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The South African Radio Astronomy Observatory Square Kilometre Array Heritage Impact Assessment and Conservation Management Plan Project

Heritage Impact Assessment Addendum

Prepared for:

South African Radio Astronomy Observatory

Project Number:

SAR6105

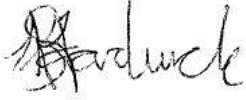


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Project Name:	The South African Radio Astronomy Observatory Square Kilometre Array Heritage Impact Assessment and Conservation Management Plan Project
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EXECUTIVE SUMMARY

Digby Wells Environmental (hereinafter Digby Wells) completed a Heritage Resources Management (HRM) process in support of the Square Kilometre Array (SKA) Project (the Project). The HRM process included a Heritage Impact Assessment (HIA) and the compilation of a Conservation Management Plan (CMP) contemplated in terms of the National Heritage Resources Act, 1999 (Act No. 25 of 1999) (NHRA). Digby Wells submitted the HIA report and CMP to the South African Heritage Resources Agency (SAHRA) and Northern Cape Provincial Heritage Resources Authority (NC-PHRA) on 30 July 2018 (Case ID:12292¹). SAHRA issued Statutory Comment on 7 September 2018 that approved of the Project and endorsed the various specialist recommendations.

Subsequent to this endorsement, the South African Radio Astronomy Observatory (SARAO) appointed Digby Wells to implement select specialist recommendations contained within the HIA and CMP. These recommendations were undertaken in response to SARAO amending select components of the development. These amendments comprised of:

- The development footprint and access route for the HIRAX instrument to the Swartfontein property;
- The location of one of the proposed temporary construction camps to the Visserskloof property; and
- The establishment of a Photo-Voltaic (PV) plant covering 30 ha on the Visserskloof property *in lieu* of the assessed proposed electrical infrastructure.

Digby Wells completed the following activities as part of the implementation of the specialist recommendations:

- Conducting a physical survey by foot of the amended Project development footprint;
- Identifying heritage resources in the affected area;
- Assessing the identified heritage resources in terms of the heritage assessment criteria captured under Section 7 of the NHRA and assess a Cultural Significance (CS) value; and
- Providing SARAO with mitigation measures to safeguard identified heritage resources.

Digby Wells identified nine additional heritage resources within and adjacent to the proposed infrastructure footprints. These resources range in their CS value from negligible to high. The table below summarises these values.

¹ Available at <https://sahris.sahra.org.za/cases/nrf4874-sarao-ska-hia-and-conservation-management-plan>



Summary of the Cultural Significance of the Cultural Landscape

Resource ID	Description	Integrity	CS Value	Cultural Significance
RA-011	Boulder than includes a geometric rock painting and an engraving of an animal.	4	17	High
SA-019, SA-020, SA-021, SA-022 and SA-023	Low- to medium-density scatters of stone tools representing the Middle and Later Stone Age (MSA and LSA).	3	10	Low
HST-002	Historical structures as part of the Visserskloof Werf.	2	6	Low
MXD-004	A Stone Age scatter adjacent to a historical farmhouse.	2	7	Low
HST-001	An isolated historical artefact	1	4	Negligible

A summary of the impact assessment is included in the final table of this section. Digby Wells recommends several actions to mitigate and manage the identified impacts. These include general and specific recommendations, which have been separated into two tables below. Where these recommendations are implemented, Digby Wells does not object to the amendments to the Project.

General Recommendations

Recommendation	Description
Structures older than 60 years are subject to permitting requirements	Structures older than 60 years are afforded general protection and subject to permitting requirements stipulated under Sections 27 & 34 of the NHRA and regulated by Chapter IV of GN R 548. Individual permit applications must therefore be submitted for each protected building proposed for demolition. The affected structures must be recorded in detail prior to their alteration or destruction. This will include <i>inter alia</i> photographs and measured drawings.



Specific Recommendations

Aspect	Recommendations	Description
Palaeontology	Implementation of the FFP developed in the previous HRM process.	The FFP must be implemented during construction activities for the HIRAX, Visserskloof construction camp and the PV plant. As per the requirements of the FFP, responsible persons must be trained in the FFP. <i>(SARAO plans to implement such training prior to the commencement of the construction phase of the Project).</i>
Archaeology	<i>In situ</i> conservation of identified heritage resources	Identified heritage resources must remain <i>in situ</i> with a demarcated no-go buffer zone between heritage resources and Project activities. Signage must be established to indicate the presence of the resource. The heritage resources must be included in the existing CMP. This recommendation with a 50 m buffer applies to: SA-019 and SA-020. Where Project infrastructure redesign is feasible, this recommendation applies to SA-021, SA-022 and SA-023 as well. This recommendation with a 25 m buffer applies to MXD-004.
	Heritage Watching Brief	A suitably-qualified archaeologist must undertake a Watching Brief during earth-moving activities in proximity to identified heritage sites to record all material culture remains that may be exposed. The results of the Watching Brief must be compiled into a Watching Brief Report and submitted to SAHRA for noting.
	Detailed recording of identified archaeological resources	Where the realignment of proposed infrastructure within the defined 50 m buffer is not feasible, the identified heritage resources must be recorded in detail prior to the construction phase. This may include <i>inter alia</i> , distribution and density mapping, surface collection and test excavations of archaeological material subject to the approval of a Section 35 Permit. This recommendation applies to: SA-019, SA-020, SA-021, SA-022 and SA-023 and MXD-004. Where applicable, this may also include detailed recording of identified heritage and adjacent structures as part of a Section 34 Destruction Permit Application process should the historical structure not be avoided. This recommendation is applicable to MXD-004.



Aspect	Recommendations	Description
Built Heritage	<i>In situ</i> conservation of identified heritage resources	Identified heritage resources must remain <i>in situ</i> with a demarcated no-go buffer zone between heritage resources and Project activities. Signage must be established to indicate the presence of the resource. The heritage resources must be included in the existing CMP. This recommendation with a 25 m buffer applies to HST-002.

Summary of the Impact Assessment

Impact	Pre-mitigation:						Post-mitigation:					
	Duration	Extent	Intensity	Consequence	Probability	Significance	Duration	Extent	Intensity	Consequence	Probability	Significance
Direct impacts to Stone Age occurrences with low CS	Permanent	Municipal Area	Very low - negative	Moderately detrimental	Highly probable	Minor - negative	Transient	Very limited	Very low - positive	Negligible	Likely	Negligible - positive
Direct impacts to historical resources with low CS	Permanent	Local	Very low - negative	Moderately detrimental	Highly probable	Minor - negative	Beyond project life	Limited	Very low - positive	Slightly beneficial	Likely	Minor - positive
Direct impacts to multi-layered sites with low CS	Permanent	Local	Very low - negative	Moderately detrimental	Highly probable	Minor - negative	Beyond project life	Limited	Very low - positive	Slightly beneficial	Likely	Minor - positive
Indirect impacts to Rock Art with high CS	Permanent	National	Extremely high - negative	Extremely detrimental	Probable	Moderate - negative	Transient	Very limited	High - negative	Slightly detrimental	Highly unlikely	Negligible - negative

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1 Introduction

Digby Wells Environmental (hereinafter Digby Wells) completed a Heritage Resources Management (HRM) Process in support of the Square Kilometre Array (SKA) Project (“the Project”), located in the Northern Cape Province of South Africa. The HRM Process comprised the compilation and submission of a Heritage Impact Assessment (HIA) and Conservation Management Plan (CMP) contemplated in terms of the National Heritage Resources Act, 1999 (Act No. 25 of 1999) (NHRA) to the South African Heritage Resources Agency (SAHRA) and Northern Cape Provincial Heritage Resources Authority (NC-PHRA) on 30 July 2018 (Case ID:12292²). SAHRA issued Statutory Comment on 7 September 2018 that approved of the Project and endorsed the various specialist recommendations.

Subsequent to the approval, the South African Radio Astronomy Observatory (SARAO) appointed Digby Wells to implement select specialist recommendations contained within the HIA and CMP.

This report constitutes an addendum to the HIA that considers the potential impact to heritage resources protected in terms of Sections 34, 35 and 36 of the NHRA from amendments made to the Project development footprint.

1.1 Project Description

The Project comprises two primary components, namely the ‘core’ (40 land parcels³) and three ‘spirals’ (72 land parcels) covering an approximate areal extent of 639 076 hectare (ha). This land makes provision for the SKA Radio Telescope site, KAT-7 radio telescope, MeerKAT, HIRAX and HERA instruments. Plan 1 presents the regional setting of the Project.

The international SKA Organisation (SKAO) proposes to establish an additional 133 antennas. Of these, 112 antennas will be established in the core and the remaining 21 will be installed in three spiral arms (seven in each arm). These spiral arms are:

- The Brandvlei Spiral (Arm), comprising the western extent;
- The Carnarvon Spiral (Arm) comprising the eastern extent; and
- The Williston Spiral (Arm), comprising the southern extent of the site-specific study area.

Together with above-mentioned antennas, the SKAO proposes to install the following infrastructure:

- Access gravel roads to a width of 4 m;
- Upgrading up to 320 km of existing roads;

² Available at <https://sahris.sahra.org.za/cases/nrf4874-sarao-ska-hia-and-conservation-management-plan>

³ Land parcels refer to any plot or piece of land which has been demarcated and which has fixed boundaries. It includes farms, farm portions and erven.



- Establishment of approximately 115 km new roads;
- Develop electrical infrastructure including:
 - Approximately 240 km above and below ground power cables within a 22-30 m wide servitude; and
 - Substations and electrical kiosks.
- Establishment of 20 borrow pits;
- Establishment of four stone quarries; and
- Establishment of two construction camps.

Subsequent to securing environmental exclusion in terms of Section 24(2)(e) for the Project from the Department of Environmental Affairs (DEA), as well as approval from SAHRA, SARA0 has proposed to amend select components of the development footprint, comprising:

- Relocating the development footprint and access route for the HIRAX instrument to the Swartfontein property;
- Adjusting the location of one of the proposed temporary construction camps to the Visserskloof property; and
- The establishment of a Photo-Voltaic (PV) plant covering 30 ha on the Visserskloof property *in lieu* of the assessed proposed electrical infrastructure.

1.2 Terms of Reference

To complete an on-site inspection in accordance with monitoring requirements captured in Section 6.3.1 and Table 6-3 of the CMP.

1.3 Scope of Work

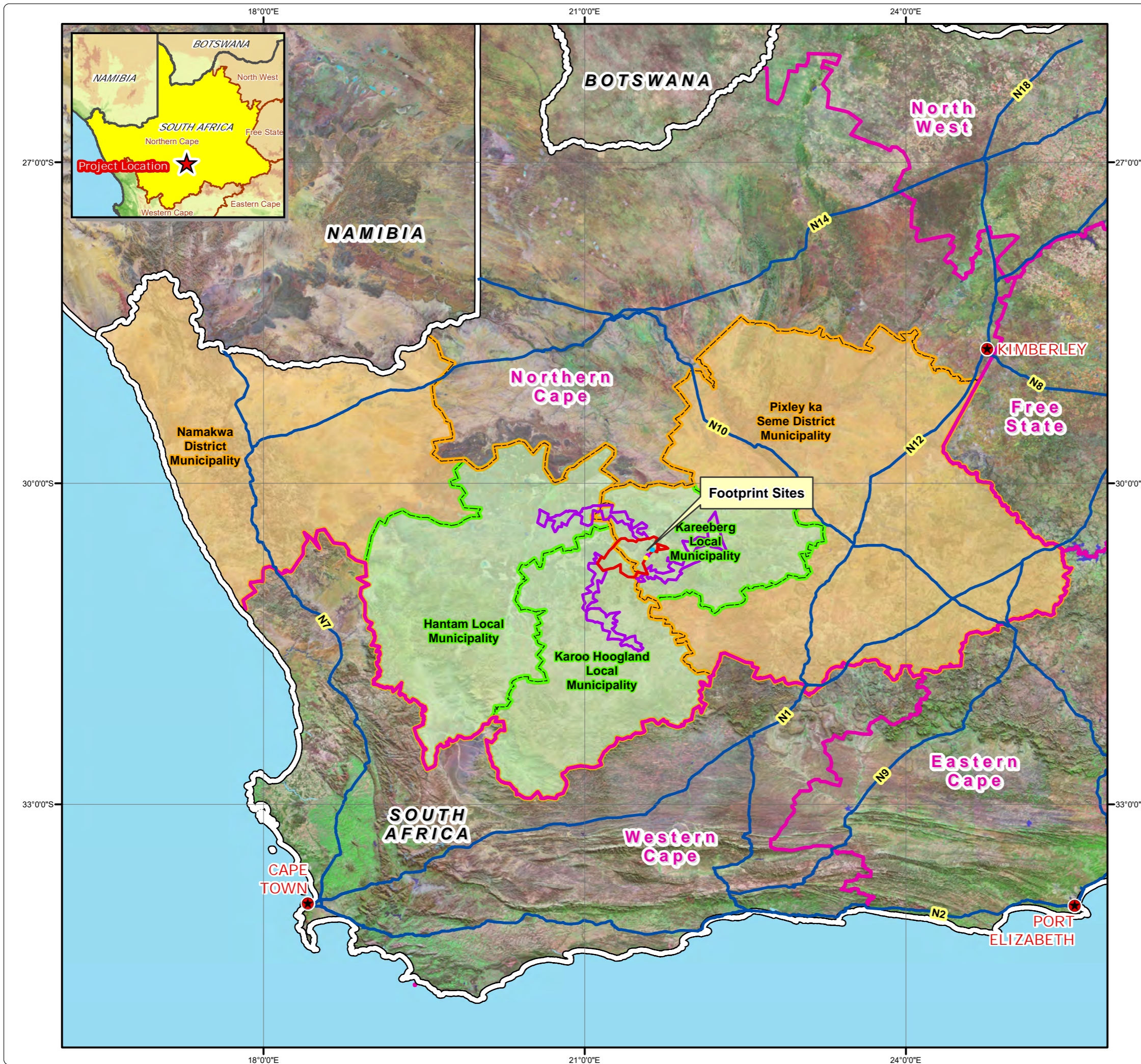
The Scope of Work (SoW) applicable to the HIA addendum is extracted from the BID: NRF SARA0 PEP6 001 2019 which requires a suitably-qualified specialist to:

- Conduct a physical survey by foot of the amended Project development footprint;
- Identify heritage resources in the affected area;
- Assess the identified heritage resources in terms of the heritage assessment criteria captured under Section 7 of the NHRA; and
- Provide SARA0 with mitigation measures to safeguard identified heritage resources.

SKA Project Regional Setting

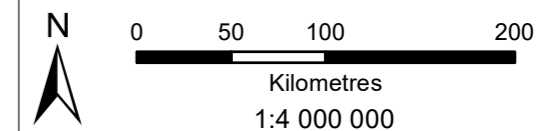
Legend

- SKA Phase 1 Core
- SKA Phase 1 Spiral Arms
- City
- National Road
- HIRAX Footprint
- Solar PV Farm Footprint
- Visserskloof Construction Camp Footprint
- Regional Study Area
- Local Study Area
- Provincial Boundary
- International Boundary



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

Projection: Geographic Datum: WGS 1984 Central Meridian: 21°E Ref #: amt.SAR6105.201912.052 Revision Number: 3 Date: 17/12/2019



1.4 Expertise of the Specialist

The expertise of the HRM specialist is presented in Table 1-1:

Table 1-1: Expertise of the Specialist

Team Member	Bio Sketch
<p>Justin du Piesanie</p> <p>ASAPA Member 270</p> <p>AMAFA Registered</p> <p>ICOMOS Member 14274</p> <p>IAIASa Member</p> <p>Years' Experience: 12</p>	<p>Justin is the Divisional Manager for Social and Heritage Services at Digby Wells. Justin joined the company in August 2011 as an archaeologist and was subsequently made HRM Manager in 2016 and Divisional Manager in 2018. He 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. Justin is a professional member of the Association of Southern African Professional Archaeologists (ASAPA), and accredited by the association's Cultural Resources Management (CRM) section. He is also a member of the International Council on Monuments and Sites (ICOMOS), an advisory body to the UNESCO World Heritage Convention. He has over 12 years combined experience in HRM in South Africa, including heritage assessments, archaeological mitigation, grave relocation, NHRA Section 34 application processes, and CMPs. Justin has gained further generalist experience since his appointment at Digby Wells in Botswana, Burkina Faso, Cameroon, the Democratic Republic of Congo, Liberia, Mali and Senegal on projects that have required compliance with IFC requirements such as Performance Standard 8: Cultural Heritage. Furthermore, Justin has acted as a technical expert reviewer of HRM projects undertaken in Cameroon and Senegal. Justin's current focus at Digby Wells is to develop the HRM process as an integrated discipline following international HRM principles and standards. This approach aims to provide clients with comprehensive, project-specific solutions that promote ethical heritage management and assist in achieving strategic objectives.</p>
<p>Jaco van der Walt</p> <p>ASAPA Member 159</p> <p>AMAFA Registered</p> <p>APHP Member 114</p> <p>Years' Experience: 20</p>	<p>Jaco van der Walt has been practicing as a CRM archaeologist for 20 years. He obtained a Master of Arts (MA) degree in Archaeology from the University of the Witwatersrand focusing on the Iron Age in 2012 and is a PhD candidate at the University of Johannesburg focusing on Stone Age Archaeology with specific interest in the Middle Stone Age (MSA) and Later Stone Age (LSA). Jaco is a professional member of ASAPA, and accredited by the association's CRM section. He is also a member of the Association of Professional Heritage Practitioners (APHP). Jaco has a vast range of experience in impact assessments, archaeological mitigation, grave relocation, NHRA Section 34 application processes, and CMPs in all provinces of South Africa. He has also worked on various international projects in Zimbabwe, Botswana, Mozambique, Lesotho, DRC, Zambia and Tanzania. Through this he has a sound understanding of the IFC Performance Standard requirements, with specific reference to Performance Standard 8 – Cultural Heritage.</p>



Team Member	Bio Sketch
Shannon Hardwick ASAPA Member 451 AMAFA Registered ICOMOS Member 38048 Years' Experience: 2	Shannon joined the Digby Wells team in May 2017 as a Heritage Management Intern and has most recently been appointed as a Heritage Resources Management Consultant. Shannon is an archaeologist who obtained a Master of Science (MSc) degree from the University of the Witwatersrand in 2013, specialising in historical archaeobotany in the Limpopo Province. She is a published co-author of one paper in <i>Journal of Ethnobiology</i> . Since joining Digby Wells, Shannon 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 2019. Shannon has gained generalist experience through the compilation of various heritage assessments, including Heritage Scoping Reports (HSRs), HIAs, Heritage Basic Assessment Reports (HBARs) and Section 34 permit applications. Her other experience includes compiling a Community Health, Safety and Security Management Plan (CHSSMP), various social baselines and research to inform a Livelihood Restoration Framework (LRF). Shannon's experience in the field includes pre-disturbance surveys in South Africa, Malawi and the Democratic Republic of the Congo and social fieldwork in South Africa and Malawi.
Alisoun House PSSA Registered Years' Experience: 1	Alisoun is currently a Postdoctoral Fellow at the Evolutionary Studies Institute (ESI) at the University of the Witwatersrand. She received her doctorate in Systematic Botany from the University in 2015. During her time at the ESI, Alisoun has contributed to palaeobotanical research with Professor Marion Bamford. At the same time, Alisoun has been trained in palaeontological fieldwork and assessments. She has completed several Palaeontological Impact Assessments (PIAs) to date.

2 Constraints and Limitations

Table 2-1 described the constraints and limitations experienced in the compilation of this report.

Table 2-1: Constraints and Limitations

Description	Consequence
This document constitutes an addendum to the HIA report and, as such, must be read in conjunction with the report.	This document does not include a description of the cultural heritage landscape.



Description	Consequence
Archaeological and palaeontological resources commonly occur at subsurface levels. These types of resources cannot be adequately recorded or documented by assessors without destructive and intrusive methodologies and without the correct permits issued in terms of Section 35 of the NHRA.	The results of the field survey are limited to surface observations. Subsurface tangible heritage may be exposed during Project activities. Should this occur, SARAO must implement the measures detailed in the CMP.

