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Environmental Authorisation Application in support of the Section 102 Amendment for the Copper Sunset Sand Mining Operation, Free State Province

Heritage Basic Assessment Report

Project Number:

COP3706

Prepared for:

Copper Sunset Sand (Pty) Ltd

April 2016

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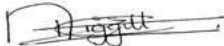


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LIST OF ACRONYMS, ABBREVIATIONS AND TERMS

Abbreviation	Meaning
ASAPA	Association of Southern African Professional Archaeologists
BA	Bachelor of Arts
Bsc	Bachelor of Science
Digby Wells	Digby Wells Environmental
EIA	Environmental Impact Assessment
EMP	Environmental Management Plan
ESA	Early Stone Age
ESTA	Extension of Security of Tenure Act (Act No. 62 of 1997)
GIS	Geographical Information System
GPS	Global Positioning System
HBAR	Heritage Basic Assessment Report
HFS	Heritage Free State
HIA	Heritage Impact Assessment
Hons	Honours degree
HRA	Heritage Resources Authority
HRM	Heritage Resources Management
ICOMOS	International Council on Monuments and Sites
LSA	Late Stone Age
MA	Master of Arts
MPRDA	Minerals and Petroleum Resources Development Act, 2002 (Act No. 28 of 2002)
MSA	Middle Stone Age
MSc	Master of Science
NEMA	National Environmental Management Act, 1998 (Act No. 107 of 1998)
NHRA	National Heritage Resources Act, 1999 (Act No. 25 of 1999)
SAHRA	South African Heritage Resources Agency
SAHRIS	South African Heritage Resources Information System
SAMA	South African Museum Association
SoW	Scope of Work
Ste	Structure
UNESCO	United Nations Education, Scientific and Cultural Organisation
UP	University of Pretoria
Wits	University of the Witwatersrand



GLOSSARY

Term	Definition
Alter	Any action affecting the structure, appearance or physical properties of a place or object, whether by way of structural or other works, by painting, plastering or other decoration or any other means.
Archaeological	Material remains resulting from human activity that are in a state of disuse and older than 100 years, including artefacts, human and hominid remains and artificial features and structures. Rock art created through human agency older than 100 years, including any area within 10 m of such representation. Wrecks older than 60 years - either vessels or aircraft - or any part thereof that was wrecked in South Africa on land, internal or territorial waters, and any cargo, debris or artefacts found or associated therewith. Features, structures and artefacts associated with military history that are older than 75 years and the sites on which they are found, e.g. battlefields.
Archaeologist	A trained professional who uses scientific methods to excavate record and study archaeological sites and deposits.
Ceramic (syn. pottery)	In an archaeological context any vessel or other object produced from natural clay that has been fired. Indigenous ceramics associated with Farming Communities are low-fired wares, typically found as potsherds. Imported and more historic ceramics generally include high-fired wares such as porcelain, stoneware, etc.
Development	<p>Any physical intervention, excavation, or action, other than those caused by natural forces, which may in the opinion of a heritage authority in any way result in a change to the nature, appearance or physical nature of a place, or influence its stability and future well-being, including:</p> <ul style="list-style-type: none"> ■ Construction, alteration, demolition, removal or change of use of a place or a structure at a place ■ Carrying out any works on or over or under a place. Subdivision or consolidation of land comprising, a place, including the structures or airspace of a place. ■ Constructing or putting up for display signs or hoardings. ■ Any change to the natural or existing condition or topography of land. ■ Any removal or destruction of trees, or removal of vegetation or topsoil.



Early Stone Age	The South African ESA dates from ~3 Mya to c. 250 Kya. This period is associated with later <i>Australopithecus</i> and early <i>Homo</i> species. The lithic industries that characterise the ESA include Oldowan and Early Acheulian, typically as simple core tools, choppers handaxes and cleavers.
Farming Community/ies	Term signifying the appearance in the southern African archaeological of Bantu-speaking agricultural based societies from the early first millennium CE. The term replaces the <i>Iron Age</i> as a more accurate description for groups who practiced agriculture and animal husbandry, extensive manufacture and use of ceramics, and metalworking. The Farming Community period is divided into an Early and Late phase. The use of Later Farming Communities especially removes the artificial boundary between archaeology and history.
Formal protection	Places with qualities so exceptional that they are of special national significance as national heritage sites or that have special qualities as provincial heritage sites.
General protection	<p>General protections are afforded to:</p> <ul style="list-style-type: none"> ■ Objects protected in terms of laws of foreign states. ■ Structures older than 60 years. ■ Archaeological and palaeontological sites and material and meteorites. ■ Burial grounds and graves. ■ Public monuments and memorials.
Grave	A place of interment and includes the contents, headstone or other marker of such a place, and any other structure on or associated with such place.
Heritage Impact Assessment (HIA)	An assessment of the cultural significance of, and possible impacts on, diverse heritage resources that may be affected by a proposed development. A HIA may include several specialist elements such as archaeological, built environment and palaeontological studies. The HIA must supply the heritage authority with sufficient information about the sites to assess, with confidence, whether or not it has any objection to a development, indicate the conditions upon which such development might proceed and assess which sites require permits for destruction, which sites require mitigation and what measures should be put in place to protect sites that should be conserved. The content of HIA reports are clearly outlined in Section 38(3) of the NHRA and SAHRA Minimum Standards.



Heritage resource	Any place or object of cultural significance.
Heritage resources management	Process required when development is intended categorised as: Any linear development exceeding 300m in length. Construction of a bridge or similar structure exceeding 50 m in length. Any activity which will change the character of a site exceeding 0.5 hectares in extent or involving three or more existing erven or subdivisions thereof or that have been consolidated within the past five years or costs of which will exceed a sum set in terms of regulations by SAHRA or a provincial heritage resources authority. Re-zoning of a site exceeding one hectare in extent. Any other category of development provided for in regulations by SAHRA or a provincial heritage resources authority.
Late Farming Community/ies	Farming Communities who either developed / evolved from EFC groups, or who migrated into southern African from the late first millennium / early second millennium CE. The LFC period evidences distinct changes in socio-political organisation, settlement patterns, trade and economic activities, including extensive trade routes. The LFC period is generally dated from c. 1000 CE well into the modern historical period of the nineteenth century.
Late Stone Age	The South African LSA dates from ~30 Kya. This period is associated with modern <i>Homo sapiens sapiens</i> and the complex hunter-gatherer societies, ancestral to the Bushmen / San and Khoi. The LSA lithic assemblage contains microlithic technology and composite tools such as arrows commonly produced from fine-grained cryptocrystalines, quartz and chert. The LSA is also associated with archaeological rock art including both paintings and engravings.
Middle Stone Age	The South African MSA dates from ~300 Kya to c. 30 Kya. This period is associated with the changing behavioural patterns and the emergence of modern cognitive abilities in early <i>Homo sapiens species</i> . The lithic industries that characterise the MSA are typically more complex tools with diagnostic identifiers, including convergent flake scars, multi-faceted platforms, retouch and backing. Assemblages are characterised as refined lithic technologies such as prepared core techniques, retouched blades and points manufactured from good quality raw material.
National estate	The national estate as defined in Section 3 of the NHRA, i.e. heritage resources of South Africa which are of cultural significance or other special value for the present community and for future generations. The national estate may include: Places, buildings, structures and equipment of cultural significance. Places to which oral traditions are attached or which are associated with living heritage. Historical settlements and townscapes.



	<p>Landscapes and natural features of cultural significance.</p> <p>Geological sites of scientific or cultural importance.</p> <p>Archaeological and palaeontological sites.</p> <p>Graves and burial grounds, including ancestral graves, royal graves and graves of traditional leaders, graves of victims of conflict, graves of individuals designated by the Minister by notice in the Gazette, historical graves and cemeteries, and other human remains which are not covered in terms of the National Health Act, 2003.</p> <p>Sites of significance relating to the history of slavery in South Africa.</p> <p>Movable objects, including objects recovered from the soil or waters of South Africa, including archaeological and palaeontological objects and material, meteorites and rare geological specimens; objects to which oral traditions are attached or which are associated with living heritage; ethnographic art and objects; military objects; objects of decorative or fine art; objects of scientific or technological interest.</p> <p>Books, records, documents, photographic positives and negatives, graphic, film or video material or sound recordings, excluding those that are public records as defined in section 1(xiv) of the National Archives of South Africa Act, 1996 (Act No. 43 of 1996).</p>
Palaeontological	<p>Any fossilised remains or fossil trace of animals or plants which lived in the geological past, other than fossil fuels or fossiliferous rock intended for industrial use, and any site which contains such fossilised remains or trace.</p>
Pre-disturbance survey (syn. reconnaissance)	<p>A survey to record a site as it exists, with all the topographical and other information that can be collected, without excavation or other disturbance of the site.</p>
Public monuments / memorials	<p>All monuments and memorials: erected on land belonging to any branch of central, provincial or local government; on land belonging to any organisation funded by or established in terms of the legislation of such a branch of government; which were paid for by public subscription, government funds, or a public-spirited or military organisation, and are on land belonging to any private individual.</p>
Structure	<p>Any building, works, device or other facility made by people and which is fixed to land, and includes any fixtures, fittings and equipment associated therewith.</p>



EXECUTIVE SUMMARY

Copper Sunset Sand (Pty) Ltd (hereafter Copper Sunset) is the holder of an approved Environmental Management Programme (EMPr) and Mining Right (Reference: FS 30/5/1/2/2/164 MR) to mine sand on the Bankfontein Farm, Free State Province. They are currently in the process of extending their Mining Right area to incorporate adjacent properties to extend its Life of Mine (LoM). In support of the strategic objective of Copper Sunset to extend the LoM of their operation, they have appointed Digby Wells Environmental (hereafter Digby Wells) to undertake necessary studies in support of a Section 102 Amendment in accordance with the Minerals and Petroleum Resources Development Act, 2002 (Act No. 28 of 2002), and Basic Assessment (BA) Process in support of Environmental Authorisation (EA) in accordance with the National Environmental Management Act, 1998 (Act No. 107 of 1998) (NEMA) and regulated in terms of the Environmental Impact Assessment (EIA) Regulations, 2014 (GN R 982).

The portion of the Remaining Extent of Rietfontein No. 152 under consideration is located in the Fezile Dabi District Municipality of the Free State Province, with the closest towns of Vereeniging and Sasolburg located approximately 11 km and 13 km distant, respectively. The site specific project area is located 4.2 km from the Vaal River.

