

# HERITAGE SCREENER

CTS Reference Number:	CTS23_019	Uohannesburg N17
SAHRIS Ref		Ventersdorp N14
Client:	Savannah	
Date:	March 2023	
Title:	Proposed development of the Phadima Solar PV Facility near Roodepoort, Gauteng, South Africa	<figure><math>f_{1}</math> <math>f_{2}</math> <math>f_{2</math></figure>
Recommendation:	RECOMMENDATION	
	The area proposed for palaeontological sensitiv	- development is located in an area of high archaeological and cultural landscape sensitivity, and moderate vity. It is recommended that a full HIA be undertaken to assess the impacts likely to result from the proposed acility and associated grid connections.



## 1. Proposed Development Summary

The development of a solar photovoltaic (PV) facility with a generating capacity of up to 240MW is proposed by WKN Windcurrent SA (Pty) Ltd on a site located near Fochville in Gauteng, South Africa The solar PV development will be known as the Phadima Solar PV Facility. The infrastructure associated with the 240MW solar PV facility will include:

- » Solar PV arrays, modules and mounting structures
- » Inverters and transformers
- » Cabling between the project components
- » Grid connection infrastructure including a switching substation to be connected via an overhead power line to the existing Fochville Rural Substation (located ~200m north of the development area) within a 300m wide corridor
- » On-site facility substation, Battery Energy Storage System (BESS), temporary and permanent laydown areas, water storage and transfer infrastructure, O&M buildings, and fencing around the development area
- » Site and internal access roads up to 6m in width, where required.

Table 1 Below provides the details of the project, including the main infrastructure components and services that will be required during the project life cycle.

Table 1: Details	of the Phadim	a Solar PV Facilitu ar	nd associated infrastructure
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Component	Description / Dimensions
District Municipality	West Rand District Municipality
Local Municipality	Merafong Local Municipality
Ward Number (s)	Ward 14
Nearest town(s)	Fochville (3km north-east)
Farm name(s) and number(s) of properties affected by the PV Facility, incl SG 21 Digit Code (s)	<ul> <li>Remaining Extent of Farm Elandsfontein 140 (T0IQ0000000014000000)</li> <li>Remainder of Portion 7 of Farm Elandsfontein 144 (T0IQ0000000014400007)</li> <li>Portion 8 of Farm Elandsfontein 144 (T0IQ0000000014400008)</li> <li>Portion 16 of Farm Elandsfontein 144 (T0IQ0000000014400016)</li> <li>Portion 28 of Farm Elandsfontein 144 (T0IQ0000000014400028)</li> <li>Portion 32 of Farm Elandsfontein 144 (T0IQ0000000014400032)</li> <li>Portion 33 of Farm Elandsfontein 144 (T0IQ0000000014400033)</li> <li>Portion 35 of Farm Elandsfontein 144 (T0IQ0000000014400035)</li> <li>Portion 37 of Farm Elandsfontein 144 (T0IQ0000000014400037)</li> </ul>



Current zoning	Agriculture
Site Coordinates (centre of development area)	26°30′31.62″S, 27°26′2.14″E
Total extent of the Affected Properties, also referred to as the project site <sup>1</sup>	~1522ha
Total extent of the Development area <sup>2</sup>	Up to ~1227ha
Total extent of the Development footprint <sup>3</sup>	To be confirmed following specialist input during the scoping phase
Contracted capacity of the PV facility	Up to 240MW
PV panels	Height: up to 6m from ground level (installed)
Power line capacity	132kV
Power line servitude width	Up to 32m
Grid corridor width (for assessment purposes)	300m
On-site Facility Substation, BESS, and O&M buildings	<ul> <li>» Located within the development area.</li> <li>» Approximately 7ha in extent.</li> </ul>
Access roads and internal roads	<ul> <li>Existing roads will be used, wherever possible, to access the project site and development area.</li> <li>Access to the PV development area is provided via: the N12, located to north-west of the development area; the R500 located east; and Kerk Street which is located to the north of the development area.</li> <li>Internal roads up to 6m in width will be required to access the PV panels and on-site substation.</li> </ul>

<sup>&</sup>lt;sup>1</sup> The project site is that identified area within which the development area and development footprint are located. It is the broader geographic area assessed as part of the EIA process, within which indirect and direct effects of the project may occur. The project site is ~1522ha in extent.

<sup>&</sup>lt;sup>2</sup> The development area is that identified area where the 240MW PV facility is planned to be located. This area has been selected as a practicable option for the facility, considering technical preference and constraints. The development area is ~1227ha in extent.

