2014	Notification of Intent to Develop	ERM Southern Africa
Daleside Acetylene Gas Production Facility	Gauteng, South Africa	2013	2013	Heritage Impact Assessment	ERM Southern Africa
Exxaro Belfast GRP	Belfast, Mpumalanga, South Africa	2013	-	Grave Relocation	Exxaro Coal Mpumalanga (Pty) Ltd
Nzoro 2 Hydro Power Project	Orientale Province, Democratic Republic of Congo	2014	2014	Social consultation	Randgold Resources Limited
Eastern Basin AMD Project	Springs, Gauteng, South Africa	2014	2014	Heritage Impact Assessment	AECOM
Soweto Cluster Reclamation Project	Soweto, Gauteng, South Africa	2014	2014	Heritage Impact Assessment	Ergo (Pty) Ltd

Project Title	Project Location	Date:		Description of the Project	Name of Client
Klipspruit South Project	Ogies, Mpumalanga, South Africa	2014	2014	Heritage Impact Assessment	BHP Billiton
Klipspruit Extension: Weltevreden Project	Ogies, Mpumalanga, South Africa	2014	2014	Heritage Impact Assessment	BHP Billiton
Ergo Rondebult Pipeline Basic Assessment	Johannesburg, South Africa	2014	2014	Heritage Basic Assessment	Ergo (Pty) Ltd
Kibali ESIA Update Project	Orientale Province, Democratic Republic of Congo	2014	2014	Heritage Impact Assessment	Randgold Resources Limited
GoldOne EMP Consolidation	Westonaria, Gauteng, South Africa	2014	2014	Gap analysis	Gold One International
Yzermite PIA	Wakkerstroom, Mpumalanga, South Africa	2014	2014	Palaeontological Assessment	EcoPartners
Sasol Mooikraal Basic Assessment	Sasolburg, Free State, South Africa	2014	2014	Heritage Basic Assessment	Sasol Mining
Oakleaf ESIA Project	Bronkhorstspruit, Gauteng, South Africa	2014	2015	Heritage Impact Assessment	Oakleaf Investment Holdings
Rea Vaya Phase II C Project	Johannesburg, Gauteng, South Africa	2014	2014	Heritage Impact Assessment	ILISO Consulting
Imvula Project	Kriel, Mpumalanga, South Africa	2014	2015	Heritage Impact Assessment	Ixia Coal
Sibanye WRTRP	Gauteng, South Africa	2014	2016	Heritage Impact Assessment	Sibanye
VMIC Vanadium EIA Project	Mokopane, Limpopo, South Africa	2014	2015	Heritage Impact Assessment	VM Investment Company
NLGM Constructed Wetlands Project	Liberia	2015	2015	Heritage Impact Assessment	Aureus Mining
ERPM Section 34 Destruction Permits Applications	Johannesburg, Gauteng, South Africa	2015	2015	Section 34 Destruction Permit Applications	Ergo (Pty) Ltd
JMEP II EIA	Botswana	2015	2015	Heritage Impact Assessment	Jindal
Gino's Building Section 34 Destruction Permit Application	Johannesburg, Gauteng, South Africa	2015	2016	Heritage Impact Assessment and Section 34 Destruction Permit Application	Bigen Africa Services (Pty) Ltd
EDC Block Refurbishment Project	Johannesburg, Gauteng, South Africa	2015	2016	Heritage Impact Assessment and Section 34 Permit Application	Bigen Africa Services (Pty) Ltd
Namane IPP and Transmission Line EIA	Steenbokpan, Limpopo Province, South Africa	2015	2016	Heritage Impact Assessment	Namane Resources (Pty) Ltd
Temo Coal Road Diversion and Rail Loop EIA	Steenbokpan, Limpopo Province, South Africa	2015	2016	Heritage Impact Assessment	Namane Resources (Pty) Ltd
Groningen and Inhambane PRA	Limpopo Province, South Africa	2016	2016	Heritage Basic Assessment	Rustenburg Platinum Mines Limited