Several categories of heritage resources occur within the local study area, protected in terms of Sections 34 to 36 of the National Heritage Resources Act, 1999 (Act No.25 of 1999) (NHRA). However, no protected resources were identified in the site-specific study area. Based on our understanding of the cultural landscape no potential impacts to heritage resources are envisaged for the expansion of the Copper Sunset mining operations on a portion of the Remaining Extent of the farm Rietfontein No. 152.

It is therefore recommended that the Project be approved and exempted from any additional heritage studies (such as Paleontological Impact Assessments and any Phase 2 permitted assessments), on condition that a project specific Chance Find Protocol (CFP) must be developed to be included into the approved EMPr.

The CFP must clearly describe the process and appropriate management of previously unidentified heritage resources, including any exposure of the potential fossiliferous *Vryheid Formation*.

The CFP should ideally detail:

- Identify roles and responsibilities of persons to monitor construction and operational activities;
- Develop a monitoring regime, if required; and
- Establish a reporting structure if chance finds are made.



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1 Introduction

Copper Sunset Sand (Pty) Ltd (hereafter Copper Sunset) is the holder of an approved Environmental Management Programme (EMPr) and Mining Right (Reference: FS 30/5/1/2/2/164 MR) to mine sand on the Bankfontein Farm, Free State Province. They are currently in the process of extending their Mining Right area to incorporate adjacent properties to extend its Life of Mine (LoM).

In support of the strategic objective of Copper Sunset to extend the LoM of their operation, they have appointed Digby Wells Environmental (hereafter Digby Wells) to undertake necessary studies in support of a Section 102 Amendment in accordance with the Minerals and Petroleum Resources Development Act, 2002 (Act No. 28 of 2002), and Basic Assessment (BA) Process in support of Environmental Authorisation (EA) in accordance with the National Environmental Management Act, 1998 (Act No. 107 of 1998) (NEMA) and regulated in terms of the Environmental Impact Assessment (EIA) Regulations, 2014 (GN R 982).

This report constitutes the specialist Heritage Basic Assessment Report (HBAR) in support of the BA process in accordance with the EIA Regulations 2014, and the requirements of the National Heritage Resources Act, 1999 (Act No. 25 of 1999) (NHRA).

2 Project background

In November 2015, Digby Wells on behalf of Copper Sunset submitted a BA Report (BAR) in support of EA and their Section 102 Amendment for the inclusion of portions of their neighbouring properties. These properties included portions of the following properties:

- Remaining Extent of the Farm Rietfontein No. 152;
- Remaining Extent of the Farm Zandfontein No. 259; and
- Remaining Extent of the Farm Bankfontein No. 9.

In support of the 2015 application, Digby Wells compiled and submitted a HBAR to the South African Heritage Resources Agency (SAHRA) and Free State Provincial Heritage Resources Authority, i.e. Heritage Free State (HFS) via the South African Heritage Resources Information System (SAHRIS) to comply with the requirements of Section 38(8) of the NHRA. A case reference number was assigned (Case ID: 8826¹) and final Statutory Comment was issued on 18 December 2015.

The final Statutory Comment issued stated that the SAHRA Archaeology, Palaeontology and Meteorites (APM) Unit had no objection to the proposed expansion of the operation if the conditions contained in the Final Comment were adhered to.

¹ <http://sahra.org.za/sahris/cases/copper-sunset-environmental-authorisation-application>



Copper Sunset is intending to apply for extension of their approved operation further onto a portion of the Remaining Extent of Rietfontein No. 152.

2.1 Project overview

The portion of Rietfontein No. 152 is located in the Fezile Dabi District Municipality of the Free State Province, with the closest towns of Vereeniging and Sasolburg located approximately 11 km and 13 km distant, respectively. The site specific project area is located 4.2 km from the Vaal River. The general landscape is characterised by extensive farmland and mining, with associated houses and buildings. See Table 2-1 for more detailed geographical details of the Project.

Table 2-1: Project location details

Province	Free State Province
Magisterial District / Local Authority	Sasolburg Magisterial District
District Municipality	Fezile Dabi District Municipality
Local Municipality	Metsimaholo Local Municipality
Nearest Town	Vereeniging / Vanderbijlpark / Sharpeville
Property Name and Number	Portion of the Remaining Extent of Rietfontein No. 152
1: 50 000 Map Sheet	2627DB Vereeniging
GPS Co-ordinates (relative centre point of study area)	26° 44' 19.54"
	27° 55' 39.36"

Existing mining infrastructure on the current sand mining operation will be used for the extended area; no additional infrastructure will be required.

The sand deposit appears between 35 cm to 50 cm below the surface and is 2.5 m to 3 m deep. Sand will be mined in 30 m to 35 m strips using strip mining methods. The extent of the strips will be constrained by the to-be-mined area, but the general distances range from 180 m to 600 m.

Mined sand will be transported via a temporary access roads adjacent to the mine strips, to the current mining operations on Bankfontein No. 9. Each mined strip will be backfilled with stockpiled topsoil as part of the concurrent rehabilitation. The backfilled excavations will be levelled, contoured and the topsoil revegetated. Changes in landscape topography through an overall decrease / lowering will occur as a result. Once a mined strip has been rehabilitated the next strip will be mined.



2.2 Listed and specific activities

The NEMA provides the regulatory environmental legal framework for South Africa. Certain regulated activities require environmental authorisation to be obtained following assessment processes outlined in the EIA Regulations, 2014. . The Regulations and activities applicable to this Project are:

- Regulation GN R. 983 – Listing Notice 1: This listing notice provides a list of various activities which require environmental authorisation and must follow the Basic Assessment process as described in Regulation 19 and Regulation 20 of the EIA Regulations, 2014; and
- Regulation GN R. 984 – Listing Notice 2: This listing notice provides a list of various activities which require environmental authorisation and must follow an EIA process as described in Regulation 21 to Regulation 24 of the EIA Regulations, 2014.

The Listed Activities, as defined in the EIA Regulations, 2014, and specified activities applicable to the Project are outlined in Table 2-2.

Table 2-2: Listed and specified activities for the Project

Name of Activity	Aerial extent of the activity	Listed Activity	Applicable Listing Notice
Listed activity			
Site clearance and vegetation removal	19.936621 ha	X – Activity 27	GN R 983
Mining of sand resource	30 m x 35 m width / 2.5 – 3 m depth / between 180 – 600 m length	X – Activity 17	GN R 984 (not applicable as existing mining right applies)
Specific activity			
Establishment of access roads / tracks	Alongside of the mine strip	Not Listed	Not Listed
Topsoil stockpiling	3 m ³	Not Listed	Not Listed
Backfilling of the mined excavations with overburden (inert waste rock used to construct the road will be used to fill the mined area)	30 m x 35 m width / 2.5 – 3 m depth / between 180 – 600 m length	Not Listed	Not Listed
Rehabilitation (topsoil cover, ripping and vegetation establishment)	19.936621 ha	Not Listed	Not Listed



3 Terms of reference

As stated in the introduction, Copper Sunset requested Digby Wells to provide specialist services to complete the required BA process. The suite of specialist studies needed to include a HRM process that adhered to the legal framework discussed under Section 4 below.

4 Legal framework

The HRM process is governed by the national legislative framework. This section provides a brief summary of the relevant legislation pertaining to the conservation and responsible management of heritage resources.

Table 4-1: Applicable legislation for the HRM process

Applicable legislation used to compile the report	Reference where applied
<p><u>Constitution of the Republic of South Africa, 1996 (Act No. 108 of 1996)</u></p> <p>Section 24 of the Constitution states that everyone has the right to an environment that is not harmful to their health or well-being and to have the environment protected, for the benefit of present and future generations, through reasonable legislative and other measures, that –</p> <ul style="list-style-type: none"> i. Prevent pollution and ecological degradation; ii. Promote conservation; and iii. Secure ecologically sustainable development and use of natural resources while promoting justifiable economic and social development 	<p>The BA process and associated HRM process is being undertaken to identify heritage resources and determine heritage impacts associated with the Project.</p> <p>As part of the HRM process, mitigation measures and monitoring plans will be recommended to ensure that any potential impacts are managed to acceptable levels to support the rights as enshrined in the Constitution.</p>
<p><u>Mineral and Petroleum Resources Development Act, 2002 (Act No. 28 of 2002) (MPRDA)</u></p> <p>In terms of the provisions of Section 102 of the MPRDA, in respect of the proposed amendments to the existing mining right, the applicant must submit an EMP to the DMR and consult with Interested & Affected Parties (I&APs) for comment regarding the Project.</p>	<p>The BA for the Project has been lodged with the DMR in June 2016.</p> <p>This HBAR, which relates specifically to the Project has been compiled in accordance with the MPRDA read with the EIA Regulations, 2014.</p>
<p><u>National Environmental Management Act, 1998 (Act No. 107 of 1998) (NEMA)</u></p> <p>The NEMA, as amended was set in place in accordance with section 24 of the Constitution of the Republic of South Africa. Certain environmental principles under NEMA have to be adhered to, to inform decision making for issues affecting the environment. Section 24 (1)(a) and (b) of NEMA state that:</p> <p><i>The potential impact on the environment and socio-economic conditions of activities that require authorisation or permission</i></p>	<p>The BA process is being undertaken in accordance with the principles of Section 2 of NEMA as well as with the EIA 2014 Regulations, promulgated in terms of NEMA.</p> <p>These Listed Notices have been reviewed against the project activities to determine the likely triggers. The listed activities which are potentially triggered under the Listing Notices are provided in Table 2-2.</p> <p>Based on the activities listed, it has been identified that a BA process is required for the Project. An application for</p>