<sup>&</sup>lt;sup>3</sup> The development footprint is the defined area (located within the development area) where the PV panel array and other associated infrastructure for the Phadima Solar PV facility is planned to be constructed. This is the actual footprint of the facility, and the area which would be disturbed.



# 2. Application References

Name of relevant heritage authority(s)	SAHRA
Name of decision making authority(s)	TBA

# 3. Property Information

Latitude / Longitude	26°30'44.95"S 27°26'6.98"E
Erf number / Farm number Farm Elandsfontein 1401Q and 1441Q	
Local Municipality	Merafong Local Municipality
District Municipality West Rand District Municipality	
Province	Gauteng
Current Use	Agriculture
Current Zoning	Agriculture

# 4. Nature of the Proposed Development

Total Surface Area	ТВА
Depth of excavation (m)	ТВА
Height of development (m)	ТВА



# 5. Category of Development

Triggers: Section 38(8) of the National Heritage Resources Act			
Triggers: Section 38(1) of the National Heritage Resources Act			
1. Construction of a road, wall, powerline, pipeline, canal or other similar form of linear development or barrier over 300m in length.			
2. Construction of a bridge or similar structure exceeding 50m in length.			
3. Any development or activity that will change the character of a site-			
a) exceeding 5 000m <sup>2</sup> in extent			
b) involving three or more existing erven or subdivisions thereof			
c) involving three or more erven or divisions thereof which have been consolidated within the past five years			
4. Rezoning of a site exceeding 10 000m <sup>2</sup>			
5. Other (state):			

# 6. Additional Infrastructure Required for this Development

TBA



7. Mapping (please see Appendix 3 and 4 for a full description of our methodology and map legends)

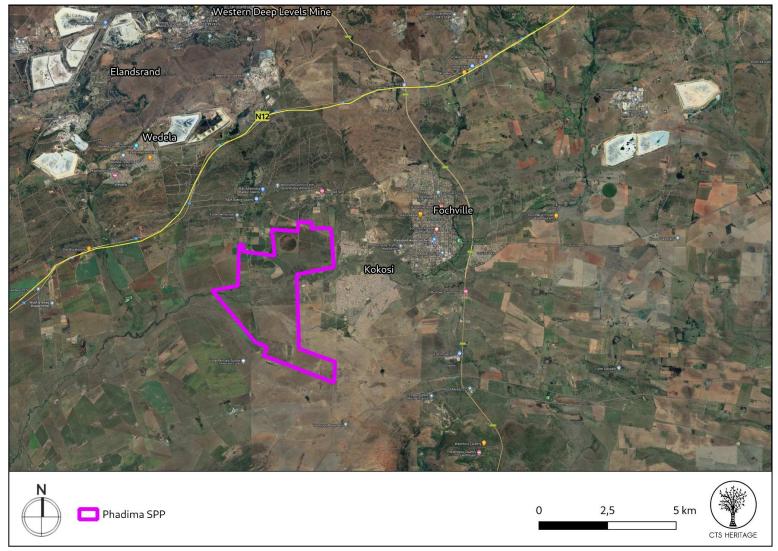


Figure 1b. Overview Map. Satellite image (2023) indicating the proposed development area.



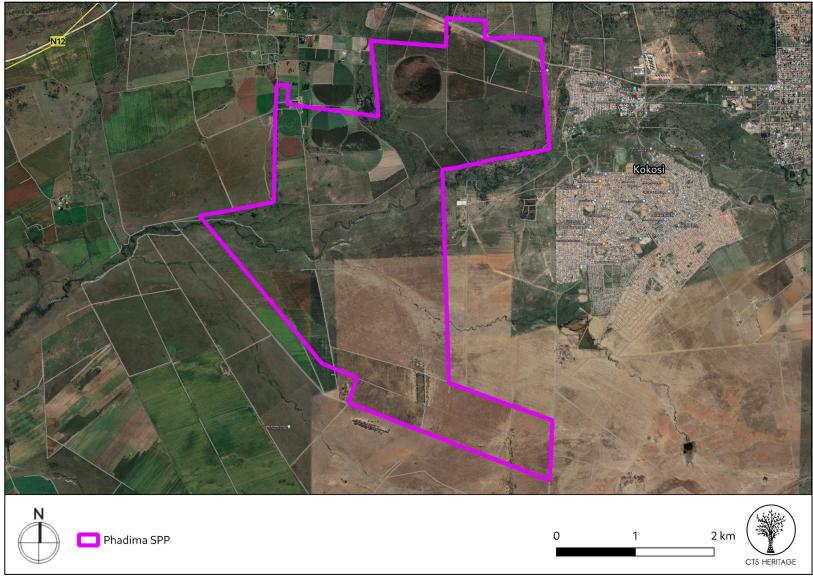


Figure 1c. Overview Map. Satellite image (2022) indicating the proposed development area, close up.



