

HERITAGE IMPACT ASSESSMENT

In terms of Section 38(8) of the NHRA for the

Proposed development of the Northam PV facility near Thabazimbi, North West Province

SAHRIS Ref:

Prepared by CTS Heritage



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For

Savannah Environmental (Pty) Ltd

May 2021



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THE INDEPENDENT PERSON WHO COMPILED A SPECIALIST REPORT OR UNDERTOOK A SPECIALIST PROCESS

I Jenna Lavin, as the appointed independent specialist hereby declare that I:

- act/ed as the independent specialist in this application;
- regard the information contained in this report as it relates to my specialist input/study to be true and correct, and
- do not have and will not have any financial interest in the undertaking of the activity, other than remuneration for work performed in terms of the NEMA, the Environmental Impact Assessment Regulations, 2010 and any specific environmental management Act;
- have and will not have no vested interest in the proposed activity proceeding;
- have disclosed, to the applicant, EAP and competent authority, any material information that have or may have the potential to influence the decision of the competent authority or the objectivity of any report, plan or document required in terms of the NEMA, the Environmental Impact Assessment Regulations, 2010 and any specific environmental management Act;
- am fully aware of and meet the responsibilities in terms of NEMA, the Environmental Impact Assessment Regulations, 2010 (specifically in terms of regulation 17 of GN No. R. 543) and any specific environmental management Act, and that failure to comply with these requirements may constitute and result in disqualification;
- have ensured that information containing all relevant facts in respect of the specialist input/study was distributed or made available to interested and affected parties and the public and that participation by interested and affected parties was facilitated in such a manner that all interested and affected parties were provided with a reasonable opportunity to participate and to provide comments on the specialist input/study;
- have ensured that the comments of all interested and affected parties on the specialist input/study were considered, recorded and submitted to the competent authority in respect of the application;
- have ensured that the names of all interested and affected parties that participated in terms of the specialist input/study were recorded in the register of interested and affected parties who participated in the public participation process;
- have provided the competent authority with access to all information at my disposal regarding the application, whether such information is favourable to the applicant or not; and
- am aware that a false declaration is an offence in terms of regulation 71 of GN No. R. 543.

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Signature of the specialist

CTS Heritage

Name of company

March 2021

Date



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EXECUTIVE SUMMARY

1. Site Name:

Northam PV Facility

2. Location:

The proposed study area is located within Northam Platinum Limited's Zondereinde Mine Area, approximately 35km south of the town of Thabazimbi and 18 km northwest of the town of Northam, between the R510 in the west and the R511 in the east. The project site falls within the jurisdiction of the Thabazimbi Local Municipality, which forms part of the Waterberg District, on the following farm properties:

- Portion 2 of the Farm Zondereinde 384 (TOKQ00000000038400002).

3. Locality Plan:

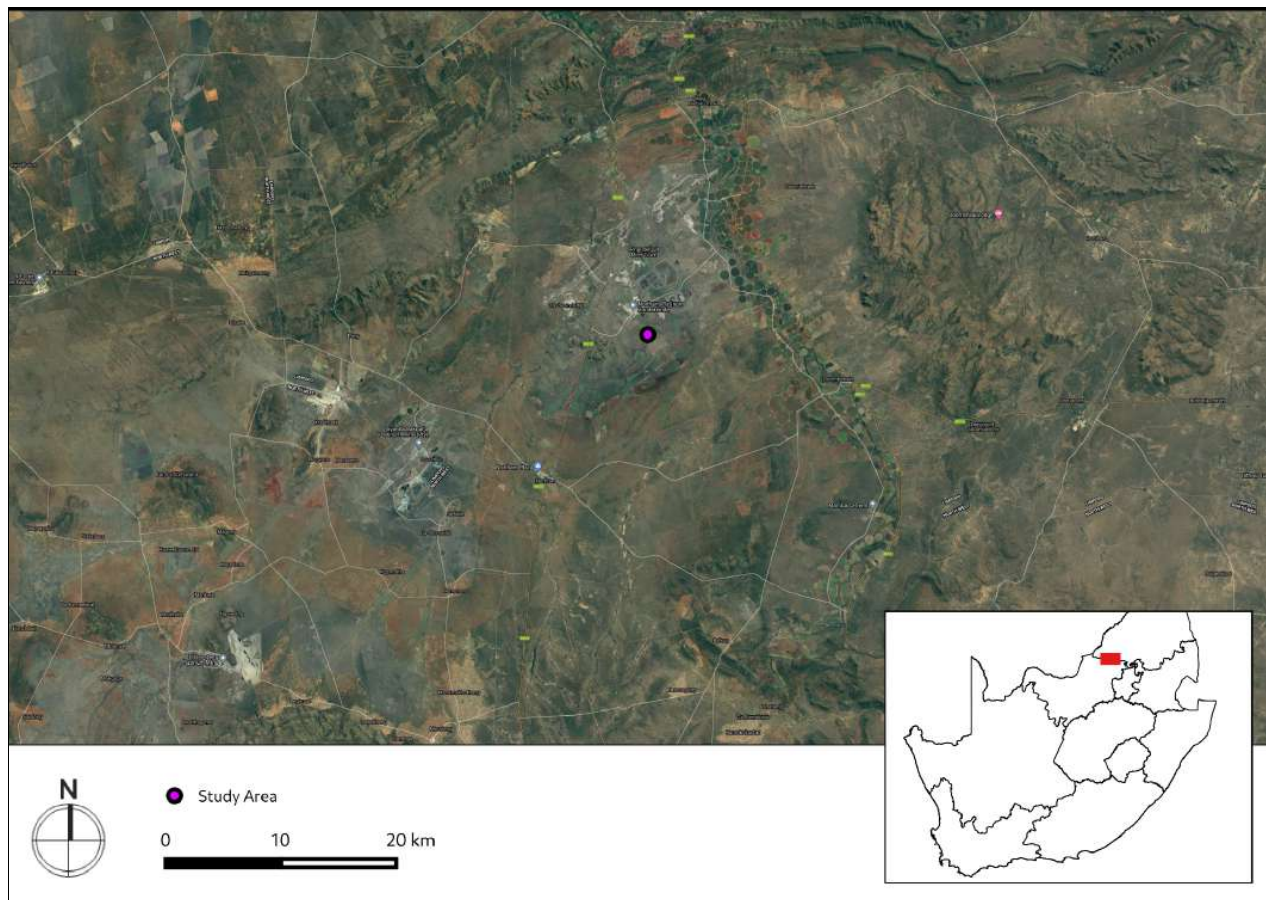


Figure 1: Location of the proposed study area

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4. Description of Proposed Development:

This application is for the proposed development of a 10MW PV Facility to be located within an identified broader study area. The Northam PV development is located within a 30km radius of two solar developments with approved Environmental Authorisations. The Solar PV facility is relatively small and will have a contracted capacity of 10MW and will use the tracking PV technology to harness the solar resource on the project site. A development area of up to 20ha in extent will be occupied by the PV panels and associated infrastructure. This 20ha development is located within a wider study area that was assessed for heritage significance.

5. Heritage Resources Identified in the broader study area:

POINT ID	Site Name	Description	Co-ordinates		Grading	Mitigation
	Northam Site 4 Complex	LIA Site complex identified by Van Vollenhoven (2013)	-24.841944	27.348333	IIIA	The site must be conserved and no impact is permitted. The site must be noted for scientific excavation.
OBS001	Northam Site 5 complex	View of ruined kraal, vertical branch still remains, stonewalling, quartz & quartzite flakes, undecorated pottery, LIA	-24.85241	27.33583	IIIA	The site must be conserved and no impact is permitted. The site must be noted for scientific excavation.
OBS002	Northam Site 5 complex	Large circular kraal wall, less than half a metre high, completely grass covered, LIA	-24.85241714	27.33527552	IIIA	The site must be conserved and no impact is permitted. The site must be noted for scientific excavation.
OBS003	Northam Site 5 complex	Small stonewalled kraals, grass cover thick, LIA	-24.8524287	27.33583603	IIIA	The site must be conserved and no impact is permitted. The site must be noted for scientific excavation.

None of the above sites are located close to the proposed development area (see Map 5 below).



6. Anticipated Impacts on Heritage Resources:

The impacts outlined below pertain specifically to the proposed 10MW PV development which is the subject of this assessment and do not apply to any other development undertaken in the area to date.

The proposed site for the 10MW PV Facility is presently located within an area identified as having low archaeological sensitivity. No impact to significant heritage resources are anticipated as long as the proposed 10MW PV Facility is located within the areas identified as having low or moderate archaeological sensitivity. At this stage, the preferred site for the proposed 10MW PV Facility is located within an area identified as having low archaeological sensitivity.

The field assessment of the broader study area undertaken to inform the placement of the PV facility has revealed that there is a large section of the broader study area that is highly sensitive for impacts to very significant archaeological resources. Although these significant archaeological resources have been previously identified by Van Vollenhoven (2013) and Van der Walt (2019), little proactive conservation interventions seem to have taken place.

Due to the significance of the LIA site complex, it is recommended that no negative impacts to these sites or their associated archaeological deposit should take place. As such, we have mapped out areas of very high archaeological sensitivity that must be avoided and areas of low and moderate sensitivity that are preferred for the development of the proposed PV facility (see Figure 5.1). A detailed mapping exercise using ground truthing and satellite imagery was conducted to establish the boundaries of the Late Iron Age site complexes at sites 4 and 5. This was combined into a shaded red sensitivity area in figures 5.1 and 5.2 to delineate an area recommended for no development of the 10MW PV facility.

7. Recommendations:

There is no objection to the proposed development of the proposed Northam PV facility and its associated infrastructure on condition that:

- The proposed PV facility is located in the low or moderate sensitivity areas (grey or yellow) identified as preferred for development as they have low archaeological sensitivity in Figure 5.
- The areas marked as having high archaeological sensitivity are avoided and it is recommended that no development activities associated with the proposed PV development take place within this area (red)



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- Should any previously unrecorded archaeological resources or possible burials be identified during the course of construction activities, work must cease in the immediate vicinity of the find, and SAHRA must be contacted regarding an appropriate way forward.

General recommendations for the proactive conservation of the significant LIA complex

The author believes the mitigation measures previously proposed by Van Vollenhoven (2013) and Van der Walt (2019) may not be sufficient for conservation of the broader cultural landscape. Whilst not within the scope of this assessment of the impacts of the PV facility, due to the significance of this complex of LIA sites located within the broader study area, it is recommended that on-going archaeological management interventions are implemented.

As the LIA complex is located on land that is privately owned, it is recommended that SAHRA enter into discussions with Northam Mine and Anglo in order to develop a Heritage Agreement in terms of section 42 of the NHRA. Appended to this agreement should be a Conservation Plan for the LIA site complex which will outline the relevant roles and responsibilities of SAHRA and the landowners in terms of ongoing management and conservation of these significant sites.

8. Author/s and Date:

Jenna Lavin

May 2021



Details of Specialist who prepared the HIA

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

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

Since 2016, Jenna has drafted over 50 Heritage Impact Assessments throughout South Africa.



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1. INTRODUCTION

1.1 Background Information on Project

This application is for the proposed development of a 10MW PV Facility to be located within an identified broader study area. The Northam PV development is located within a 30km radius of two solar developments with approved Environmental Authorisations. The Solar PV facility is relatively small and will have a contracted capacity of 10MW, and will use the tracking PV technology to harness the solar resource on the project site. A development area of up to 20ha in extent will be occupied by the PV panels and associated infrastructure. This 20ha development is located within a wider study area that was assessed for heritage significance.