Applicable legislation used to compile the report	Reference where applied
<p><i>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 authorizing, permitting, or otherwise allowing the implementation of an activity.</i></p> <p>The Environmental Impact Assessment (EIA) Regulations, Government Notice Regulation (GN) R.982 were published on 04 December 2014 and promulgated on 08 December 2014. Together with the EIA Regulations, the Minister also published GN R.983 (Listing Notice No. 1), GN R.984 (Listing Notice No. 2) and GN R.985 (Listing Notice No. 3) in terms of Sections 24(2) and 24D of the NEMA, as amended.</p>	<p>the listed activities will be submitted to the DMR who is the relevant Competent Authority in terms of this application for Environmental Authorisation.</p>
<p><u>GN R. 982: Environmental Impact Assessment Regulations, 2014</u></p> <p>These three Listing Notices set out a list of identified activities which may not commence without an Environmental Authorisation from the relevant Competent Authority through one of the following processes:</p> <ul style="list-style-type: none"> ▪ Regulation GN R. 983 - Listing Notice 1: This listing notice provides a list of various activities which require environmental authorisation and which must follow a BA process. ▪ Regulation GN R. 984 – Listing Notice 2: This listing notice provides a list of various activities which require environmental authorisation and which must follow an environmental impact assessment process. ▪ Regulation GN R. 985 – Listing Notice 3: This notice provides a list of various environmental activities which have been identified by provincial governmental bodies which if undertaken within the stipulated provincial boundaries will require environmental authorisation. The basic assessment process will need to be followed. 	<p>Refer to Table 2-2 above for the listed activities which could potentially be triggered by the Project.</p>
<p><u>National Heritage Resources Act, 1999 (Act No. 25 of 1999) (NHRA)</u></p> <p>The NHRA is the overarching legislation that protects and regulates the management of heritage resources in South Africa, with specific reference to the following Sections:</p> <ul style="list-style-type: none"> ■ 5. General principles for HRM ■ 6. Principles for management of heritage resources 	<p>A Notification of Intent to Develop (NID) will be submitted, as part of this HBAR, to the SAHRA and HFS. The HBAR was compiled to comply with the following parts of subsection 3(3)(a) and (b) of the NHRA.</p>



Applicable legislation used to compile the report	Reference where applied
<ul style="list-style-type: none"> ■ 7. Heritage assessment criteria and grading ■ 38. Heritage resources management <p>The Act requires that Heritage Resources Authorities (HRAs), in this case the SAHRA and HFS, be notified as early as possible of any developments that may exceed certain minimum thresholds in terms of Section 38(1), or when assessments of impacts on heritage resources are required by other legislation in terms of Section 38(8) of the Act.</p>	

Table 2: Applicable policies for the HRM process

Applicable policies used to compile the report	Reference where applied
<p><u>South African Heritage Resources Agency (SAHRA) Archaeology, Palaeontology and Meteorites (APM) Guidelines: Minimum Standards for the Archaeological and Palaeontological Components of Impact Assessment Reports (2007)</u></p> <p>The guidelines provide the minimum standards that must be adhered to for the compilation of a Heritage Impact Assessment (HIA) Report.</p> <p>Chapter II Section 7 outlines the minimum requirements for inclusion in the heritage assessment as follows:</p> <ul style="list-style-type: none"> ■ Background information on the Project; ■ Background information on the cultural baseline; ■ Description of the properties or affected environs; ■ Description of identified sites or resources; ■ Recommended field rating of the identified sites to comply with Section 38 of the NHRA; ■ A statement of Cultural Significance in terms of Section 3(3) of the NHRA; and ■ Recommendations for mitigation or management of identified heritage resources. 	<p>The HBAR was compiled to adhere to the minimum standards as defined by Chapter II of the SAHRA APM Guidelines (2007)</p>



5 Expertise of the specialist

Natasha Higgitt² obtained her Bachelor of Arts (BA) Honours degree in Archaeology in 2010 from the University of Pretoria. She currently holds the position of Assistant Heritage Consultant: Archaeology Specialist at Digby Wells. She has more than 5 years' experience in archaeological survey and gained further generalist heritage experience since her appointment at Digby Wells in South Africa and Liberia.

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

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

Justin is a professional and accredited CRM member of ASAPA (*Member No. 270*) and the ICOMOS South Africa (*Member No. 14274*).

Johan Nel is the manager of the HRM unit. He joined Digby Wells in June 2010 as an archaeologist and was subsequently made unit manager of the HRM unit in the Social Department. Johan holds an Honours degree in Archaeology from the University of Pretoria. He is a professional member of the Association of Southern African Archaeologists (ASAPA, No. 095), and accredited by the association's Cultural Resources Management (CRM) section. He is also a member of the International Council for Monuments and Sites (ICOMOS, No. 13839), an advisory body to the UNESCO World Heritage Convention. He has more than 16 years' experience in undertaking HRM projects, including archaeological mitigation and grave relocation. Johan has diverse international HRM experience in various African countries including Botswana, the Democratic Republic of Congo, Liberia, Sierra Leone and South Africa. This experience includes archaeological surveys, excavations, community consultation and grave relocations completed to IFC and other international standards. He has also acted as an expert reviewer of HRM projects undertaken in, amongst other countries, Malawi and Tanzania. Johan's present focus at Digby Wells is to develop the HRM unit into an integrated vehicle for assessing impacts on heritage resources through multidisciplinary approaches, following international HRM principles and standards.

² It must be noted that Ms. Higgitt has subsequently left Digby Wells and currently a Heritage Officer in the SAHRA APM unit.



6 Methodology

This chapter details the methodologies undertaken in the compilation of this HBAR, including the following:

- Defining of study areas;
- Data collection
- Developing Cultural Significance (CS) and field ratings; and
- Impact assessment.

These methodologies are discussed separately below.

6.1 Defining study areas

As heritage resources do not exist in isolation from the wider natural, social, cultural and heritage landscape, assessment of potential impacts on heritage resources are complicated by the fact that diverse heritage impacts may manifest in different geographical areas and affect different communities.

Defined study areas are necessary to develop statements of CS, predict the types and intensity of impacts, and develop management plans. The general definition for a “study area” in terms of an impact assessment is the area most likely to experience impacts arising from, or to exert an influence on, the project or activity being assessed. For the purposes of this study, three ‘concentric’ study areas were defined to enable CS to be determined that informed the assessment of impacts and guided appropriate management measures. The defined study areas are:

- **The regional study area**, defined by the district municipality, in this instance the Fezile Dabi District Municipality (FDDM). 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 (Plan 1).
- **The local study area**, defined as the area most likely to be influenced by any changes to heritage resources, or where project development could cause heritage impacts. This area was defined as the immediate surrounding properties / farms, as well as the affected local municipality, in this instance the Metsimaholo Local Municipality (MLM) (Plan 2).
- **The site-specific study area**, defined as the bounded project area i.e. the farm portions, within which the proposed expansion of the mining activities will be undertaken (Plan 3).



6.2 Data collection

Data collection was aimed at information gathering relating to known heritage resources within and surrounding the site specific study area defined in Section 6.1 above. Individual data collection activities are described in more detail below.

6.2.1 Literature review

Relevant information was sourced from available reports and cartographic sources. Information from these sources was collated and analysed to determine their relevance to this HBAR. Sources that were used to inform the findings are fully referenced in Section 12 below, and briefly listed in Table 6-1.

Table 6-1: Summary of reviewed information sources

Relevant Previous Heritage Studies		
Author	Report Type	Area/development
du Piesanie, 2014	NID	Bankfontein 9
Fourie, 2007	HIA	Bankfontein 9
Higgitt, 2015	HBAR	Bankfontein 9
Hollmann, 1999	Rock art report	Leeuwkuil engraving site
Pistorius, 2007	HIA	Vanderbijlpark
van der Walt, 2005	Heritage Scoping Report	New Vaal Colliery
van der Walt & Birkholtz, 2005	Heritage Scoping Report	New Vaal Colliery
Van Schalkwyk, 1998	HIA	Emfuleni Development Area
Van Vollenhoven, 2008	HIA	Midvaal Municipal Area

6.2.2 Historical layering

Historical layering was completed for the site specific area and aimed to identify heritage resources, especially historical built environment generally protected in accordance with Section 34 of the NHRA. 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 three fold 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 6-2 below.

Table 6-2: Relevant reviewed cartographic sources

Historical maps						
Map series		Name / number			Date	
Jeppes		Transvaal			1899	
Aerial photographs						
Job no.	Flight plan	Photo no.	Map ref.	Area	Date	Reference
256	017	00518	2627	Vereeniging	1948	1948/256
		00519				
	019	01217				
314	018	41222	2627 2628	Johannesburg/Vereeniging	1952	1952/314
698	004	01213	2627 2628 2727 2728	Vereeniging	1973	1973/698
498/258	005	00293	2627	Vereeniging	1989	1989/498/258

6.3 Pre-disturbance survey

The pre-disturbance survey was undertaken by Natasha Higgitt, a qualified and accredited archaeologist on 11 November 2015. The site specific project area was surveyed through pedestrian methods using an unstructured and unsystematic approach. Undisturbed areas located within the site specific area were surveyed, as no significant natural features were present in the area to focus the survey. The survey was recorded as a GPS track logs and the landscape was documented through photographic and written records.

7 Constraints and limitations

Many tangible heritage resources, specifically archaeological resources, commonly occur below the surface, and may not be identified, documented and assessed without intrusive and destructive methods.

Intrusive archaeological assessments require permits issued as per Section 35 of the NHRA, however these are not issued as part of impact assessments. Therefore, the findings in the reviewed literature, and especially existing HIA reports, are in themselves limited to surface observations.



8 Cultural heritage baseline

8.1 Geological context and palaeontology

The site specific study area is underlain by lithologies associated with the Karoo Supergroup. The Karoo Supergroup comprises the Dwyka, Ecca and Beaufort Groups. Of relevance to this assessment is the Ecca Group, with the primary underlying stratigraphic unit being the *Vryheid Formation*³ deposited during the Permian era about 280 million years ago (mya). The *Vryheid Formation* consists of sandstone, shale, mudstone and coal (Wilson & Anhaeusser, 1998). The *Vryheid Formation* has a high potential to contain fossil heritage inclusive of Permian Glossopteris flora, diverse palynomorphs, rare insects and fossil woods, and non-marine bivalves. As a result the palaeontological sensitivity is rated very high (SAHRA, 2013a).

However, based on the results of the pre-disturbance survey discussed in 8.4 below, the *Vryheid formation* does not outcrop in the site-specific study area. In addition, existing, current mining operations were noted not to extend to any bedrock.

Table 8-1: Geological text and fossil heritage for the site specific study area

	Era	Period	Ma	Lithographic Units			Significance	Fossils
				Supergroup	Group	Formation		
Eon	Palaeozoic	Permian	300	Karoo	Ecca Group	Vryheid	Very high	Abundant plant fossils of Glossopteris and other plants. Trace fossils. The reptile Mesosaurus has been found in the southern part of the Karoo Basin. Rich fossil plant assemblages of the Permian Glossopteris Flora (lycopods, rare ferns and horsetails, abundant glossopterids, cordaitaleans, conifers, ginkgoaleans), rare fossil wood, diverse palynomorphs. Abundant, low diversity trace fossils, rare insects, possible conchostracans, non-marine bivalves, fish scales.