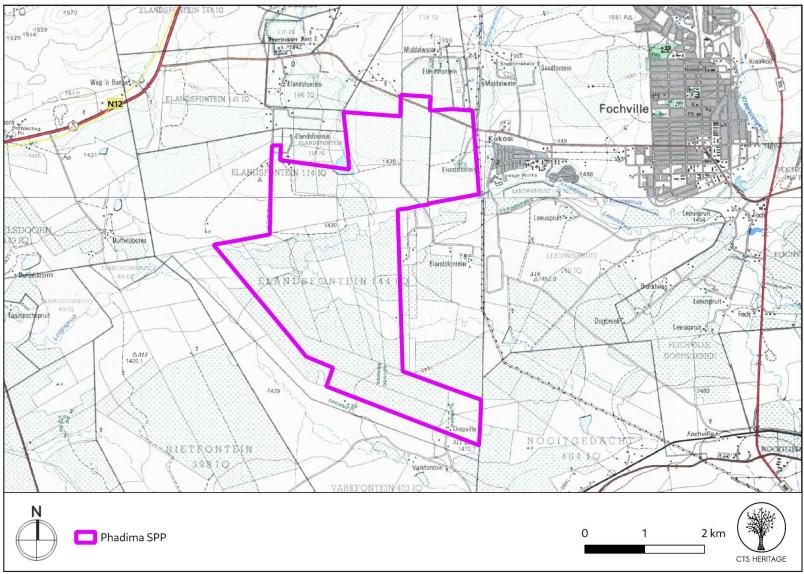


Figure 1d. Overview Map. Extract from the 1:50 000 Topo map for the development area.



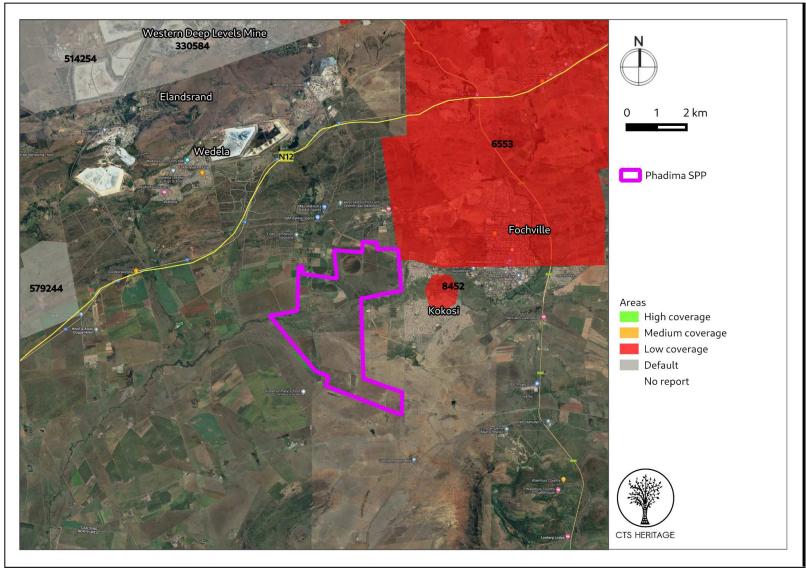


Figure 2. Previous HIAs Map. Previous Heritage Impact Assessments surrounding the proposed development area within 15km, with SAHRIS NIDS indicated. Please see Appendix 2 for a full reference list.



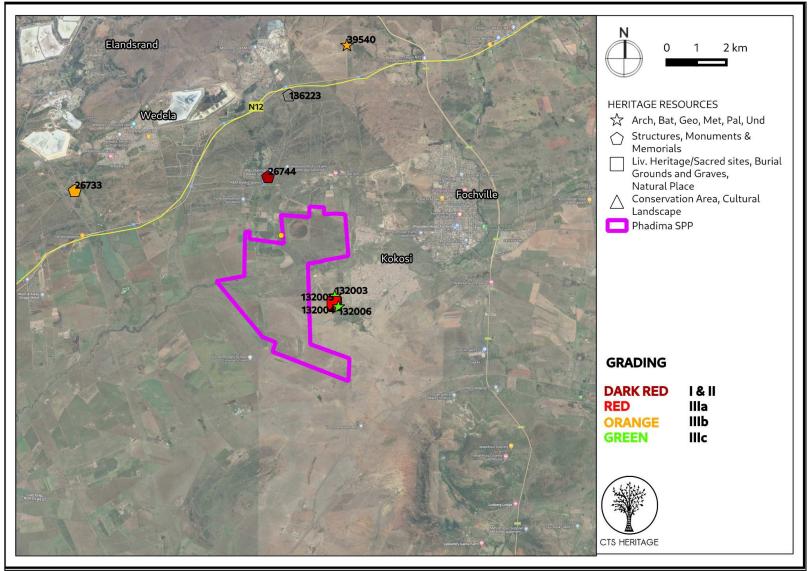


Figure 3a. Heritage Resources Map. Heritage Resources previously identified in and near the study area, with SAHRIS Site IDs indicated within 10km. Please See Appendix 4 for full description of heritage resource types.