The proposed broader study area within which the 10MW PV facility will be located is located within Northam Platinum Limited's Zondereinde Mine Area, approximately 35km south of the town of Thabazimbi and 18 km northwest of the town of Northam, between the R510 in the west and the R511 in the east. The project site falls within the jurisdiction of the Thabazimbi Local Municipality, which forms part of the Waterberg District, on the following farm properties:

- Portion 2 of the Farm Zondereinde 384 (TOKQ00000000038400002).

Infrastructure associated with the proposed 10MW solar PV facility will include the following:

- Solar PV array comprising PV modules and mounting structures;
- Inverters and transformers;
- Cabling between the project components;
- On-site facility substation to facilitate the connection between the solar PV facility and the mine electrical distribution network;
- Combined gatehouse, site offices and storage facility;
- Temporary laydown areas; and
- Access paved roads, internal roads and fencing around the development area.

Details of the proposed project infrastructure

The Northam Solar PV facility will be designed to have a contracted capacity of up to 10MW. The project will make use of fixed-tilt, single-axis tracking, and/or double-axis tracking PV technology. Monofacial or bifacial panels are both considered. PV technology forms part of the energy mix, as indicated in the latest Integrated Resource Plan (IRP) for South Africa.



The project will comprise solar panels which, once installed, will stand approximately 5m above ground level. The solar panels will include centralised inverter stations, or string inverters mounted above ground. If centralised inverter stations are used, mega volt (MV) distribution transformers are located internally, whereas string inverters are containerised with switchgear. The main transformer capacity varies according to detailed design and project-specific requirements.

Water supply

Northam Solar PV facility will utilise water during both the construction and operation phases of development. Water is required during construction for dust suppression, and potable water will be required on site for the construction crew. During operations, water is required to clean the PV panels, for human consumption, and for use in the auxiliary buildings (i.e. for use in the office building). During construction, the appointed contractor will bring their own water to site. Approximately 400 000 litres of water will be required for the construction civil works, with 225,000 litres/month for drinking and sanitation. During operation, 15,750 litres/month will be required for drinking and sanitation, whereas 8-10m³/cycle will be required for module cleaning, with four cleaning cycles occurring annually (32-40m³/annum).

Water required for the construction and operational activities will be sourced from Magalies Water via the existing mine water supply network. Alternatively, water will be supplied via truck from on-mine sources. No groundwater abstraction from boreholes is proposed.

On-site facility substation

The Northam Solar PV Facility will include an on-site facility substation to facilitate the connection between the Solar PV facility and the Eskom electricity grid. An onsite substation including associated equipment and infrastructure will be required, comprising a footprint of up to approximately 1ha including the following:

- Temporary and permanent laydown areas
- Site Building
- Powerlines (primary and secondary)
- Ground wires and overhead lines
- Transformers (various)
- Circuit breaker
- Lightning arrester
- Control building



- Security fencing

The construction of the onsite substation would require a survey of the site, site clearing and levelling and construction of access road/s (where required), construction of a level terrace and foundations, assembly, erection, installation and connection of equipment, and rehabilitation of any disturbed areas and protection of erosion sensitive areas.

Panel Cleaning

It is anticipated that the PV panels will be washed four times a year during operation (approximately 275 litres/cycle will be required for module cleaning, with four cleaning cycles occurring annually (1100 litres/annum)). Only clean water (i.e. with no cleaning products), or non-hazardous biodegradable cleaning products, will be utilised for the washing of panels. Wastewater generated by washing panels will be collected and recycled for future use, or alternatively, in the event that an environmentally friendly non-hazardous biodegradable cleaning product is utilised, wastewater can be allowed to run-off under the panels.

Effluent and Wastewater

Since the proposed site is located within the Zondereinde Mine Area, where possible, the contractors will utilise the existing toilet facilities available at the mine. In addition, chemical toilets will be placed close to the proposed site. These facilities will be maintained and serviced regularly by an appropriate waste contractor. Any other effluent discharge during construction will be collected in sealed containers/tanks and collected by a registered service provider (i.e. the Local Municipality/Contractor) to be disposed of at an approved facility off-site.

Waste

All waste generated on site will be handled in accordance with the Zondereinde Mine Waste Management Plan. Solid waste generated during construction will mainly be in the form of construction material, excavated substrate and domestic solid waste. Cardboard waste will be produced from panel packaging, which will be compacted on site prior to removal. Other wastes included rubber caps on panel edges, wooden pallets, plastic wrapping (all related to the panel packaging). Waste will be disposed of in either waste skips and/or scavenger proof recycling bins (where possible) and temporarily placed in a central location for removal by an appropriate contractor. Where possible, waste will be recycled. Non-recyclable solid construction waste will be temporarily held in skips or other appropriate waste containers to be disposed of at an appropriately licensed landfill site. Any other waste and excess material will be removed once construction is complete and disposed of at a registered waste facility.



During construction, use of the following hazardous substances are anticipated: paint, grease, petrol / diesel for trucks, cranes, bulldozers etc. Limited amounts of transformer oils and chemicals will be used. Dangerous goods required to be stored during construction (e.g. limited quantities of fuel, oil, lubricants etc.) will be stored in compliance with relevant legislation (i.e. stored on covered and bunded areas / bin, and disposed of at a registered hazardous waste site). Hazardous waste will be appropriately stored and disposed of.

Several post-authorisation factors are expected to influence the final design of the solar energy facility and could result in small-scale modifications of the PV array and/or associated infrastructure. A final detailed design will only be available once adjudication of the contract is complete and a contractor is appointed for the project.

The findings and results of this Heritage Impact Assessment pertain specifically to the proposed 10MW PV development which is the subject of this assessment and do not apply to any other development undertaken in the area to date.

1.2 Description of Property and Affected Environment

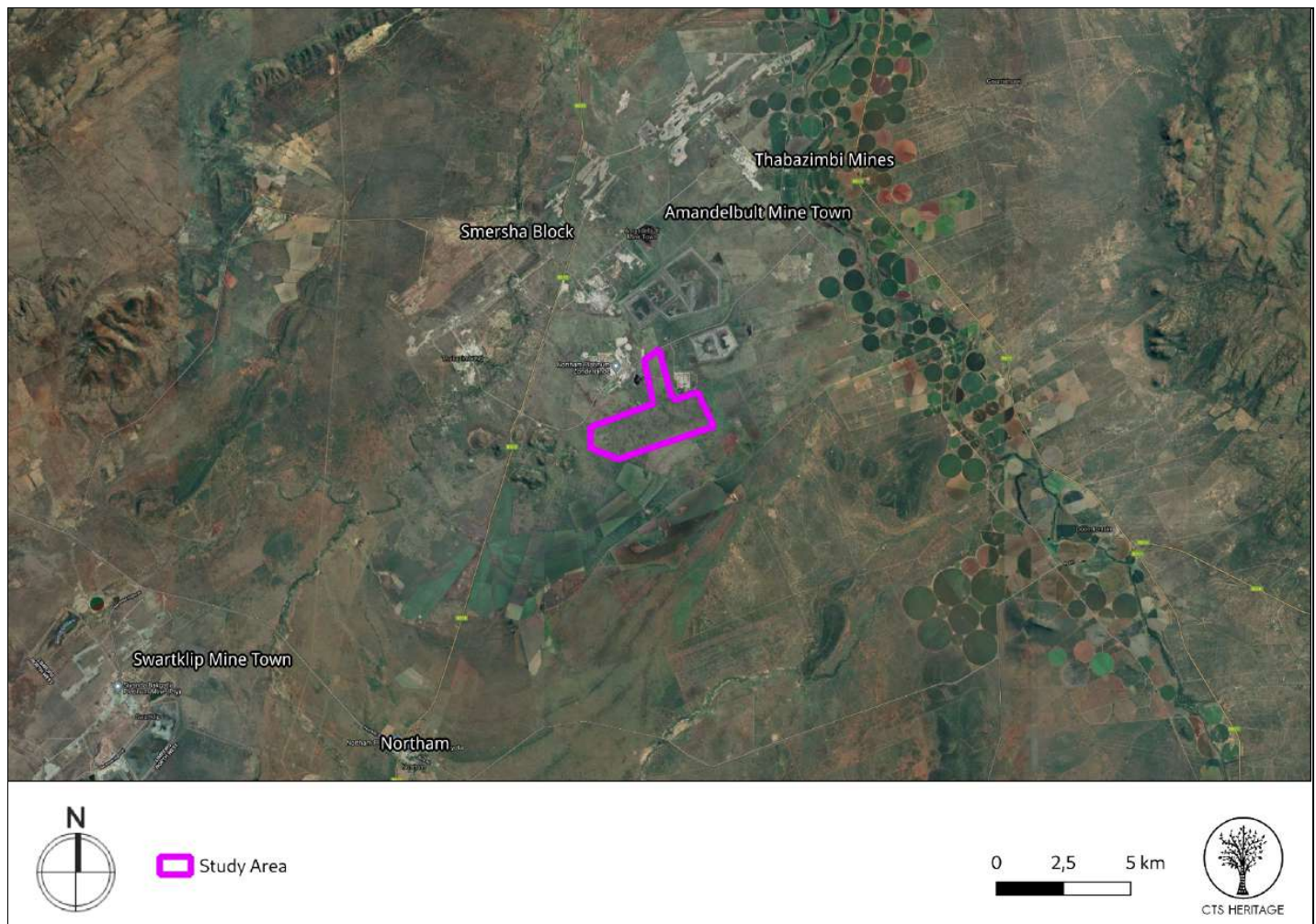
The surface area of the Northam Platinum mine lies mainly on Farm Zondereinde 384 and is located in an area that was previously thoroughly surveyed by Van Vollenhoven (2013) and Van der Walt (2019). The Northam Platinum mine lies to the northeast of a series of granite outcrops and interconnecting areas surrounding the koppie complex in the southwestern end of the study area which have been previously identified as archaeologically sensitive. The town of Northam lies another 12.5km further southeast of the koppie complex and Thabazimbi is around 60km to the north when following the R510 road. The vegetation lies firmly within the Dwaalboom Thornveld and is dominated by dense grasslands and acacia trees. Farm Kopje Alleen 422 has been farmed with crop agriculture, wild game animals and grazing animals, but only the southern end has been ploughed with much of the ground in portion 2 lying fallow and uncultivated bush. Besides the large stretch of mining activities continuing to the north and west of Northam mine, the area is surrounded by mainly maize, wheat and soybean farms.