8.2 Archaeological context

8.2.1 Stone Age and Rock Art

Archaeologically, Stone Age sites have been identified in the local study area. Pistorius (2007) notes the numerous Stone Age sites discovered along the ancient banks of the Vaal and Klip Rivers, at localities such as Klipplaatdrift, the Klip River Quarry site and the Duncanville Archaeological Reserve. Van Schalkwyk (1998) makes reference to the Vaal

³ **Note:** In the previous assessment (Case ID: 8226), the the *Vryheid Formation* was incorrectly identified as the *Madzaringwe Formation*. This was due to the use of outdated geological plans and information. The *Madzaringwe Formation* is exclusively associated with the Tshipise Basin of the Limpopo Belt (Johanson, et al., 2006) and does not occur in the regional study area.



River basin and its association with the ESA. Here it is noted that the Vaal River gravels remain an important source of information on the ESA which is associated with the Oldowan and Acheulian industries. These resources are significant as they are contributing to the understanding of early hominid cognitive evolution through the examination of stone tool production techniques (Leader IV, 2009).

These industries are typified by large core tools such as choppers, bi-facial handaxes and cleavers (Deacon & Deacon, 1999). Van Vollenhoven (2008) notes the presence of MSA artefacts within the local study area. These stone tools commonly date to between 300 000 years ago (kya) and 20 kya consisting primarily of blade technologies.

In Fourie (2007) open scatters associated with the LSA (Fourie – 2007/MHC001) were identified 3.5 km from the project area. The LSA is typically associated with the transition from the MSA some 20 kya in which a series of technological innovations in the form of microliths were introduced. These tools were often shaped through secondary retouch into a variety of formal tools suited to hafting. These finds made by Fourie (2007) occurred in secondary contexts and were deemed to have negligible to low heritage value.

Approximately 4.4 km directly northwest of current sand mining operations, the rock engraving site of Leeuwkuil is located. Hollmann (1999) described the site 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 (Hollmann, 1999).

The pre-disturbance survey discussed in 8.4 below did not identify any visible, surface artefacts or sites in the site-specific study area.

8.2.2 Farming Community Period

No sites associated with the southern African Farming Communities have been identified in the local study area. This can be attributed to the reasonably unfavourable natural environment. Much of the Farming Community settlements on the Highveld have been precluded by factors in which settlement was unfavourable.

Taking this into consideration, it may be assumed that little significant Farming Community settlement in the local study area.

8.3 Colonial and historical period

The historical period has traditionally been defined as contact between Europeans and indigenous peoples, generally considered to have occurred in the South African interior in the early to mid-19th century. However, this distinction is now considered artificial in many ways, and the current definition of the historical period includes the past 500 years (Swanepoel, Esterhuysen, & Bonner, 2008). This reinterpretation notwithstanding, this section considers the historical landscape from around the beginning of the 19th century.

The regional study area has been subject to several significant historical events in the history of South Africa. In terms of mining, coal was discovered in the region as early as



1879 by George William Stow (Pistorius, 2007). However, the closest town to the site specific study area, Vereeniging was only established in 1882 and officially proclaimed in 1889.

Significantly, 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 at Viljoensdrift in 1892. This railway was established to service the developing gold and coal mining industries in the region. The railway, station and crossing are clearly depicted in the 1899 Jeppes Map of the Transvaal (Figure 8-1).



Figure 8-1: Extract from Jeppes 1899 Map of the Transvaal showing the project area

The South African War (also known as the Second Anglo-Boer War) began on 11 October 1899 lasting until 31 May 1902. It was in Vereeniging that Generals Botha, Hertzog, Smuts, and de la Rey met with Lord Milner and General Kitchener in May 1902 to negotiate the Peace Treaty to end the war (Fourie, 2007). The site is today indicated by a sawn-off tree trunk near the Vereeniging Refractories' Recreation Hall.

Subsequent to the cessation of the war, in 1903 a report compiled by Dr Hatch identified a coal formation that extended for almost 40 000 ha. Two collieries were opened, the Cornelia Colliery situated in then Orange Free State, and the Camp Colliery situated on the then Transvaal (Fourie, 2007). These collieries produced large quantities of waste coal, which Sammy Marks believed could be exploited to generate electricity for the gold mines of the Witwatersrand. The Vereeniging Power Station was completed in 1912 and extended four times between 1923 and 1933. Power demands from the Witwatersrand resulted in the establishment of the Klip Power Station in the early 1930s and the Vaal Power Station commencing operations in 1945 (Fourie, 2007).

Fourie (2007) noted the remains of built structures that could possibly have been associated with the Vaal Power Station, which was decommissioned in 1989 and demolished by 1998.



One stone structure (Fourie – 2007/MHC002) with low heritage significance was recorded in the report. Van der Walt (2005) also notes that large areas where historic structures once stood have been demolished and rubble litters the area.

Historical aerial imagery shows how the area surrounding the project has been altered since the 1940's. In 1948, the site-specific project area and the surrounding areas are undeveloped areas of veld. The rail siding of Viljoensdrift is visible in the north-western corner of the image and the old Vaal Power Station is visible in the south-eastern corner. In 1952, the Vaal Power Station complex had been expanded, along with the residential development around it (Figure 8-2). By 1973, the Vaal Power Station development has expanded northwards, however the proposed site specific project area is still unaffected directly. Eventually, by 1989 development has occurred in close proximity to the proposed site-specific project area. The current Anglo American Training Centre was built between 1973 and 1989, and a large amount of mining activity has taken place in the surrounding areas. Additionally, between 1989 and 2005, the Vaal Power Station was decommissioned and demolished (Figure 8-3).



Figure 8-2: Aerial imagery dating to 1948 and 1952 respectively



Figure 8-3: Historic aerial imagery of the site-specific study area

8.4 Results of the pre-disturbance survey

A pre-disturbance survey of the site specific study area was undertaken on 11 November 2015. The study area is characterised by flat topography with no significant topographical features such as hills or ridges, or water courses. The soils are predominantly deep sandy E-horizon soils (Figure 8-4). The Land type has been defined as Upland Duplex and/or Margalithic soils (Ca1) (Jackson, 2014).



Figure 8-4: General view of the current state of the environment

No visible surface evidence of heritage resources was observed within study area. The soil type (Kroonstad) was instrumental in this. Kroonstad soils drain poorly, have a low nutrient status and are highly erosive (Jackson, 2014). The loose sand is not conducive for long term settlement or extensive agricultural activities. No rocky outcrops or exposed bedrock was identified within the project area.

9 Heritage impact assessment

Based on the results of the desktop study and pre-disturbance survey, no heritage impacts are envisioned for the expansion of the Copper Sunset operations. No visible heritage resources were identified within the site specific project area.

9.1 Cultural Significance Assessment

The CS assigned to the identified *Vryheid Formation* is summarised in Table 9-1 and presented in detail in Table 9-2.


Table 9-1: Summary of identified heritage resources CS

Summary of Identified Heritage Resources and CS	Number
Very High CS	1
Natural Feature	1
<i>Vryheid Formation</i>	1
Grand Total	1

The *Vryheid Formation* is a highly significant geological formation due to the important plant fossil (*Glossopteris*) that are present within the formation. The motivation is based on this formation's global scientific importance and due to the fossils contained within it being under-collected during recent years. The integrity of the formation underlying the Copper Sunset Project area was also considered to be excellent, thereby contributing to a very high significance rating. This rating is consistent with the sensitivity rating provided in the SAHRIS Fossil Heritage Layer Browser.

Table 9-2: CS of identified heritage resources

Resource ID	<i>Vryheid Formation</i>
Type	Natural feature
Description	Fossil heritage inclusive of Permian <i>Glossopteris</i> flora, diverse palynomorphs, rare insects and fossil woods, and non-marine bivalves.
CS	Very High
CS Motivation	The geological formation can be considered in particular dimensions against scientific criteria.
Field Rating	General Protection IV A
Field Rating Motivation	The heritage sites are defined according to Section 2 of the NHRA and are generally protected under Section 35 of the NHRA
Mitigation	Based on the project activities, there is no need for mitigation and / or management measures.



9.2 Impact Assessment

No impacts to the *Vryheid Formation* are envisaged considering the proposed project activities detailed in Table 2-2. The sand resource extends to an approximate depth of 6 m; however, proposed mining will only mine up to 3 m.

9.3 Unplanned Events and Low Risks

Unplanned events may occur on any project at any time. Based on the proposed project activities, potential unplanned events and the associated impacts and management measures have been identified and summarised in Table 9-3 below.

Table 9-3: Unplanned events and their management measures

Unplanned event	Potential impact	Mitigation/ Management/ Monitoring
Accidental exposure of unidentified heritage resources	Damage and/or destruction of heritage resources generally protected under section 34 to 36 of the NHRA	Chance Finds Procedures (CFPs) must be developed and included as a condition of authorisation that clearly describes the reporting process and appropriate management of the exposure of previously unidentified heritage resources. The established and defined CFPs must be implemented prior to any development taking place as part of the proposed mining activities
Accidental exposure and damage to palaeontological resources in areas where unidentified subsurface <i>Vryheid formation</i> elements may occur.	Damage and/or destruction of heritage resources generally protected under section 35 of the NHRA	

10 Recommendations

Based on our understanding of the cultural landscape as described in Section 8 above, no potential impacts to heritage resources are envisaged for the expansion of the Copper Sunset mining operations on a portion of the Remaining Extent of the farm Rietfontein No. 152.

It is therefore recommended that the Project be approved and exempted from any additional heritage studies (such as Paleontological Impact Assessments and any Phase 2 permitted assessments), on condition that a project specific Chance Find Protocol (CFP) must be developed to be included into the approved EMP.

The CFP must clearly describe the process and appropriate management of previously unidentified heritage resources, including any exposure of the potential fossiliferous *Vryheid Formation*.

The CFP should ideally detail:

- Identify roles and responsibilities of persons to monitor construction and operational activities;
- Develop a monitoring regime, if required; and
- Establish a reporting structure if chance finds are made.

11 Conclusion

Several categories of heritage resources occur within the local study area, protected in terms of Sections 34 to 36 of the NHRA. However, no protected resources were identified in the site-specific study area. No heritage impacts could therefore be assessed.

Notwithstanding the potentially fossiliferous *Vryheid Formation* underlying the site-specific study area, no outcrops or other evidence were noted. The proposed Project will therefore not have any direct impact on the formation or fossils.