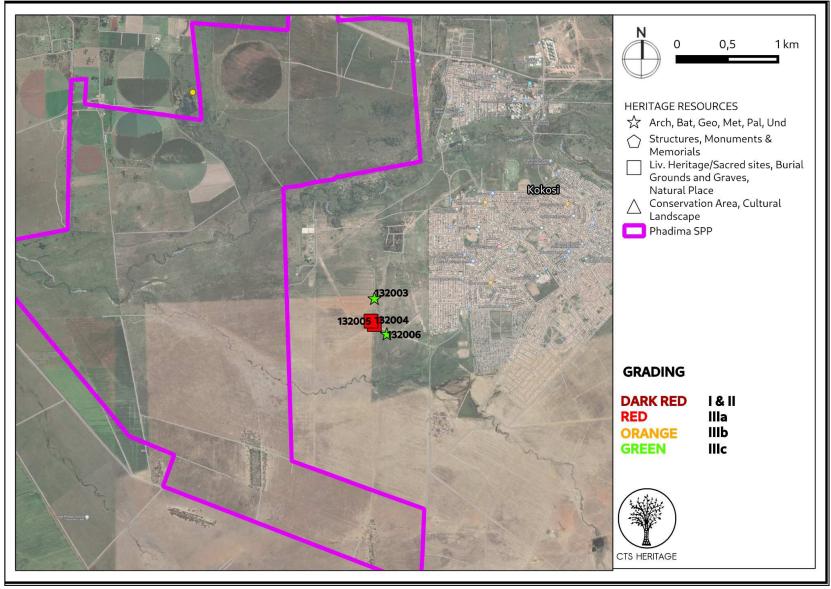


Figure 3b. Heritage Resources Map. Heritage Resources Inset



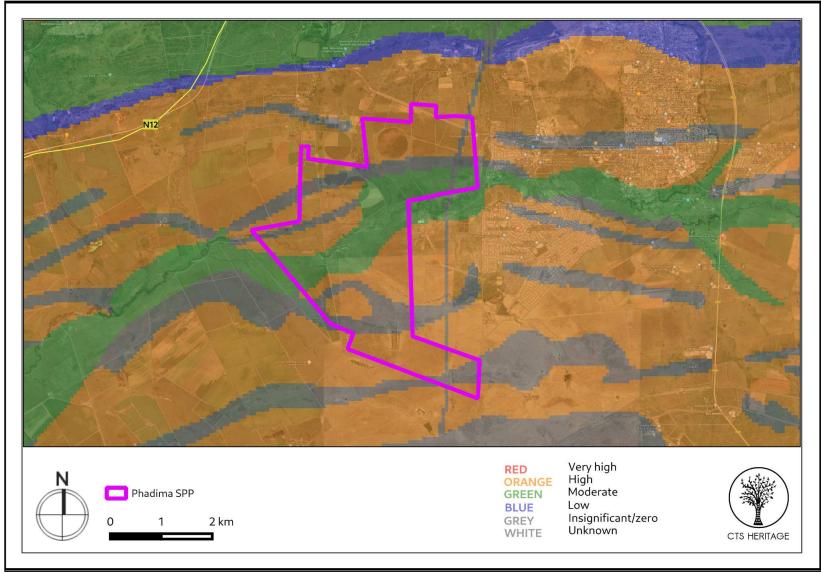


Figure 4a. Palaeosensitivity Map. Indicating high and moderate fossil sensitivity underlying the study area. Please See Appendix 3 for a full guide to the legend.