3 Methodology

3.1 Developing Cultural Significance and Field Ratings

Digby Wells has designed a significance rating process to provide a numerical rating of the CS⁴ of identified heritage resources. This process considers heritage resources assessment criteria as set out in subsection 3(3) of the NHRA to determine the intrinsic, comparative and contextual significance of identified heritage resources. The importance rating of a resource is based on information obtained through a review of available credible sources as well as its representativity or uniqueness (i.e. known examples of similar resources to exist).

The matrix rated the importance (or the potential) of an identified resource relative to its contribution to certain values – aesthetic, historical, scientific and social. Resource significance was directly related to the impact on it that could result from project-related activities, as it provided minimum accepted levels of change to the resource.

The value of an identified heritage resource is determined prior to the completion of any assessments of impacts. A heritage resource's value is a direct indication of its sensitivity to change (i.e. impacts).

3.1.1 Determining Cultural Significance

CS was determined based on identified resources' importance or contribution to four broad value categories: aesthetic, historical, scientific and social values. These categories summarised the CS and other values described in Section 3(3) of the NHRA. The resources' importance or contributions to these values were considered in terms of associative (qualitative) and / or rarity (quantitative) attributes, based on collected secondary data. The integrity or condition of resources further influenced the CS. Integrity is largely determined based on resources' current, observed state of conservation, as well as notable changes made to it over the years.

⁴ Cultural significance is defined in the NHRA as the intrinsic "aesthetic, architectural, historical, scientific, social, spiritual, linguistic or technological value or significance" of a heritage resource. These attributes are combined and reduced to four themes used in the Digby Wells significance matrix: aesthetic, historical, scientific and social.

3.1.2 Determining Field Ratings

Field ratings assist the responsible heritage resources authority to grade heritage resources into national (Grade I), provincial (Grade II) or local (Grade III) categories, and are required under Chapter II Section 7(J) of the SAHRA Minimum Standards.

Field ratings considered the assigned CS and the level of official management required or the local competency of heritage authorities⁵.

3.2 Primary Data Collection

3.2.1.1 Palaeontological Survey

Alisoun House undertook the paleontological survey on 3 December 2019. The assessor completed the survey as an adaptive, non-intrusive pedestrian survey, i.e.: no sampling was carried out.

The assessor examined sediments and geology and recorded the general landscape. Identified paleontological resources were recorded as waypoints using handheld GPS and documented through written and photographic records. The results of the site inspection are presented separately for the three areas surveyed in Plan 2 to Plan 4 below.

3.2.1.2 Archaeological Survey

Justin du Piesanie, Jaco van der Walt and Shannon Hardwick undertook the archaeological survey of the proposed amended Project development footprint on 3 December 2019.

The assessors completed the survey as an adaptive, non-intrusive pedestrian survey, i.e.: no sampling or STPs were carried out. The survey focussed on the aforementioned development footprint. Identified heritage resources were recorded as waypoints using handheld GPS. The survey was recorded as GPS track logs which are presented in Plan 2 to Plan 4 below. The sites were documented by field notes and photographs.

3.3 Defining Heritage Impacts

Potential impacts to heritage resources may manifest differently across geographical areas or diverse communities when one considers the simultaneous affect to the tangible resource and social repercussions associated with the intangible aspects. Furthermore, potential impacts may concurrently influence the CS of heritage resources. This assessment therefore considers three broad categories adapted from Winter & Bauman (2005, p. 36).

⁵ Currently the NC-PHRA is only competent to manage and issue permits on NHRA Section 34 heritage resources, and no local (i.e. local government) competency exists within the province. All decisions relating to archaeology, palaeontology and burial grounds and graves therefore fall under the ambit of SAHRA.

**Table 3-1: Impact definition**

Category	Description
Direct Impact	Affect the fabric or physical integrity of the heritage resource, for example destruction of an archaeological site or historical building. Direct impacts may be the most immediate and noticeable. Such impacts are usually ranked as the most intense, but can often be erroneously assessed as high-ranking.
Indirect Impact	Occur later in time or at a different place from the causal activity, or as a result of a complex pathway. For example, restricted access to a heritage resource resulting in the gradual erosion of its CS that may be dependent on ritual patterns of access. Although the physical fabric of the resource is not affected through any direct impact, its significance is affected to the extent that it can ultimately result in the loss of the resource itself.
Cumulative Impact	Result from in-combination effects on heritage resources acting within a host of processes that are insignificant when seen in isolation, but which collectively have a significant effect. Cumulative effects can be: <ul style="list-style-type: none"> ▪ Additive: the simple sum of all the effects, e.g. the removal of a historical structures will minimise the sense of the historic landscape. ▪ Synergistic: effects interact to produce a total effect greater than the sum of the individual effects, e.g. the removal of all historical structures will sterilise the historic landscape. ▪ Time crowding: frequent, repetitive impacts on a particular resource at the same time, e.g. the effect of regular blasting activities on a nearby rock art site or protected historical building could be high. ▪ Neutralizing: where the effects may counteract each other to reduce the overall effect, e.g. the effect of changes from a historic to modern mining landscape could reduce the overall impact on the sense-of-place of the study area. ▪ Space crowding: high spatial density of impacts on a heritage resource, e.g. density of new buildings resulting in suburbanisation of a historical rural landscape.

4 Results from the Field Survey

Table 4-1 includes descriptions of the heritage resources identified during the heritage pre-disturbance survey and the palaeontological site inspection. No fossils were identified during the site inspection. Table 4-2 presents a summary of the on-site observations recorded during the site inspection.

Identified heritage resources were recorded through GPS waypoints, photographs and descriptions. Figure 4-1 presents photographs of selected heritage resources. Appendix B includes the recording forms developed in the previous HRM process. Plan 2 shows the track logs and heritage resources identified in the proposed HIRAX infrastructure area and access road, Plan 3 presents the results for the updated Visserskloof temporary construction camp



and Plan 4 for the Visskerkloof PV Plant footprint. Plan 5 presents the three pre-disturbance areas in relation to each other.

Table 4-1: Detailed descriptions of identified heritage resources

Site Reference	Abbreviated Description	Detailed description
SA-019	Low-density surface scatter (10:1 sq. m) representing the Middle Stone Age (MSA) and Later Stone Age (LSA).	<p>Low-density background scatter of lithics, all made from hornfels. All but one flake is patinated.</p> <p>The scatter includes end- and side-scrapers and blades with dorsal removals and use wear. Some of the flakes have faceted striking platforms, which is typical of the MSA.</p> <p>This site is adjacent to the power lines and is near a road.</p>
SA-020	Medium-density surface scatter (20:1 sq. m) representing the MSA and LSA.	<p>Medium-density background scatter of lithics (± 18 lithics/sq. m) across an area of approximately 30 m by 30 m.</p> <p>The scatter is similar to SA-019 and includes no diagnostic pieces. Chunks with either use wear or trampling and end-scrapers were noted.</p>
SA-021	Low-density lithic surface scatter (10:1 sq. m).	<p>Low-density surface scatter of stone tools. Given the location of the tools within the environment and in relation to the topography, this most likely represents wash from the nearby ridge.</p>
SA-022	Low-density MSA and LSA surface scatter (10:1 sq. m).	<p>Low-density surface scatter of MSA and LSA lithics.</p> <p>The MSA component of the scatter includes diagnostic points and blades with dorsal removals and use wear along the edges. One Levallois -removal point was present.</p> <p>The LSA component is dominated by blades made on unpatinated hornfels.</p>
SA-023	Low-density MSA and LSA surface scatter (10:1 sq. m).	<p>Low-density lithic scatters that appear to represent a mix of wash as well as potentially <i>in situ</i> material. Some of the material appears relatively fresh and a refit was identified within this area.</p>
HST-001	Isolated surface find: historical ammunition.	<p>A single Martini Henry soft-shell cartridge which dates to the late 1890s and which were used by the Boers.</p>



Site Reference	Abbreviated Description	Detailed description
HST-002	Structural complex: werf	Additional structures associated with the historical Visserskloof farmhouse ⁶ . These include foundations near the Visskerskloof barn. The foundations are L-shaped and appear to have an internal division. There are also furrows and a large well near the foundations.
MXD-004	Site: high complexity, multiple components >2500 m ² / 50 m x 50 m	An extensive MSA scatter adjacent to a historical farmhouse. The MSA scatter extends across an area of approximately 50 m by 50 m and has a high artefact density (\pm 18 lithics/sq. m).
RA-011	Rock art: engraving and painting	Rock art including geometrics in white paint and a small engraved antelope on a boulder.

Table 4-2: Summary of the Palaeontological On-site Observations

Site	Geological Setting	Observations
HIRAX Footprint (<i>Farm Swartfontein</i>)	<i>Tierkloof Formation;</i> <i>Ecce Group;</i> <i>Karoo Supergroup</i>	The HIRAX footprint is located in an open, flat, washed area which is covered with a shallow layer of fine-grained weathered mudstone and sandstone soils. A network of dolerite dykes has been exposed. Intermittent calcrete nodules were scattered across the surface.
Visserskloof Construction Camp (<i>Farm Visserskloof</i>)		The proposed footprint includes the existing farmhouse and associated infrastructure. The site has been disturbed and is not considered palaeontologically-sensitive.
PV Plant (<i>Farm Visserskloof</i>)		The PV footprint is located within a large, open area that is traversed by many water courses and is most likely a floodplain. The area is surrounded by mountains of dolerite boulders. Scattered Calcrete nodules were observed at the site.

⁶ The Visserskloof main dwelling, adjoining shed and outbuildings were identified in the Built Heritage Specialist assessment in the previous HIA process. These dwellings are likely to be less than 60 years old and were therefore not assessed as built heritage resources. The foundations and well were not described in that assessment and may be older than 60 years.



MSA and LSA lithics from site SA-019



LSA blade which refits into the blade core (SA-023)



Engraved antelope at RA-011



Ammunition dating to the early 1900s (HST-001)



L-shaped foundations near the Visserskloof farmhouse (HST-002)










Historical well lined with slate and supported by timbers at HST-002

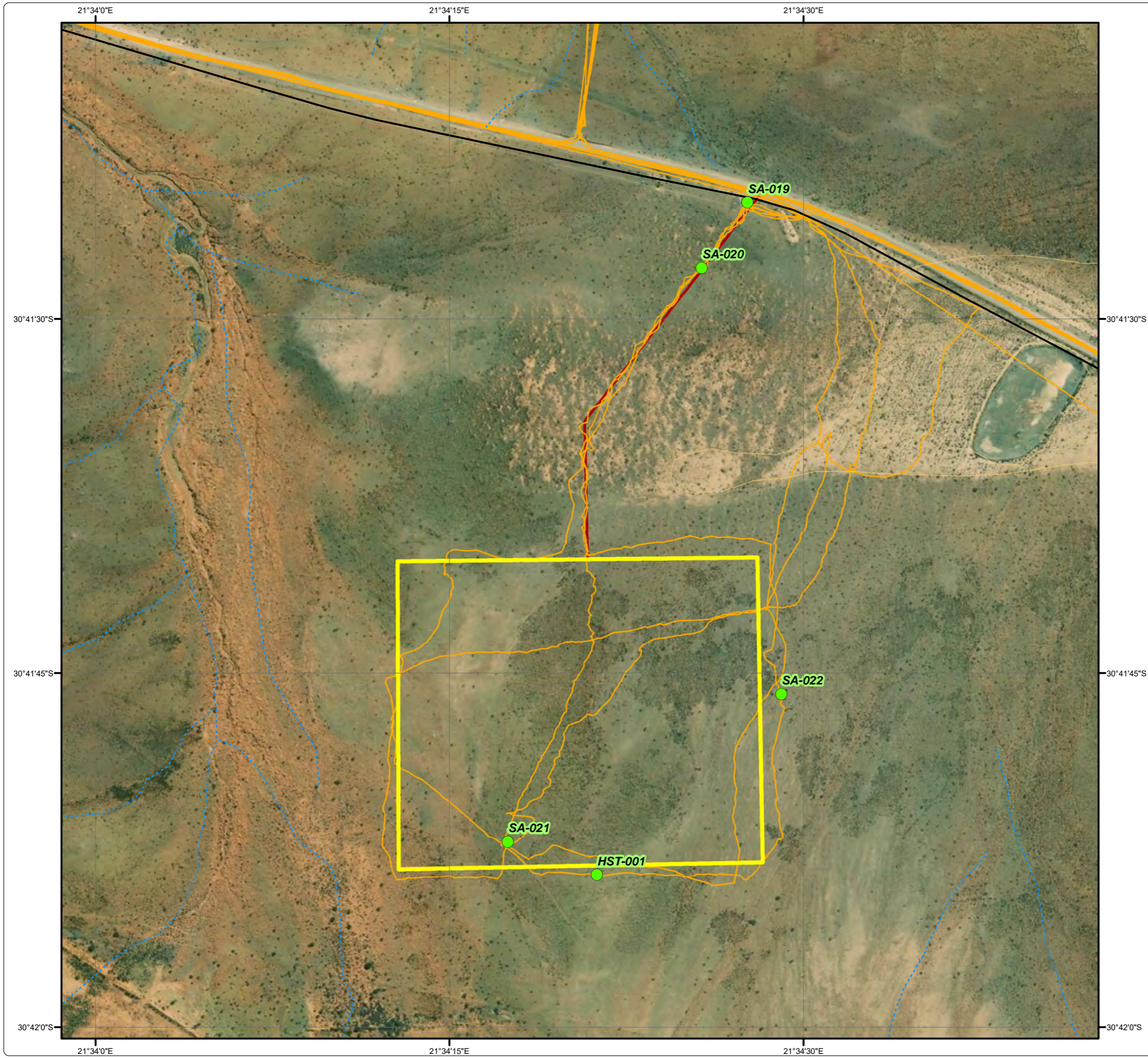
Figure 4-1: Select Photographs of Heritage Resources Identified during the Pre-disturbance Survey and Site Inspection

SKA Project

HIRAX Track Logs and Heritage Points

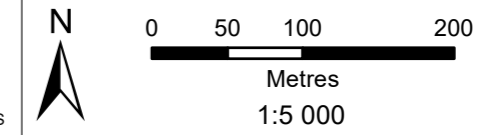
Legend

-  HIRAX Footprint
-  Heritage Point
-  Secondary Road
-  Non-Perennial
-  Access Road
-  Dry pans
-  Track Log








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Datum: WGS 1984	Revision Number: 1
Central Meridian: 21°E	Date: 11/12/2019



SKA Project Visserskloof Construction Camp Track Logs and Heritage Points

Legend

-  Visserskloof Construction Camp Footprint
-  Heritage Point
-  Street
-  Non-Perennial
-  Track Log

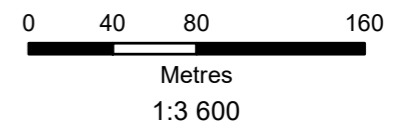


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Revision Number: 1
Date: 11/12/2019

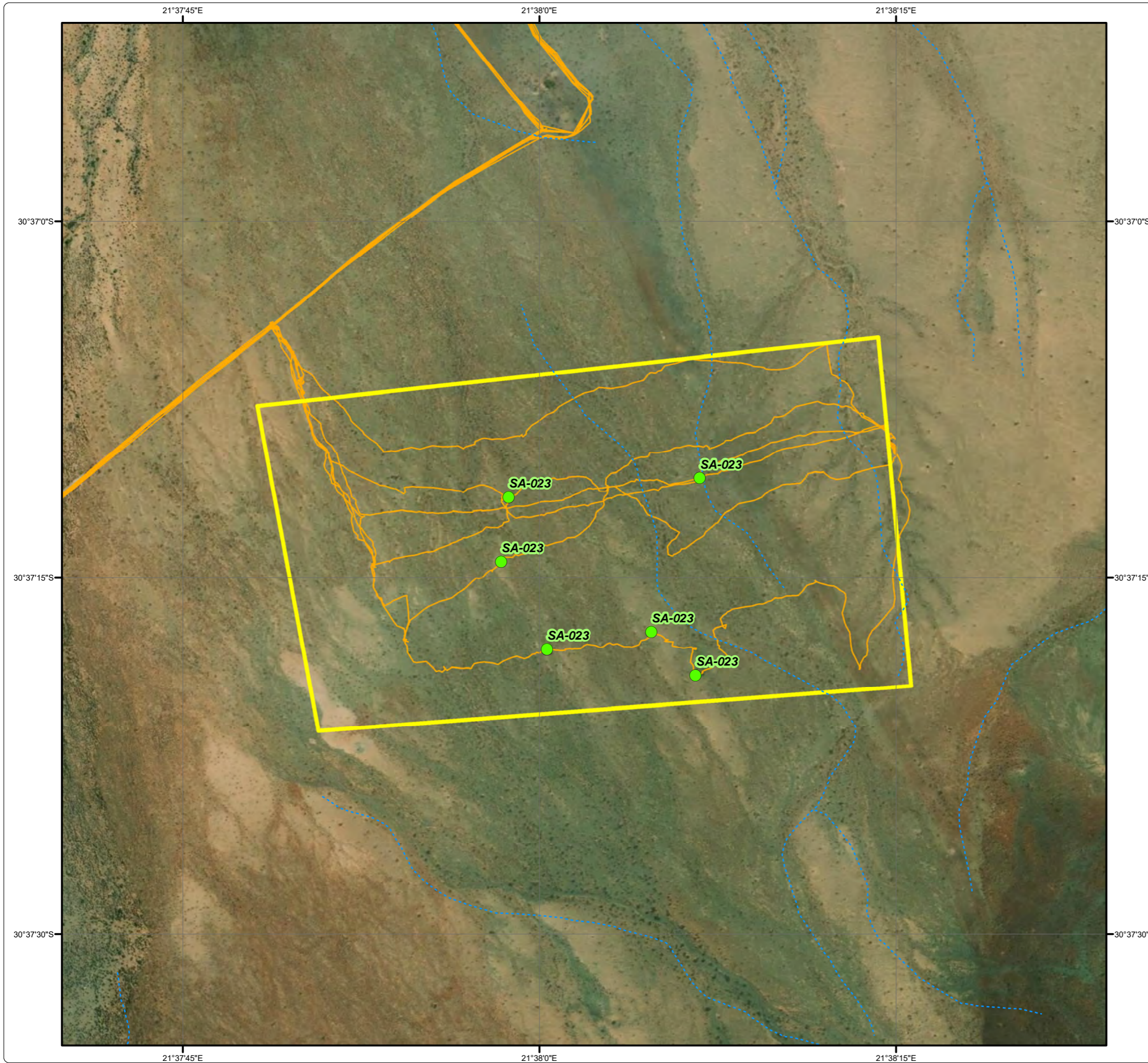


SKA Project

Solar PV Farm Camp Track Logs and Heritage Points

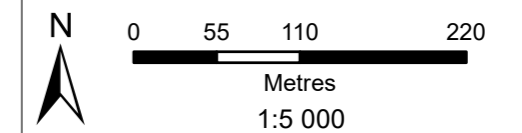
Legend

-  Solar PV Farm Footprint
-  Heritage Points
-  Non-Perennial
-  Track Log

















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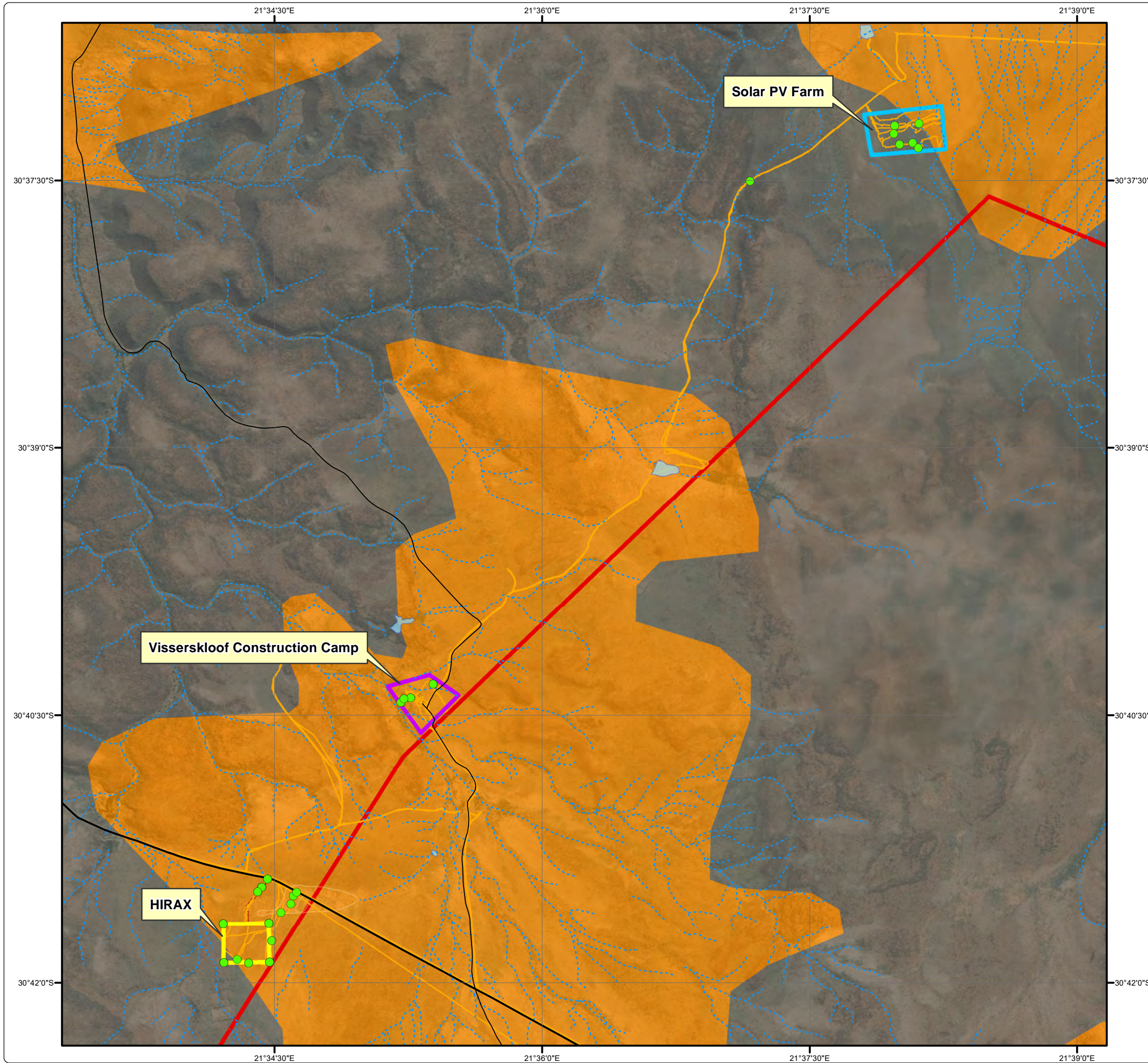
Projection: Geographic	Ref #: amt.SAR6105.201912.055
Datum: WGS 1984	Revision Number: 1
Central Meridian: 21°E	Date: 11/12/2019