The Northam Platinum mine has a deep mining shaft that reaches over 1.5km underground. The above ground impacts consist of slimes dams, spoil heaps and post-processing areas, a large smelting facility built on site to the eastern end of the study area, and various overhead power lines running through the area. Staff housing, offices, road infrastructure and other facilities related to the running of the mine are present. However, this is only the

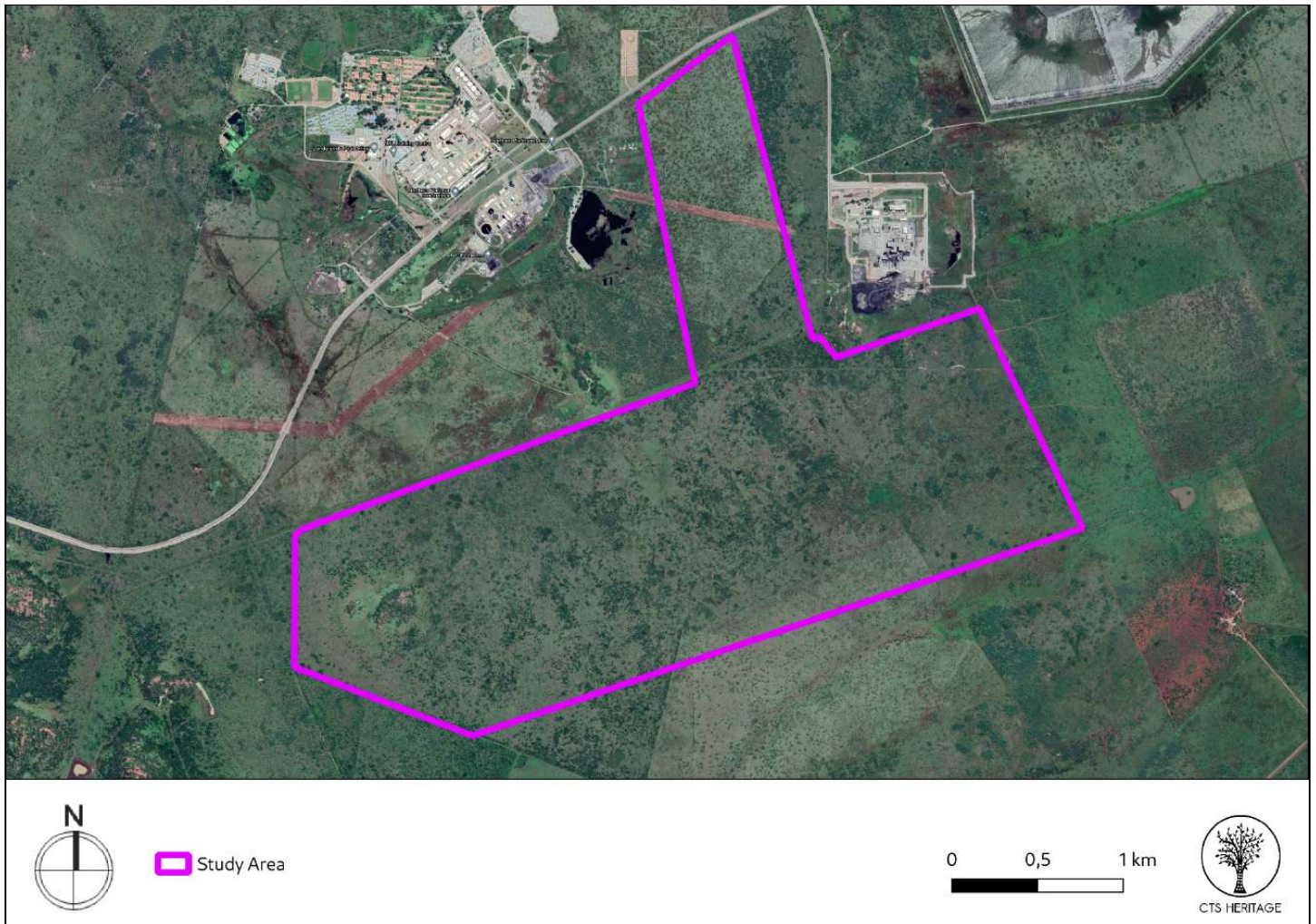


southern end of a much larger mining area around Amandelbult mine where opencast mining of chrome and platinum is taking place.

A number of LIA heritage sites have been identified within the broader study area. These are described in Section 4 of this report.



Map 1a: The proposed study area within which the 10MW PV facility will be located



Map 1b: The proposed study area within which the 10MW PV facility will be located



2. METHODOLOGY

2.1 Purpose of HIA

The purpose of this Heritage Impact Assessment (HIA) is to satisfy the requirements of section 38(8), and therefore section 38(3) of the National Heritage Resources Act (Act 25 of 1999). The broader study area was assessed for heritage resources in order to inform the preferred location for the proposed 10MW PV facility.

2.2 Summary of steps followed

- A Desktop Study was conducted of relevant reports previously written (please see the reference list for the age and nature of the reports used)
- An archaeologist conducted an assessment of the broader study area in order to determine the archaeological resources likely to be disturbed by the proposed development. The archaeologist conducted his site visit on 29 March 2021
- The identified resources were assessed to evaluate their heritage significance
- Alternatives and mitigation options were discussed with the Environmental Assessment Practitioner

2.3 Assumptions and uncertainties

- The *significance* of the sites and artefacts is determined by means of their historical, social, aesthetic, technological and scientific value in relation to their uniqueness, condition of preservation and research potential. It must be kept in mind that the various aspects are not mutually exclusive, and that the evaluation of any site is done with reference to any number of these.
- It should be noted that archaeological and palaeontological deposits often occur below ground level. Should artefacts or skeletal material be revealed at the site during construction, such activities should be halted, and it would be required that the heritage consultants are notified for an investigation and evaluation of the find(s) to take place.

However, despite this, sufficient time and expertise was allocated to provide an accurate assessment of the heritage sensitivity of the area.

2.4 Constraints & Limitations

The survey was conducted on 29 March 2021 towards the end of the summer rainfall season. Previous surveys had already taken place in the study area and this particular study was focused on mapping out the extent of



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known sites and filling in any gaps that may have existed between the various studies conducted. The grass and bush were unfortunately extremely thick and overgrown during the survey which made it difficult to identify stone walling areas at ground level. We therefore attempted to overcome this with a detailed pre- and post- GIS mapping exercise using historical satellite aerial photography and these were used to draw identifiable enclosures. Security guards also have to be assigned to the impact assessors on site as part of a mandatory security protocol run by the mine which limited the ability of the archaeologist to thoroughly assess the study area.

Given the extent of previous assessments and the work covered in this study, we feel confident in marking off a larger area of sensitivity in the broader study area than was previously recommended.

2.5 Savannah Impact Assessment Methodology

Direct, indirect and cumulative impacts of the issues identified through the Basic Assessment process were assessed in terms of the following criteria:

- The nature, which shall include a description of what causes the effect, what will be affected and how it will be affected.
- The extent, wherein it will be indicated whether the impact will be local (limited to the immediate area or site of development) or regional, and a value between 1 and 5 will be assigned as appropriate (with 1 being low and 5 being high).
- The duration, wherein it will be indicated whether:
 - The lifetime of the impact will be of a very short duration (0 – 1 years) – assigned a score of 1.
 - The lifetime of the impact will be of a short duration (2 – 5 years) – assigned a score of 2.
 - Medium-term (5 – 15 years) – assigned a score of 3.
 - Long term (> 15 years) – assigned a score of 4.
 - Permanent – assigned a score of 5.
- The consequences (magnitude), quantified on a scale from 0 – 10, where 0 is small and will have no effect on the environment, 2 is minor and will not result in an impact on processes, 4 is low and will cause a slight impact on processes, 6 is moderate and will result in processes continuing but in a modified way, 8 is high (processes are altered to the extent that they temporarily cease), and 10 is very high and results in complete destruction of patterns and permanent cessation of processes.
- The probability of occurrence, which shall describe the likelihood of the impact actually occurring. Probability will be estimated on a scale of 1 – 5, where 1 is very improbable (probably will not happen), 2 is

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improbable (some possibility, but low likelihood), 3 is probable (distinct possibility), 4 is highly probable (most likely) and 5 is definite (impact will occur regardless of any prevention measures).

- The significance, which shall be determined through a synthesis of the characteristics described above and can be assessed as low, medium or high.
- The status, which will be described as either positive, negative or neutral.
- The degree to which the impact can be reversed.
- The degree to which the impact may cause irreplaceable loss of resources.
- The degree to which the impact can be mitigated.

The significance is calculated by combining the criteria in the following formula:

$$S = (E + D + M) \times P$$

S = Significance weighting

E = Extent

D = Duration

M = Magnitude

P = Probability

The significance weightings for each potential impact are as follows:

- < 30 points: Low (i.e. where this impact would not have a direct influence on the decision to develop in the area).
- 30 – 60 points: Medium (i.e. where the impact could influence the decision to develop in the area unless it is effectively mitigated).
- > 60 points: High (i.e. where the impact must have an influence on the decision process to develop in the area).

3. HISTORY AND EVOLUTION OF THE SITE AND CONTEXT

3.1 Desktop Assessment

The broader study area assessed in this HIA is located immediately adjacent to the town of Thabazimbi and the existing Northam Platinum Mine. The area immediately surrounding both the town and the mine largely consists of agricultural lands used for crop cultivation. The name Thabazimbi means *mountain of iron* because of the large iron ore reef that was discovered in 1919 by J. H. Williams. The mine boasts one of the largest mining shafts in Africa. More than 2 million tons of ore are mined every year and hauled by train to Mittal's iron and steel works.

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The railway line from Rustenburg reached the area in the 1930s and full scale iron and steel production began. The town was proclaimed in 1953 and its history is intimately linked with that of the mines in the area. Much of the central landscape of the North West Province is defined by bushveld and grasslands scattered with trees and shrubs; the mountains, deep valleys, rivers and dams of the northeast; the flat and arid semi-deserts plains of the west; and the lush vegetation of areas bordering the Vaal River in the south.

A broad history of the area is included in Murimbika (2010) and is referred to here. According to Murimbika (2010), the broader region has also yielded some significant Iron Age Sites such as the Mzonjani facies Broederstroom site (AD 430 to AD 780). According to Murimbika (2010), the broader region was subject to a number of instances of migration and settlement from 450 AD. Evidence indicates that Sotho-Tswana groups migrated in and out of the Magaliesberg region, and such groups are responsible for the many early stone-walled settlements in this region. One of the most documented migrations is the Mfecane (forced migration or scattering) which was a period of widespread chaos and warfare among indigenous ethnic communities in southern Africa during the period between 1815 and about 1840. During this time, the Ndebele under Mzilikazi reached the Magaliesberg region and are responsible for introducing the Doornspruit-type walled settlements that are known from this region (the Doornspruit River drains into the project area). According to Murimbika (2010) this type of stone-walled settlement represents “typical Nguni-Sotho-Tswana acculturation”. Murimbika (2010) further explains that one of the most acculturated groups in the region is known as the “Po”, whose Chief Mogale lends his name to the Magaliesberg Mountains and the Mogale City Municipality. By the mid-1800’s, Voortrekkers had begun to settle in the foothills of the Magaliesberg mountains and in so doing, clashed with Mzilikazi’s Ndebele in 1837. These early colonial battles forced the Ndebele north of the Limpopo River and effectively ended the independence of African Chiefdoms in the area. The Voortrekkers went on to establish the Republic of the Transvaal. As articulated by Murimbika (2010), it is in this context that the Magaliesberg area, in which the proposed development is located, is an important cultural landscape.