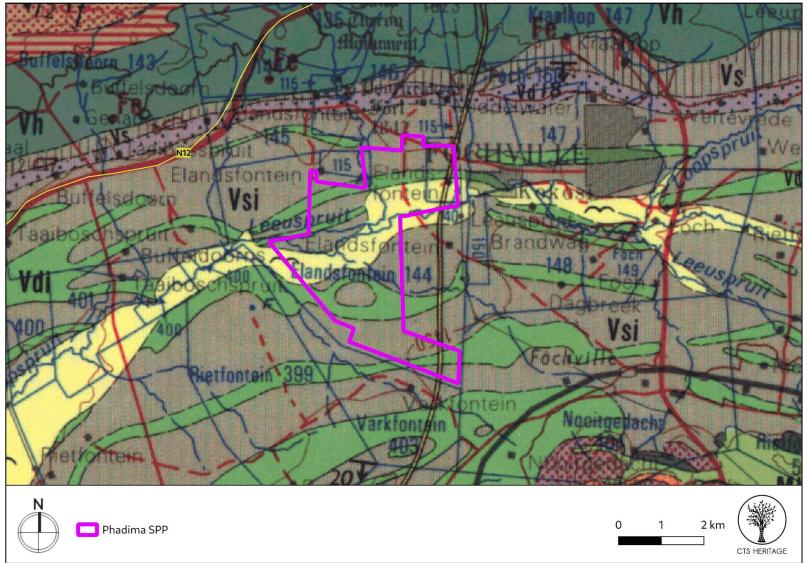


Figure 4b. Geology Map. Extract from the CGS Map 2626 for West Rand indicating that the development area is underlain by Vsi: Silverton Formation of the Pretoria Group and Qs: Quaternary Sands



## 8. Heritage Assessment

#### Cultural Landscape

The area proposed for development is located approximately 15km south of Carltonville and immediately adjacent to Fochville within the Merafong Municipality. Carltonville was developed by various mining companies from 1937 onwards, but was not officially incorporated until 1959, and was subsequently recognised as a provincial town in 1967. Surrounding Carltonville are a number of privately owned gold-mining township villages and contractor labour quarters established by the mining companies on land owned by the mines. The area surrounding Carltonville is dominated by a cultural landscape that is shaped and defined by the historic and on-going mining activities associated with the Witwatersrand. Fochville was established as an agricultural centre in 1920 and is known for the Tlokwe Ruins - remains of Sotho-Tswana settlements located on the hills surrounding the town that were inhabited until the 1820's when the inhabitants were driven away by Mzilikazi. These ruins are located approximately 2km east of the development area immediately outside of the town of Fochville. The Sotho-Tswana people lived in this area for roughly 300 years before the 1815-1840 Difaqane and the 1815-1816 volcanic winter. They farmed sorghum, maize and cattle in the fertile valleys and had a thriving community. During the Difaqane they accepted refugees from the south and eventually, caving in to both population and environmental pressures, moved toward the Brits area.

Birkholtz and Groenewald (2016, SAHRIS NID 369805) completed an HIA on a property located north of the area proposed for development. They describe the broader areas as "The overall study area can be described as generally undulating with a number of extensive pans located within this area... While the overall study area is mostly utilised for agricultural activities, the proposed development bulk sample area that was assessed in the field is characterised by agricultural fields (maize), a large number of small livestock camps associated with stud farming (cattle) as well as Eskom power lines." The N12 is an historic scenic route that runs between Klerksdorp and Johannesburg and is likely based on the original wagon route used for this journey. This route is located approximately 2km away from the PV Footprint area. In general, for the development of PV infrastructure and its associated grid connection infrastructure, it is preferred for such development to be clustered with existing development, such as mining or residential development, in order to reduce the perception of urban and infrastructure sprawl across an otherwise agricultural landscape.

#### Archaeology

Archaeological sites spanning the Earlier, Middle and Later Stone Age, as well as sites pertaining to Iron Age farming communities have been found in the region despite the extensive agricultural transformation of the area. Archaeological resources from these technological periods have been identified in the vicinity of the project area by Huffman et al (1991), Schoeman and Barry (2004), Du Pisanie (2015), Van der Walt (2017) and De Bruyn (2020). Du Pisanie (2015) notes that, in the broader area, "Stone Age lithics recorded have been found as surface scatters outside of any discernible context thereby limiting the information potential and overall significance of these resources. Late Farming Community sites within the region have primarily been identified as stone walled settlements classified as Type N and Klipriviersberg." This finding is reiterated by Van der Walt (2017) who notes that "widely dispersed isolated lithics was recorded. These are made entirely from quartzite and consist of cores and flakes with faceted platforms characteristic of the Middle Stone Age. These artefacts are not in-situ and are scattered too sparsely to be of any significance..."