SKA Project Overall Footprint Sites Track Logs and Heritage Points


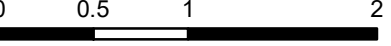
Legend

-  SKA Phase 1 Core
 -  HIRAX Footprint
 -  Solar PV Farm Footprint
 -  Visserskloof Construction Camp Footprint
 -  Heritage Points
 -  Track Log
 -  Access Road
 -  Secondary Road
 -  Street
 -  Non-Perennial
 -  Dams and lakes
 -  Dry pans
- Palaeo-Sensitivity**
-  High
 -  Zero




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5 Cultural Significance

Heritage resources are intrinsic to the history and beliefs of communities. Such resources characterise community identity and cultures and they are finite, non-renewable and irreplaceable. Notwithstanding the intrinsic value of heritage resources, it is incumbent on the assessor to determine the significance of these resources to allow for the implementation of appropriate management. This is achieved through assessing the value of heritage resources relative to certain prescribed criteria encapsulated in policies and legal frameworks.

This section presents a statement of CS as relevant to the newly identified heritage resources and greater cultural landscape of the site-specific study area. The statement of significance considers the identified heritage resources and landscape importance or contribution to four broad value categories: aesthetic, historical, scientific and social values, to summarise the CS and other values described in Section 3(3) of the NHRA.

The site-specific study area is known to comprise tangible and intangible heritage resources ranging from palaeontological through to the historical period⁷. These resources do not occur in isolation from one another but are rather as temporal palimpsests⁸. These resources must be considered within the context of the cultural heritage baseline to provide a meaningful interpretation of the CS of the individual resources, their interactions through time, and the multi-layered landscape.

Table 5-1 provides a summary of the determined CS of the various heritage resource types known to occur within the site-specific and local study areas as relevant to the newly-identified heritage resources⁹.

⁷ Refer to Section 5 of the HIA report for a description of the cultural landscape within which the Project is located.

⁸ An assemblage of material and objects that form part of the same deposit but are of different ages and 'life' span (Bailey, 2007).

⁹ Refer to Section 7 of the HIA report for the CS value of all heritage resources identified within the greater Project area.

Table 5-1: CS of the Known Heritage Resource Types within the Site-Specific and Local Study Areas

Resource ID	Resource Period	Type	Description	Aesthetic	Historic	Scientific	Social	INTEGRITY	VALUE	Designation
MSA	Middle Stone Age (c. 300 kya to 30 kya) (MSA)	Occurrence	High proportion of minimally modified blades and points produced from good quality raw material, including hornfels (which is highly patinated) and quartz. Occur widely over the landscape mostly through geological action rather than human.	3	-	1	-	2	4	Negligible
LSA Occurrences	Later Stone Age (c. 30 kya to 2 000 years ago [ya]) (LSA)	Occurrence	Accumulations characterised by un-patinated hornfels.	1	3	4	5	3	10	Low
Rock Engravings	Later Stone Age (c. 30 kya to 2 000 ya) (LSA)	Rock art	Images produced by incising, chipping, or pecking to depict imagery of realistic and proportionally correct animals, human figures and shamanistic concepts	4	4	4	5	4	17	High

Resource ID	Resource Period	Type	Description	Aesthetic	Historic	Scientific	Social	INTEGRITY	VALUE	Designation
LSA	LSA Herder period (after 2 000 ya to c. 1000 CE)	Site	Lithics dominated by coarse irregular flakes commonly on quarts, with small or absent retouched component. Associated with thin walled ceramics	1	3	3	4	4	11	Medium
Rock Paintings	LSA Herder period (after 2 000 ya to c. 1000 CE)	Rock art	Limited and distinctive set of geometric forms, such as circular outlines, crosses, lines, concentric circles, oblong forms and finger-applied dots	4	4	4	5	4	17	High
Historic Built Environment	Union of South Africa (1910 CE to 1961 CE)	Site	Farmstead ruins and complexes as tangible markers of a historically layered cultural landscape	3	4	2	3	2	6	Low



6 Heritage Impact Assessment

The assessment of potential impacts to heritage resources considers the aforementioned Project description as included in Section 1.1 above and the associated construction and operation activities. These are discussed in the context of the various heritage resource types and summarised into a consolidated assessment of the cultural landscape as a zone of entanglement and palimpsest of these heritage resources.

6.1 Palaeontological Impact Assessment

No fossils were identified during the site inspection and no direct impacts to the fossil heritage are envisaged. This notwithstanding, there is potential for fossils to be encountered during construction activities. Table 6-1 below presents an overview of the geological setting underlying the three amended footprints and summarises the palaeosensitivity¹⁰ of these layers. Based on previous records, vertebrate fossils are extremely rare and plants are absent from the Tierkloof Formation. The presence of the dolerite dykes within the HIRAX footprint suggests that it is unlikely that a significant fossil find will be encountered in this area.

Due to the potential for fossil heritage, Digby Wells recommends that the Fossil Finds Procedure (FFP) developed in the previous HRM process be implemented during the construction of the HIRAX, Visskerskloof construction camp and the PV plant.

Table 6-1: Geological Context and Palaeontological Sensitivities of the Infrastructure Areas

Lithostratigraphic Units		Sensitivity	Fossil Heritage
Beaufort Group	Teekloof Formation	Very High	Diverse terrestrial and freshwater tetrapods of <i>Tapinocephalus</i> to <i>Lystrosaurus</i> Biozones (amphibians, true reptiles, synapsids – especially therapsids), palaeoniscoid fish, freshwater bivalves, trace fossils (including tetrapod trackways) and sparse vascular plants (<i>Glossopteris</i> Flora, including petrified wood)
	Abrahamskraal Formation		
Ecca Group	Waterford Formation	Moderate	Non-marine trace fossils, vascular plants (including petrified wood) and palynomorphs of <i>Glossopteris</i> flora, mesosaurid reptiles, fish (including microvertebrate remains, coprolites), crustaceans, sparse marine shelly invertebrates (molluscs, brachiopods), microfossils (radiolarians <i>etc</i>) and insects.
	Kookfontein Formation		
	Skoorsteenberg Formation		
	Tierberg Formation		
	Collingham Formation		

¹⁰ As per the SAHRIS palaeosensitivity Map (PSM) and the SAHRIS Fossil Heritage Browser (2013). Accessible at: <https://sahris.sahra.org.za/map/palaeo> and <https://sahris.sahra.org.za/fossil-heritage-layer-browser>



Lithostratigraphic Units		Sensitivity	Fossil Heritage
	Whitehill Formation	Very High	Mesosaurid reptiles, rare cephalochordates, variety of palaeoniscoid fish, small eocarid crustaceans, insects, low diversity of trace fossils (e.g. king crab trackways, possible shark coprolites), palynomorphs, and petrified wood and other sparse vascular plant remains (<i>Glossopteris</i> leaves, lycopods etc).
	Prince Albert Formation	High	Low diversity marine invertebrates (bivalves, nautiloids, brachiopods), palaeoniscoid fish, sharks, fish coprolites, protozoans (foraminiferans, radiolarians), petrified wood, palynomorphs (spores, acritarchs), non-marine trace fossils (especially arthropods, fish, also various "worm" burrows), possible stromatolites and oolites
Dwyka Group		Low	Trace fossils, organic-walled microfossils, rare marine invertebrates (e.g. molluscs), fish, vascular plants, interglacial and post-glacial trace fossil assemblages and there is a possibility of body fossils (e.g. molluscs, fish, plants).

6.2 Archaeological Impact Assessment

This section assesses potential impacts to archaeological resources from the Project. In accordance with the SAHRA Minimum Standards (2007), heritage resources with negligible CS are considered sufficiently recorded through their inclusion in a HIA report and no further mitigation is deemed necessary. This is applicable to HST-001 as recorded in Section 4 above and this resource is not assessed any further.

The assessment of the envisaged impacts from Project activities are summarised in Table 6-2 to Table 6-4 below. Table 6-2 is applicable to the following sites: SA-019, SA-020, SA-021, SA-022 and SA-023. Table 6-3 applies to MDX-004 and Table 6-4 to RA-011.

**Table 6-2: Summary of the Assessment of Impacts to Stone Age Resources of Low CS**

IMPACT DESCRIPTION: Direct impacts to Stone Age occurrences with low CS				
Dimension	Rating	Motivation		
PRE-MITIGATION				
Duration	Permanent (7)	Unmitigated impacts to these sites will result in permanent damage or destruction, or in the permanent loss of context if the artefacts in the scatter are removed without being recorded.	Consequence: Moderately detrimental (-12)	Significance: Minor – negative (-72)
Extent	Municipal Area (4)	Damage or destruction of these sites will impact the heritage and cultural landscape of the region in the context of the baseline presented.		
Intensity x type of impact	Very low - negative (-1)	Any impacts to these resources will be considered a negative change to resources of low CS.		
Probability	Highly probable (6)	Considering the nature of the Project and the extent of the development footprint in relation to the known distribution of these sites, it is most likely that the negative impact will manifest.		
MITIGATION:				
<p>The identified heritage resources should be maintained <i>in situ</i> as far as is feasible. Digby Wells recommends that SARAO establish a buffer of 50 m around known Stone Age sites with a low CS value. This recommendation is applicable sites SA-019 and SA-020, which will be impacted by the access road as presently proposed.</p> <p>Where the proposed infrastructure that is less likely to move overlies the heritage resources or lies within 50 m of the heritage resources, Digby Wells recommends a suitably-qualified archaeologist undertake a Heritage Watching Brief during construction activities. This recommendation is applicable to the following identified heritage resources: SA-021, SA-022 and SA-023.</p>				
POST-MITIGATION				
Duration	Transient (1)	Where these recommendations are adopted, any impact that may manifest will be transient and will not affect the heritage value.	Consequence: Negligible (3)	Significance: Negligible – positive (15)
Extent	Very limited (1)	Isolated aspects of individual resources will be affected		



IMPACT DESCRIPTION: Direct impacts to Stone Age occurrences with low CS				
Dimension	Rating	Motivation		
Intensity x type of impact	Very low - positive (1)	Adoption of the proposed mitigation measures will result in a positive change to a resource with low CS		
Probability	Likely (5)	Through implementation of the recommended management and mitigation measures, identified negative impacts will be avoided, or where not possible, the positive impacts enhanced.		

Table 6-3: Summary of the Assessment of Impacts to Multi-Layered Resources of Low CS

IMPACT DESCRIPTION: Direct impacts to multi-layered sites with low CS				
Dimension	Rating	Motivation		
PRE-MITIGATION				
Duration	Permanent (7)	Any unmitigated impacts to the multi-layered sites will result in a permanent loss of the heritage resource.	Consequence: Moderately detrimental (-11)	Significance: Minor – negative (-66)
Extent	Local (3)	The loss of this heritage resource of will affect the local environment and the local cultural landscape.		
Intensity x type of impact	Very low - negative (-1)	The loss of the resource of this werf will be considered a negative impact to a heritage resource of low CS.		
Probability	Highly probable (6)	Considering the nature of the Project and the current proposed layout of the infrastructure, the impact will most likely occur.		



IMPACT DESCRIPTION: Direct impacts to multi-layered sites with low CS				
Dimension	Rating	Motivation		
MITIGATION:				
<p>These impacts and recommendations are applicable to MXD-004.</p> <p>Digby Wells recommends that the layout of the construction camp proposed at the Visskerskloof farmhouse be amended to avoid the multi-layered site and incorporate a 25 m buffer around this resource. The site must then be incorporated into the existing CMP.</p> <p>Should the redesign of the proposed construction camp layout not be feasible, SARAO must undertake both a Section 34 and Section 35 Destruction Permit Application process in compliance with Sections 34 and 35 of the NHRA and Chapters III and IV of the NHRA Regulations 2000, Government Notice Regulations (GN R) 548. The identified heritage and associated adjacent structures must be recorded in detail in support of the application for demolition, and as a method of "preservation through record". Records should consist of photographs, measured drawings and may include <i>inter alia</i> distribution and density mapping, surface collections and test excavations.</p> <p>The post-mitigation scenario assumes that the infrastructure layout design will be amended.</p>				
POST-MITIGATION				
Duration	Beyond project life (6)	Should the heritage resource be conserved <i>in situ</i> as part of the CMP, this benefit will extend beyond the Project lifetime.	Consequence: Slightly beneficial (9)	Significance: Minor – positive (45)
Extent	Limited (2)	The conservation <i>in situ</i> will apply to the individual site.		
Intensity x type of impact	Very low - positive (1)	<i>In situ</i> conservation will be considered a positive impact on a heritage resource of low CS.		
Probability	Likely (5)	Given the nature of the Project and the existing CMP, it is likely that the envisaged benefits will manifest.		

**Table 6-4: Summary of the Assessment of Impacts to Rock Art Resources of High CS**

IMPACT DESCRIPTION: Indirect impacts to Rock Art with medium CS				
Dimension	Rating	Motivation		
PRE-MITIGATION				
Duration	Permanent (7)	Unmitigated impacts may result in the permanent damage, or in extreme cases destruction, of Rock Art sites inherently associated with the /Xam, Khoekhoe and physical landscape.	Consequence: Extremely detrimental (-20)	Significance: Moderate – negative (-80)
Extent	National (6)	Damage or destruction to this site, considering its affiliation with the /Xam, San in general and Khoekhoe, is considered an impact to a resource important in the pattern of the country's history.		
Intensity x type of impact	Extremely high - negative (-7)	Any indirect impacts resulting in the damage or destruction of Rock Art sites is considered a major change to heritage resources with a high CS		
Probability	Probable (4)	Considering the nature of the Project and the extent of the development footprint in relation to the location of these heritage resources, it is unlikely that the impact will manifest, but it is still possible.		
MITIGATION:				
<p>The identified heritage resources must be maintained <i>in situ</i>. It is recommended that a minimum buffer of 50 m be established around all known Rock Art sites. Established buffers must be clearly demarcated during the construction phase.</p> <p>This recommendation is applicable to RA-011.</p>				
POST-MITIGATION				
Duration	Transient (1)	The proposed recommendation will remove the identified potential impact.	Consequence: Slightly detrimental (-7)	Significance: Negligible – negative (-7)
Extent	Very limited (1)	If an impact does manifest through unplanned events, it will be limited to select resources.		



IMPACT DESCRIPTION: Indirect impacts to Rock Art with medium CS				
Dimension	Rating	Motivation		
Intensity x type of impact	High – negative (-5)	Any unplanned events manifesting on these resources, where the recommended management measures are adopted, will result in a minor change to a heritage resource with high CS.		
Probability	Highly unlikely (1)	Considering the nature of the Project and the extent of the development footprint in relation to the location of these heritage resources, it is highly-unlikely that an impact will manifest.		

6.3 Historical Built Environment Assessment

This section assesses the impacts to the historical built environment resources from the Project. HST-002 is the only additional built heritage resource identified in the pre-disturbance survey and the assessment of the potential impact to this resource is described in Table 6-5 below.

Table 6-5 Summary of the Assessment of Impacts to Historical Resources of Low CS

IMPACT DESCRIPTION: Direct impacts to historical resources with low CS				
Dimension	Rating	Motivation		
PRE-MITIGATION				
Duration	Permanent (7)	Unmitigated impacts to or the demolition of structures will be permanent.	Consequence: Moderately detrimental (-11)	Significance: Minor – negative (-66)
Extent	Local (3)	The loss of the historical components of this werf will affect the local environment and the other built structures therein.		
Intensity x type of impact	Very low - negative (-1)	The loss of the historical components of this werf will be considered a negative impact to a heritage resource of low CS.		
Probability	Highly probable (6)	Considering the nature of the Project and the current proposed layout of the infrastructure, the impact will most likely occur.		



IMPACT DESCRIPTION: Direct impacts to historical resources with low CS				
Dimension	Rating	Motivation		
MITIGATION:				
<p>These impacts are applicable to HST-002.</p> <p>Digby Wells recommends that the layout of the construction camp proposed at the Visskerskloof farmhouse be amended to avoid the historical components of the werf and incorporate a 25 m buffer around these components. The historical components of the werf must then be incorporated into the existing CMP.</p> <p>Should the redesign of the proposed construction camp layout not be feasible, SARAO must undertake a Section 34 Destruction Permit Application process in compliance with Section 34 of the NHRA and Chapter III of GN R 548. The identified heritage and associated adjacent structures must be recorded in detail in support of the application for demolition, and as a method of "preservation through record". Records should consist of photographs and measured drawings.</p> <p>The post-mitigation scenario assumes that the infrastructure layout design will be amended.</p>				
POST-MITIGATION				
Duration	Beyond project life (6)	Should the heritage resource be conserved <i>in situ</i> as part of the CMP, this benefit will extend beyond the Project lifetime.	Consequence: Slightly beneficial (9)	Significance: Minor – positive (45)
Extent	Limited (2)	The conservation <i>in situ</i> will apply to the individual werf.		
Intensity x type of impact	Very low - positive (1)	<i>In situ</i> conservation will be considered a positive impact on a heritage resource of low CS.		
Probability	Likely (5)	Given the nature of the Project and the existing CMP, it is likely that the envisaged benefits will manifest.		

7 Recommendations

As demonstrated in the HIA report and as alluded to in the preceding sections, the SKA Project occurs within a sensitive cultural landscape. Digby Wells has made several specific and general recommendations to manage or mitigate against the identified impacts described in Section 6 above. Table 7-1 details the recommendations specific to newly-identified heritage resources within the Project area and Table 7-2 the general recommendations applicable to these heritage resources.