Archaeology

Previous Heritage Impact Assessments conducted in the immediate vicinity of the proposed study area (Von Vollenhoven, 2013 and van der Walt 2019) have identified a number of significant archaeological sites in the vicinity of the study area, dated to the Late Iron Age (Figure 3, 3a and 3b). Van Vollenhoven (2013) noted three clusters of Late Iron Age sites consisting of a number of individual features of stone walling of a variety of heights and diameters. Similarly, Van der Walt (2019) identified clusters of stone packed kraals up to 20m in diameter and deflated middens. According to Van der Walt (2019), a number of Late Iron Age middens and stone-walled

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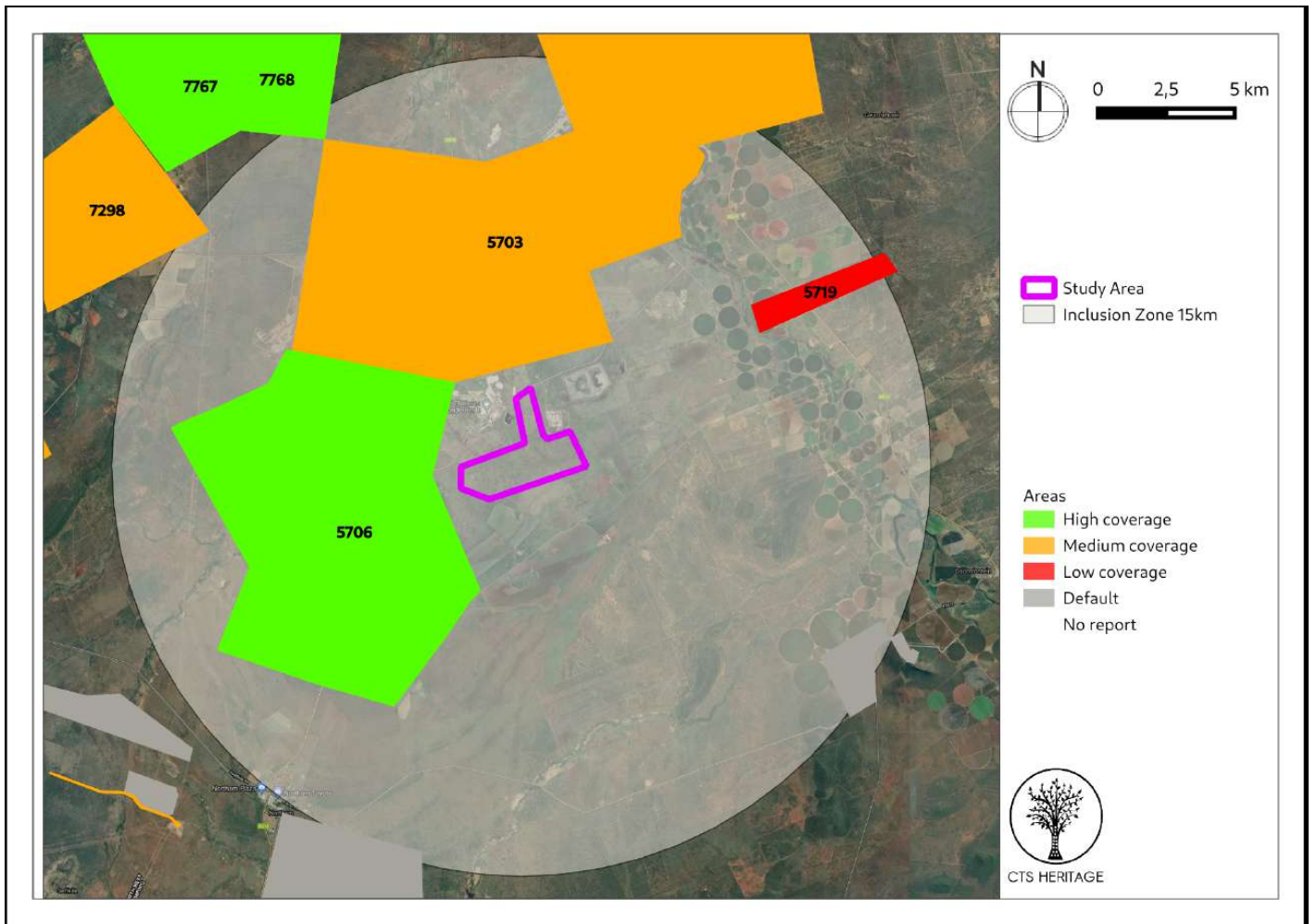


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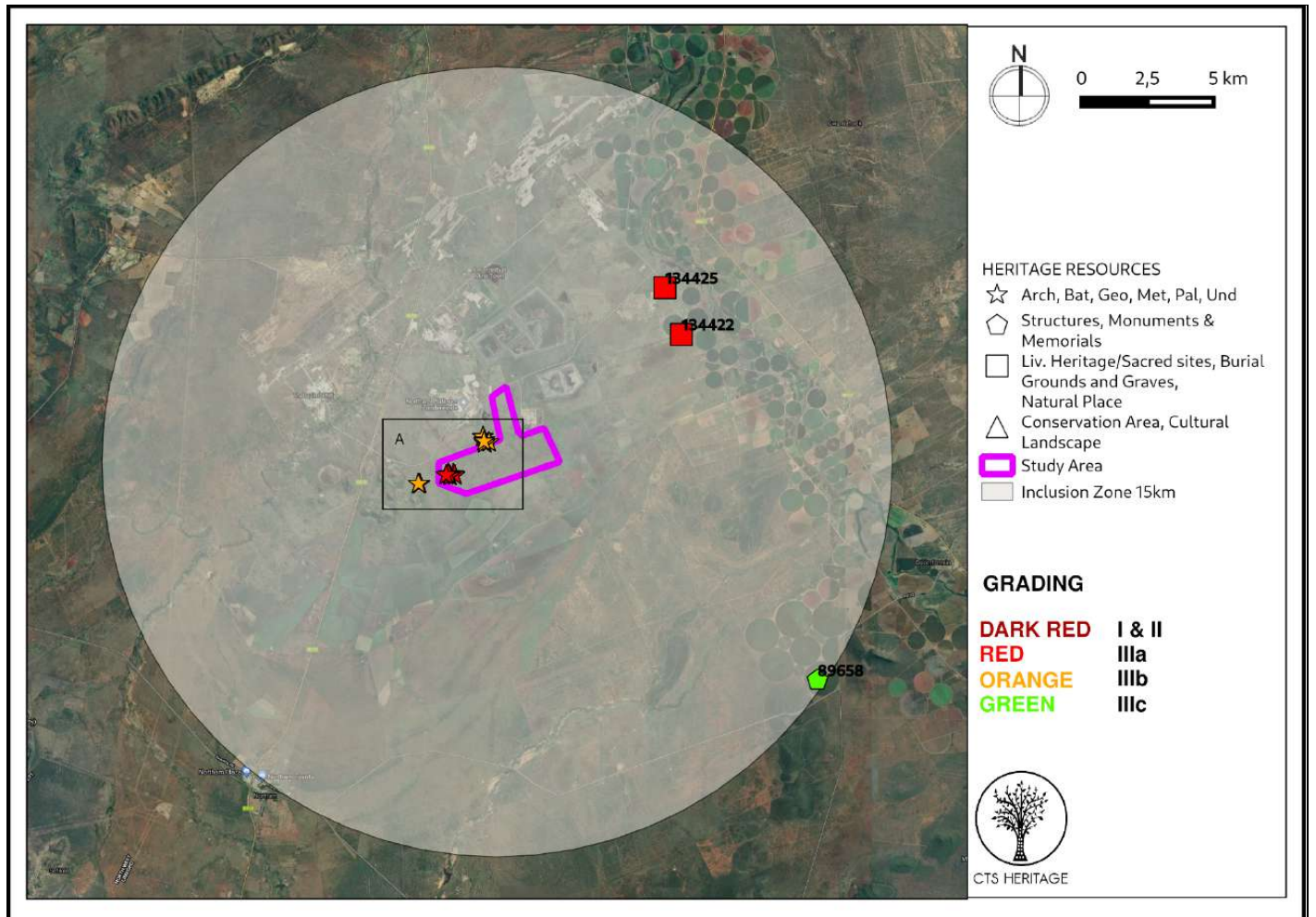
enclosures were identified as having high local significance (Grade IIIA). Van der Walt (2019) also identified individual artefacts outside of these kraal locations such as upper grindstones and undecorated ceramics. As mitigation against impacts to the identified Iron Age sites, Van der Walt (2019) recommended the implementation of buffer zones of 30m around the identified sites however the author is of the view that this may not be sufficient for conservation of the broader cultural landscape.

Table 1: Sites previously identified in and near the broader study area

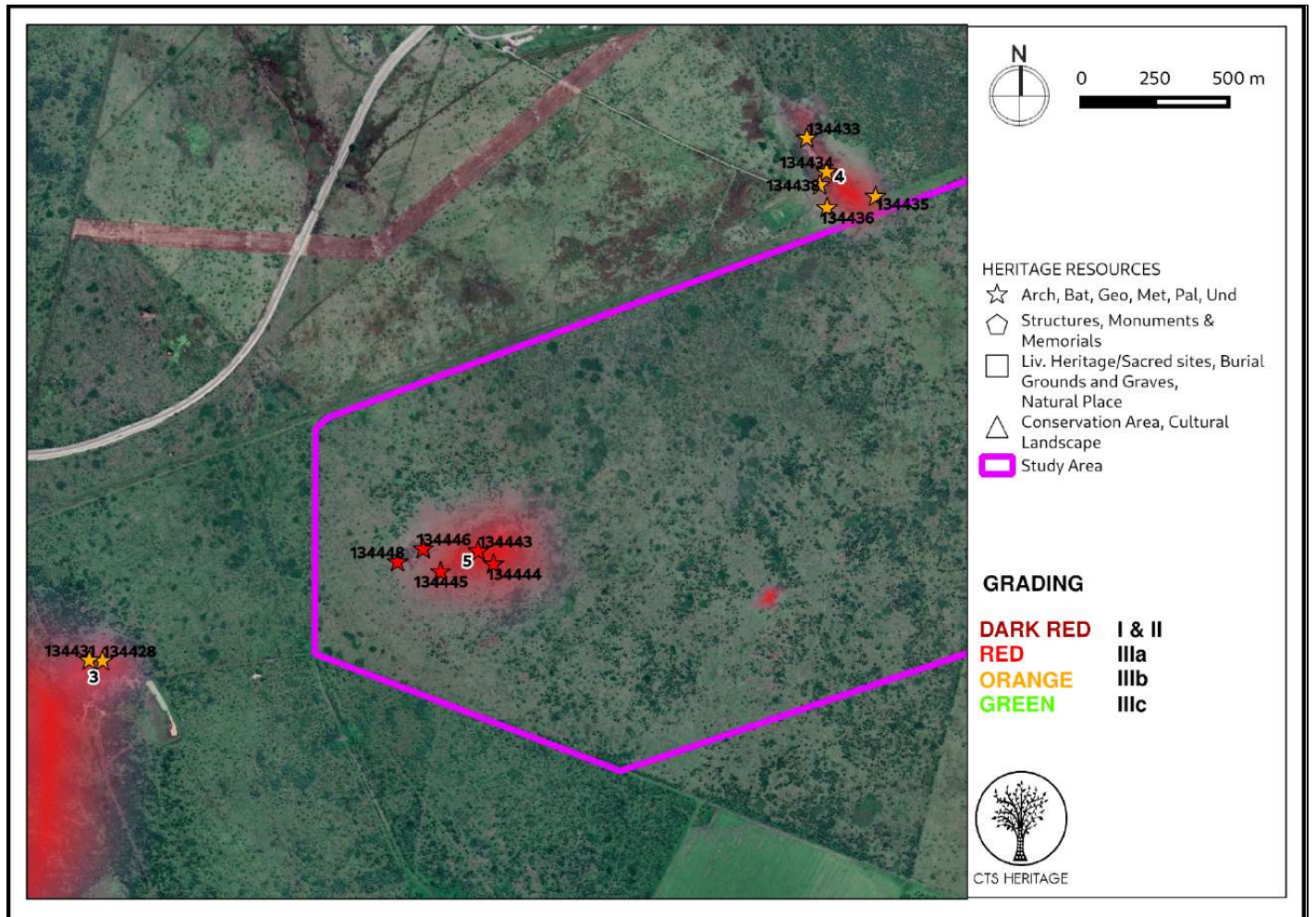
SAHRIS ID	Site No.	Site Name	Site Type	Grading
134428	ZRM003A	ZONDEREINDE MINE - Site 3	Stone walling	Grade IIIb
134431	ZRM003B	ZONDEREINDE MINE - Site 3	Stone walling	Grade IIIb
134433	ZRM004A	ZONDEREINDE MINE - Site 4	Stone walling	Grade IIIb
134434	ZRM004B	ZONDEREINDE MINE - Site 4	Stone walling	Grade IIIb
134435	ZRM004C	ZONDEREINDE MINE - Site 4	Stone walling	Grade IIIb
134436	ZRM004D	ZONDEREINDE MINE - Site 4	Stone walling	Grade IIIb
134438	ZRM004E	ZONDEREINDE MINE - Site 4	Stone walling	Grade IIIb
134443	ZRM005A	ZONDEREINDE MINE - Site 5	Stone walling	Grade IIIa
134444	ZRM005B	ZONDEREINDE MINE - Site 5	Stone walling	Grade IIIa
134445	ZRM005C	ZONDEREINDE MINE - Site 5	Stone walling	Grade IIIa
134446	ZRM005D	ZONDEREINDE MINE - Site 5	Stone walling	Grade IIIa
134448	ZRM005E	ZONDEREINDE MINE - Site 5	Stone walling	Grade IIIa
134422	ZRM001	ZONDEREINDE MINE	Burial Grounds & Graves	Grade IIIa
134425	ZRM002	ZONDEREINDE MINE	Burial Grounds & Graves	Grade IIIa