Birkholtz and Groenewald (2016) go on to note that examples of published excavated archaeological sites from the general surroundings of the study area include the Later Stone Age and Iron Age sites located along the Magaliesberg Mountains. Birkholtz and Groenewald (2016) note that the one of the nearest published excavated archaeological site to the present study area is the underground cavern system known as Lepalong, that was used as shelter by the Kwena ba Modimosa ba Mmatau during the turmoil of the Difaqane/Mefaqane. According to Birkholtz and Groenewald (2016), oral histories indicate that Lepalong was occupied from 1827 into the 1830s (Reid & Lane, 2003). Lepalong is located some 25km north-west of the study area. The known presence of ruins in this area such as the Tlokwe Ruins noted above, highlights the broader archaeological sensitivity of this specific site. Based on this information, it is very likely that evidence of similar ruins will be present within the area proposed for development. A



preliminary assessment of the aerial imagery has identified such areas that require further interrogation through field assessment.

According to Du Pisanie and Nel (2016, SAHRIS NID 356134), with the onset of the Transvaal and South African Wars, this area became a strategic location for British troops who occupied Potchefstroom. This region was located in close proximity to the Western Railway, which provided a tactical advantage. To exploit and protect this advantage, a number of blockhouses were constructed. The 1:50 000 Topo Map (Figure 1d) reflects the existence of a "Voortrekker Fort - 1842" located approximately 2km north of the development area. The next major event to take place in this region was the discovery of gold, which facilitated the establishment of several towns from the 1920s, an increase in population and an increase in services. Early mines established include Venterspost (1934), Libanon (1936), West Driefontein (1945), East Driefontein (1968) and later Kloof (1968). Shaped by these events and activities the study area has through time transformed into a historic mining landscape. In their Heritage Impact Assessment located nearby, Du Pisanie and Nel (2016, SAHRIS NID 356134) identified a number of heritage resources, the majority of which were determined to be not conservation-worthy. The nature of the resources identified include burials and burial grounds (graded IIIA) as well as historic and modern farm structures. Similar resources are likely to be present within the proposed development area.

#### Palaeontology

According to the SAHRIS Palaeosensitivity Map, the Proposed Development Area is located within areas that has high and moderate palaeontological sensitivity. According to the extract from the Council of GeoScience Map for West Rand 2626, the highly sensitive formations that may be impacted include the Silverton Formation (Vsi) and the sediments of moderate sensitivity are described as diabase sediments (Vdi). According to the SAHRIS fossil heritage browser, diabase sediments have unknown palaeontological sensitivity whereas sediments of the Silverton Formation have moderate palaeontological sensitivity. It is possible that the proposed development may impact on significant palaeontological heritage resources.

#### RECOMMENDATION

The area proposed for development is located in an area of high archaeological and cultural landscape sensitivity, and moderate palaeontological sensitivity. It is recommended that a full HIA be undertaken to assess the impacts likely to result from the proposed development of the PV facility and associated grid connections.



# 9. Scoping Assessment Impact Table

#### Impact

- Impact to archaeological resources
- Impact to palaeontological resources
- Impact to Cultural Landscape
- Cumulative Impact

#### Desktop Sensitivity Analysis of the Site

- Impact to significant archaeological resources such as Stone Age artefact scatters, burial grounds and graves, Iron age sites and historical artefacts through destruction during the development phase is likely.
- Impacts to palaeontological resources are likely.
- Due to the nature of the development and its context, cumulative impact and negative impact to the cultural landscape is likely

Issue	Nature of Impact	Extent of Impact	No-Go Areas
Impact to significant heritage resources through destruction during the construction phase.	Destruction of significant heritage resources	Local scale with broader impacts to scientific knowledge	None known at present

#### Gaps in knowledge & recommendations for further study

- It is likely that the proposed development will impact significant cultural landscape, archaeological and palaeontological heritage and as such, it is recommended that a heritage impact assessment be completed that assesses these impacts as per section 38(3) of the NHRA.



## **APPENDIX 1:** List of heritage resources in proximity to the development area

Site ID	Site no	Full Site Name	Site Type	Grading
26733	9/2/256/0039	Farmstead, Buffelsdoorn, Potchefstroom District	Building	Grade IIIb
26744	9/2/256/0025	Voortrekker Fort, Elandsfontein, Potchefstroom District	Structures	Grade II
39540	DRIEF08	Driefontein Mines 08	Stone walling, Settlement	Grade IIIb
132003	KSO002	KOKOSI SEWER OUTFALL	Archaeological	Grade IIIc
132004	KSO003	KOKOSI SEWER OUTFALL	Burial Grounds & Graves	Grade IIIa
132005	KSO004	KOKOSI SEWER OUTFALL	Burial Grounds & Graves	Grade IIIa
132006	KSO005	KOKOSI SEWER OUTFALL	Archaeological	Grade IIIc
136223	DC48/NAMM/0005	Danie Theron Monument, Theronskop, Fochville	Monuments & Memorials	