**Table 7-1: Specific Recommendations**

Aspect	Recommendations	Description
Palaeontology	Implementation of the FFP developed in the previous HRM process.	The FFP must be implemented during construction activities for the HIRAX, Visserskloof construction camp and the PV plant. As per the requirements of the FFP, responsible persons must be trained in the FFP. <i>(SARAO plans to implement such training prior to the commencement of the construction phase of the Project).</i>
Archaeology	<i>In situ</i> conservation of identified heritage resources	Identified heritage resources must remain <i>in situ</i> with a demarcated no-go buffer zone between heritage resources and Project activities. Signage must be established to indicate the presence of the resource. The heritage resources must be included in the existing CMP. This recommendation with a 50 m buffer applies to: SA-019 and SA-020. Where Project infrastructure redesign is feasible, this recommendation applies to SA-021, SA-022 and SA-023 as well. This recommendation with a 25 m buffer applies to MXD-004.
	Heritage Watching Brief	A suitably-qualified archaeologist must undertake a Watching Brief during earth-moving activities in proximity to identified heritage sites to record all material culture remains that may be exposed. The results of the Watching Brief must be compiled into a Watching Brief Report and submitted to SAHRA for noting.
	Detailed recording of identified archaeological resources	Where the realignment of proposed infrastructure within the defined 50 m buffer is not feasible, the identified heritage resources must be recorded in detail prior to the construction phase. This may include <i>inter alia</i> , distribution and density mapping, surface collection and test excavations of archaeological material subject to the approval of a Section 35 Permit. This recommendation applies to: SA-019, SA-020, SA-021, SA-022 and SA-023 and MXD-004. Where applicable, this may also include detailed recording of identified heritage and adjacent structures as part of a Section 34 Destruction Permit Application process should the historical structure not be avoided. This recommendation is applicable to MXD-004.



Aspect	Recommendations	Description
Built Heritage	<i>In situ</i> conservation of identified heritage resources	Identified heritage resources must remain <i>in situ</i> with a demarcated no-go buffer zone between heritage resources and Project activities. Signage must be established to indicate the presence of the resource. The heritage resources must be included in the existing CMP. This recommendation with a 25 m buffer applies to HST-002.

Table 7-2: General Recommendations

Recommendation	Description
Structures older than 60 years are subject to permitting requirements	Structures older than 60 years are afforded general protection and subject to permitting requirements stipulated under Sections 27 & 34 of the NHRA and regulated by Chapter IV of GN R 548. Individual permit applications must therefore be submitted for each protected building proposed for demolition. The affected structures must be recorded in detail prior to their alteration or destruction. This will include <i>inter alia</i> photographs and measured drawings.

8 Summary and Conclusion

This document constitutes an addendum to the HRM process in support of the SKA Project. This assessment focused on three amendments to the approved Project design. Digby Wells undertook the following tasks to provide SARAO with specialist heritage assessments in accordance with monitoring requirements captured in of the CMP:

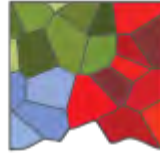
- A pedestrian survey of the specific amended footprint areas by suitably qualified archaeologists and a palaeontologist to identify potential cultural and fossil heritage resources that may be affected by the Project;
- Definition of the CS of identified heritage resources in keeping with the CS of the surrounding cultural landscape and in line with the methodologies employed in the HRM process;
- Identification of the potential impacts to the newly-identified heritage resources from the amended Project activities; and
- A summary of reasonable recommendations to mitigate and manage the identified impacts to the heritage resources.



Through consideration of the potential impacts to heritage resources and the cultural heritage landscape within which the Project is situated (as described in the HIA report), Digby Wells has no objections to the proposed amendments to the Project, provided the recommendations outlined in Section 7 above are implemented.



Appendix A: Heritage Impact Assessment Methodology



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Cultural Significance, Field Rating and Impact Assessment

Methodology Statement

Project Number:

ZZZ9999

Prepared for:

Internal Document

June 2019

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This document has been prepared by Digby Wells Environmental.

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Project Name:	Cultural Significance, Field Rating and Impact Assessment
Project Code:	ZZZ9999

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Name	Responsibility	Version	Date
Johan Nel ASAPA Member 095	HRM Unit Manager	Ver. 1	May 2014
		Ver. 2	October 2014
		Ver. 3	May 2015
Justin du Piesanie ASAPA Member 270	Divisional Manager: Social and Heritage Services	Ver. 4	January 2016
		Ver. 5	June 2016
		Ver. 6	June 2019

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1 Introduction

Cultural heritage resources are intrinsic to the history and beliefs of communities. They characterise community identity and cultures, are finite, non-renewable and irreplaceable. Considering the innate value of cultural heritage resources, Heritage Resources Management (HRM) acknowledges that these have lasting worth as evidence of the origins of life, humanity and society. It is incumbent of the assessor to determine the cultural significance¹ (CS) of cultural heritage resources to allow for the implementation of appropriate management. This is achieved through assessing cultural heritage resources' value relative to certain prescribed criteria encapsulated in policies and legal frameworks, such as the South African National Heritage Resources Act, 1999 (Act No. 25 of 1999) (NHRA).

Commensurate to the NHRA, with specific reference to Section 38, this methodology aims to ensure that clients protect cultural heritage during implementation of project activities by either avoiding, removing or reducing the intensity of adverse impacts to tangible² and intangible³ cultural heritage resources within the defined area of influence.

The methodology to define CS and assess the potential effects of a project is discussed separately in the sections below.

2 Evaluation of Cultural Significance and Field Ratings

2.1 Cultural Significance Determination

Digby Wells developed a CS Determination Methodology to assign identified cultural heritage resources with a numerical CS rating in an objective as possible way and that can be independently reproduced provided that the same information sources are used, should this be required.

This methodology determines the intrinsic, comparative and contextual significance of identified cultural heritage resources by considering their:

1. Importance rated on a six-point scale against four criteria; and
2. Physical integrity rated on a five-point scale.

¹ Cultural significance is defined as the intrinsic "aesthetic, architectural, historical, scientific, social, spiritual, linguistic or technological value or significance" of a cultural heritage resource. These attributes are combined and reduced to four themes used in the Digby Wells significance matrix: aesthetic, historical, scientific and social.

² (i) Moveable or immovable objects, property, sites, structures, or groups of structures, having archaeological (prehistoric), paleontological, historical, cultural, artistic, and religious values; (ii) unique natural features or tangible objects that embody cultural values, such as sacred groves, rocks, lakes, and waterfalls.

³ Cultural knowledge, innovations, and practices of communities embodying traditional lifestyles.

The assigned ratings consider information obtained through a review of available credible sources and representativity or uniqueness (i.e. known examples of similar resources to exist), as well as the current preservation *status-quo* as observed.

Figure 2-2 depicts the CS formula and importance criteria, and it describes ratings on the importance physical integrity scales

2.2 Field Rating Determination

Grading of heritage resources remains the responsibility of heritage resources authorities. However, the South African Heritage Resources Agency (SAHRA) Minimum Standards requires heritage reports include Field Ratings for identified resources to comply with section 38 of the NHRA. Section 7 of the NHRA provides for a system of grading of heritage resources that form part of the national estate and distinguishes between three categories.

The field rating process is designed to provide a numerical rating of the recommended grading of identified heritage resources. The evaluation is done as objectively as possible by integrating the field rating into the significance matrix.

Field ratings guide decision-making in terms of appropriate minimum required mitigation measures and consequent management responsibilities in accordance with Section 8 of the NHRA. Figure 2-1 presents the formula and the parameters used to determine the Field Ratings.

Field Rating = Average Sum of Aesthetic + Historic + Scientific + Social			
rated against			
Value	Field Rating	Designation	Authority
0	Resource not assessed	None	None
1	Resources afforded general protection in terms of Sections 34 to 37 of the NHRA and with negligible significance	Grade IV C	Local
2	Resources afforded general protection in terms of Sections 34 to 37 of the NHRA and with low significance	Grade IV B	
3	Resources afforded general protection in terms of Sections 34 to 37 of the NHRA and with medium-high significance	Grade IV A	
4	Resources afforded general protection in terms of Sections 34 to 37 of the NHRA and with high significance	Grade III B	
5	Resources afforded general protection in terms of Sections 34 to 37 of the NHRA and with very high significance	Grade II A	
6	Resources under formal protection that can be considered to have special qualities that make them significant within a province or region	Grade II	Provincial
7	Resources under formal protection that can be considered to have special qualities that make them significant within a national or international context	Grade I	National

Figure 2-1: Field Ratings Methodology

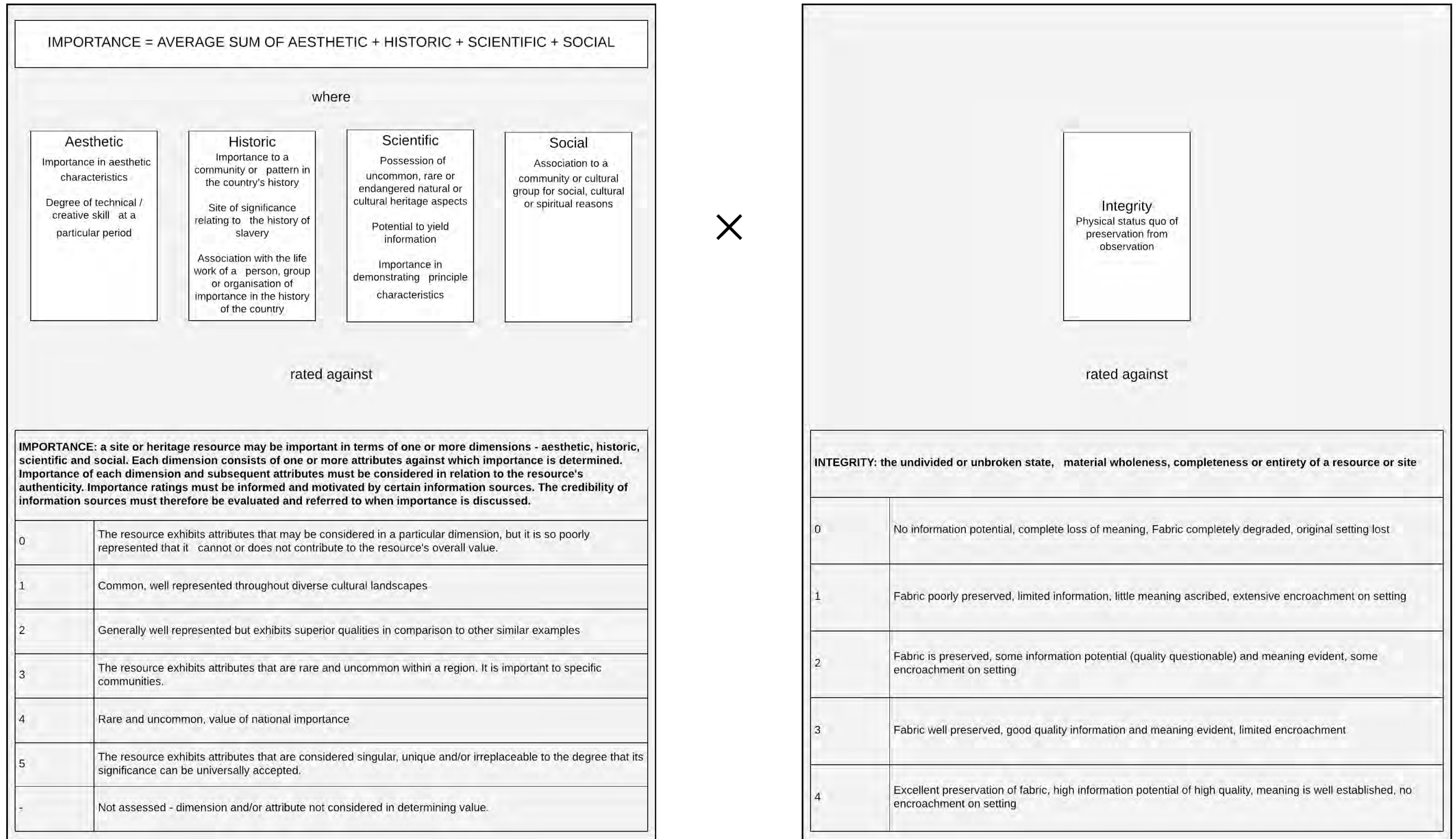


Figure 2-2: CS Determination Methodology

3 Impact Assessment Methodology

The rationale behind CS determination recognises that the value of a cultural heritage resource is a direct indication of its sensitivity to change (impacts) as well as the maximum acceptable levels of change to the resource. Therefore, the assessor must determine CS prior to the completion of any impact assessment.

These requirements in terms of international best practice standards are integrated into the impact assessment methodology to guide both assessments of impacts and recommendations for mitigation and management of resources.

The following are terms and definitions applicable to the Environmental Impact Assessment (EIA) concept (ISO 14001):

- **Project Activity:** Activities associated with the Project that result in an environmental interaction during various phases, i.e. construction, operation and decommissioning, e.g., new processing plant, new stockpiles, development of open pit, dewatering, water treatment plant;
- **Environmental Interaction:** An element or characteristic of an activity, product, or service that interacts or can interact with the environment. Environmental interactions can cause environmental impacts (but may not necessarily do so). They can have either beneficial impacts or adverse impacts and can have a direct and decisive impact on the environment or contribute only partially or indirectly to a larger environmental change;
- **Environmental Aspect:** Various natural and human environments that an activity may interact with. These environments extend from within the activity itself to the global system, and include air, water, land, flora, fauna (including people) and natural resources of all kinds; and
- **Environmental Impact:** A change to the environment that is caused either partly or entirely by one or more environmental interactions. An environmental interaction can have either a direct and decisive impact on the environment or contribute only partially or indirectly to a larger environmental change. In addition, it can have either a beneficial environmental impact or an adverse environmental impact.

The assessment process identified potential issues and impacts through examination of:

- Project phases and activities,
- Interactions between activities and the environmental aspect; and
- The interdependencies between environmental aspects.

Figure 3-1 presents a graphical summary of this concept and Figure 3-2 provides an example of the process.

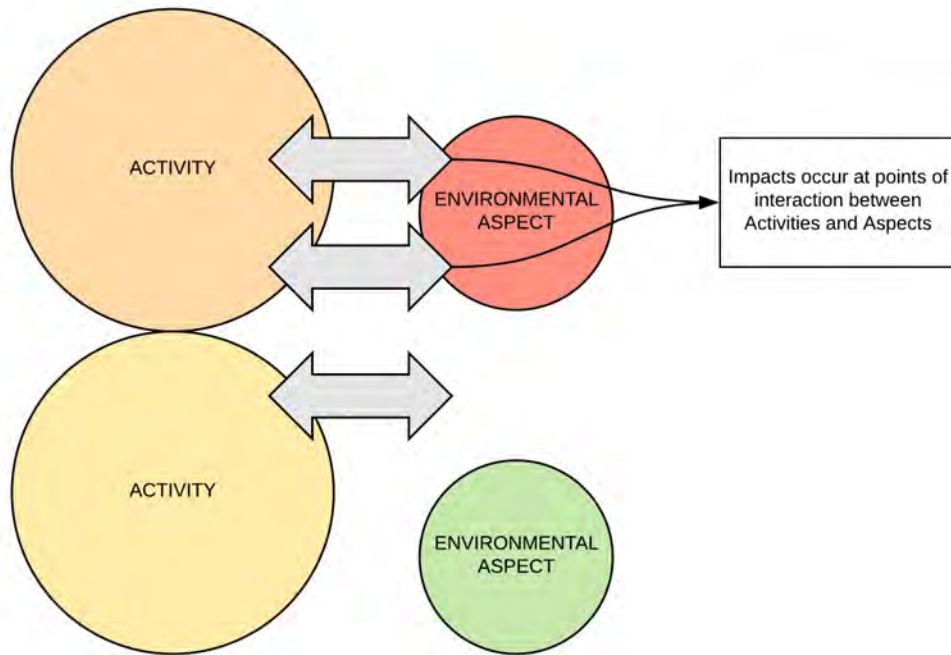


Figure 3-1: Graphical Representation of Impact Assessment Concept

Project Activity & Interaction		Environmental Aspect		Potential Environmental Impact	
Project Phase	Activity	Aspect	Interdependencies	Issue	Potential Impact
This relates to the consideration of the relevant phase of the project. Example: Construction	This refers to one or more of the activities that will be undertaken during the corresponding phase of the project. Example: Topsoil clearing	This identifies and considers the various aspects that will be affected by the project activity. Example: Heritage, Biophysical, and Social	This identifies and considers the interdependencies between the various aspects and how they may be impacted upon by the relevant activity. Example: Removal of topsoil will impact on flora which may have heritage and social implications	The issues considers the activity in relation to the identified aspects and interdependencies. Note: Activities and Aspects can have several issues resulting in various impacts. Example: Physical alteration of the land	Potential impacts are a culmination of the various categories evaluated as part of the impact assessment. Example: Topsoil clearing will remove medicinal plants that will erode indigenous knowledge systems and cultural significance.

Figure 3-2: Example of how Potential Impacts are considered



3.1 Categorising Impacts to Cultural Heritage

Impacts may manifest differently among geographical areas and diverse communities. For instance, impacts to cultural heritage resources can simultaneously affect the tangible cultural heritage resource and have social repercussions. The severity of the impact is compounded when the intensity of physical impacts and social repercussions differ significantly, e.g. removal of a grave surface dressings results in a minor physical impact but has a significant social impact. In addition, impacts to cultural heritage resources can influence the determined CS without a physical impact taking place. Given this reasoning, impacts as considered here are generally placed into three broad categories (adapted from Winter & Bauman 2005: 36):

- **Direct or primary impacts** affect the fabric or physical integrity of the cultural heritage resource, for example destruction of an archaeological site or historical building. Direct or primary impacts may be the most immediate and noticeable. Such impacts are usually ranked as the most intense, but can often be erroneously assessed as high-ranking. For example, the destruction of a low-density scatter of archaeological material culture may be assessed as a negatively high impact if CS is not considered;
- **Indirect, induced or secondary impacts** can occur later in time or at a different place from the causal activity, or because of a complex pathway. For example, restricted access to a cultural heritage resource resulting in the gradual erosion of its CS that may be dependent on ritual patterns of access. Although the physical fabric of the cultural heritage resource is not affected through any primary impact, its CS is affected, which can ultimately result in the loss of the resource itself; and
- **Cumulative impacts** result from in-combination effects on cultural heritage resources acting within a host of processes that are insignificant when seen in isolation, but which collectively have a significant effect. Cumulative effects can be:
 - **Additive:** the simple sum of all the effects, e.g. the total number of development activities that will occur within the study area;
 - **Synergistic:** effects interact to produce a total effect greater than the sum of the individual effects, e.g. the effect of each different activity on the archaeological landscape in the study area;
 - **Time crowding:** frequent, repetitive impacts on a cultural heritage resource at the same time, e.g. the effect of regular blasting activities on a nearby rock art site or protected historical building;
 - **Neutralizing:** where the effects may counteract each other to reduce the overall effect, e.g. the effect of changes in land use could reduce the overall impact on sites within the archaeological landscape of the study area; and/or

- **Space crowding:** high spatial density of impacts on a cultural heritage resource, e.g. density of new buildings resulting in suburbanisation of a historical rural landscape.

The fact that cultural heritage resources do not exist in isolation from the wider natural, social, cultural and heritage landscape demonstrates the relevance of the above distinctions: CS is therefore also linked to rarity / uniqueness, physical integrity and importance to diverse communities.

3.2 Impact Assessment

The impact assessment process is designed to provide a numerical rating of the identified potential impacts. This methodology follows the established impact assessment formula:

Impact = consequence of an event x probability of the event occurring

where:

Consequence = type of impact x (Duration + Extent + Intensity)

and

Probability = Likelihood of an impact occurring

In the formula for calculating consequence:

Type of impact = +1 (positive) or -1 (negative)

Table 3-1 presents a description of the duration, extent, intensity and probability ratings. The intensity rating definitions consider the determined CS of the identified cultural heritage resources. These criteria are used to determine the impact ratings as defined in Table 3-2 below. Table 3-3 represents the relationship between consequence, probability and significance.