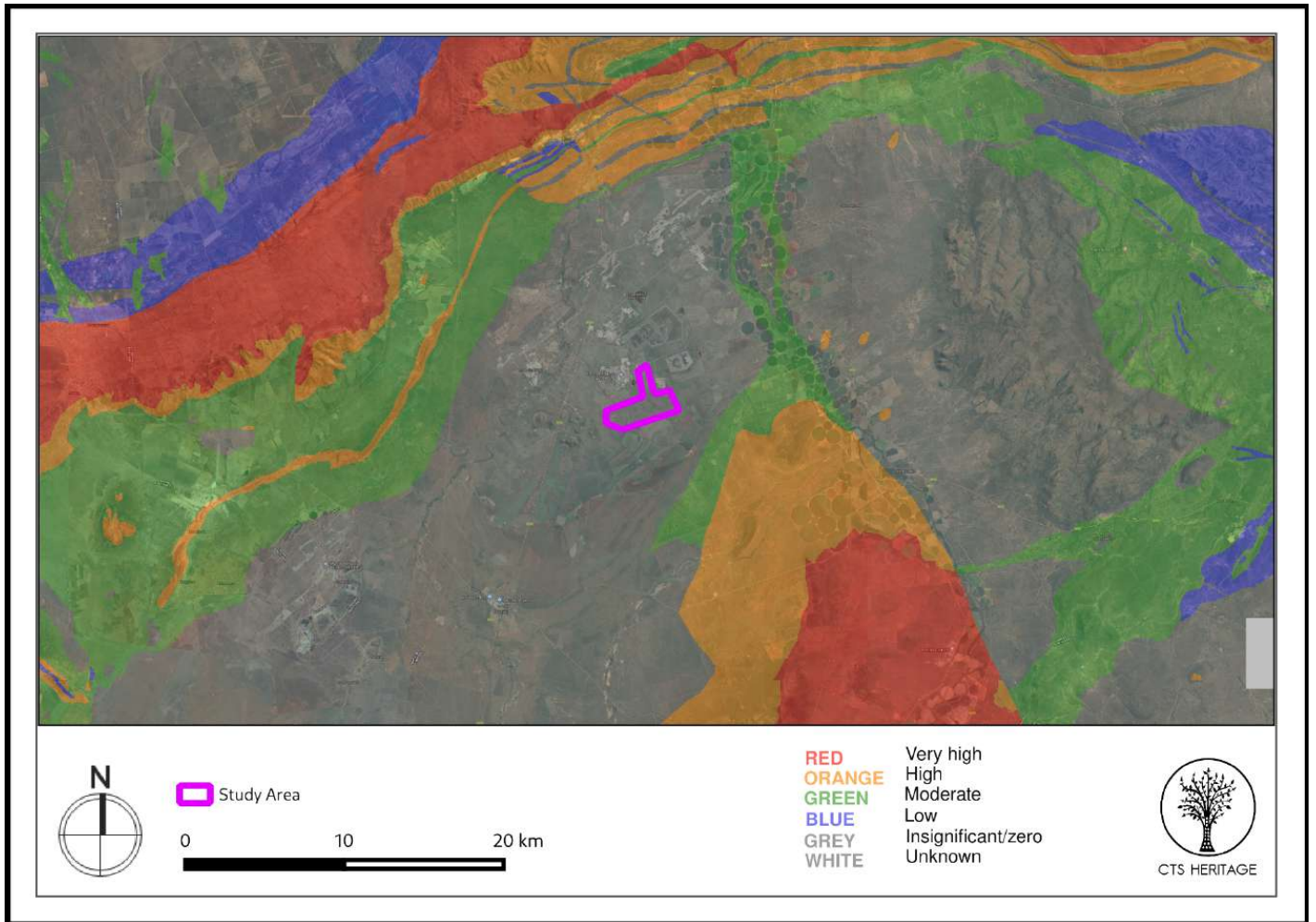
Map 2.2: Spatialisation of heritage assessments conducted in proximity to the broader study area



Map 2.3: Spatialisation of heritage resources known in proximity to the broader study area



Map 2.4: Spatialisation of heritage resources known in proximity to the broader study area



Map 3.1: Palaeontological sensitivity of the area surrounding the broader study area

3.2 Palaeontology

According to the SAHRIS Palaeosensitivity Map (Figure 4), the area proposed for development of the PV facilities is underlain by sediments that have zero palaeontological sensitivity. As such, no palaeontological resources will be impacted by the proposed development and no further specialist palaeontological assessment is recommended.



4. IDENTIFICATION OF HERITAGE RESOURCES

4.1 Summary of findings of Specialist Reports

The findings and results of this Heritage Impact Assessment pertain specifically to the proposed 10MW PV development which is the subject of this assessment and do not apply to any other development undertaken in the area to date.

Archaeology

The survey of the broader study area was conducted on foot and by vehicle with a high clearance to move through the tracks along the fence lines that are maintained as firebreaks. No heritage sites of significance were identified within the preferred area identified for the 10MW PV facility.

Two main site complexes previously recorded by Van Vollenhoven (2013) occupy two smaller outcrops when compared to the larger outcrops in the main koppie complex southeast of the study area. The smaller complex (site 4) was disturbed when a large water reservoir was built through the middle of the site somewhere between 2000 and 2013 in service of the mining in the area in the early 2000s. Further impacts have been made to this site by the construction of a shooting range along the southwestern end of this site complex. Site 5 has fortunately had very low impacts limited to a jeep track and no additional infrastructure has been built there (Figure 3b).

With previous studies in mind, this field assessment sought to clarify the extent of sites 4 and 5 in more detail and to provide guidance as to the areas that should be avoided by development activities. The distribution of artefactual material was noted on the ground and this was found in large numbers surrounding sites 4 and 5 in an among extensive stone walling enclosures and ruined remains. We were aware of the likely locations of the stone walls using satellite imagery and once the fieldwork was concluded we mapped out the areas with the benefit of historical and current satellite imagery. We are certain that even more detail would be possible should surveys be conducted during winter and with the use of drone footage - however, our main objective was to identify a substantial buffer area around these sites where no stone walling or significant artefact distributions would be found beyond the boundaries.

A more detailed photographic record was taken of the koppie complex lying just to the southeast of the study area along with the outcrops containing sites 4 and 5 previously recorded by Van Vollenhoven (2013). This has significantly improved the appreciation of the sense of place and nature of the area containing an extensive Late Iron Age settlement that we believe should be conserved and carefully managed for the remaining period of mining in the area.



Palaeontology

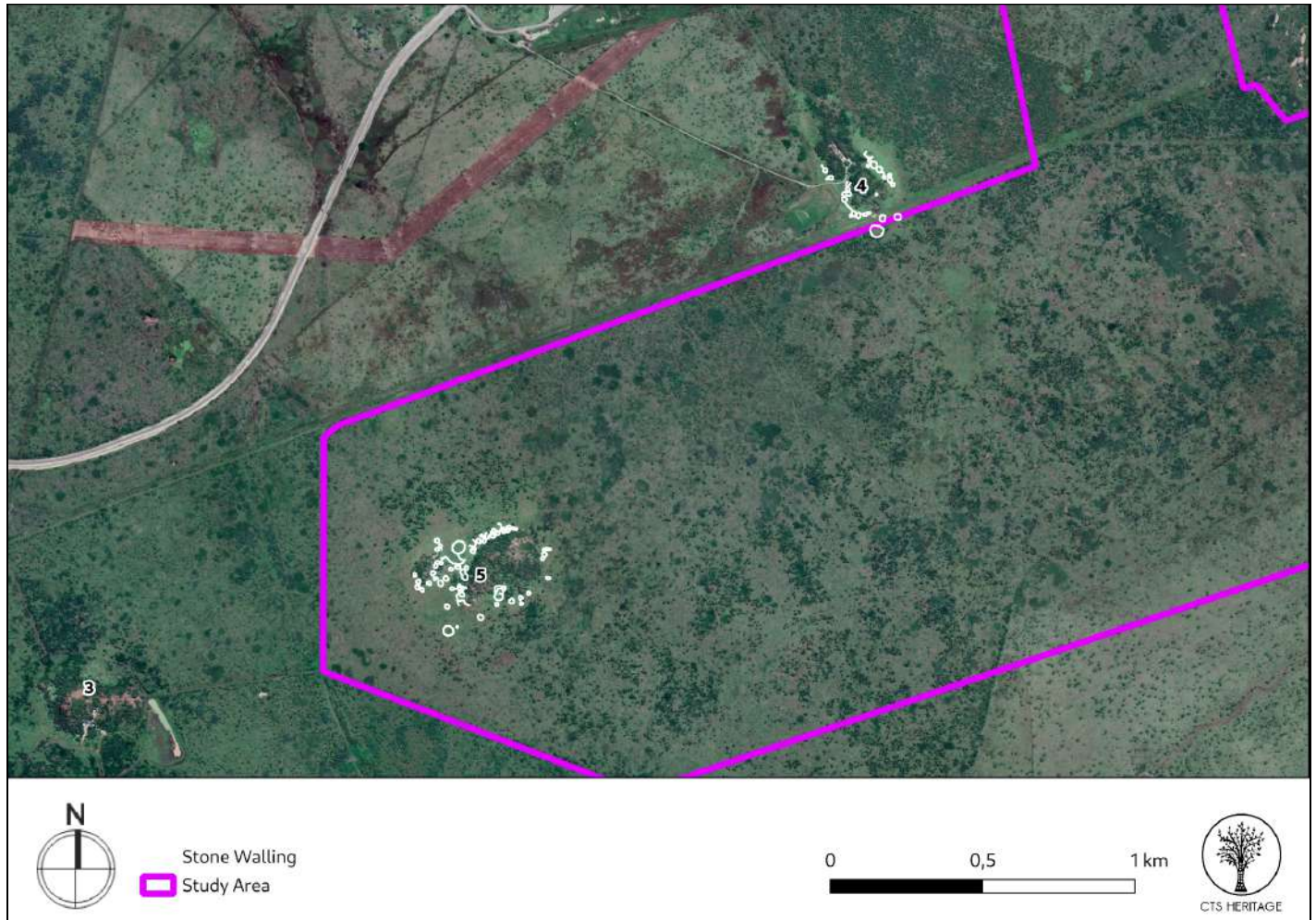
No impacts to palaeontological heritage are expected as the broader study area is underlain by Pyramid Gabbro-Norite which has zero palaeontological sensitivity.

4.2 Heritage Resources identified

Table 2: Heritage resources identified in the broader study area

POINT ID	Site Name	Description	Co-ordinates		Grading	Mitigation
	Northam Site 4 Complex	LIA Site complex identified by Van Vollenhoven (2013)	-24.841944	27.348333	IIIA	The site must be conserved and no impact is permitted. The site must be noted for scientific excavation.
OBS001	Northam Site 5 complex	View of ruined kraal, vertical branch still remains, stonewalling, quartz & quartzite flakes, undecorated pottery, LIA	-24.85241	27.33583	IIIA	The site must be conserved and no impact is permitted. The site must be noted for scientific excavation.
OBS002	Northam Site 5 complex	Large circular kraal wall, less than half a metre high, completely grass covered, LIA	-24.85241714	27.33527552	IIIA	The site must be conserved and no impact is permitted. The site must be noted for scientific excavation.
OBS003	Northam Site 5 complex	Small stonewalled kraals, grass cover thick, LIA	-24.8524287	27.33583603	IIIA	The site must be conserved and no impact is permitted. The site must be noted for scientific excavation.