## **APPENDIX 2:** Reference List

	Heritage Impact Assessments				
Nid	Report Type	Author/s	Date	Title	
104305	AIA Phase 1	Justin du Piesanie, Johan Nel	01/05/2012	Phase 1 Heritage Impact Assessment of the proposed Geluksdal Tailings Storage Facility and Pipeline Infrastructure	
330584	Heritage Scoping	Justin du Piesanie	29/05/2015	Sibanye Gold Limited's West Rand Tailings Retreatment Project Heritage Scoping Report	
356134	Heritage Impact Assessment Specialist Reports	Justin du Piesanie, Johan Nel	13/01/2016	Environmental Impact Assessment for Sibanye Gold Limited's West Rand Tailings Retreatment Project - Heritage Impact Assessment	
5550	AIA Phase 1	MH Alex Schoeman, L Barrie	01/04/2004	Archaeological Reconnaissance for the Proposed New South Deep Tailings Dam	
6553	AIA Phase 1	Thomas Huffman, HD van der Merwe, R Steel	31/03/1994	Archaeological Survey of the East and West Driefontein Mines	
7730	AIA Phase 1	Thomas Huffman, GS Kruger, R Steel, Simon Hall	01/01/1991	PWV-18 Archaeological Impact Report	
8452	HIA Phase 1	Udo Kusel	01/08/2008	Cultural Heritage Resources Impact Assessment of Portion 11 of the Farm Leeuspruit 184 IQ, Fochville, North West Province	



# APPENDIX 3 - Keys/Guides

## Key/Guide to Acronyms

AIA	Archaeological Impact Assessment		
DARD	Department of Agriculture and Rural Development (KwaZulu-Natal)		
DEFF	Department of Environment, Forest and Fisheries (National)		
DEADP	Department of Environmental Affairs and Development Planning (Western Cape)		
DEDEAT	Department of Economic Development, Environmental Affairs and Tourism (Eastern Cape)		
DEDECT	Department of Economic Development, Environment, Conservation and Tourism (North West)		
DEDT	Department of Economic Development and Tourism (Mpumalanga)		
DEDTEA	Department of economic Development, Tourism and Environmental Affairs (Free State)		
DENC	Department of Environment and Nature Conservation (Northern Cape)		
DMR	Department of Mineral Resources (National)		
GDARD	Gauteng Department of Agriculture and Rural Development (Gauteng)		
HIA	Heritage Impact Assessment		
LEDET	Department of Economic Development, Environment and Tourism (Limpopo)		
MPRDA	Mineral and Petroleum Resources Development Act, no 28 of 2002		
NEMA	National Environmental Management Act, no 107 of 1998		
NHRA	National Heritage Resources Act, no 25 of 1999		
PIA	Palaeontological Impact Assessment		
SAHRA	South African Heritage Resources Agency		
SAHRIS	South African Heritage Resources Information System		
VIA	Visual Impact Assessment		

## Full guide to Palaeosensitivity Map legend

RED:	VERY HIGH - field assessment and protocol for finds is required
ORANGE/YELLOW:	HIGH - desktop study is required and based on the outcome of the desktop study, a field assessment is likely
GREEN:	MODERATE - desktop study is required
BLUE/PURPLE:	LOW - no palaeontological studies are required however a protocol for chance finds is required
GREY:	INSIGNIFICANT/ZERO - no palaeontological studies are required



WHITE/CLEAR:

UNKNOWN - these areas will require a minimum of a desktop study.

# APPENDIX 4 - Methodology

The Heritage Screener summarises the heritage impact assessments and studies previously undertaken within the area of the proposed development and its surroundings. Heritage resources identified in these reports are assessed by our team during the screening process.

The heritage resources will be described both in terms of **type**:

- Group 1: Archaeological, Underwater, Palaeontological and Geological sites, Meteorites, and Battlefields
- Group 2: Structures, Monuments and Memorials
- Group 3: Burial Grounds and Graves, Living Heritage, Sacred and Natural sites
- Group 4: Cultural Landscapes, Conservation Areas and Scenic routes

and **significance** (Grade I, II, IIIa, b or c, ungraded), as determined by the author of the original heritage impact assessment report or by formal grading and/or protection by the heritage authorities.

Sites identified and mapped during research projects will also be considered.

#### DETERMINATION OF THE EXTENT OF THE INCLUSION ZONE TO BE TAKEN INTO CONSIDERATION

The extent of the inclusion zone to be considered for the Heritage Screener will be determined by CTS based on:

- the size of the development
- the number and outcome of previous surveys existing in the area
- the potential cumulative impact of the application.