The impact assessment process considers pre- and post-mitigation scenarios with the intention of managing and/or mitigating impacts in line with the EIA Mitigation Hierarchy, i.e. avoiding all impacts on cultural heritage resources. Where Project-related mitigation does not avoid or sufficiently minimise negative impacts on cultural heritage resources, mitigation of these resources may be required.

Table 3-1: Description of Duration, Extent, Intensity and Probability Ratings Used in the Impact Assessment

Value	CONSEQUENCE						PROBABILITY RATING - A measure of the chance that consequences of that selected level of severity could occur during the exposure window.	
	DURATION RATING - A measure of the lifespan of the impact		EXTENT RATING A measure of how wide the impact would occur		INTENSITY RATING- A measure of the degree of harm, injury or loss.		Probability	Description
	Probability	Description	Exposure	Description	Intensity	Description		
7	Permanent	Impact will permanently alter or change the heritage resource and/or value (Complete loss of information)	International	Impacts on heritage resources will have international repercussions, issues or effects, i.e. in context of international cultural significance, legislation, associations, etc.	Extremely high	Major change to Heritage Resource with High-Very High Value	Certain/Definite	Happens frequently. The impact will occur regardless of the implementation of any preventative or corrective actions.
6	Beyond Project Life	Impact will reduce over time after project life (Mainly renewable resources and indirect impacts)	National	Impacts on heritage resources will have national repercussions, issues or effects, i.e. in context of national cultural significance, legislation, associations, etc.	Very high	Moderate change to Heritage Resource with High-Very High Value	High probability	Happens often. It is most likely that the impact will occur.
5	Project Life	The impact will cease after project life.	Region	Impacts on heritage resources will have provincial repercussions, issues or effects, i.e. in context of provincial cultural significance, legislation, associations, etc.	High	Minor change to Heritage Resource with High-Very High Value	Likely	Could easily happen. The impact may occur.
4	Long Term	Impact will remain for >50% - Project Life	Municipal area	Impacts on heritage resources will have regional repercussions, issues or effects, i.e. in context of the regional study area.	Moderately high	Major change to Heritage Resource with Medium-Medium High Value	Probable	Could happen. Has occurred here or elsewhere
3	Medium Term	Impact will remain for >10% - 50% of Project Life	Local	Impacts on heritage resources will have local repercussions, issues or effects, i.e. in context of the local study area.	Moderate	Moderate change to Heritage Resource with Medium - Medium High Value	Unlikely / Low probability	Has not happened yet, but could happen once in a lifetime of the project. There is a possibility that the impact will occur.

Value	CONSEQUENCE						PROBABILITY RATING - A measure of the chance that consequences of that selected level of severity could occur during the exposure window.	
	DURATION RATING - A measure of the lifespan of the impact		EXTENT RATING A measure of how wide the impact would occur		INTENSITY RATING- A measure of the degree of harm, injury or loss.		Probability	Description
	Probability	Description	Exposure	Description	Intensity	Description		
2	Short Term	Impact will remain for <10% of Project Life	Limited	Impacts on heritage resources will have site specific repercussions, issues or effects, i.e. in context of the site-specific study area.	Low	Minor change to Heritage Resource with Medium - Medium High Value	Rare / Improbable	Conceivable, but only in extreme circumstances. Have not happened during the lifetime of the project, but has happened elsewhere. The possibility of the impact materialising is very low as a result of design, historic experience or implementation of adequate mitigation measures
1	Transient	Impact may be sporadic/limited duration and can occur at any time. E.g. Only during specific times of operation, and not affecting heritage value.	Very Limited	Impacts on heritage resources will be limited to the identified resource and its immediate surroundings, i.e. in context of the specific heritage site.	Very low	No change to Heritage Resource with values medium or higher, or Any change to Heritage Resource with Low Value	Highly Unlikely /None	Expected never to happen. Impact will not occur.

Table 3-2: Impact Significance Scores, Descriptions and Ratings

Score	Description	Rating
109 to 147	A very beneficial impact which may be sufficient by itself to justify implementation of the project. The impact may result in permanent positive change.	Major (positive)
73 to 108	A beneficial impact which may help to justify the implementation of the project. These impacts would be considered by society as constituting a major and usually a long-term positive change to the heritage resources.	Moderate (positive)
36 to 72	An important positive impact. The impact is insufficient by itself to justify the implementation of the project. These impacts will usually result in positive medium to long-term effect on the heritage resources.	Minor (positive)
3 to 35	A small positive impact. The impact will result in medium to short term effects on the heritage resources.	Negligible (positive)
-3 to -35	An acceptable negative impact for which mitigation is desirable but not essential. The impact by itself is insufficient even in combination with other low impacts to prevent the development being approved. These impacts will result in negative medium to short term effects on the heritage resources.	Negligible (negative)
-36 to -72	An important negative impact which requires mitigation. The impact is insufficient by itself to prevent the implementation of the project but which in conjunction with other impacts may prevent its implementation. These impacts will usually result in negative medium to long-term effect on the heritage resources.	Minor (negative)
-73 to -108	A serious negative impact which may prevent the implementation of the project. These impacts would be considered by society as constituting a major and usually a long-term change to the heritage resources and result in severe effects.	Moderate (negative)
-109 to -147	A very serious negative impact which may be sufficient by itself to prevent implementation of the project. The impact may result in permanent change. Very often these impacts are immitigable and usually result in very severe effects.	Major (negative)

Table 3-3 Relationship between Consequence, Probability and Significance

Relationship between consequence, probability and significance ratings																																						
Probability	Significance																																					
	7	-147	-140	-133	-126	-119	-112	-105	-98	-91	-84	-77	-70	-63	-56	-49	-42	-35	-28	-21	21	28	35	42	49	56	63	70	77	84	91	98	105	112	119	126	133	140
6	-126	-120	-114	-108	-102	-96	-90	-84	-78	-72	-66	-60	-54	-48	-42	-36	-30	-24	-18	18	24	30	36	42	48	54	60	66	72	78	84	90	96	102	108	114	120	126
5	-105	-100	-95	-90	-85	-80	-75	-70	-65	-60	-55	-50	-45	-40	-35	-30	-25	-20	-15	15	20	25	30	35	40	45	50	55	60	65	70	75	80	85	90	95	100	105
4	-84	-80	-76	-72	-68	-64	-60	-56	-52	-48	-44	-40	-36	-32	-28	-24	-20	-16	-12	12	16	20	24	28	32	36	40	44	48	52	56	60	64	68	72	76	80	84
3	-63	-60	-57	-54	-51	-48	-45	-42	-39	-36	-33	-30	-27	-24	-21	-18	-15	-12	-9	9	12	15	18	21	24	27	30	33	36	39	42	45	48	51	54	57	60	63
2	-42	-40	-38	-36	-34	-32	-30	-28	-26	-24	-22	-20	-18	-16	-14	-12	-10	-8	-6	6	8	10	12	14	16	18	20	22	24	26	28	30	32	34	36	38	40	42
1	-21	-20	-19	-18	-17	-16	-15	-14	-13	-12	-11	-10	-9	-8	-7	-6	-5	-4	-3	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21
	-21	-20	-19	-18	-17	-16	-15	-14	-13	-12	-11	-10	-9	-8	-7	-6	-5	-4	-3	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21
	Consequence																																					

4 Recommended Management and Mitigation Measures

The CS of an identified heritage resource informs the level of the identified potential impact to that resource which in turn informs the recommended management and mitigation requirements. Table 4-1 presents an overview of the minimum recommended mitigation requirements considering the CS of the heritage resource.

Table 4-1: Minimum Recommended Management or Mitigation Requirements Considering CS

Determined CS	Minimum Management / Mitigation Requirements ⁴
Negligible	Sufficiently recorded through assessment, no mitigation required
Low	Resource must be recorded before destruction, may include detailed mapping or surface sampling
Medium	Mitigation of the resource to include detailed recording and limited test excavations
Medium-High	Project design must aim to minimise impacts; Mitigation of resources to include extensive sampling through test excavations and analysis
High	Project design must aim to avoid impacts; Cultural heritage resource to be partially conserved, must be managed by way of Conservation Management Plan
Very High	Project design must be amended to avoid all impacts; Cultural heritage resources to be conserved in entirety and conserved and managed by way of Conservation Management Plan

The desired outcome of an impact assessment is the avoidance of all negative impacts and enhancement of positive ones. While this is not always possible, the recommended management or mitigation measures must be reasonable and feasible taking into consideration the determined CS and nature of the Project.

Two categories of impact management options are considered: avoidance and mitigation.

Avoidance requires changes or amendments to Project design, planning and siting of infrastructure to avoid physical impacts on heritage resources. It is the preferred option, especially where cultural heritage resources with high – very-high CS will be impacted.

⁴ Based on minimum requirements encapsulated in guidelines developed by SAHRA



Mitigation of cultural heritage resources may be necessary where avoidance is not possible, thus resulting in partial or complete changes (including destruction) to a resource. Such resources need to be protected until they are fully recorded, documented and researched before any negative impact occurs. Options for mitigating a negative impact can include minimization, offsets, and compensation. Examples of mitigation measures specific to cultural heritage include:

- Intensive detailed recording of sites through various non-intrusive techniques to create a documentary record of the site – “preservation by record”; and
- Intrusive recording and sampling such as shovel test pits (STPs) and excavations, relocation (usually burial grounds and graves, but certain types of sites may be relocated), restoration and alteration. Any form of intrusive mitigation is normally a regulated permitted activity for which permits⁵ need to be issued by the Heritage Resource Authorities (HRAs). Such mitigation may result in a reassessment of the value of a cultural heritage resource that could require conservation measures to be implemented. Alternatively, an application for a destruction permit may be made if the resource has been sufficiently sampled.

Where resources have negligible CS, the specialist may recommend that no further mitigation is required, and the site may be destroyed where authorised.

Community consultation is an integral activity to all above-mentioned avoidance and mitigation measures.

⁵ Permit application processes must comply with the relevant Section of the NHRA and applicable Chapter(s) of the NHRA Regulations, 2000 (Government Notice Regulation [GN R] 548) and must be issued by SAHRA or the Provincial Heritage Resources Authority (PHRA) as is applicable.



Appendix B: Recording Forms

SITE RECORDING AND PRELIMINARY CONDITIONAL ASSESSMENT FORM



DIGBY WELLS
ENVIRONMENTAL

Recorder:	Shannon		Date:	03/12/2019	
Classification:	Immovable	Movable X	Intangible		
Location:	HIRAX Footprint (farm Swartfontein)		Photograph Numbers:	812 to 819	
Ref No:	SA-019		Co-ordinates	30°41'25.07"S	21°34'27.62"E
<small>Site name/number or other reference</small>			<small>Decimal degrees using the WGS84 datum</small>		
1. Immovable Heritage Resources					
SAHRIS ID Reference:	<small>where applicable</small>				
Type of resource:	<small>See form</small>	Age / Industry / Period:	<small>Cultural period / style / associated persons / history</small>		
Resource Description Summary:	<small>See form</small>				
Functional Type:		Current Function:	<small>Original / changed from past / current function</small>		
<i>Please proceed to Section 4</i>					
2. Movable Heritage Resources					
SAHRIS ID Reference:	N/A				
Type of resource:	Archaeological artefact		Age / Industry / Period:	Stone Age (MSA and LSA)	
Resource Description Summary:	Artefact: Low density surface scatter, <10:1 m ² Represents the MSA and LSA				
Quantity recorded:	<10:1 m ²				
<i>Please proceed to Section 4</i>					
3. Intangible Heritage Resources					
SAHRIS ID Reference:					
Type of resource:		To whom is the resource significant?			
Describe the resource or summarise provided information:					
Informant / source of information:					Wishes to remain anonymous
<i>Please proceed to Section 4</i>					

Type of Resource: Archaeological: Artefacts, Rock Art, Deposit, Shell Midden, Ruin > 100 years, Stone walling, Settlement; Living heritage / sacred site; Battlefield; Burial Grounds and Graves; Conservation Area; Cultural Landscape; Geological; Meteorites; Monuments & Memorials; Natural, Palaeontological; Place; Structure: bridge, building, transport infrastructure; Underwater: Shipwreck, Submerged (intertidal, partially submerged, fully submerged).

Summary Description: Artefact: Isolated surface, Artefact: Low density surface scatter, <10:1 sq m, Artefact: medium density surface scatter, <20:1 sq m, Artefact: high density surface scatter, >20:1 sq m, Artefact: embedded in rock matrix, Burial ground: Undetermined, Single grave, ≤10 graves, ≤50 graves, >100 graves; Deposit: ash, ≤1 cm, ~5 cm, ~10 cm, >20 cm; Deposit: charcoal; Deposit: Faunal; Deposit: Kraal; Fossil, hominin: embedded in rock matrix; Fossil, hominin: tracks; Fossil, invertebrate: embedded in rock matrix; Fossil, invertebrate: isolated surface; Fossil, invertebrate: tracks; Fossil, plant: embedded in rock matrix; Fossil, plant: isolated surface; Fossil, vertebrate: embedded in rock matrix; Fossil, vertebrate: isolated surface; Fossil, vertebrate: tracks; Fossil: breccia with visible remains; Fossil: breccia without visible remains; Rock art: combination; Rock art: engraving; Rock art: painting; Shelter: including artefact/s;

Shelter: including artefact/s + deposit; Shelter: including artefact/s + deposit + structures; Shelter: rock art + artefacts / deposit / structures; Shelter: rock art combination; Shelter: rock art engraving; Shelter: rock art painting; Site: high complexity, multiple components >2500 sq m / 50 x 50 m; Site: low complexity, multiple components <25 sq m / 5 x 5 m; Site: medium complexity, multiple components >25 sq m / 5 x 5 m to <2500 sq m / 50 x 50 m; Structural: complex, e.g. weir; Structural: functional, e.g. fences, wind pumps, troughs; Structural: industrial, e.g. warehouse, headgear; Structural: remains, e.g. daga, hut floor, foundations, bricks; Structural: stonewall; Other

SITE RECORDING AND PRELIMINARY CONDITIONAL ASSESSMENT FORM



DIGBY WELLS
ENVIRONMENTAL

4. Description and Notes						
Restrictions/sensitivities: <i>Please note any restrictions with regard to this heritage resource and/or information obtained by an informant</i>	None X	No photographs		Do not publish		
	Other:					
	Reason for Restrictions:	N/A				
Please provide a brief description of the resource:	<p>Low-density background scatter of lithics, all made from hornfels. All but one flake is patinated (unpatinated flakes are generally considered to represent the LSA).</p> <p>The scatter includes end- and side-scrapers and blades with dorsal removals and use wear. Some of the flakes have faceted striking platforms, which is typical of the MSA.</p> <p>This site is adjacent to the power lines and is near a road.</p>					
Condition of the resource:	Damaged	Peer	Fair X	Good		
Quality of the resource: (Scales of damage)	Peer	Fair	Good X	Excellent		
Please describe: <i>(including scale of damage or neglect and factors influencing the integrity of the resource)</i>	<p>Artefacts are <i>ex situ</i> and most likely represent wash. There are powerlines and a road near the site which represents additional disturbance to the site.</p> <p>Some artefacts show what may be use wear suggesting they are not extensively weathered.</p>					
Statement of Significance: <i>(please provide a brief assessment of the significance of the resource, in your opinion)</i>	Negligible	Low	Medium	Med-Hi	High	V. High
	<p>Consider aesthetic, historic, scientific and social criteria</p> <p>Based on previous assessment of the CS of the cultural landscape and heritage resources.</p> <p>The site represents low scientific potential due to the lack of primary context but still has historical and aesthetic value.</p>					
Are there any observable / apparent threats / impacts to the resource?	<p>Located within proposed development footprint.</p> <p>Open site, susceptible to washing away further.</p>					
Please include any additional notes here: <i>(e.g. any notable features, additional information from an informant, damage)</i> <i>Should this be a Chance Find, please include details surrounding the find (e.g. personnel involved, activities being undertaken, decisions made and steps taken after find, date and time of find)</i>						

Type of Resource: Archaeological: Artefacts, Rock Art, Deposit, Shell Midden, Ruin > 100 years, Stone walling, Settlement; Living heritage / sacred site; Battlefield; Burial Grounds and Graves; Conservation Area; Cultural Landscape; Geological; Meteorites; Monuments & Memorials; Natural, Palaeontological; Place; Structure: bridge, building, transport infrastructure; Underwater: Shipwreck, Submerged (intertidal, partially submerged, fully submerged).

Summary Description: Artefact: Isolated surface, Artefact: Low density surface scatter, <10.1 sq m, Artefact: medium density surface scatter, <20.1 sq m, Artefact: high density surface scatter, >20.1 sq m, Artefact: embedded in rock matrix, Burial ground: Undetermined, Single grave, <10 graves, <20 graves, <50 graves, >100 graves; Deposit: ash, <1 cm, ~5 cm, ~10 cm, >20 cm; Deposit: charcoal; Deposit: Faunal; Deposit: Kraal; Fossil, hominin: embedded in rock matrix; Fossil, hominin: tracks; Fossil, invertebrate: embedded in rock matrix; Fossil, invertebrate: isolated surface; Fossil, invertebrate: tracks; Fossil, plant: embedded in rock matrix; Fossil, plant: isolated surface; Fossil, vertebrate: embedded in rock matrix; Fossil, vertebrate: isolated surface; Fossil, vertebrate: tracks; Fossil: breccia with visible remains; Fossil: breccia without visible remains; Rock art: combination; Rock art: engraving; Rock art: painting; Shelter: including artefact/s;

Shelter: including artefact/s + deposit; Shelter: including artefact/s + deposit + structures; Shelter: rock art + artefacts / deposit / structures; Shelter: rock art combination; Shelter: rock art engraving; Shelter: rock art painting; Site: high complexity, multiple components >2500 sq m / 50 x 50 m; Site: low complexity, multiple components <25 sq m / 5 x 5 m; Site: medium complexity, multiple components >25 sq m / 5 x 5 m to <2500 sq m / 50 x 50 m; Structural: complex, e.g. werf; Structural: functional, e.g. fences, wind pumps, troughs; Structural: industrial, e.g. warehouse, headgear; Structural: remains, e.g. daga, hut floor, foundations, bricks; Structural: stonewall; Other

SITE RECORDING AND PRELIMINARY CONDITIONAL ASSESSMENT FORM



DIGBY WELLS
ENVIRONMENTAL

Recorder:	Shannon		Date:	03/12/2019	
Classification:	Immovable	Movable X	Intangible		
Location:	HIRAX Footprint (farm Swartfontein)		Photograph Numbers:	826 to 828	
Ref No:	SA-020		Co-ordinates	30°41'27.92"S	21°34'25.65"E
<small>Site name/number or other reference</small>			<small>Decimal degrees using the WGS84 datum</small>		
1. Immovable Heritage Resources					
SAHRIS ID Reference:	<small>where applicable</small>				
Type of resource:	<small>See form</small>	Age / Industry / Period:	<small>Cultural period / style / associated persons / history</small>		
Resource Description Summary:	<small>See form</small>				
Functional Type:		Current Function:	<small>Original / changed from past / current function</small>		
<i>Please proceed to Section 4</i>					
2. Movable Heritage Resources					
SAHRIS ID Reference:	N/A				
Type of resource:	Archaeological artefact		Age / Industry / Period:	Stone Age (MSA and LSA)	
Resource Description Summary:	Artefact: Medium density surface scatter, <20:1 m ² Represents the MSA and LSA				
Quantity recorded:	± 18 lithics per m ²				
<i>Please proceed to Section 4</i>					
3. Intangible Heritage Resources					
SAHRIS ID Reference:					
Type of resource:		To whom is the resource significant?			
Describe the resource or summarise provided information:					
Informant / source of information:					Wishes to remain anonymous
<i>Please proceed to Section 4</i>					

Type of Resource: Archaeological: Artefacts, Rock Art, Deposit, Shell Midden, Ruin > 100 years, Stone walling, Settlement; Living heritage / sacred site; Battlefield; Burial Grounds and Graves; Conservation Area; Cultural Landscape; Geological; Meteorites; Monuments & Memorials; Natural, Palaeontological; Place; Structure: bridge, building, transport infrastructure; Underwater: Shipwreck, Submerged (intertidal, partially submerged, fully submerged).