Project Title	Project Location	Date:		Description of the Project	Name of Client
NTEM Iron Ore Mine and Pipeline Project	Cameroon	2014	2016	Technical Review	IMIC plc
Palmietkuilen MRA	Springs, Gauteng, South Africa	2016	2016	Heritage Impact Assessment	Canyon Resources (Pty) Ltd
Copper Sunset Sand Mining S.102	Free State, South Africa	2016	2016	Heritage Basic Assessment	Copper Sunset Sand (Pty) Ltd
Grootvlei MRA	Springs, Gauteng, South Africa	2016	2016	Notification of Intent to Develop	Ergo (Pty) Ltd
Lambda EMP	Mpumalanga, South Africa	2016	2016	Palaeontological Impact Assessment	Eskom Holdings SOC Limited
Kilbarchan Basic Assessment and EMP	Newcastle, KwaZulu-Natal, South Africa	2016	2016	Heritage Basic Assessment	Eskom Holdings SOC Limited
Grootegeluk Amendment	Lephalale, Limpopo Province, South Africa	2016	2016	Notification of Intent to Develop	Exxaro
Garsfontein Township Development	Pretoria, Gauteng, South Africa	2016	2016	Notification of Intent to Develop	Leungo Construction Enterprises
Massawa EIA	Senegal	2016	2017	Technical Reviewer Heritage Impact Assessment	Randgold Resources Limited
Louis Botha Phase 2	Johannesburg, Gauteng, South Africa	2016	2016	Phase 2 Excavations	Royal Haskoning DHV
Beatrix EIA and EMP	Welkom, Free State, South Africa	2016	2017	Heritage Impact Assessment	Sibanye Gold Ltd
Sun City Heritage Mapping	Pilanesberg, North-West Province, South Africa	2016	2016	Phase 2 Mapping	Sun International
Sun City Chair Lift	Pilanesberg, North-West Province, South Africa	2016	2017	Notification of Intent to Develop and Heritage Basic Assessment	Sun International
Hendrina Underground Coal Mine EIA	Hendrina, Mpumalanga, South Africa	2016	2017	Heritage Impact Assessment	Umcebo Mining (Pty) Ltd
Elandsfontein EMP Update	Clewer, Mpumalanga, South Africa	2016	2017	Heritage Impact Assessment	Anker Coal
Eskom Northern KZN Strengthening	KwaZulu-Natal, South Africa	2016	-	Heritage Impact Assessment	ILISO Consulting
Thabametsi GRP	Lephalale, Limpopo Province, South Africa	2017	-	Grave Relocation	Exxaro Resources Ltd
Grootegeluk Watching Brief	Lephalale, Limpopo Province, South Africa	2017	2017	Watching Brief	Exxaro Resources Ltd
Matla HSMP	Kriel, Mpumalanga Province, South Africa	2017	2017	Heritage Site Management Plan	Exxaro Coal Mpumalanga (Pty) Ltd
Ledjadja Coal Borrow Pits	Lephalale, Limpopo Province, South Africa	2017	2017	Heritage Basic Assessment	Ledjadja Coal (Pty) Ltd
Exxaro Belfast Implementation Project PIA	Belfast, Mpumalanga, South Africa	2017	2017	Palaeontological Impact Assessment	Exxaro Coal Mpumalanga (Pty) Ltd

Project Title	Project Location	Date:		Description of the Project	Name of Client
Lanxess Chrome Mine Archaeological Mitigation	Rustenburg, North West Province, South Africa	2017	2017	Phase 2 Excavations	Lanxess Chrome Mine (Pty) Ltd
Goulamina EIA Project	Goulamina, Sikasso Region, Mali	2017	2017	Heritage Impact Assessment	Birimian Limited
Zuurfontein Residential Establishment Project	Ekurhuleni, Gauteng, South Africa	2017	2017	Notification of Intent to Develop	Shuma Africa Projects
Kibali Grave Relocation Training and Implementation	Orientale Province, Democratic Republic of Congo	2017	-	Grave Relocation	Randgold Resources Limited
Exxaro Matla HRM	Kriel, Mpumalanga	2017	-	Heritage Impact Assessment	Exxaro Coal Mpumalanga (Pty) Ltd

6 Professional Registrations

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
Member	International Association of Impact Assessors (IAIA) South Africa	5494

7 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

du Piesanie, J.J., 2017. Book Review: African Cultural Heritage Conservation and Management. South African Archaeological Bulletin 72(205)