4.3 Mapping and spatialisation of heritage resources



Map 4: Map of heritage resources identified during the field assessment, relative to the broader study area

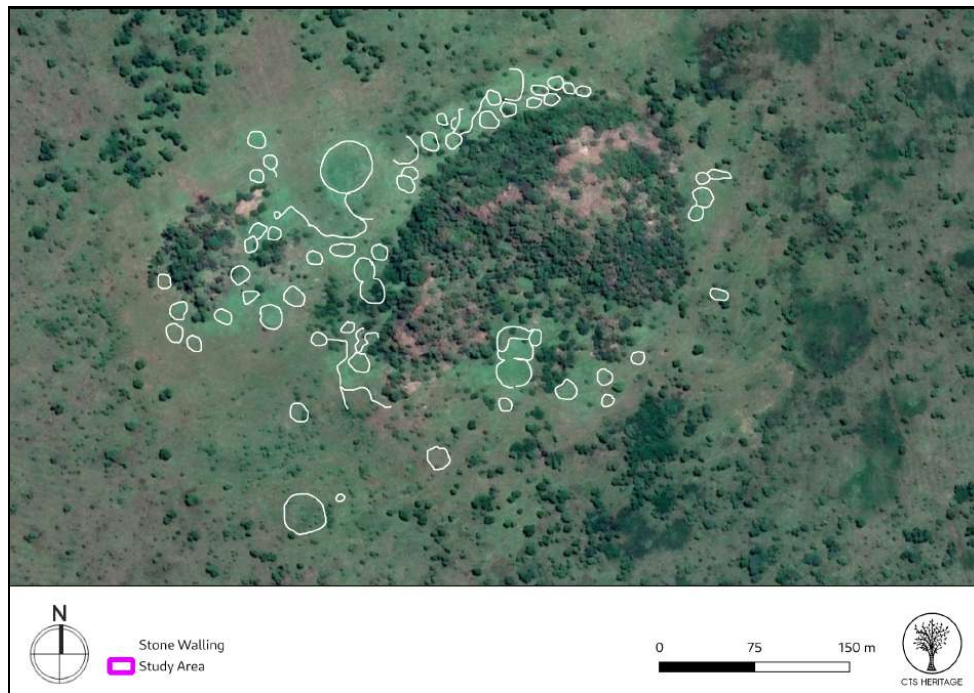


Figure 4.1: Detailed map of stone walling evident at Site 5 complex from satellite imagery



Figure 4.2: Detailed map of stone walling evident at Site 4 complex from satellite imagery located adjacent to the shooting range



5. ASSESSMENT OF THE IMPACT OF THE DEVELOPMENT

5.1 Assessment of impact to Heritage Resources

The impacts outlined below pertain specifically to the proposed 10MW PV development which is the subject of this assessment and do not apply to any other development undertaken in the area to date.

In order to inform the location of the proposed 10MW PV facility to ensure minimal impacts on heritage resources, sensitivity of the area from a heritage perspective was determined. As such, we have provided a map of the areas of very high and low archaeological and heritage sensitivity within the broader study area in order to inform the appropriate siting of the proposed 10MW PV facilities. This map has also considered the broader natural veld and mining context. Two low sensitivity areas were identified during the study where it is recommended that the footprint of the solar PV facility should be placed. The preferred area from a heritage perspective lies in the northern end of the study area between the smelting facility and the main mine complex of facilities. This area is highly disturbed and does not contain any archaeological sites. The site 4 complex lies at the far southwestern corner of the northern section but this can be entirely avoided by keeping the solar PV facility in the grey areas marked in Figure 5. The preferred 10MW PV facility location has been proposed by the developer within this area.

A second area on the southern border of the study area could also be used where the ground has been completely ploughed in the past by crop agriculture. No archaeological sites have been found in this area either but it does leapfrog the industrial development across an area of undisturbed bushveld which is less preferable than the previous low sensitivity area discussed.

Areas of high and moderate sensitivity from a visual, heritage and archaeological perspective have been identified within the study area. These are indicated in Figure 5 (orange and yellow) along with the preferred location for the proposed 10MW PV facility. The area identified as having Moderate Sensitivity has been previously impacted by development in the form of two farm roads running through it and has already been assessed in detail archaeologically. There are no known archaeological resources located here despite two previous archaeological surveys. Any development located within this moderately sensitive area is located sufficiently far from the sensitive heritage zone and assists in the formation of a more contiguous belt of industrial development that is perceived as part of the mining area.

The field assessment has revealed that there is a large section of the broader study area that is highly sensitive for impacts to very significant archaeological resources. Although these significant archaeological resources have



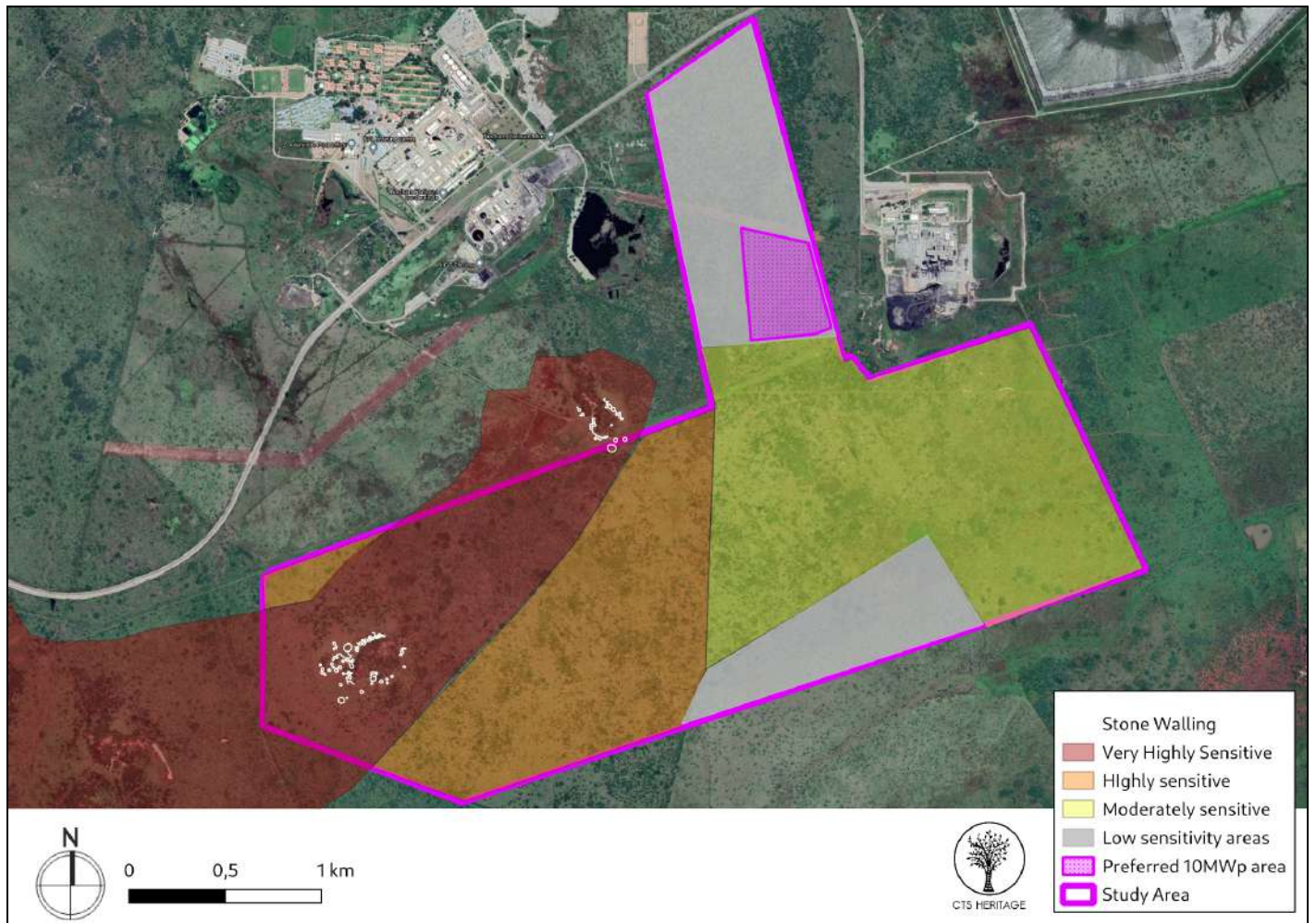
been previously identified by Van Vollenhoven (2013) and Van der Walt (2019), little proactive conservation interventions seem to have taken place.

Although the exposed stone walling associated with these LIA sites is located on top and immediately surround the granite koppies, it is clear that these sites were historically connected and as such form part of a complex of sites that stretches east-west. It is therefore very likely that archaeological evidence of this connection is located in the spaces between these granite koppies however this was not able to be verified during the field assessment due the dense vegetation. Despite this, we are confident that the areas located between the granite koppies are as archaeologically sensitive as the koppies themselves. Any development of the proposed 10MW PV facilities in the areas between the granite koppies is likely to negatively impact on significant archaeological heritage.

Development of the proposed PV facility in the areas shaded in orange (high archaeological and cultural landscape sensitivity, Figure 5) is undesirable from an overall cumulative impact on heritage resources as it would spread the development envelope of the industrial area much wider than it needs to be in the context of the highly significant heritage zone demarcated in red. There is also a good chance of finding more archaeological material that is currently hidden by the dense bush cover in the orange shaded area. The area shaded in red (very high archaeological and cultural landscape sensitivity) in Figures 5 should be avoided entirely as the two LIA sites (Sites 4 and 5) lie within this stretch with archaeological material found in areas connecting these outcrops and associated archaeological exposures.

Table 3: Description of zones of heritage sensitivity in the study area in Figure 5.