The inclusion zone will be considered as the region within a maximum distance of 50 km from the boundary of the proposed development.

## DETERMINATION OF THE PALAEONTOLOGICAL SENSITIVITY

The possible impact of the proposed development on palaeontological resources is gauged by:

- reviewing the fossil sensitivity maps available on the South African Heritage Resources Information System (SAHRIS)
- considering the nature of the proposed development
- when available, taking information provided by the applicant related to the geological background of the area into account



#### DETERMINATION OF THE COVERAGE RATING ASCRIBED TO A REPORT POLYGON

Each report assessed for the compilation of the Heritage Screener is colour-coded according to the level of coverage accomplished. The extent of the surveyed coverage is labelled in three categories, namely low, medium and high. In most instances the extent of the map corresponds to the extent of the development for which the specific report was undertaken.

**Low coverage** will be used for:

- desktop studies where no field assessment of the area was undertaken;
- reports where the sites are listed and described but no GPS coordinates were provided;
- older reports with GPS coordinates with low accuracy ratings;
- reports where the entire property was mapped, but only a small/limited area was surveyed;
- uploads on the National Inventory which are not properly mapped.

#### $\ensuremath{\text{Medium coverage}}$ will be used for

- reports for which a field survey was undertaken but the area was not extensively covered. This may apply to instances where some impediments did not allow for full coverage such as thick vegetation, etc.
- reports for which the entire property was mapped, but only a specific area was surveyed thoroughly. This is differentiated from low ratings listed above when these surveys cover up to around 50% of the property.

High coverage will be used for

• reports where the area highlighted in the map was extensively surveyed as shown by the GPS track coordinates. This category will also apply to permit reports.

## RECOMMENDATION GUIDE

The Heritage Screener includes a set of recommendations to the applicant based on whether an impact on heritage resources is anticipated. One of three possible recommendations is formulated:

# (1) The heritage resources in the area proposed for development are sufficiently recorded - The surveys undertaken in the area adequately captured the heritage resources. There are no known sites which require mitigation or management plans. No further heritage work is recommended for the proposed development.

This recommendation is made when:

• enough work has been undertaken in the area



• it is the professional opinion of CTS that the area has already been assessed adequately from a heritage perspective for the type of development proposed.

(2) The heritage resources and the area proposed for development are only partially recorded - The surveys undertaken in the area have not adequately captured the heritage resources and/or there are sites which require mitigation or management plans. Further specific heritage work is recommended for the proposed development.

This recommendation is made in instances in which there are already some studies undertaken in the area and/or in the adjacent area for the proposed development. Further studies in a limited HIA may include:

- improvement on some components of the heritage assessments already undertaken, for instance with a renewed field survey and/or with a specific specialist for the type of heritage resources expected in the area
  - compilation of a report for a component of a heritage impact assessment not already undertaken in the area
  - undertaking mitigation measures requested in previous assessments/records of decision.

(3) The heritage resources within the area proposed for the development have not been adequately surveyed yet - Few or no surveys have been undertaken in the area proposed for development. A full Heritage Impact Assessment with a detailed field component is recommended for the proposed development.

#### Note:

The responsibility for generating a response detailing the requirements for the development lies with the heritage authority. However, since the methodology utilised for the compilation of the Heritage Screeners is thorough and consistent, contradictory outcomes to the recommendations made by CTS should rarely occur. Should a discrepancy arise, CTS will immediately take up the matter with the heritage authority to clarify the dispute.

## **APPENDIX 5 -Summary of Specialist Expertise**

Jenna Lavin, an archaeologist with an MSc in Archaeology and Palaeoenvironments, and currently completing an MPhil in Conservation Management, heads up the heritage division of the organisation, and has a wealth of experience in the heritage management sector. Jenna's previous position as the Assistant Director for Policy, Research and Planning at Heritage Western Cape has provided her with an in-depth understanding of national and international heritage legislation. Her 8 years of experience at various heritage authorities in South Africa means that she has dealt extensively with permitting, policy formulation, compliance and heritage management at national and provincial level and has also been heavily involved in rolling out training on SAHRIS to the Provincial Heritage Resources Authorities and local authorities.

Jenna is a member of the Association of Professional Heritage Practitioners (APHP), and is also an active member of the International Committee on Monuments and Sites (ICOMOS) as well as the International Committee on Archaeological Heritage Management (ICAHM). In addition, Jenna has been a member of the Association of Southern African Professional Archaeologists (ASAPA) since 2009. Recently, Jenna has been responsible for conducting training in how to write Wikipedia articles for the Africa Centre's WikiAfrica project.



Since 2016, Jenna has drafted over 70 Heritage Impact Assessments throughout South Africa.