- It is recommended that the proposed Project be approved and exempt from any other heritage assessments on condition that the recommended management measures are implemented.



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Heritage Basic Assessment Report

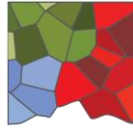
Environmental Authorisation Application in support of the Section 102 Amendment for the
Copper Sunset Sand Mining Operation, Free State Province

COP3706



DIGBY WELLS
ENVIRONMENTAL

Appendix A: Specialist CV



DIGBY WELLS

ENVIRONMENTAL

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

1 Education

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

2 Language Skills

Language	Written	Spoken
English	Excellent	Excellent
Afrikaans	Proficient	Good

3 Employment

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

Digby Wells and Associates (South Africa) (Pty) Ltd (Subsidiary of Digby Wells & Associates (Pty) Ltd). Co. Reg. No. 2010/008577/07. Fern Isle, Section 10, 359 Pretoria Ave Randburg Private Bag X10046, Randburg, 2125, South Africa
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Directors: A Sing*, AR Wilke, DJ Otto, GB Beringer, LF Koeslag, AJ Reynolds (Chairman) (British)*, J Leaver*, GE Trusler (C.E.O)
*Non-Executive

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

4 Professional Affiliations

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

5 Publications

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

6 Experience

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

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

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

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

7 Project Experience

Please see the following table for relevant project experience:



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



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



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



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



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



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



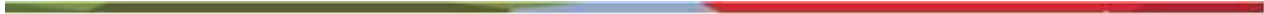
Project Title	Project Location	Date:	Description of the Project	Role of Firm in the Project	Own Role in the Project	Time involved (man months)	Name of Client	Contract Outcomes	Reference
Rea Vaya Phase II C Project	Johannesburg, Gauteng, South Africa	2014 2014	Heritage Impact Assessment on 2 structures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

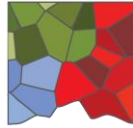


Project Title	Project Location	Date:	Description of the Project	Role of Firm in the Project	Own Role in the Project	Time involved (man months)	Name of Client	Contract Outcomes	Reference
Namane IPP and Transmission Line EIA	Steenbokpan, Limpopo Province, South Africa	2015 2016	Heritage Impact Assessment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



DIGBY WELLS
ENVIRONMENTAL





DIGBY WELLS

ENVIRONMENTAL

Mr Johan Nel

Unit manager: Heritage Resources Management

Social Sciences

Digby Wells Environmental

1 Education

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

2 Language Skills

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

3 Employment

Period	Company	Title/position
2009/2011 to present	Digby Wells Environmental	Manager: Heritage Resources Management unit
2005/2010-2011	Digby Wells Environmental	Archaeologist
2010/2005-2005/2010	Archaic Heritage Project Management	Manager and co-owner
2003-2007		Freelance archaeologist

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

4 Experience

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

5 Project Experience

5.1 Archaeological Surveys and Impact Assessments

2003-2004. Freelance consulting archaeologist. Roodt & Roodt CC. RSA. Archaeological surveys. Specialist.

2004-2005. Resident archaeologist Rock Art Mapping Project. University of KwaZulu-Natal. Kwazulu-Natal, RSA. Rock art mapping & recording. Specialist.

5.2 Archaeological Mitigation

2007. Archaeological investigation of Old Johannesburg Fort. Johannesburg Development Agency. Gauteng, RSA. Archaeological mitigation. Project manager.



2008. Final consolidated report: Watching Brief on Soutpansberg Road Site for the new Head Offices of the Department of Foreign Affairs, Pretoria Gauteng. Imbumba-Aganang D & C Joint Venture. Gauteng, RSA. Watching Brief. Project manager.
2011. Sessenge archaeological site mitigation. Randgold Resources. Doko, DRC. Archaeological mitigation. Specialist.
2011. Mitigation of three sites, Koidu Kimberlite Project. Koidu Holdings SA. Koidu, Sierra Leone. Archaeological mitigation. Project manager.
2012. Boikarabelo Phase 2 Mitigation of Archaeological Sites. Ledjadja Coal (Pty) Ltd. Limpopo, RSA. Archaeological permitting and mitigation. Project manager.
2012. Additional Archaeology Mitigation of Sites. Ledjadja Coal (Pty) Ltd. Limpopo, RSA. Archaeological permitting and mitigation. Project manager.
2013. Archaeological Excavations of Old Well, Rhodes University, Grahamstown. Rhodes University. Eastern Cape, RSA. Archaeological mitigation. Specialist.
2014. Archaeological Site Destruction. Ledjadja Coal (Pty) Ltd. Limpopo, RSA. Archaeological permitting and mitigation. Project manager.

5.3 Heritage Impact Assessments

2005. Final consolidated Heritage Impact Assessment report: Proposed development of high-cost housing and filling station, Portion of the farm Mooiplaats 147 JT. Go-Enviroscience. Mpumalanga, RSA. Heritage Impact Assessment. Project manager.
2006. Final report: Heritage resources Scoping survey and preliminary assessment for the Transnet Freight Line EIA, Eastern Cape and Northern Cape. ERM Southern Africa (Pty) Ltd. Northern & Eastern Cape, RSA. Heritage Scoping Assessment. Project manager.
2007. Proposed road upgrade of existing, and construction of new roads in Burgersfort, Limpopo Province. AGES South Africa (Polokwane). Limpopo, RSA. Heritage Impact Assessment. Project manager.
2007. Recommendation of Exemption: Above-ground SASOL fuel storage tanks located at grain silos in localities in the Eastern Free State. Sasol Group Services (Pty) Ltd. Free State, RSA. Letter of Exemption. Project manager.
2008. Summary report: Old dump on premises of the new Head Offices, Department of Foreign Affairs, Pretoria, Gauteng. Imbumba-Aganang D & C Joint Venture. Gauteng, RSA. Archaeological Impact Assessment. Project manager.
2008. Van Reenen Eco-Agri Development Project. Go-Enviroscience. Kwazulu-Natal & Free State, RSA. Heritage Impact Assessment. Project manager.



2008. Heritage Impact Assessment for proposed water pipeline routes, Mogalakwena District, Limpopo Province. AGES South Africa (Polokwane). Limpopo, RSA. Heritage Impact Assessment. Project manager.
2008. Phase 1 Heritage and Archaeological Impact Assessment: Proposed establishment of an access road between Sapekoe Drive and Koedoe Street, Erf 3366 (Extension 22) and the Remainder of Erf 430 (Extension 4). AGES South Africa (Polokwane). Limpopo, RSA. Heritage Impact Assessment. Project manager.
2008. Heritage resources scoping survey and preliminary assessment: Proposed establishment of township on Portion 28 of the farm Kennedy's Vale 362 KT, Steelpoort, Limpopo Province. AGES South Africa (Polokwane). Limpopo, RSA. Heritage Scoping Assessment. Project manager.
2008. Randwater Vlaktefontein-Mamelodi water pipeline survey. Archaeology Africa CC. Gauteng, RSA. Heritage Impact Assessment. Specialist.
2010. Heritage Impact Assessment for conversion of PR to MRA. Georock Environmental. Northwest, RSA. Heritage Impact Assessment. Project manager.
2010. Temo Coal Project. Namane Commodities (Pty) Ltd. Limpopo, RSA. Heritage Impact Assessment. Specialist.
2011. Marapong Treatment Works. Ceenex (Pty) Ltd. Limpopo, RSA. Archaeological Impact Assessment. Project manager.
2011. Complete Environmental Authorisation. Rhodium Reefs Ltd. Limpopo, RSA. Archaeological Impact Assessment. Specialist.
2011. Big 5 PV Solar Plants. Orlight (Pty) Ltd. Western and Northern Cape, RSA. Heritage Impact Assessment. Specialist.
2011. Heritage Impact Assessment for Koidu Diamond Mine. Koidu Holdings SA. Koidu, Sierra Leone. Heritage Impact Assessment. Specialist.
2012. TSF and Pipeline. Gold One. Gauteng, RSA. Heritage Impact Assessment. Project manager.
2012. Kangra Coal Heritage Screening Assessment. ERM Southern Africa (Pty) Ltd. Mpumalanga, RSA. Heritage Screening Assessment. Project manager.
2012. Environmental and Social Studies. Platreef Resources (Pty) Ltd. Limpopo, RSA. Heritage specialist advice. Project manager.
2012. ESKOM Powerline EIA. Ledjadja Coal (Pty) Ltd. Limpopo, RSA. Notification of Intent to Develop. Project manager.
2012. Falea Project ESIA. Denison Mines Corp. (Rockgate Capital Corp). Falea, Mali. Heritage Impact Assessment. Specialist.



2012. EIA for Proposed Emergency Measures to Pump and Treat. AECOM SA (Pty) Ltd. Gauteng, RSA. Heritage Impact Assessment. Specialist.
2012. Tonguma Baseline Studies. Koidu Holdings SA. Tonguma, Sierra Leone. Heritage Impact Assessment. Specialist.
2012. Vedanta IPP. Black Mountain Mining (Pty) Ltd. Limpopo, RSA. Heritage Impact Assessment. Specialist.
2012. Boikarabelo Railway Realignment. Ledjadja Coal (Pty) Ltd. Limpopo, RSA. Heritage Impact Assessment. Specialist.
2012. Platreef ESIA. Platreef Resources (Pty) Ltd. Limpopo, RSA. Heritage Impact Assessment. Specialist.
2012. Roodekop EIA. Universal Coal Development 4 (Pty) Ltd. Mpumalanga, RSA. Heritage Impact Assessment. Specialist.
2012. Kangala HIA. Universal Coal Development 1 (Pty) Ltd. Mpumalanga, RSA. Heritage Impact Assessment and permitting. Specialist.
2012. Roodepoort Strengthening. Eskom Holdings SOC Ltd. Gauteng, RSA. Notification of Intent to Develop. Specialist.
2012. Trichardtsfontein EIA / EMP. Xstrata Coal South Africa. Limpopo, RSA. Heritage Impact Assessment. Specialist.
2012. Zandbaken EIA/EMPR. Xstrata Coal South Africa. Limpopo, RSA. Heritage Impact Assessment. Specialist.
2013. ATCOM Tweefontein NID. Jones & Wagener (Pty) Ltd. Mpumalanga, RSA. Burial grounds and graves consultation, permitting and relocation. Project manager.
2013. Roodepoort Heritage Impact Assessment. Fourth Element Consulting (Pty) Ltd. Gauteng, RSA. Heritage Impact Assessment. Project manager.
2013. JHB BRT Phase 2 Heritage Impact Assessment. Iliso Consulting (Pty) Ltd. Gauteng, RSA. Heritage Impact Assessment. Project manager.
2013. Kangra Coal HIA. ERM Southern Africa (Pty) Ltd. Mpumalanga, RSA. Heritage Impact Assessment. Project manager.
2013. Slypsteen Bulk Sample Application. Summer Season Trading (Pty) Limited. Northern Cape, RSA. Heritage Impact Assessment. Project manager.
2013. Kempton Park Heritage Statement and NID. ERM Southern Africa (Pty) Ltd. Gauteng, RSA. Notification of Intent to Develop. Project manager.
2013. Sasol Twistdraai CFD. ERM Southern Africa (Pty) Ltd. Gauteng, RSA. Notification of Intent to Develop. Project manager.
2013. HRS & NID - River Crossings Upgrade. Iliso Consulting (Pty) Ltd. Gauteng, RSA. Notification of Intent to Develop. Project manager.