Summary Description: Artefact: Isolated surface, Artefact: Low density surface scatter, <10:1 sq m, Artefact: medium density surface scatter, <20:1 sq m, Artefact: high density surface scatter, >20:1 sq m, Artefact: embedded in rock matrix, Burial ground: Undetermined, Single grave, ≤10 graves, ≤50 graves, >100 graves; Deposit: ash, ≤1 cm, ~5 cm, ~10 cm, >20 cm; Deposit: charcoal; Deposit: Faunal; Deposit: Kraal; Fossil, hominin: embedded in rock matrix; Fossil, hominin: tracks; Fossil, invertebrate: embedded in rock matrix; Fossil, invertebrate: isolated surface; Fossil, invertebrate: tracks; Fossil, plant: embedded in rock matrix; Fossil, plant: isolated surface; Fossil, vertebrate: embedded in rock matrix; Fossil, vertebrate: isolated surface; Fossil, vertebrate: tracks; Fossil: breccia with visible remains; Fossil: breccia without visible remains; Rock art: combination; Rock art: engraving; Rock art: painting; Shelter: including artefact/s;

Shelter: including artefact/s + deposit; Shelter: including artefact/s + deposit + structures; Shelter: rock art + artefacts / deposit / structures; Shelter: rock art combination; Shelter: rock art engraving; Shelter: rock art painting; Site: high complexity, multiple components >2500 sq m / 50 x 50 m; Site: low complexity, multiple components <25 sq m / 5 x 5 m; Site: medium complexity, multiple components >25 sq m / 5 x 5 m to <2500 sq m / 50 x 50 m; Structural: complex, e.g. weir; Structural: functional, e.g. fences, wind pumps, troughs; Structural: industrial, e.g. warehouse, headgear; Structural: remains, e.g. daga, hut floor, foundations, bricks; Structural: stonewall; Other

SITE RECORDING AND PRELIMINARY CONDITIONAL ASSESSMENT FORM



DIGBY WELLS
ENVIRONMENTAL

4. Description and Notes						
Restrictions/sensitivities: <i>Please note any restrictions with regard to this heritage resource and/or information obtained by an informant</i>	None X	No photographs	Do not publish			
	Other:					
	Reason for Restrictions:	N/A				
Please provide a brief description of the resource:	Medium-density background scatter of lithics (\pm 18 lithics per m ²) across an area of approximately 30 m in diameter. The scatter is similar to SA-019 and includes no diagnostic pieces. Chunks with either use wear or trampling and end-scrappers were noted.					
Condition of the resource:	Damaged	Poor	Fair X	Good		
Quality of the resource: (Scales of damage)	Poor	Fair	Good X	Excellent		
Please describe: <i>(including scale of damage or neglect and factors influencing the integrity of the resource)</i>	Artefacts are <i>ex situ</i> and most likely represent wash. There are powerlines and a road near the site which represents additional disturbance to the site. Some artefacts show what may be use wear suggesting they are not extensively weathered.					
Statement of Significance: <i>(please provide a brief assessment of the significance of the resource, in your opinion)</i>	Negligible	Low	Medium	Med Hi	High	V. High
	<p style="text-align: center;">Consider aesthetic, historic, scientific and social criteria</p> <p>Based on previous assessment of the CS of the cultural landscape and heritage resources.</p> <p>The site represents low scientific potential due to the lack of primary context but still has historical and aesthetic value.</p>					
Are there any observable / apparent threats / impacts to the resource?	<p>Located within proposed development footprint.</p> <p>Open site, susceptible to washing away further.</p>					
Please include any additional notes here: <i>(e.g. any notable features, additional information from an informant, damage)</i> <i>Should this be a Chance Find, please include details surrounding the find (e.g. personnel involved, activities being undertaken, decisions made and steps taken after find, date and time of find)</i>	N/A					

Type of Resource: Archaeological: Artefacts, Rock Art, Deposit, Shell Midden, Ruin > 100 years, Stone walling, Settlement; Living heritage / sacred site; Battlefield; Burial Grounds and Graves; Conservation Area; Cultural Landscape; Geological; Meteorites; Monuments & Memorials; Natural, Palaeontological; Place; Structure: bridge, building, transport infrastructure; Underwater: Shipwreck, Submerged (intertidal, partially submerged, fully submerged).

Summary Description: Artefact: isolated surface, Artefact: Low density surface scatter, <10:1 sq m, Artefact: medium density surface scatter, <20:1 sq m, Artefact: high density surface scatter, >20:1 sq m, Artefact: embedded in rock matrix, Burial ground: Undetermined, Single grave, \leq 10 graves, \leq 20 graves, \leq 50 graves, >100 graves; Deposit: ash, \leq 1 cm, \sim 5 cm, \sim 10 cm, >20 cm; Deposit: charcoal; Deposit: Faunal; Deposit: Kraal; Fossil, hominin: embedded in rock matrix; Fossil, hominin: tracks; Fossil, invertebrate: embedded in rock matrix; Fossil, invertebrate: isolated surface; Fossil, invertebrate: tracks; Fossil, plant: embedded in rock matrix; Fossil, plant: isolated surface; Fossil, vertebrate: embedded in rock matrix; Fossil, vertebrate: isolated surface; Fossil, vertebrate: tracks; Fossil: breccia with visible remains; Fossil: breccia without visible remains; Rock art: combination; Rock art: engraving; Rock art: painting; Shelter: including artefact/s;

Shelter: including artefact/s + deposit; Shelter: including artefact/s + deposit + structures; Shelter: rock art + artefacts / deposit / structures; Shelter: rock art combination; Shelter: rock art engraving; Shelter: rock art painting; Site: high complexity, multiple components >2500 sq m / 50 x 50 m; Site: low complexity, multiple components <25 sq m / 5 x 5 m; Site: medium complexity, multiple components >25 sq m / 5 x 5 m to <2500 sq m / 50 x 50 m; Structural: complex, e.g. wref; Structural: functional, e.g. fences, wind pumps, troughs; Structural: industrial, e.g. warehouse, headgear; Structural: remains, e.g. daga, hut floor, foundations, bricks; Structural: stonewall; Other

SITE RECORDING AND PRELIMINARY CONDITIONAL ASSESSMENT FORM



DIGBY WELLS
ENVIRONMENTAL

Recorder:	Shannon		Date:	03/12/2019	
Classification:	Immovable	Movable X	Intangible		
Location:	HIRAX Footprint (farm Swartfontein)		Photograph Numbers:	839 to 840	
Ref No:	SA-021		Co-ordinates	30°41'52.14"S	21°34'17.47"E
<small>Site name/number or other reference</small>					
1. Immovable Heritage Resources					
SAHRIS ID Reference:	<small>where applicable</small>				
Type of resource:	<small>See form</small>	Age / Industry / Period:	<small>Cultural period / style / associated persons / history</small>		
Resource Description Summary:	<small>See form</small>				
Functional Type:		Current Function:	<small>Original / changed from past / current function</small>		
<i>Please proceed to Section 4</i>					
2. Movable Heritage Resources					
SAHRIS ID Reference:	N/A				
Type of resource:	Archaeological artefact		Age / Industry / Period:	Stone Age (MSA and LSA)	
Resource Description Summary:	Artefact: Low density surface scatter, <10:1 m ² Represents the MSA and LSA				
Quantity recorded:	<10:1 m ²				
<i>Please proceed to Section 4</i>					
3. Intangible Heritage Resources					
SAHRIS ID Reference:					
Type of resource:		To whom is the resource significant?			
Describe the resource or summarise provided information:					
Informant / source of information:					Wishes to remain anonymous
<i>Please proceed to Section 4</i>					

Type of Resource: Archaeological: Artefacts, Rock Art, Deposit, Shell Midden, Ruin > 100 years, Stone walling, Settlement; Living heritage / sacred site; Battlefield; Burial Grounds and Graves; Conservation Area; Cultural Landscape; Geological; Meteorites; Monuments & Memorials; Natural, Palaeontological; Place; Structure: bridge, building, transport infrastructure; Underwater: Shipwreck, Submerged (intertidal, partially submerged, fully submerged).

Summary Description: Artefact: Isolated surface, Artefact: Low density surface scatter, <10:1 sq m, Artefact: medium density surface scatter, <20:1 sq m, Artefact: high density surface scatter, >20:1 sq m, Artefact: embedded in rock matrix, Burial ground: Undetermined, Single grave, ≤10 graves, ≤50 graves, >100 graves; Deposit: ash, ≤1 cm, ~5 cm, ~10 cm, >20 cm; Deposit: charcoal; Deposit: Faunal; Deposit: Kraal; Fossil, hominin: embedded in rock matrix; Fossil, hominin: tracks; Fossil, invertebrate: embedded in rock matrix; Fossil, invertebrate: isolated surface; Fossil, invertebrate: tracks; Fossil, plant: embedded in rock matrix; Fossil, plant: isolated surface; Fossil, vertebrate: embedded in rock matrix; Fossil, vertebrate: isolated surface; Fossil, vertebrate: tracks; Fossil: breccia with visible remains; Fossil: breccia without visible remains; Rock art: combination; Rock art: engraving; Rock art: painting; Shelter: including artefact/s;

Shelter: including artefact/s + deposit; Shelter: including artefact/s + deposit + structures; Shelter: rock art + artefacts / deposit / structures; Shelter: rock art combination; Shelter: rock art engraving; Shelter: rock art painting; Site: high complexity, multiple components >2500 sq m / 50 x 50 m; Site: low complexity, multiple components <25 sq m / 5 x 5 m; Site: medium complexity, multiple components >25 sq m / 5 x 5 m to <2500 sq m / 50 x 50 m; Structural: complex, e.g. weir; Structural: functional, e.g. fences, wind pumps, troughs; Structural: industrial, e.g. warehouse, headgear; Structural: remains, e.g. daga, hut floor, foundations, bricks; Structural: stonewall; Other

SITE RECORDING AND PRELIMINARY CONDITIONAL ASSESSMENT FORM



DIGBY WELLS
ENVIRONMENTAL

4. Description and Notes

Restrictions/sensitivities: <i>Please note any restrictions with regard to this heritage resource and/or information obtained by an informant</i>		None X	No photographs	Do not publish		
Other:						
Reason for Restrictions:		N/A				
Please provide a brief description of the resource:		Low-density surface scatter of stone tools. Given the location of the tools within the environment and in relation to the topography, this most likely represents wash from the nearby ridge.				
Condition of the resource:		Damaged	Poor	Fair X	Good	
Quality of the resource: (Scales of damage)		Poor	Fair	Good X	Excellent	
Please describe: <i>(including scale of damage or neglect and factors influencing the integrity of the resource)</i>		Artefacts are <i>ex situ</i> and most likely represent wash. There is a road near the site which represents additional disturbance to the site. Some artefacts show what may be use wear suggesting they are not extensively weathered.				
Statement of Significance: <i>(please provide a brief assessment of the significance of the resource, in your opinion)</i>		Negligible	Low	Medium	Med Hi	High
		V. High				
		Consider aesthetic, historic, scientific and social criteria Based on previous assessment of the CS of the cultural landscape and heritage resources. The site represents low scientific potential due to the lack of primary context but still has historical and aesthetic value.				
Are there any observable / apparent threats / impacts to the resource?		Located within proposed development footprint. Open site, susceptible to washing away further.				
Please include any additional notes here: <i>(e.g. any notable features, additional information from an informant, damage)</i> <i>Should this be a Chance Find, please include details surrounding the find (e.g. personnel involved, activities being undertaken, decisions made and steps taken after find, date and time of find)</i>		N/A				

SITE RECORDING AND PRELIMINARY CONDITIONAL ASSESSMENT FORM



DIGBY WELLS
ENVIRONMENTAL

Recorder:	Shannon		Date:	03/12/2019	
Classification:	Immovable	Movable X	Intangible		
Location:	HIRAX Footprint (farm Swartfontein)		Photograph Numbers:	846 to 847	
Ref No:	SA-022		Co-ordinates	30°41'45.88"S	21°34'29.06"E
<small>Site name/number or other reference</small>			<small>Decimal degrees using the WGS84 datum</small>		
1. Immovable Heritage Resources					
SAHRIS ID Reference:	<small>where applicable</small>				
Type of resource:	<small>See form</small>	Age / Industry / Period:	<small>Cultural period / style / associated persons / history</small>		
Resource Description Summary:	<small>See form</small>				
Functional Type:		Current Function:	<small>Original / changed from past / current function</small>		
<i>Please proceed to Section 4</i>					
2. Movable Heritage Resources					
SAHRIS ID Reference:	N/A				
Type of resource:	Archaeological artefact		Age / Industry / Period:	Stone Age (MSA and LSA)	
Resource Description Summary:	Artefact: Low density surface scatter, <10:1 m ² Represents the MSA and LSA				
Quantity recorded:	<10:1 m ²				
<i>Please proceed to Section 4</i>					
3. Intangible Heritage Resources					
SAHRIS ID Reference:					
Type of resource:		To whom is the resource significant?			
Describe the resource or summarise provided information:					
Informant / source of information:					Wishes to remain anonymous
<i>Please proceed to Section 4</i>					

Type of Resource: Archaeological: Artefacts, Rock Art, Deposit, Shell Midden, Ruin > 100 years, Stone walling, Settlement; Living heritage / sacred site; Battlefield; Burial Grounds and Graves; Conservation Area; Cultural Landscape; Geological; Meteorites; Monuments & Memorials; Natural, Palaeontological; Place; Structure: bridge, building, transport infrastructure; Underwater: Shipwreck, Submerged (intertidal, partially submerged, fully submerged).

Summary Description: Artefact: isolated surface, Artefact: Low density surface scatter, <10:1 sq m, Artefact: medium density surface scatter, <20:1 sq m, Artefact: high density surface scatter, >20:1 sq m, Artefact: embedded in rock matrix, Burial ground: Undetermined, Single grave, ≤10 graves, ≤50 graves, >100 graves; Deposit: ash, ≤1 cm, ~5 cm, ~10 cm, >20 cm; Deposit: charcoal; Deposit: Faunal; Deposit: Kraal; Fossil, hominin: embedded in rock matrix; Fossil, hominin: tracks; Fossil, invertebrate: embedded in rock matrix; Fossil, invertebrate: isolated surface; Fossil, invertebrate: tracks; Fossil, plant: embedded in rock matrix; Fossil, plant: isolated surface; Fossil, vertebrate: embedded in rock matrix; Fossil, vertebrate: isolated surface; Fossil, vertebrate: tracks; Fossil: breccia with visible remains; Fossil: breccia without visible remains; Rock art: combination; Rock art: engraving; Rock art: painting; Shelter: including artefact/s;

Shelter: including artefact/s + deposit; Shelter: including artefact/s + deposit + structures; Shelter: rock art + artefacts / deposit / structures; Shelter: rock art combination; Shelter: rock art engraving; Shelter: rock art painting; Site: high complexity, multiple components >2500 sq m / 50 x 50 m; Site: low complexity, multiple components <25 sq m / 5 x 5 m; Site: medium complexity, multiple components >25 sq m / 5 x 5 m to <2500 sq m / 50 x 50 m; Structural: complex, e.g. weir; Structural: functional, e.g. fences, wind pumps, troughs; Structural: industrial, e.g. warehouse, headgear; Structural: remains, e.g. daga, hut floor, foundations, bricks; Structural: stonewall; Other

SITE RECORDING AND PRELIMINARY CONDITIONAL ASSESSMENT FORM



DIGBY WELLS
ENVIRONMENTAL

4. Description and Notes

Restrictions/sensitivities: <i>Please note any restrictions with regard to this heritage resource and/or information obtained by an informant</i>		None X	No photographs	Do not publish		
Other:						
Reason for Restrictions:		N/A				
Please provide a brief description of the resource:		<p>Low-density surface scatter of MSA and LSA lithics.</p> <p>The MSA component of the scatter includes diagnostic points and blades with dorsal removals and use wear along the edges. One Levallois -removal point was present.</p> <p>The LSA component is dominated by blades made on unpatinated hornfels and is not microlithic.</p>				
Condition of the resource:		Damaged	Poor	Fair X	Good	
Quality of the resource: (Scales of damage)		Poor	Fair	Good X	Excellent	
Please describe: <i>(including scale of damage or neglect and factors influencing the integrity of the resource)</i>		<p>Artefacts are <i>ex situ</i> and most likely represent wash. There is a road near the site which represents additional disturbance to the site.</p> <p>Some artefacts show what may be use wear suggesting they are not extensively weathered.</p>				
Statement of Significance: <i>(please provide a brief assessment of the significance of the resource, in your opinion)</i>		Negligible	Low	Medium	Med Hi	High
		<p>Consider aesthetic, historic, scientific and social criteria</p> <p>Based on previous assessment of the CS of the cultural landscape and heritage resources.</p> <p>The site represents low scientific potential due to the lack of primary context but still has historical and aesthetic value.</p>				
Are there any observable / apparent threats / impacts to the resource?		<p>Located within proximity to a proposed development footprint.</p> <p>Open site, susceptible to washing away.</p>				
Please include any additional notes here: <i>(e.g. any notable features, additional information from an informant, damage)</i> <i>Should this be a Chance Find, please include details surrounding the find (e.g. personnel involved, activities being undertaken, decisions made and steps taken after find, date and time of find)</i>		The LSA component could possibly represent the Robberg. This will require further investigation.				

SITE RECORDING AND PRELIMINARY CONDITIONAL ASSESSMENT FORM



DIGBY WELLS
ENVIRONMENTAL

Recorder:	Shannon		Date:	03/12/2019	
Classification:	Immovable	Movable X	Intangible		
Location:	HIRAX Footprint (farm Swartfontein)		Photograph Numbers:	842 to 843	
Ref No:	HST-001		Co-ordinates	30°41'53.54"S	21°34'21.24"E
<small>Site name/number or other reference</small>			<small>Decimal degrees using the WGS84 datum</small>		
1. Immovable Heritage Resources					
SAHRIS ID Reference:	<small>where applicable</small>				
Type of resource:	<small>See form</small>	Age / Industry / Period:	<small>Cultural period / style / associated persons / history</small>		
Resource Description Summary:	<small>See form</small>				
Functional Type:		Current Function:	<small>Original / changed from past / current function</small>		
<i>Please proceed to Section 4</i>					
2. Movable Heritage Resources					
SAHRIS ID Reference:	N/A				
Type of resource:	Archaeological artefact		Age / Industry / Period:	Historical (between British Colony and First Boer Republics and the Union of South Africa)	
Resource Description Summary:	Historical artefact: isolated				
Quantity recorded:	1				
<i>Please proceed to Section 4</i>					
3. Intangible Heritage Resources					
SAHRIS ID Reference:					
Type of resource:		To whom is the resource significant?			
Describe the resource or summarise provided information:					
Informant / source of information:				Wishes to remain anonymous	
<i>Please proceed to Section 4</i>					

Type of Resource: Archaeological: Artefacts, Rock Art, Deposit, Shell Midden, Ruin > 100 years, Stone walling, Settlement; Living heritage / sacred site; Battlefield; Burial Grounds and Graves; Conservation Area; Cultural Landscape; Geological; Meteorites; Monuments & Memorials; Natural, Palaeontological; Place; Structure: bridge, building, transport infrastructure; Underwater: Shipwreck, Submerged (intertidal, partially submerged, fully submerged).