<i>Sensitivity</i>	<i>Description</i>	<i>Mitigation</i>
Very high	The two LIA sites (Sites 4 and 5) lie within this stretch with archaeological material found in areas connecting these outcrops and associated archaeological exposures.	No development of the 10MW PV recommended here
High	There is a good chance of finding more archaeological material that is currently hidden by the dense bush cover in the orange shaded area.	Development of the 10MW PV undesirable here
Moderate	The remaining unshaded ground consists of undeveloped and relatively undisturbed bushveld with no known archaeological sites found during the various assessments conducted. We are confident that no archaeological impacts will be made should the PV facility be built	Development of the 10MW PV possible here
Low	These areas have been highly previously disturbed and no archaeological resources have been found here.	Development of the 10MW PV preferred here



Map 5: Map of heritage resources identified during the field assessment, relative to the study area and the proposed preferred development footprint and associated archaeological sensitivity



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Table 4.1: Impacts of the Northam 10MW PV facility and associated infrastructure to archaeological resources

NATURE: It is possible that buried archaeological resources may be impacted by the proposed development in the preferred location				
		Without Mitigation		With Mitigation
MAGNITUDE	H (8)	Two significant LIA sites that form part of a larger LIA complex are located within the broader study area but will not be impacted if the development is located in the preferred location	H (6)	Two significant LIA sites that form part of a larger LIA complex are located within the broader study area but will not be impacted if the development is located in the preferred location
DURATION	H (5)	Where manifest, the impact will be permanent.	H (5)	Where manifest, the impact will be permanent.
EXTENT	L (1)	Limited to the development footprint	L (1)	Limited to the development footprint
PROBABILITY	L (1)	It is unlikely that significant archaeological resources will be impacted	L (1)	It is unlikely that significant archaeological resources will be impacted
SIGNIFICANCE	L	(6+5+1)x1 = 11	L	(6+5+1)x1 = 11
STATUS		Negative		Negative
REVERSIBILITY	L	Any impacts to heritage resources that do occur are irreversible	L	Any impacts to heritage resources that do occur are irreversible
IRREPLACEABLE LOSS OF RESOURCES?	L	Not Likely	L	Not Likely
CAN IMPACTS BE MITIGATED		Yes		
MITIGATION: <ul style="list-style-type: none">• The proposed PV development must be limited to the areas marked as low or moderate sensitivity in Figures 5.1 and 5.2 and the areas marked as very high and high archaeological sensitivity must be avoided by all development activities• Should any previously unrecorded archaeological resources or possible burials be identified during the course of construction activities, work must cease in the immediate vicinity of the find, and SAHRA must be contacted regarding an appropriate way forward.				
RESIDUAL RISK: None				

Table 4.2: Impacts of the Northam 10MW PV facility and associated infrastructure to palaeontological resources

NATURE: It is possible that buried palaeontological resources may be impacted by the proposed development in the preferred location				
		Without Mitigation		With Mitigation
MAGNITUDE	L (1)	According to the SAHRIS Palaeosensitivity Map (Figure 4), the area proposed for development of the PV facilities is underlain by sediments that have zero palaeontological sensitivity. As such, no palaeontological resources will be impacted by the proposed development	L (1)	According to the SAHRIS Palaeosensitivity Map (Figure 4), the area proposed for development of the PV facilities is underlain by sediments that have zero palaeontological sensitivity. As such, no palaeontological resources will be impacted by the proposed development
DURATION	H (5)	Where manifest, the impact will be permanent.	H (5)	Where manifest, the impact will be permanent.
EXTENT	L (1)	Limited to the development footprint	L (1)	Limited to the development footprint
PROBABILITY	L (1)	It is unlikely that significant fossils will be impacted	L (1)	It is unlikely that significant fossils will be impacted
SIGNIFICANCE	H	$(1+5+1) \times 1 = 7$	H	$(1+5+1) \times 1 = 7$

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STATUS		Negative		Negative
REVERSIBILITY	L	Any impacts to heritage resources that do occur are irreversible	L	Any impacts to heritage resources that do occur are irreversible
IRREPLACEABLE LOSS OF RESOURCES?	H	Unlikely	L	Not Likely
CAN IMPACTS BE MITIGATED		No		
MITIGATION: <ul style="list-style-type: none"> Should any previously unrecorded palaeontological resources be identified during the course of construction activities, work must cease in the immediate vicinity of the find, and SAHRA must be contacted regarding an appropriate way forward. 				
RESIDUAL RISK: None				

5.2 Sustainable Social and Economic Benefit

Although a socio-economic impact assessment is not being undertaken for the project, some of the anticipated socio-economic benefits are however listed below.

At the peak of construction, the project is likely to create a maximum of 100 employment opportunities. These employment opportunities will be temporary and will last for a period of approximately 12 - 18 months (i.e. the length of construction). Employment opportunities generated during the construction phase will include low skilled, semi-skilled, and skilled opportunities. Solar PV projects make use of high levels of unskilled and semi-skilled labour so there will be good opportunity to use local labour, where available. Employment opportunities will peak during the construction phase and significantly decline during the operation phase. The injection of income into the area in the form of wages will represent an opportunity for the local economy and businesses in the area. A significant portion of the labour force is expected to be sourced from the surrounding towns.

The operation phase will create approximately 10-12 full-time equivalent employment positions, which will include low-skilled, semi-skilled and skilled personnel. Employees that can be sourced from the local municipal area include the less skilled and semi-skilled personnel (such as safety and security staff and certain maintenance crew). Highly skilled personnel may need to be recruited from outside the local area where these resources are not available within the area.

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Based on the available information, the anticipated socio-economic benefits of the proposed development of the 10MW PV Facility outweigh the anticipated impacts to heritage resources on condition that all of the recommendations included below in section 8 are implemented.

5.3 Proposed development alternatives

No alternatives (site-specific and layout alternatives, activity alternatives, technology alternatives and 'do-nothing' alternative) are being considered for this project. The location of the proposed project site and development area was informed by the consideration of environmental constraints and sensitivities, and is therefore deemed as the best environmental option from the broader study area reviewed. The site is also in close proximity to the load it feeds, away from dust sources such as tailings facilities and on Northam property. There are no comparable alternatives on site to PV power generation. The area is unsuitable for wind generation and no bio fuels are available in the area.

5.4 Cumulative Impacts

The preferred area proposed for development is located within an area that has been previously impacted by the development of the Northam Mine. As such, it is not anticipated that the proposed PV development will have a negative cumulative impact on the broader landscape which is already dominated by mining infrastructure and agriculture. In terms of renewable development activities which can have an industrial feel, it is recommended that such infrastructure be grouped or clustered to avoid sprawl across natural landscapes.

As indicated above, we have provided a map of the areas of varying heritage sensitivity within the broader study area in order to inform the appropriate siting of the proposed PV facility. Two low sensitivity areas were identified during the study where it is recommended that the footprint of the solar PV facility should be placed. The preferred area from a heritage perspective lies in the northern end of the study area between the smelting facility and the main mine complex of facilities. This area is highly disturbed and does not contain any archaeological sites. The site 4 complex lies at the far southwestern corner of the northern section but this can be entirely avoided by keeping the solar PV facility in the grey areas marked in Figure 5.1.

A second area on the southern border of the study area could also be used where the ground has been completely ploughed in the past by crop agriculture. No archaeological sites have been found in this area either but it does leapfrog the industrial development across an area of undisturbed bushveld which is less preferable than the previous low sensitivity area discussed.



New developments proposed within the study area have the potential to have a negative impact on the significant archaeological resources identified here. These cumulative impacts can be mitigated through the development of a Conservation Plan for the LIA site complex which will outline the relevant roles and responsibilities of SAHRA and the landowners in terms of ongoing management and conservation of these significant sites.

Table 5: Cumulative Impact Table

NATURE: Cumulative Impact to the sense of place and known archaeological resources				
		Overall impact of the proposed project considered in isolation		Cumulative impact of the project and other projects in the area
MAGNITUDE	L (4)	Low	M (5)	Moderate
DURATION	M (3)	Medium-term	H (4)	Long-term
EXTENT	L (1)	Low	L (1)	Low
PROBABILITY	L (2)	Improbable	H (3)	Probable
SIGNIFICANCE	L	$(4+3+1) \times 2 = 16$	L	$(5+4+1) \times 3 = 30$
STATUS		Neutral		Neutral
REVERSIBILITY	H	High	L	Low
IRREPLACEABLE LOSS OF RESOURCES?	L	Unlikely	L	Possible
CAN IMPACTS BE MITIGATED		NA		NA
CONFIDENCE IN FINDINGS: High				
MITIGATION: A Conservation Plan is developed for the LIA site complex which will outline the relevant roles and responsibilities of SAHRA and the landowners in terms of ongoing management and conservation of these significant sites. This Conservation Plan must be appended to a Heritage Agreement signed between the landowners and SAHRA in terms of section 42 of the NHRA.				

6. RESULTS OF PUBLIC CONSULTATION

The public consultation process will be undertaken by the EAP during the EIA. No heritage-related comments have been received to-date. SAHRA is required to comment on this HIA and make recommendations prior to the granting of the Environmental Authorisation.



7. CONCLUSION

The conclusions outlined below pertain specifically to the proposed 10MW PV development which is the subject of this assessment and do not apply to any other development undertaken in the area to date.

The palaeontological sensitivity of the broader study area is very low and as such, no impacts to palaeontological heritage resources are anticipated.

No impact to significant heritage resources are anticipated as long as the proposed 10MW PV Facility is located within the areas identified as having low or moderate archaeological sensitivity. The preferred site for the proposed 10MW PV Facility is located within an area identified as having low archaeological sensitivity.

Due to the significance of the identified LIA site complex located within the broader study area, it is recommended that no impact to these sites or their associated archaeological deposit should take place.

It is recommended that on-going archaeological management interventions are implemented. As the LIA complex is located on land that is privately owned, it is recommended that SAHRA enter into discussions with Northam Mine in order to develop a Heritage Agreement in terms of section 42 of the NHRA. Appended to this agreement should be a Conservation Plan for the LIA site complex which will outline the relevant roles and responsibilities of SAHRA and the landowners in terms of ongoing management and conservation of these significant sites.

8. RECOMMENDATIONS

There is no objection to the proposed development of the proposed Northam 10MW PV facility and its associated infrastructure on condition that:

- The proposed PV facility is located in the low or moderate sensitivity areas (grey or yellow) identified as preferred for development as they have low archaeological sensitivity in Figure 5.
- The areas marked as having high archaeological sensitivity are avoided and it is recommended that no development activities associated with the proposed PV development take place within this area (red)
- Should any previously unrecorded archaeological resources or possible burials be identified during the course of construction activities, work must cease in the immediate vicinity of the find, and SAHRA must be contacted regarding an appropriate way forward.



General recommendations for the proactive conservation of the significant LIA complex

The author believes the mitigation measures previously proposed by Van Vollenhoven (2013) and Van der Walt (2019) may not be sufficient for conservation of the broader cultural landscape. Whilst not within the scope of this assessment of the impacts of the PV facility, due to the significance of this complex of LIA sites located within the broader study area, it is recommended that on-going archaeological management interventions are implemented.

As the LIA complex is located on land that is privately owned, it is recommended that SAHRA enter into discussions with Northam Mine and Anglo in order to develop a Heritage Agreement in terms of section 42 of the NHRA. Appended to this agreement should be a Conservation Plan for the LIA site complex which will outline the relevant roles and responsibilities of SAHRA and the landowners in terms of ongoing management and conservation of these significant sites.



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9. REFERENCES

Heritage Impact Assessments				
Nid	Report Type	Author/s	Date	Title
5703	AIA Phase 1	Johnny Van Schalkwyk	01/09/1994	A Survey of Archaeological and Cultural Historical Resources in the Amandelbult Mining Lease Area
5706	AIA Phase 1	Johnny Van Schalkwyk, Frank Teichert, Anton Pelser	01/06/2003	A Survey of Archaeological Sites for the Amandelbult Platinum Mine Seismic Exploration Program
5719	AIA Phase 1	Johnny Van Schalkwyk	28/08/2007	Heritage Impact Assessment: Portion 6 Aapieskraal
7298	AIA Phase 1	Udo Kusel	30/07/2008	Cultural Heritage Resources Impact Assessment for Portions 1, 4, 5, 6, 7, 18, 19, 27 and 28 of the Farm Maroeloestfontein 366 KQ, Limpopo Province
7767	AIA Phase 1	Thomas Huffman	01/12/2004	Archaeological Assessment for the Rhino Andalusite Mine Second Report
7768	AIA Phase 1	Thomas Huffman	01/05/2007	Further Reconnaissance for the Rhino Andalusite Mine, Thabazimbi, Limpopo Province
534905	HIA Phase 1	McEdward Murimbika	05/02/2010	Phase 1 Archaeological and Heritage Impact Assessment Specialist Study Report for Proposed Installation of New Antennae and Associated Infrastructure at Farm Hartebeesthoek 502 JQ, Gauteng Province
530577	HIA Phase 1	Jaco van der Walt	16/10/2019	Heritage Impact Assessment for the proposed Northam Zondereinde Platinum Mine 3 Shaft, Thabazimbi Local Municipality
557639	HIA Phase 1	Anton van Vollenhoven	01/03/2013	A REPORT ON A CULTURAL HERITAGE IMPACT ASSESSMENT FOR THE PROPOSED PHOTOVOLTIC POWER PLANT AND EMP AMENDMENT FOR THE NORTHAM PLATINUM ZONDEREINDE MINE CLOSE TO NORTHAM, NORTHWEST PROVINCE