2013. Waterberg Prospecting Right Applications. Platinum Group Metals (Pty) Ltd. Limpopo, RSA. Notification of Intent to Develop. Project manager.
2013. Landau Waste Licence Application. Anglo Operations (Pty) Limited. Mpumalanga, RSA. Notification of Intent to Develop. Reviewer / specialist.
2013. Prospecting Right Consultation Report. Rustenburg Platinum Mines Limited. Mpumalanga, RSA. Notification of Intent to Develop. Reviewer / specialist.
2013. Witrand Prospecting EMP. Rustenburg Platinum Mines Limited. Mpumalanga, RSA. Notification of Intent to Develop. Reviewer / specialist.
2013. EMP Amendment for CST. Copper Sunset Trading (Pty) Ltd. Mpumalanga, RSA. Notification of Intent to Develop. Reviewer / specialist.
2013. Maseve IFC ESHIA. Maseve Investment (Pty) Ltd. Mpumalanga, RSA. Notification of Intent to Develop. Reviewer / specialist.
2013. Dalyshope ESIA. Anglo Operations (Pty) Limited. Limpopo, RSA. Heritage Impact Assessment. Specialist.
2013. Klipfontein Opencast Project. Bokoni Platinum Mines (Pty) Ltd. Limpopo, RSA. Heritage Impact Assessment. Specialist.
2013. Consbrey and Harwar MPRDA EIA/EMP. Msobo Coal (Pty) Ltd. Mpumalanga, RSA. Heritage Impact Assessment. Specialist.
2013. Slyphsteen 102 EMP Amendment. Summer Season Trading (Pty) Limited. Northern Cape, RSA. Heritage Impact Assessment. Specialist.
2013. Putu Iron Ore ESIA. Atkins Limited Incorporated. Putu, Liberia. Heritage Impact Assessment. Specialist.
2013. Ash backfilling at Sigma Colliery. Sasol Mining (Pty) Ltd. Gauteng, RSA. Notification of Intent to Develop. Specialist.
2013. Syferfontein Block 4 - Underground Coal Mining for Sasol. Sasol Mining (Pty) Ltd. Mpumalanga, RSA. Notification of Intent to Develop. Specialist.
2013. Prospecting Right Amendment to Include Bulk Sampling. Sikhuliso Resources (Pty) Ltd. Mpumalanga, RSA. Notification of Intent to Develop. Specialist.
2013. Nooitgedacht EIA, EMP Amendment & Gap Analysis. Xstrata Coal South Africa. Limpopo, RSA. Heritage Impact Assessment. Specialist.
2014. Gold One EMP Consolidation Phase 0. Gold One. Gauteng, RSA. Heritage Impact Assessment. Reviewer / specialist.
2014. Kilbarchan Audit and EIA. Eskom Holdings SOC Ltd. Kwazulu-Natal, RSA. Heritage Impact Assessment. Reviewer / specialist.



2014. Klipspruit Extension Environmental Assessment. BHP Billiton Energy Coal South Africa Limited. Mpumalanga, RSA. Heritage Impact Assessment. Reviewer / specialist.
2014. Klipspruit South BECSA EIA. BHP Billiton Energy Coal South Africa Limited. Mpumalanga, RSA. Heritage Impact Assessment. Reviewer / specialist.
2014. EIA/EMP Soweto Cluster. DRD GOLD ERGO (Ergo Mining (Pty) Ltd. Gauteng, RSA. Notification of Intent to Develop. Reviewer / specialist.
2014. London Road Heritage Statement. ERM Southern Africa (Pty) Ltd. Gauteng, RSA. Notification of Intent to Develop. Reviewer / specialist.
2014. Grootegeluk MPRDA, NEMA and IWULA. Exxaro Coal (Pty) Ltd. Limpopo, RSA. Notification of Intent to Develop. Reviewer / specialist.
2014. Kibali ESIA & EMP Update. Randgold Resources. Doko, DRC. Heritage Impact Assessment. Specialist.
2014. Nokuhle Colliery NEMA Process. HCI Coal (Pty) Ltd. Mpumalanga, RSA. Heritage Impact Assessment. Specialist.
2014. HRM Process for Hendrina Wet Ashing. Lidwala Consulting Engineers (Pty) Ltd. Mpumalanga, RSA. Heritage Impact Assessment. Specialist.
2014. Weltevreden NEMA. Northern Coal (Pty) Ltd. Mpumalanga, RSA. Heritage Impact Assessment. Specialist.
2014. Sasol Sigma Mooikraal Pipeline BA. Sasol Mining (Pty) Ltd. Mpumalanga, RSA. Notification of Intent to Develop. Specialist.

5.4 Burial Grounds and Graves Consultation and Relocation

2005. Report on exhumation, relocation and re-internment of 49 graves on Portion 10 of the farm Tygervallei 334 JR, Kungwini Municipality, Gauteng D Georgiades East Farm (Pty) Ltd. Gauteng, RSA. Burial grounds and graves consultation, permitting and relocation. Project manager.
2005. Southstock Collieries Grave Relocation. Doves Funerals, Witbank. Mpumalanga, RSA. Burial grounds and graves consultation, permitting and relocation. Project manager.
2005. Social consultation for Smoky Hills Platinum Mine Grave Relocation. PGS (Pty) Ltd. Limpopo, RSA. Stakeholder consultation on burial grounds and graves. Social consultant.
2005. Social consultation for Elawini Lifestyle Estate Grave Relocation. PGS (Pty) Ltd. Mpumalanga, RSA. Stakeholder consultation on burial grounds and graves. Social consultant.



2006. Social consultation for Zonkezizwe Grave Relocation. PGS (Pty) Ltd. Gauteng, RSA. Stakeholder consultation on burial grounds and graves. Social consultant.
2006. Social consultation for Motaganeng Residential Development Grave Relocation. PGS (Pty) Ltd. Mpumalanga, RSA. Stakeholder consultation on burial grounds and graves. Social consultant.
2006. Social consultation for Zondagskraal Coal Mine Grave (Pty) Ltd. Mpumalanga, RSA. Stakeholder consultation on burial grounds and graves. Social consultant.
2007. Exploratory excavation of an unknown cemetery at Du Preezhoek, Fountains Valley, Portion 383 of the farm Elandspoort 357 JR, Pretoria, Gauteng. Bombela Civil Joint Venture. Gauteng, RSA. Burial grounds and graves consultation, permitting and relocation. Project manager.
2007. Final consolidated report: Phase 2 test excavations ascertaining the existence of alleged mass graves, Tlhabane West, Extension 2, Rustenburg, Northwest Province. Bigen Africa Consulting Engineers. Northwest, RSA. Burial grounds and graves consultation, permitting and relocation. Project manager.
2007. Repatriation of Mapungubwe Human Remains. Department of Environmental Affairs and Tourism. Limpopo, RSA. Repatriation. Project manager.
2008. Report on skeletal material found at Pier 30, R21 Jones Street off-ramp, Kempton Park. Bombela Civil Joint Venture. Gauteng, RSA. Heritage Scoping Assessment. Project manager.
2011. Kibali Grave Relocation. Randgold Resources. Doko, DRC. International grave relocation. Specialist.
2012. Platreef Platinum Mine Burial Grounds and Graves Census. Platreef Resources (Pty) Ltd. Limpopo, RSA. Stakeholder consultation on burial grounds and graves. Project manager.
2013. New Liberty Grave Relocation Process. Aureus Mining Inc. Kinjor, Liberia. International grave relocation. Project manager.
2013. Bokoni Burial Grounds and Grave Census and Grave Relocation Plan. Bokoni Platinum Mines (Pty) Ltd. Limpopo, RSA. Stakeholder consultation on burial grounds and graves. Project manager.
2014. Arnot Colliery Grave Relocation Project. Exxaro Coal (Pty) Ltd. Mpumalanga, RSA. Burial grounds and graves consultation, permitting and relocation. Project manager.
2014. Paardeplaats and Belfast RAPs. Exxaro Coal (Pty) Ltd. Mpumalanga, RSA. Burial grounds and graves consultation, permitting and relocation. Reviewer / specialist.
2014. Thabametsi EIA, EMP, IWULA, IWWMP and PPP. Exxaro Coal (Pty) Ltd. Limpopo, RSA. Stakeholder consultation on burial grounds and graves. Specialist.

5.5 Research Reports and Reviews

2007. Research report on cultural symbols. Ministry of Intelligence Services. RSA. Research report. Project manager.
2007. Research report on the remains of kings Mampuru I and Nyabela. National Department of Arts and Culture. RSA. Research report. Project manager.
2012. Baseline Scoping and Pre-feasibility Songwe Rare Earth Element Project. Mkango Resources Limited. Songwe, Malawi. Heritage Impact Assessment. Reviewer / specialist.
2013. Fatal Flaw Analysis and EIA Process for AMD Man in Eastern Basin. AECOM SA (Pty) Ltd. Gauteng, RSA. Heritage Impact Assessment. Reviewer / specialist.