Summary Description: Artefact: Isolated surface, Artefact: Low density surface scatter, <10:1 sq m, Artefact: medium density surface scatter, <20:1 sq m, Artefact: high density surface scatter, >20:1 sq m, Artefact: embedded in rock matrix, Burial ground: Undetermined, Single grave, ≤10 graves, ≤20 graves, ≤50 graves, >100 graves; ≤100 graves; Deposit: ash, ≤1 cm, ~5 cm, ~10 cm, >20 cm; Deposit: charcoal; Deposit: Faunal; Deposit: Kraal; Fossil, hominin: embedded in rock matrix; Fossil, hominin: tracks; Fossil, hominin: embedded in rock matrix; Fossil, invertebrate: embedded in rock matrix; Fossil, invertebrate: isolated surface; Fossil, invertebrate: tracks; Fossil, plant: embedded in rock matrix; Fossil, plant: isolated surface; Fossil, vertebrate: embedded in rock matrix; Fossil, vertebrate: isolated surface; Fossil, vertebrate: tracks; Fossil: breccia with visible remains; Fossil: breccia without visible remains; Rock art: combination; Rock art: engraving; Rock art: painting; Shelter: including artefact/s;

Shelter: including artefact/s + deposit; Shelter: including artefact/s + deposit + structures; Shelter: rock art + artefacts / deposit / structures; Shelter: rock art combination; Shelter: rock art engraving; Shelter: rock art painting; Site: high complexity, multiple components >2500 sq m / 50 x 50 m; Site: low complexity, multiple components <25 sq m / 5 x 5 m; Site: medium complexity, multiple components >25 sq m / 5 x 5 m to <2500 sq m / 50 x 50 m; Structural: complex, e.g. weir; Structural: functional, e.g. fences, wind pumps, troughs; Structural: industrial, e.g. warehouse, headgear; Structural: remains, e.g. daga, hut floor, foundations, bricks; Structural: stonewall; Other

SITE RECORDING AND PRELIMINARY CONDITIONAL ASSESSMENT FORM



DIGBY WELLS
ENVIRONMENTAL

4. Description and Notes						
Restrictions/sensitivities: <i>Please note any restrictions with regard to this heritage resource and/or information obtained by an informant</i>	None X	No photographs		Do not publish		
	Other:					
	Reason for Restrictions:	N/A				
Please provide a brief description of the resource:	A single Martini Henry soft-shell cartridge which dates to the late 1890s and which were used by the Boers.					
Condition of the resource:	Damaged	Poor	Fair X	Good		
Quality of the resource: (Scales of damage)	Poor	Fair	Good X	Excellent		
Please describe: <i>(including scale of damage or neglect and factors influencing the integrity of the resource)</i>	Given the location and surrounding environment, the artefact is most likely <i>ex situ</i> . The find is, however, preserved well enough to establish some meaning.					
Statement of Significance: <i>(please provide a brief assessment of the significance of the resource, in your opinion)</i>	Negligible	Low	Medium	Med-Hi	High	V. High
	<p style="text-align: center;"><i>Consider aesthetic, historic, scientific and social criteria</i></p> <p>Based on previous assessment of the CS of the cultural landscape and heritage resources.</p> <p>The artefact is most likely not in its original depositional setting and there is no associated context. The item does have some historical value.</p>					
Are there any observable / apparent threats / impacts to the resource?	<p>Located in proximity to the proposed development footprint.</p> <p>Open site, susceptible to washing away further.</p>					
Please include any additional notes here: <i>(e.g. any notable features, additional information from an informant, damage)</i> <i>Should this be a Chance Find, please include details surrounding the find (e.g. personnel involved, activities being undertaken, decisions made and steps taken after find, date and time of find)</i>	N/A					

SITE RECORDING AND PRELIMINARY CONDITIONAL ASSESSMENT FORM



DIGBY WELLS
ENVIRONMENTAL

Recorder:	Shannon		Date:	03/12/2019	
Classification:	Immovable X	Movable	Intangible		
Location:	Visserskloof construction camp Footprint (farm Visserskloof)		Photograph Numbers:	856 to 916	
Ref No: <small>Site name/number or other reference</small>	HST-002		Co-ordinates <small>Decimal degrees using the WGS84 datum</small>	30°40'24.53"S	21°35'13.46"E
1. Immovable Heritage Resources					
SAHRIS ID Reference: <small>where applicable</small>	N/A				
Type of resource:	Structure (complex)	Age / Industry / Period:	Historical (historical built environment)		
Resource Description Summary:	Structural Complex (werf) Associated with modern structures.				
Functional Type:	Agricultural infrastructure	Current Function:	Abandoned		
<i>Please proceed to Section 4</i>					
2. Movable Heritage Resources					
SAHRIS ID Reference:					
Type of resource:	<small>Artefacts, artefacts, books, documents, machines, clothing</small>	Age / Industry / Period:			
Resource Description Summary:					
Quantity recorded:					
<i>Please proceed to Section 4</i>					
3. Intangible Heritage Resources					
SAHRIS ID Reference:					
Type of resource:			To whom is the resource significant?		
Describe the resource or summarise provided information:					
Informant / source of information:				Wishes to remain anonymous	
<i>Please proceed to Section 4</i>					

Type of Resource: Archaeological: Artefacts, Rock Art, Deposit, Shell Midden, Ruin > 100 years, Stone walling, Settlement; Living heritage / sacred site; Battlefield; Burial Grounds and Graves; Conservation Area; Cultural Landscape; Geological; Meteorites; Monuments & Memorials; Natural, Palaeontological; Place; Structure: bridge, building, transport infrastructure; Underwater: Shipwreck, Submerged (intertidal, partially submerged, fully submerged).

Summary Description: Artefact: Isolated surface, Artefact: Low density surface scatter, <10:1 sq m, Artefact: medium density surface scatter, <20:1 sq m, Artefact: high density surface scatter, >20:1 sq m, Artefact: embedded in rock matrix, Burial ground: Undetermined, Single grave, ≤10 graves, ≤20 graves, ≤50 graves, >100 graves; Deposit: ash, ≤1 cm, ~5 cm, ~10 cm, >20 cm; Deposit: charcoal; Deposit: Faunal; Deposit: Kraal; Fossil, hominin: embedded in rock matrix; Fossil, hominin: isolated surface; Fossil, hominin: tracks; Fossil, invertebrate: embedded in rock matrix; Fossil, invertebrate: isolated surface; Fossil, invertebrate: tracks; Fossil, plant: embedded in rock matrix; Fossil, plant: isolated surface; Fossil, vertebrate: embedded in rock matrix; Fossil, vertebrate: isolated surface; Fossil, vertebrate: tracks; Fossil: breccia with visible remains; Fossil: breccia without visible remains; Rock art: combination; Rock art: engraving; Rock art: painting; Shelter: including artefact/s; Shelter: rock art + artefact/s + deposit + structures; Shelter: rock art + artefact/s + deposit / structures; Shelter: rock art combination; Shelter: rock art engraving; Shelter: rock art painting; Site: high complexity, multiple components >2500 sq m / 50 x 50 m; Site: low complexity, multiple components <25 sq m / 5 x 5 m; Site: medium complexity, multiple components >25 sq m / 5 x 5 m to <2500 sq m / 50 x 50 m; Structural: complex, e.g. werf; Structural: functional, e.g. fences, wind pumps, troughs; Structural: industrial, e.g. warehouse, headgear; Structural: remains, e.g. daga, hut floor, foundations, bricks; Structural: stonewall; Other

SITE RECORDING AND PRELIMINARY CONDITIONAL ASSESSMENT FORM



DIGBY WELLS
ENVIRONMENTAL

4. Description and Notes						
Restrictions/sensitivities: <i>Please note any restrictions with regard to this heritage resource and/or information obtained by an informant</i>	None X	No photographs	Do not publish			
	Other:					
	Reason for Restrictions:	N/A				
Please provide a brief description of the resource:	<p>The Visserskloof main dwelling, adjoining shed and outbuildings were identified in the Built Heritage Specialist assessment in the previous HIA process. These dwellings are likely to be less than 60 years old and were therefore not assessed as built heritage resources. The foundations and well were not described in that assessment and may be older than 60 years.</p> <p>Additional structures associated with the historical Visserskloof farmhouse. These include foundations near the Visserskloof barn. The foundations are L-shaped and appear to have an internal division. There are also furrows and a large well near the foundations.</p>					
Condition of the resource:	Damaged	Peer	Fair X	Good		
Quality of the resource: (Scales of damage)	Peer	Fair	Good X	Excellent		
Please describe: <i>(including scale of damage or neglect and factors influencing the integrity of the resource)</i>	<p>The furrows are of indeterminate age but have been well maintained.</p> <p>The foundations are in a state of collapse and the full extent of the structure is not visible.</p> <p>The well is lined with slate which is well preserved. The original wooden beams used to construct the well are still intact. The well has been covered in corrugated zinc and the bottom appears to be in some state of collapse.</p>					
Statement of Significance: <i>(please provide a brief assessment of the significance of the resource, in your opinion)</i>	Negligible	Low	Medium	Med-Hi	High	V. High
	<p>Consider aesthetic, historic, scientific and social criteria</p> <p>Based on previous assessment of the CS of the cultural landscape and heritage resources.</p> <p>The werf structures have historical, aesthetic and social value.</p>					
Are there any observable / apparent threats / impacts to the resource?	Located within proposed development footprint.					
Please include any additional notes here: <i>(e.g. any notable features, additional information from an informant, damage)</i> <i>Should this be a Chance Find, please include details surrounding the find (e.g. personnel involved, activities being undertaken, decisions made and steps taken after find, date and time of find)</i>	N/A					

SITE RECORDING AND PRELIMINARY CONDITIONAL ASSESSMENT FORM



DIGBY WELLS
ENVIRONMENTAL

Recorder:	Shannon		Date:	03/12/2019	
Classification:	Immovable X		Movable	Intangible	
Location:	Visserskloof construction camp Footprint (farm Visserskloof)		Photograph Numbers:	N/A	
Ref No: <small>Site name/number or other reference</small>	MXD-004		Co-ordinates <small>Decimal degrees using the WGS84 datum</small>	30°40'19.45"S	21°35'23.42"E
1. Immovable Heritage Resources					
SAHRIS ID Reference: <small>where applicable</small>	N/A				
Type of resource:	Structure (complex) with archaeological artefacts		Age / Industry / Period:	Mixed – historical and Stone Age (MSA)	
Resource Description Summary:	Site: low complexity, multiple components (less than 25 m ² / 5 x 5 m in extent)				
Functional Type:	Stone tools / Agricultural infrastructure		Current Function:	Abandoned	
<i>Please proceed to Section 4</i>					
2. Movable Heritage Resources					
SAHRIS ID Reference:					
Type of resource:	<small>Artefacts, objects, books, documents, machines, clothing</small>		Age / Industry / Period:		
Resource Description Summary:					
Quantity recorded:					
<i>Please proceed to Section 4</i>					
3. Intangible Heritage Resources					
SAHRIS ID Reference:					
Type of resource:			To whom is the resource significant?		
Describe the resource or summarise provided information:					
Informant / source of information:				Wishes to remain anonymous	
<i>Please proceed to Section 4</i>					

Type of Resource: Archaeological: Artefacts, Rock Art, Deposit, Shell Midden, Ruin > 100 years, Stone walling, Settlement; Living heritage / sacred site; Battlefield; Burial Grounds and Graves; Conservation Area; Cultural Landscape; Geological; Meteorites; Monuments & Memorials; Natural, Palaeontological; Place; Structure: bridge, building, transport infrastructure; Underwater: Shipwreck, Submerged (intertidal, partially submerged, fully submerged).

Summary Description: Artefact: Isolated surface, Artefact: Low density surface scatter, <10:1 sq m, Artefact: medium density surface scatter, <20:1 sq m, Artefact: high density surface scatter, >20:1 sq m, Artefact: embedded in rock matrix, Burial ground: Undetermined, Single grave, <10 graves, <20 graves, <50 graves, >100 graves; Deposit: ash, <1 cm, ~5 cm, ~10 cm, ~20 cm, >20 cm; Deposit: charcoal; Deposit: Faunal; Deposit: Kraal; Fossil, hominin: embedded in rock matrix; Fossil, hominin: isolated surface; Fossil, hominin: tracks; Fossil, invertebrate: embedded in rock matrix; Fossil, invertebrate: isolated surface; Fossil, invertebrate: tracks; Fossil, plant: embedded in rock matrix; Fossil, plant: isolated surface; Fossil, vertebrate: embedded in rock matrix; Fossil, vertebrate: isolated surface; Fossil, vertebrate: tracks; Fossil: breccia with visible remains; Fossil: breccia without visible remains; Rock art: combination; Rock art: engraving; Rock art: painting; Shelter: including artefact/s; Shelter: including artefact/s + deposit; Shelter: including artefact/s + deposit + structures; Shelter: rock art + artefacts / deposit / structures; Shelter: rock art combination; Shelter: rock art engraving; Shelter: rock art painting; Site: high complexity, multiple components >2500 sq m / 50 x 50 m; Site: low complexity, multiple components <25 sq m / 5 x 5 m; Site: medium complexity, multiple components >25 sq m / 5 x 5 m to <2500 sq m / 50 x 50 m; Structural: complex, e.g. werf; Structural: functional, e.g. fences, wind pumps, troughs; Structural: industrial, e.g. warehouse, headgear; Structural: remains, e.g. daga, hut floor, foundations, bricks; Structural: stonewall; Other

SITE RECORDING AND PRELIMINARY CONDITIONAL ASSESSMENT FORM



DIGBY WELLS
ENVIRONMENTAL

4. Description and Notes						
Restrictions/sensitivities: <i>Please note any restrictions with regard to this heritage resource and/or information obtained by an informant</i>	None X	No photographs		Do not publish		
	Other:					
	Reason for Restrictions:	N/A				
Please provide a brief description of the resource:	<p>An extensive MSA scatter adjacent to a historical farmhouse. The farmhouse is some distance from the Visserskloof werf but is visible from the werf.</p> <p>The MSA scatter extends across an area of approximately 50 m by 50 m and has a high artefact density (\pm 18 lithics per m²).</p>					
Condition of the resource:	Damaged	Poor	Fair X	Good		
Quality of the resource: (Scales of damage)	Poor	Fair	Good X	Excellent		
Please describe: <i>(including scale of damage or neglect and factors influencing the integrity of the resource)</i>	<p>The farmhouse is standing and has retained its roof.</p> <p>The MSA scatter is similar to the other artefacts represented in the broader landscape.</p>					
Statement of Significance: <i>(please provide a brief assessment of the significance of the resource, in your opinion)</i>	Negligible	Low	Medium	Med-Hi	High	V. High
	<p>Consider aesthetic, historic, scientific and social criteria</p> <p>Based on previous assessment of the CS of the cultural landscape and heritage resources.</p> <p>The farmhouse has historical, aesthetic and social value. The stone tools represent historical and aesthetic value. In combination, however, the site represents an example of the temporal palimpsest that characterises the landscape.</p>					
Are there any observable / apparent threats / impacts to the resource?	<p>Located within proposed development footprint.</p> <p>Open site, susceptible to being washed away.</p>					
Please include any additional notes here: <i>(e.g. any notable features, additional information from an informant, damage)</i> <i>Should this be a Chance Find, please include details surrounding the find (e.g. personnel involved, activities being undertaken, decisions made and steps taken after find, date and time of find)</i>	N/A					

SITE RECORDING AND PRELIMINARY CONDITIONAL ASSESSMENT FORM



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Recorder:	Shannon		Date:	03/12/2019	
Classification:	Immovable X		Movable	Intangible	
Location:	Farm Visserskloof		Photograph Numbers:	919 to 925	
Ref No:	RA-011		Co-ordinates	30°37'30.15"S	21°37'9.98"E
<small>Site name/number or other reference</small>					
1. Immovable Heritage Resources					
SAHRIS ID Reference:	<small>where applicable</small> N/A				
Type of resource:	Rock Art		Age / Industry / Period:	LSA to Later herder period	
Resource Description Summary:	Rock Art: Combination No engagement with local communities regarding this art. Intangible resources were considered in the HIA process with engagement with a representative of the San Council who accompanied the team in the previous surveys. Intangible heritage is not considered here.				
Functional Type:	Art		Current Function:	Art	
<i>Please proceed to Section 4</i>					
2. Movable Heritage Resources					
SAHRIS ID Reference:					
Type of resource:	<small>Artefacts, artworks, books, documents, machines, clothing</small>		Age / Industry / Period:		
Resource Description Summary:					
Quantity recorded:					
<i>Please proceed to Section 4</i>					
3. Intangible Heritage Resources					
SAHRIS ID Reference:					
Type of resource:			To whom is the resource significant?		
Describe the resource or summarise provided information:					
Informant / source of information:			Wishes to remain anonymous		
<i>Please proceed to Section 4</i>					

Type of Resource: Archaeological: Artefacts, Rock Art, Deposit, Shell Midden, Ruin > 100 years, Stone walling, Settlement; Living heritage / sacred site; Battlefield; Burial Grounds and Graves; Conservation Area; Cultural Landscape; Geological; Meteorites; Monuments & Memorials; Natural, Palaeontological; Place; Structure: bridge, building, transport infrastructure; Underwater: Shipwreck, Submerged (intertidal, partially submerged, fully submerged).
Summary Description: Artefact: isolated surface, Artefact: Low density surface scatter, <10.1 sq m, Artefact: medium density surface scatter, <20.1 sq m, Artefact: high density surface scatter, >20.1 sq m, Artefact: embedded in rock matrix, Burial ground: Undetermined, Single grave, <10 graves, <20 graves, <50 graves, >100 graves; Deposit: ash, <1 cm, ~5 cm, ~10 cm, ~20 cm, >20 cm; Deposit: charcoal; Deposit: Faunal; Deposit: Kraal; Fossil, hominin: embedded in rock matrix; Fossil, hominin: tracks; Fossil, invertebrate: embedded in rock matrix; Fossil, invertebrate: isolated surface; Fossil, invertebrate: tracks; Fossil, plant: embedded in rock matrix; Fossil, plant: isolated surface; Fossil, vertebrate: embedded in rock matrix; Fossil, vertebrate: isolated surface; Fossil, vertebrate: tracks; Fossil: breccia with visible remains; Fossil: breccia without visible remains; Rock art: combination; Rock art: engraving; Rock art: painting; Shelter: including artefact/s; Shelter: including artefact/s + deposit + structures; Shelter: rock art + artefacts / deposit / structures; Shelter: rock art combination; Shelter: rock art engraving; Shelter: rock art painting; Site: high complexity, multiple components >2500 sq m / 50 x 50 m; Site: low complexity, multiple components <25 sq m / 5 x 5 m; Site: medium complexity, multiple components >25 sq m / 5 x 5 m to <2500 sq m / 50 x 50 m; Structural: complex, e.g. weir; Structural: functional, e.g. fences, wind pumps, troughs; Structural: industrial, e.g. warehouse, headgear; Structural: remains, e.g. daga, hut floor, foundations, bricks; Structural: stonewall; Other

SITE RECORDING AND PRELIMINARY CONDITIONAL ASSESSMENT FORM



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ENVIRONMENTAL

4. Description and Notes

Restrictions/sensitivities: <i>Please note any restrictions with regard to this heritage resource and/or information obtained by an informant</i>		None X	No photographs	Do not publish			
Other:							
Reason for Restrictions:		N/A					
Please provide a brief description of the resource:		Rock art including an engraving and paintings on one dolerite boulder. The paintings consist of geometric designs in white paint and the engraving consist of an antelope.					
Condition of the resource:		Damaged	Poor	Fair	Good X		
Quality of the resource: (Scales of damage)		Poor	Fair	Good	Excellent X		
Please describe: <i>(including scale of damage or neglect and factors influencing the integrity of the resource)</i>		The condition of the resource is good, and the condition is excellent. The images are					
Statement of Significance: <i>(please provide a brief assessment of the significance of the resource, in your opinion)</i>		Negligible	Low	Medium	Med-Hi	High	V. High
		Consider aesthetic, historic, scientific and social criteria Based on previous assessment of the CS of the cultural landscape and heritage resources. Rock Art within the cultural landscape has significant social value and also has historical value.					
Are there any observable / apparent threats / impacts to the resource?		None.					
Please include any additional notes here: <i>(e.g. any notable features, additional information from an informant, damage)</i> <i>Should this be a Chance Find, please include details surrounding the find (e.g. personnel involved, activities being undertaken, decisions made and steps taken after find, date and time of find)</i>		N/A					

SITE RECORDING AND PRELIMINARY CONDITIONAL ASSESSMENT FORM



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Recorder:	Shannon	Date:	03/12/2019	
Classification:	Immovable	Movable X	Intangible	
Location:	PV Plant Footprint (farm Visserskloof)		Photograph Numbers:	936 to 946
Ref No:	SA-023	Co-ordinates	30°37'14.32"S	21°37'58.39"E
<small>Site name/number or other reference</small>		<small>Decimal degrees using the WGS84 datum</small>		
1. Immovable Heritage Resources				
SAHRIS ID Reference: <small>where applicable</small>				
Type of resource:	<small>See form</small>	Age / Industry / Period:	<small>Cultural period / style / associated persons / history</small>	
Resource Description Summary:	<small>See form</small>			
Functional Type:		Current Function:	<small>Original / changed from past / current function</small>	
<i>Please proceed to Section 4</i>				
2. Movable Heritage Resources				
SAHRIS ID Reference:	N/A			
Type of resource:	Archaeological artefact	Age / Industry / Period:	Stone Age (MSA and LSA)	
Resource Description Summary:	Artefact: Low density surface scatter, <10:1 m ² Represents the MSA and LSA			
Quantity recorded:	<10:1 m ²			
<i>Please proceed to Section 4</i>				
3. Intangible Heritage Resources				
SAHRIS ID Reference:				
Type of resource:		To whom is the resource significant?		
Describe the resource or summarise provided information:				
Informant / source of information:		Wishes to remain anonymous		
<i>Please proceed to Section 4</i>				

Type of Resource: Archaeological: Artefacts, Rock Art, Deposit, Shell Midden, Ruin > 100 years, Stone walling, Settlement; Living heritage / sacred site; Battlefield; Burial Grounds and Graves; Conservation Area; Cultural Landscape; Geological; Meteorites; Monuments & Memorials; Natural, Palaeontological; Place; Structure: bridge, building, transport infrastructure; Underwater: Shipwreck, Submerged (intertidal, partially submerged, fully submerged).