6 Professional Registration

Position	Professional Body	Registration Number
Council member	Association for Southern African Professional Archaeologists (ASAPA); ASAPA Cultural Resources Management (CRM) section	095
Member	International Association of Impact Assessors (IAIA)	N/A
Member	International Council on Monuments and Sites (ICOMOS)	13839
Member	Society for Africanist Archaeologists (SAfA)	N/A

7 Publications

Authors and Year	Title	Published in/presented at
Nel, J. (2001)	Cycles of Initiation in Traditional South African Cultures.	South African Encyclopaedia (MWEB).
Nel, J. 2001.	Social Consultation: Networking Human Remains and a Social Consultation Case Study	Research poster presentations at the. Bi-annual Conference (SA3) Association of Southern African Professional Archaeologists the National Museum, Cape Town



Nel, J. 2002.	Collections policy for the WG de Haas Anatomy museum and associated Collections.	Unpublished. Department of Anatomy, School of Medicine: University of Pretoria.
Nel, J. 2004.	Research and design of exhibition for Eloff Belting and Equipment CC	Institute of Quarrying 35th Conference and Exhibition on 24 – 27 March 2004
Nel, J. 2004.	Ritual and Symbolism in Archaeology, Does it exist?	Research paper presented at the Bi-annual Conference (SA3) Association of Southern African Professional Archaeologists: Kimberley
Nel, J & Tiley, S. 2004.	The Archaeology of Mapungubwe: a World Heritage Site in the Central Limpopo Valley, Republic of South Africa.	Archaeology World Report, (1) United Kingdom p.14-22.
Nel, J. 2007.	The Railway Code: Gautrain, NZASM and Heritage.	Public lecture for the South African Archaeological Society, Transvaal Branch: Roedean School, Parktown.
Nel, J. 2009.	Un-archaeologically speaking: the use, abuse and misuse of archaeology in popular culture.	The Digging Stick. April 2009. 26(1): 11-13: Johannesburg: The South African Archaeological Society.
Nel, J. 2011.	'Gods, Graves and Scholars' returning Mapungubwe human remains to their resting place.' In: Mapungubwe Remembered.	University of Pretoria commemorative publication: Johannesburg: Chris van Rensburg Publishers.
Nel, J. 2012	HIAs for EAPs.	. Paper presented at IAIA annual conference: Somerset West.
Nel, J. 2013.	The Matrix: A proposed method to evaluate significance of, and change to, heritage resources.	Paper presented at the 2013 ASAPA Biennial conference: Gaborone, Botswana.
Nel, J. 2013	HRM and EMS: Uncomfortable fit or separate process.	. Paper presented at the 2013 ASAPA Biennial conference:



Gaborone, Botswana.

Heritage Basic Assessment Report

Environmental Authorisation Application in support of the Section 102 Amendment for the
Copper Sunset Sand Mining Operation, Free State Province

COP3706



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Appendix B: Plans

Copper Sunset Sand

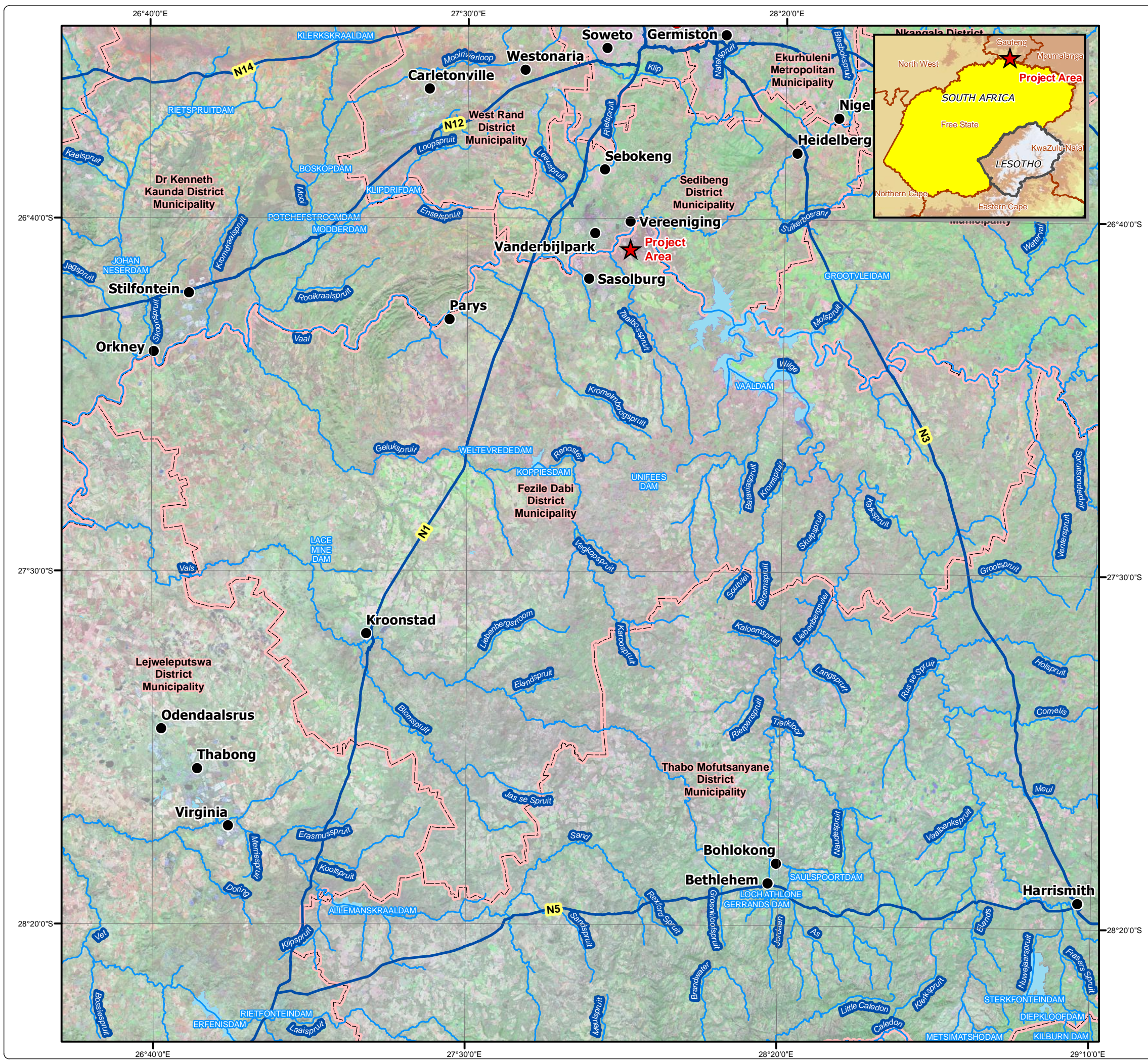
Extension Application

Regional Study Area



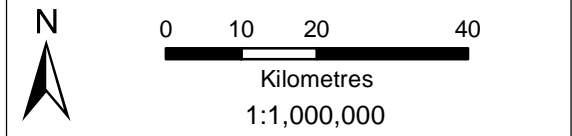
Legend

- Project Area
- City
- Major Town
- National Road
- River
- Dam
- District Municipality



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

Projection: Transverse Mercator Datum: WGS 1984 Central Meridian: 27°E Ref #: kam.COP3706.201604.088 Revision Number: 1 Date: 12/04/2016



Copper Sunset Sand Extension Application Local Study Area

Legend

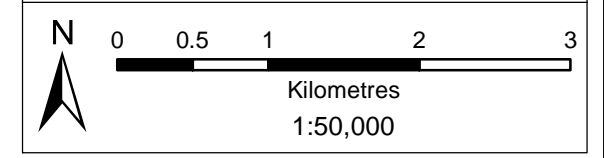
- Project Area
- Other Town
- Arterial/National Route
- Main Road
- Minor Road
- Track
- ++ Railway Line
- Perennial Stream
- Non-Perennial Stream
- Dam Wall
- Dam/Lake
- Non-Perennial Pan/Stream
- Perennial Pan
- Wetland
- Local Municipality



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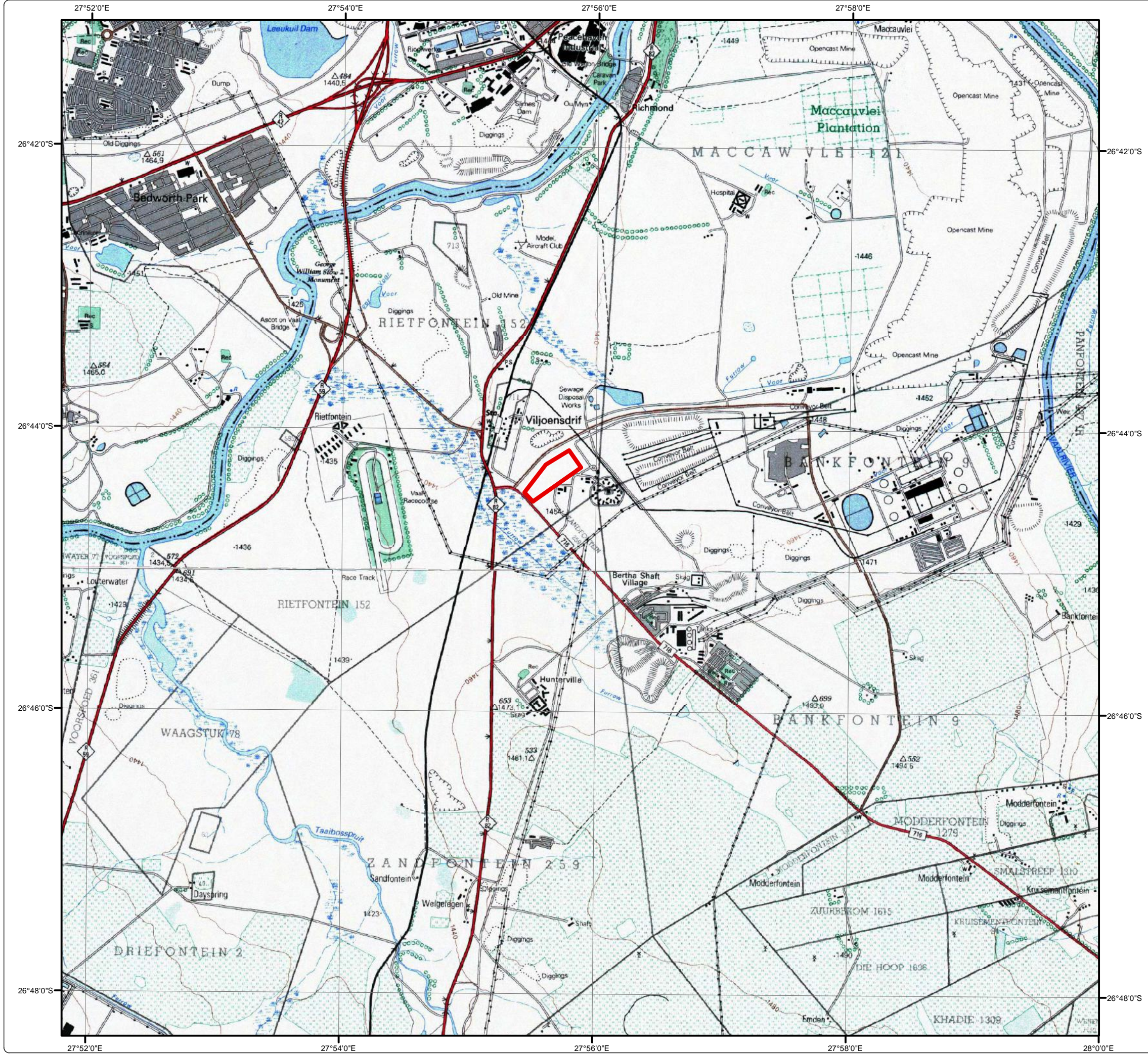
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Central Meridian: 27°E Date: 12/04/2016