Summary Description: Artefact: Isolated surface, Artefact: Low density surface scatter, <10:1 sq m, Artefact: medium density surface scatter, <20:1 sq m, Artefact: high density surface scatter, >20:1 sq m, Artefact: embedded in rock matrix, Burial ground: Undetermined, Single grave, ≤10 graves, ≤50 graves, >100 graves; Deposit: ash, ≤1 cm, ~5 cm, ~10 cm, >20 cm; Deposit: charcoal; Deposit: Faunal; Deposit: Kraal; Fossil, hominin: embedded in rock matrix; Fossil, hominin: tracks; Fossil, hominin: embedded in rock matrix; Fossil, invertebrate: embedded in rock matrix; Fossil, invertebrate: isolated surface; Fossil, invertebrate: tracks; Fossil, plant: embedded in rock matrix; Fossil, plant: isolated surface; Fossil, vertebrate: embedded in rock matrix; Fossil, vertebrate: isolated surface; Fossil, vertebrate: tracks; Fossil: breccia with visible remains; Fossil: breccia without visible remains; Rock art: combination; Rock art: engraving; Rock art: painting; Shelter: including artefact/s;

Shelter: including artefact/s + deposit; Shelter: including artefact/s + deposit + structures; Shelter: rock art + artefacts / deposit / structures; Shelter: rock art combination; Shelter: rock art engraving; Shelter: rock art painting; Site: high complexity, multiple components >2500 sq m / 50 x 50 m; Site: low complexity, multiple components <25 sq m / 5 x 5 m; Site: medium complexity, multiple components >25 sq m / 5 x 5 m to <2500 sq m / 50 x 50 m; Structural: complex, e.g. weir; Structural: functional, e.g. fences, wind pumps, troughs; Structural: industrial, e.g. warehouse, headgear; Structural: remains, e.g. daga, hut floor, foundations, bricks; Structural: stonewall; Other

SITE RECORDING AND PRELIMINARY CONDITIONAL ASSESSMENT FORM



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4. Description and Notes						
Restrictions/sensitivities: <i>Please note any restrictions with regard to this heritage resource and/or information obtained by an informant</i>	None X	No photographs	Do not publish			
	Other:					
	Reason for Restrictions:	N/A				
Please provide a brief description of the resource:	Low-density lithic scatters that appear to represent a mix of wash as well as potentially <i>in situ</i> material. Some of the material appears relatively fresh and a refit was identified within this area.					
Condition of the resource:	Damaged	Poor	Fair X	Good		
Quality of the resource: (Scales of damage)	Poor	Fair	Good	Excellent X		
Please describe: <i>(including scale of damage or neglect and factors influencing the integrity of the resource)</i>	Some artefacts are <i>ex situ</i> and most likely represent wash. However, some artefacts appear to be <i>in situ</i> and a refit (blade and blade core) was found in the scatter. Some artefacts appear relatively fresh in comparison to the artefacts identified at previous sites.					
Statement of Significance: <i>(please provide a brief assessment of the significance of the resource, in your opinion)</i>	Negligible	Low	Medium	Med Hi	High	V. High
	<p style="text-align: center;">Consider aesthetic, historic, scientific and social criteria</p> <p>Based on previous assessment of the CS of the cultural landscape and heritage resources.</p> <p>The site represents historical and aesthetic value and has a higher scientific value as some of the artefacts appear to be in their original depositional context.</p>					
Are there any observable / apparent threats / impacts to the resource?	<p>Located within proposed development footprint.</p> <p>Open site, susceptible to washing away further.</p>					
Please include any additional notes here: <i>(e.g. any notable features, additional information from an informant, damage)</i> <i>Should this be a Chance Find, please include details surrounding the find (e.g. personnel involved, activities being undertaken, decisions made and steps taken after find, date and time of find)</i>	The area was originally thought to represent all wash and was surveyed in multiple transects. The photographs represent select lithics identified in the PV Plant development footprint area					

Type of Resource: Archaeological: Artefacts, Rock Art, Deposit, Shell Midden, Ruin > 100 years, Stone walling, Settlement; Living heritage / sacred site; Battlefield; Burial Grounds and Graves; Conservation Area; Cultural Landscape; Geological; Meteorites; Monuments & Memorials; Natural, Palaeontological; Place; Structure: bridge, building, transport infrastructure; Underwater: Shipwreck, Submerged (intertidal, partially submerged, fully submerged).

Summary Description: Artefact: isolated surface, Artefact: Low density surface scatter, <10.1 sq m, Artefact: medium density surface scatter, <20.1 sq m, Artefact: high density surface scatter, >20.1 sq m, Artefact: embedded in rock matrix, Burial ground: Undetermined, Single grave, <10 graves, <20 graves, <50 graves, >100 graves; Deposit: ash, <1 cm, ~5 cm, ~10 cm, ~20 cm, >20 cm; Deposit: charcoal; Deposit: Faunal; Deposit: Kraal; Fossil, hominin: embedded in rock matrix; Fossil, hominin: tracks; Fossil, invertebrate: embedded in rock matrix; Fossil, invertebrate: isolated surface; Fossil, invertebrate: tracks; Fossil, invertebrate: embedded in rock matrix; Fossil, invertebrate: isolated surface; Fossil, invertebrate: tracks; Fossil: breccia with visible remains; Fossil: breccia without visible remains; Rock art: combination; Rock art: engraving; Rock art: painting; Shelter: including artefact/s;

Shelter: including artefact/s + deposit; Shelter: including artefact/s + deposit + structures; Shelter: rock art + artefacts / deposit / structures; Shelter: rock art combination; Shelter: rock art engraving; Shelter: rock art painting; Site: high complexity, multiple components >2500 sq m / 50 x 50 m; Site: low complexity, multiple components <25 sq m / 5 x 5 m; Site: medium complexity, multiple components >25 sq m / 5 x 5 m to <2500 sq m / 50 x 50 m; Structural: complex, e.g. weir; Structural: functional, e.g. fences, wind pumps, troughs; Structural: industrial, e.g. warehouse, headgear; Structural: remains, e.g. daga, hut floor, foundations, bricks; Structural: stonewall; Other



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Appendix C: PIA Addendum

Palaeontological Impact Assessment Addendum Report for the Square Kilometre Array Project

Walkthrough Report

12 December 2019

Prof Marion Bamford

Palaeobotanist

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1. Background

A Palaeontological walkthrough site visit was requested for the proposed SKA Project (SAR6105). This site visit was conducted by Dr Alisoun House on 3rd December 2019, and is presented here.

To comply with the South African Heritage Resources Agency (SAHRA) in terms of Section 38(8) of the National Heritage Resources Act, 1999 (Act No. 25 of 1999) (NHRA), a Palaeontological Impact Assessment (PIA) was completed in June 2018 for the proposed application. This report is an addendum to the 2018 PIA.

The Palaeontologist Consultant is: Prof Marion Bamford (PhD; FRSAf, ASSAf)

2. On Site Observations

i. HIRAX: Farm Swartfontein 496 (GPS 30°41'24.76"S 21°34'28.30"E)

The site presents a vast open flat washed area, covered in a shallow layer of fine grained, weathered mudstone and sandstone soils, overlying carbonaceous shales and supporting xerophytic vegetation. An access farm road was visible. A network of dolerite dykes was exposed, barely protruding through the overlying sediment. Intermittent calcrete nodules were scattered across the surface (Figure 2-1). The site is on the mudstones of the Tierkloof Fm, (Ecca Group, Early Permian, Karoo Supergroup) which is too old for most vertebrate fossils. *Glossopteris* flora plant fossils could occur here but the sediments are deep water deposits and no plant fossils have been recorded (Johnson et al., 2006).

The presence of the dolerite dykes makes the probability of a significant fossil find unlikely.

No fossils were observed on this site.



Figure 2-1: Calcrete nodules, and weathered soils from mudstones on Swartfontein farm

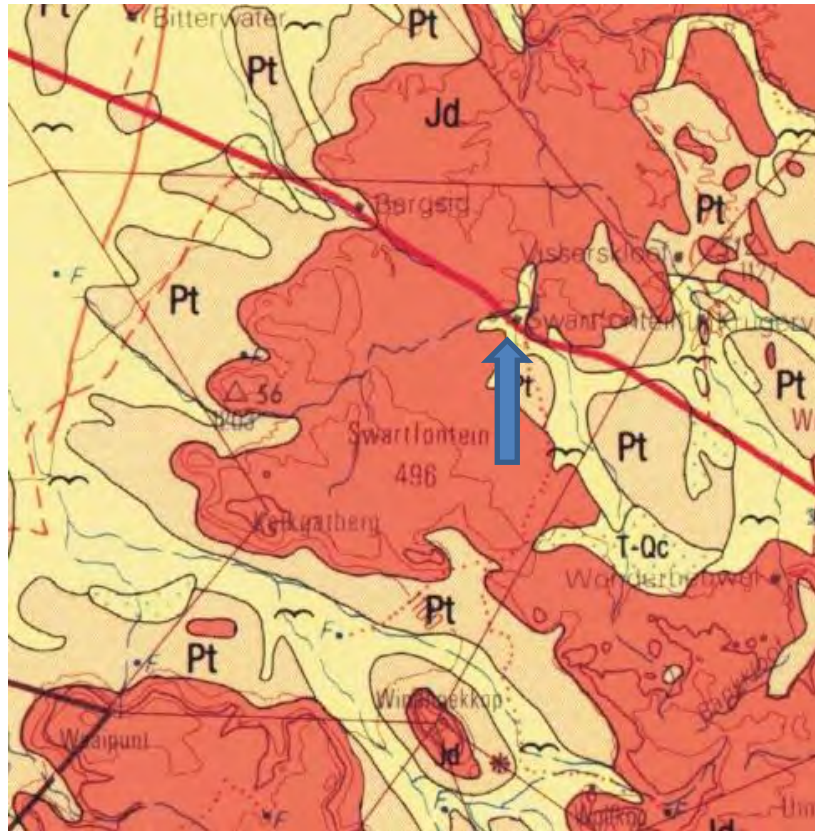


Figure 2-2: Geological map of the Farm Swartfontein 496.

Symbols: Jd = Jurassic dolerite dyke, Pt = Tierberg Fm, Eccra group (mudstones), T-Qc = undifferentiated Tertiary-Quaternary calcareous sand and calcrete, QS = Kalahari sand group (aeolian sands).

Map enlarged from the council of geoscience map 1:250 000, 3020 Britstown map.

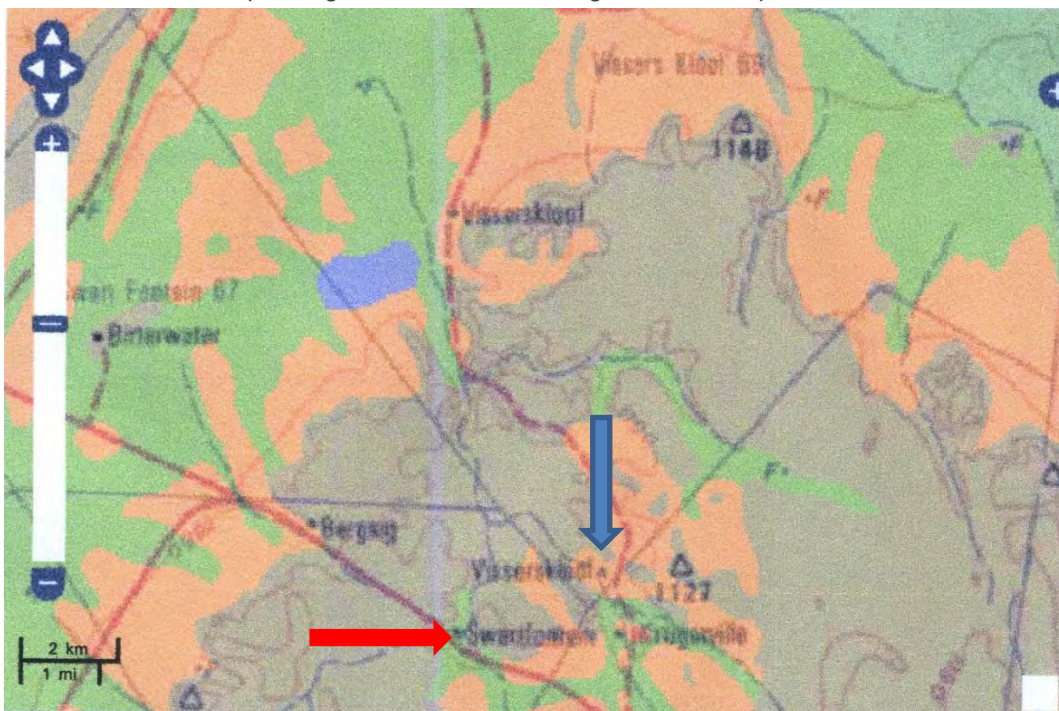


Figure 2-3: SAHRIS Palaeosensitivity Map for Swartfontein 496 with the Site Indicated by the Red Arrow; Visserskloof 69 Farmstead and PV Site Indicated by the Blue Arrow.

Colours indicate the following degrees of sensitivity: red = very highly sensitive; orange/yellow = high; green = moderate; blue = low; grey = insignificant/zero.

ii. Homestead of Visserskloof 69 (GPS 30°40'24.09"S 21°35'17.40"E)

The site was the farm house and immediate surrounding areas, showing significant evidence of disturbance in the form of construction, gardening, reservoirs, dumping, livestock byres and grazing. As such this was not a palaeontologically sensitive site and no fossils were observed on the site. The site is on the mudstones of the Tierkloof Fm, (Ecca Group Early Permian) which is too old for most vertebrate fossils. *Glossopteris* flora plant fossils could occur here but the sediments are deep water deposits and no plant fossils have been recorded.

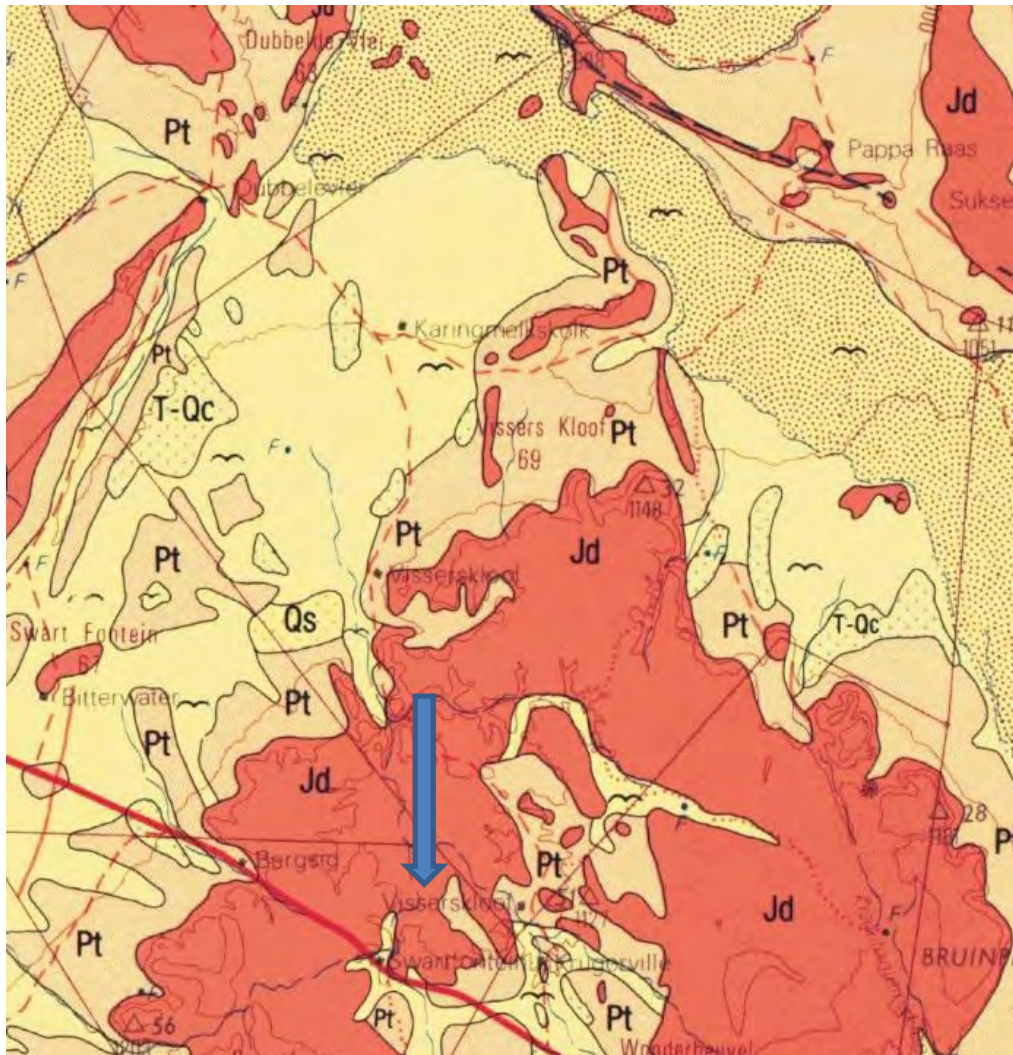


Figure 2-4: Geological Map of the Farm Visserskloof 69.

Symbols: Jd = Jurassic dolerite dyke, Pt = Tierberg Fm, Ecca Group (mudstones), T-Qc = undifferentiated Tertiary-Quaternary calcareous sand and calcrete, Qs = Kalahari Sand Group (aeolian sands).

Map enlarged from the Council of Geoscience map 1:250 000, 3020 Britstown map.

iii. PV site on Visserskloof 69 (GPS 30°37'18.17"S 21°37'55.55"E)

This was a large, open area, probably a floodplain, traversed by numerous water courses and surrounded by mountains of dolerite boulders. The vegetation was mainly xerophytic scrub. Scattered Calcrete nodules were observed (Figure 2-5) but no fossils were observed on the site. It is recommended, however, that a Fossil Chance Find protocol should be followed during the construction. See Figure 2-3 and Figure 2-4 for the PV site.



Figure 2-5: Calcrete Nodules at the PV Site on Visserskloof 69.

3. Conclusion and Recommendation

No vertebrate bones or fossil plant impressions were found in any of the project locations that were visited. All the areas were on the soils that originated from Tierberg Formation (Ecca Group, Early Permian Karoo Supergroup mudstones). The land surface was extremely weathered and represented deflation surfaces. Although the Tierberg Formation is indicated as highly sensitive palaeontologically on the Sahrís map (orange), no fossils were found during the walkthrough, and based on previous records, vertebrates are extremely rare, while plants are absent.

It is recommended, however, that a Fossil Chance Find Protocol be added to the EMP, so if putative fossils are found when excavations begin, they are photographed and put aside. The photographs are sent to a palaeontologist, and found to be of scientific then the palaeontologist must obtain a SAHRA permit and collect the fossils.