Copper Sunset Sand Extension Application Site Specific Study Area

Legend

 Project Area

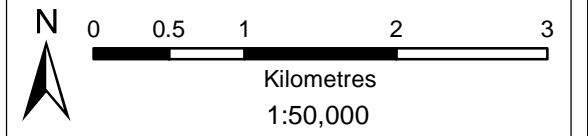


2627DB Vereeniging
2627DD Sasolburg



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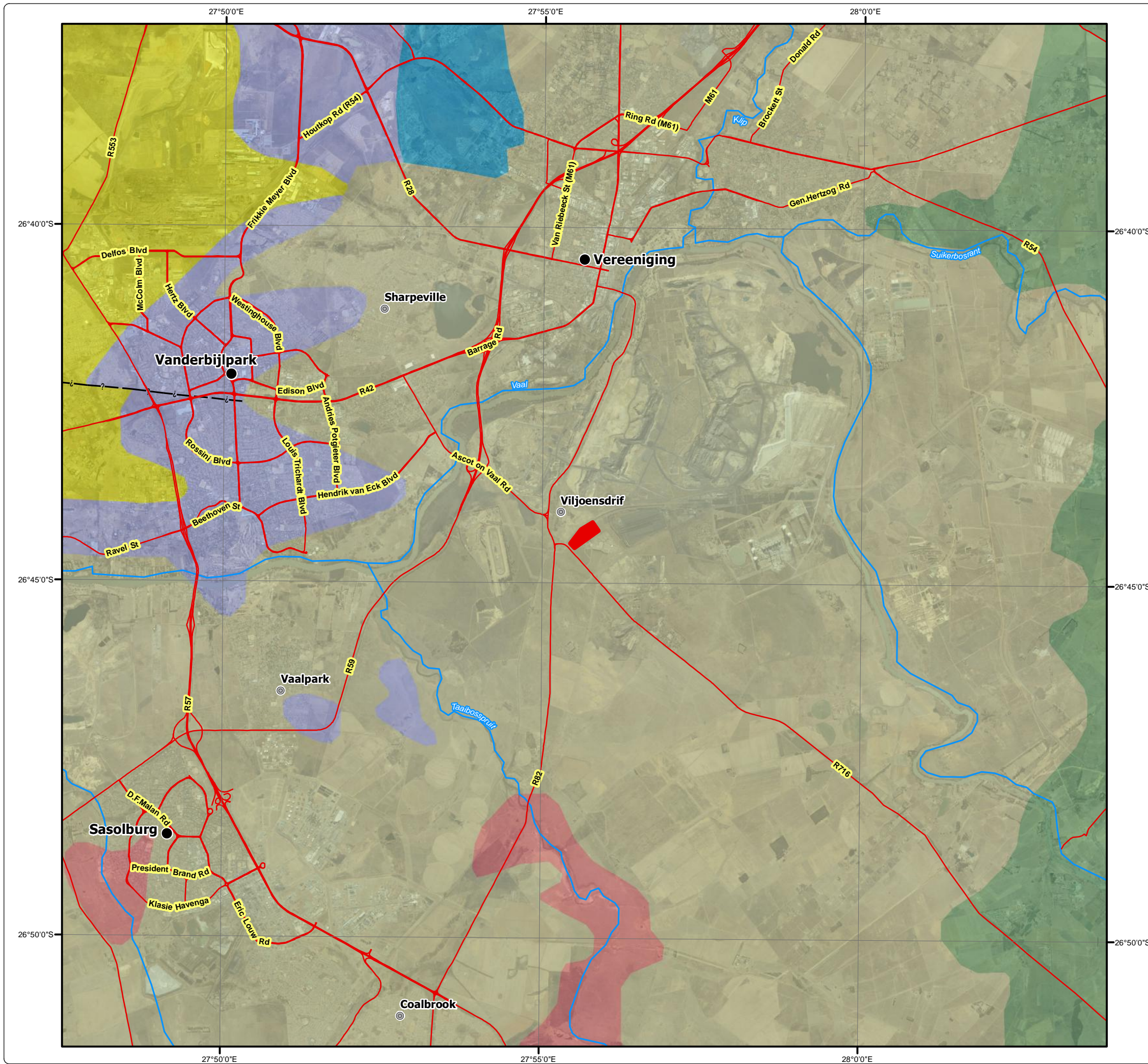
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Central Meridian: 27°E	Date: 12/04/2016



Copper Sunset Sand Extension Application Geology

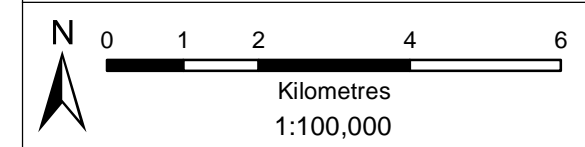
Legend

- Project Area
- Major Town
- Other Town
- Main Road
- River
- Fault Observed
- Karoo Dolerite Sui
- Klipriviersberg Grp, Ventersdorp Spgrp
- Malmani Sbgrp, Chuniespoort Grp
- Pretoria Grp, Transvaal Spgrp
- Silverton Fm, Pretoria Grp
- Vryheid Fm, Karoo Spgrp



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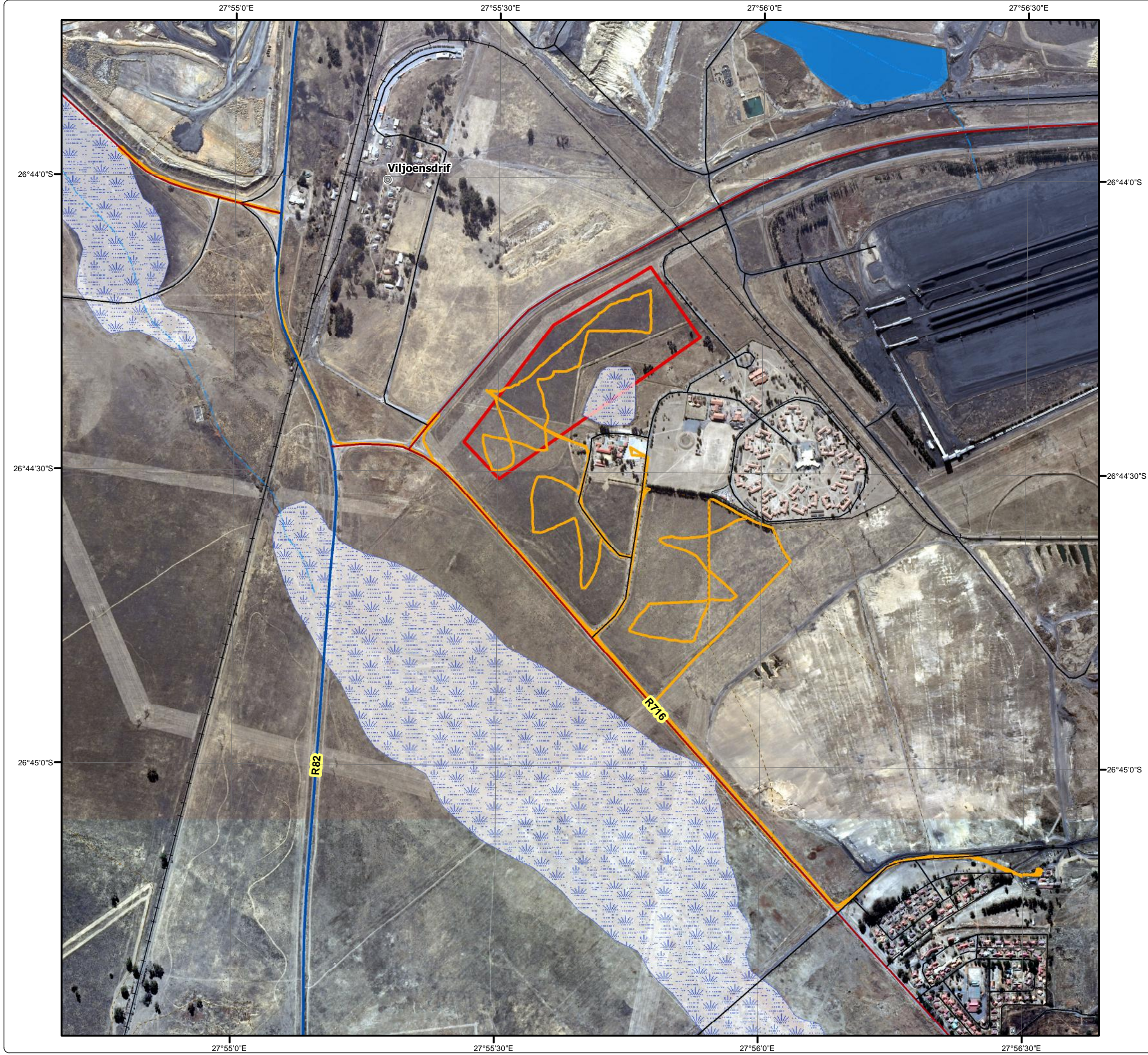
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 Central Meridian: 27°E Date: 12/04/2016



Copper Sunset Sand Extension Application Heritage Pre-Disturbance Survey

Legend

- Project Area
- Heritage Reconnaissance Track Log
- Other Town
- Arterial/National Route
- Main Road
- Minor Road
- Track
- Railway Line
- Perennial Stream
- Dam Wall
- Dam/Lake
- Wetland



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