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APPENDICES

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APPENDIX 1: Archaeological Assessment

ARCHAEOLOGICAL SPECIALIST STUDY

In terms of Section 38(8) of the NHRA for a

Proposed development of the Northam PV facility near
Thabazimbi, North West Province

Prepared by



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In Association with

Savannah Environmental

April 2021



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THE INDEPENDENT PERSON WHO COMPILED A SPECIALIST REPORT OR UNDERTOOK A SPECIALIST PROCESS

I Jenna Lavin, as the appointed independent specialists hereby declare that we:

- act/ed as the independent specialist in this application;
- regard the information contained in this report as it relates to my specialist input/study to be true and correct, and
- do not have and will not have any financial interest in the undertaking of the activity, other than remuneration for work performed in terms of the NEMA, the Environmental Impact Assessment Regulations, 2010 and any specific environmental management Act;
- have and will not have no vested interest in the proposed activity proceeding;
- have disclosed, to the applicant, EAP and competent authority, any material information that have or may have the potential to influence the decision of the competent authority or the objectivity of any report, plan or document required in terms of the NEMA, the Environmental Impact Assessment Regulations, 2010 and any specific environmental management Act;
- am fully aware of and meet the responsibilities in terms of NEMA, the Environmental Impact Assessment Regulations, 2010 (specifically in terms of regulation 17 of GN No. R. 543) and any specific environmental management Act, and that failure to comply with these requirements may constitute and result in disqualification;
- have ensured that information containing all relevant facts in respect of the specialist input/study was distributed or made available to interested and affected parties and the public and that participation by interested and affected parties was facilitated in such a manner that all interested and affected parties were provided with a reasonable opportunity to participate and to provide comments on the specialist input/study;
- have ensured that the comments of all interested and affected parties on the specialist input/study were considered, recorded and submitted to the competent authority in respect of the application;
- have ensured that the names of all interested and affected parties that participated in terms of the specialist input/study were recorded in the register of interested and affected parties who participated in the public participation process;
- have provided the competent authority with access to all information at our disposal regarding the application, whether such information is favourable to the applicant or not; and
- are aware that a false declaration is an offence in terms of regulation 71 of GN No. R. 543.

Jenna Lavin

Signature of the specialist

CTS Heritage

Name of company

March 2021

Date



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EXECUTIVE SUMMARY

The proposed study area is located within Northam Platinum Limited's Zondereinde Mine Area, approximately 35km south of the town of Thabazimbi and 18 km northwest of the town of Northam, between the R510 in the west and the R511 in the east. The project site falls within the jurisdiction of the Thabazimbi Local Municipality, which forms part of the Waterberg District, on the following farm properties:

- Remaining extent of Portion 1 of the Farm Kopje Alleen 422 (T0KQ00000000042200001); and
- Portion 2 of the Farm Zondereinde 384 (T0KQ000000000038400002).

The Northam PV development is located within a 30km radius of two solar developments with an approved Environmental Authorisation. The Solar PV facility is relatively small and will have a contracted capacity of 10MW, and will use the tracking PV technology to harness the solar resource on the project site. A development area of up to 20ha in extent will be occupied by the PV panels and associated infrastructure.

The field assessment has revealed that there is a large section of the study area that is highly sensitive for impacts to very significant archaeological resources. Although these significant archaeological resources have been previously identified by Van Vollenhoven (2013) and Van der Walt (2019), little proactive conservation interventions seem to have taken place.

Although the exposed stone walling associated with these LIA sites is located on top and immediately surround the granite koppies, it is clear that these sites were historically connected and as such form part of a complex of sites that stretches east-west. It is therefore very likely that archaeological evidence of this connection is located in the spaces between these granite koppies however this was not able to be verified during the field assessment due the dense vegetation. Despite this, we are confident that the areas located between the granite koppies are as archaeologically sensitive as the koppies themselves. Any development of the proposed PV facilities in the areas between the granite koppies is likely to negatively impact on significant archaeological heritage.

Due to the significance of the LIA site complex, it is recommended that no impact to these sites or their associated archaeological deposit should take place. As such, we have mapped out areas of high archaeological sensitivity that must be avoided (see Figure 7.1). A detailed mapping exercise using ground truthing and satellite imagery was conducted to establish the boundaries of the Late Iron Age site complexes at sites 4 and 5. This was combined into a shaded red sensitivity area in figures 7.1 and 7.2 to delineate an area of no development.

Due to the significance of this complex of LIA sites, it is recommended that on-going archaeological management interventions are implemented. As the LIA complex is located on land that is privately owned, it is recommended that SAHRA enter into discussions with Northam Mine in order to develop a Heritage Agreement in terms of section 42 of the NHRA. Appended to this agreement should be a Conservation Plan for the LIA site complex which will outline the relevant roles and responsibilities of SAHRA and the landowners in terms of ongoing management and conservation of these significant sites.



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Recommendations

There is no objection to the proposed development of the proposed Northam PV facility and its associated infrastructure on condition that:

- The areas marked as having high archaeological sensitivity are avoided and no development activities associated with the proposed PV development take place within this area (Figure 7.1)
- Should any previously unrecorded archaeological resources or possible burials be identified during the course of construction activities, work must cease in the immediate vicinity of the find, and SAHRA must be contacted regarding an appropriate way forward.

Additional Recommendations for the proactive conservation of the significant LIA complex:

- A Conservation Plan is developed for the LIA site complex which will outline the relevant roles and responsibilities of SAHRA and the landowners in terms of ongoing management and conservation of these significant sites. This Conservation Plan must be appended to a Heritage Agreement signed between the landowners and SAHRA in terms of section 42 of the NHRA.



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1. INTRODUCTION

1.1 Background Information on Project

The proposed study area is located within Northam Platinum Limited's Zondereinde Mine Area, approximately 35km south of the town of Thabazimbi and 18 km northwest of the town of Northam, between the R510 in the west and the R511 in the east. The project site falls within the jurisdiction of the Thabazimbi Local Municipality, which forms part of the Waterberg District, on the following farm properties:

- Remaining extent of Portion 1 of the Farm Kopje Alleen 422 (T0KQ00000000042200001); and
- Portion 2 of the Farm Zondereinde 384 (T0KQ00000000038400002).

The Northam PV development is located within a 30km radius of two solar developments with an approved Environmental Authorisation. The Solar PV facility is relatively small and will have a contracted capacity of 10MW, and will use the tracking PV technology to harness the solar resource on the project site. A development area of up to 20ha in extent will be occupied by the PV panels and associated infrastructure.

1.2 Description of Property and Affected Environment

The Northam Platinum mine lies mainly on Farm Zondereinde 384 and is located in an area that was previously thoroughly surveyed by Van Vollenhoven (2013) and Van der Walt (2019). The Northam Platinum mine lies to the northeast of a series of granite outcrops and interconnecting areas surrounding the koppie complex in the southwestern end of the study area which have been previously identified as archaeologically sensitive. The town of Northam lies another 12.5km further southeast of the koppie complex and Thabazimbi is around 60km to the north when following the R510 road. The vegetation lies firmly within the Dwaalboom Thornveld and is dominated by dense grasslands and acacia trees. Farm Kopje Alleen 422 has been farmed with crop agriculture, wild game animals and grazing animals, but only the southern end has been ploughed with much of the ground in portion 2 lying fallow and uncultivated bush. Besides the large stretch of mining activities continuing to the north and west of Northam mine, the area is surrounded by mainly maize, wheat and soybean farms.

Two main site complexes previously recorded Van Vollenhoven (2013) occupy two smaller outcrops when compared to the larger outcrops in the main koppie complex southeast of the study area. The smaller complex (site 4) was disturbed when a large water reservoir was built through the middle of the site somewhere between 2000 and 2013 in service of the platinum mine in the early 2000s. Further impacts have been made to this site by the construction of a shooting range along the southwestern end of this site complex. Site 5 has fortunately had very low impacts due to a jeep track and no additional infrastructure has been built there (Figure 3b).

The Northam Platinum mine has a deep mining shaft that reaches over 1.5km underground. The above ground impacts consist of slimes dams, spoil heaps and post-processing areas, a large smelting facility built on site to the eastern end of the study area, and various overhead power lines running through the area. Staff housing, offices, road infrastructure and other facilities related to the running of the mine are present. However, this is only the southern end of a much larger mining area around Amandelbult where opencast mining of chrome and platinum is taking place.



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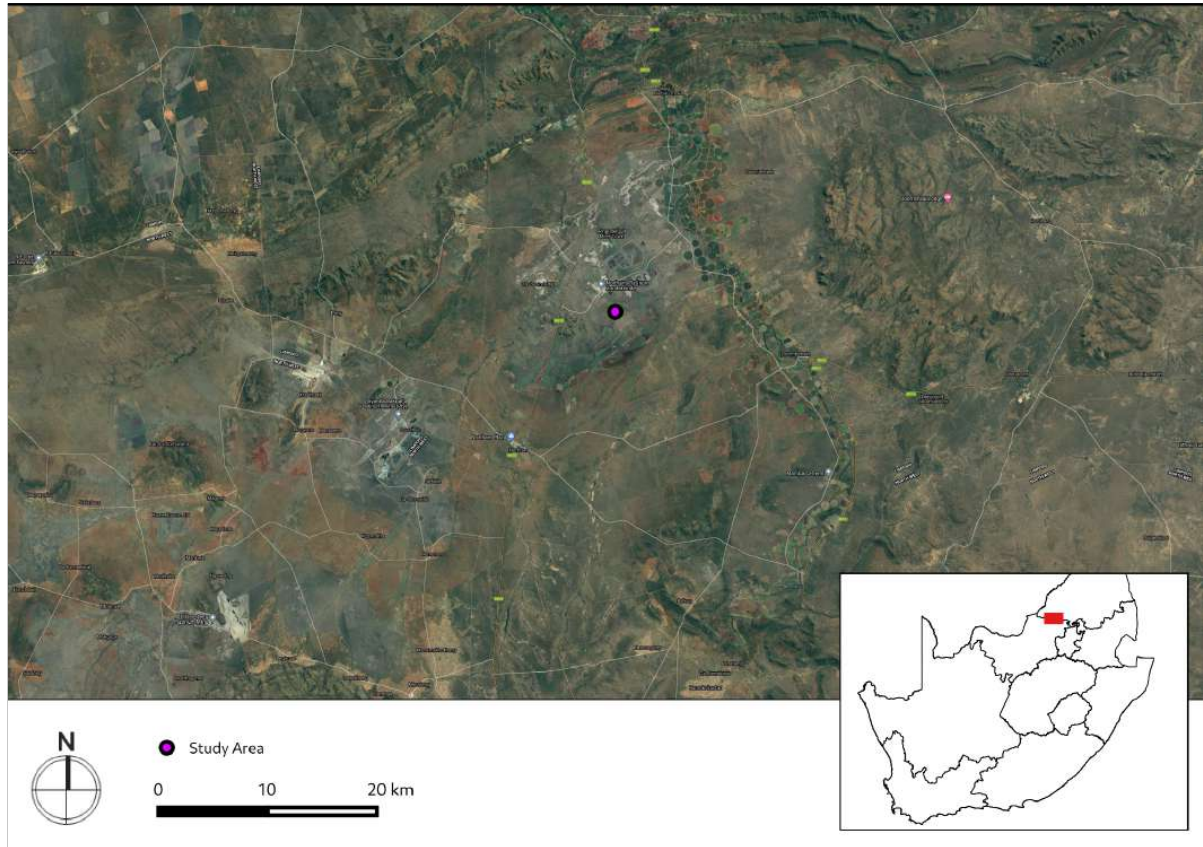


Figure 1.1: Close up satellite image indicating proposed location of study area

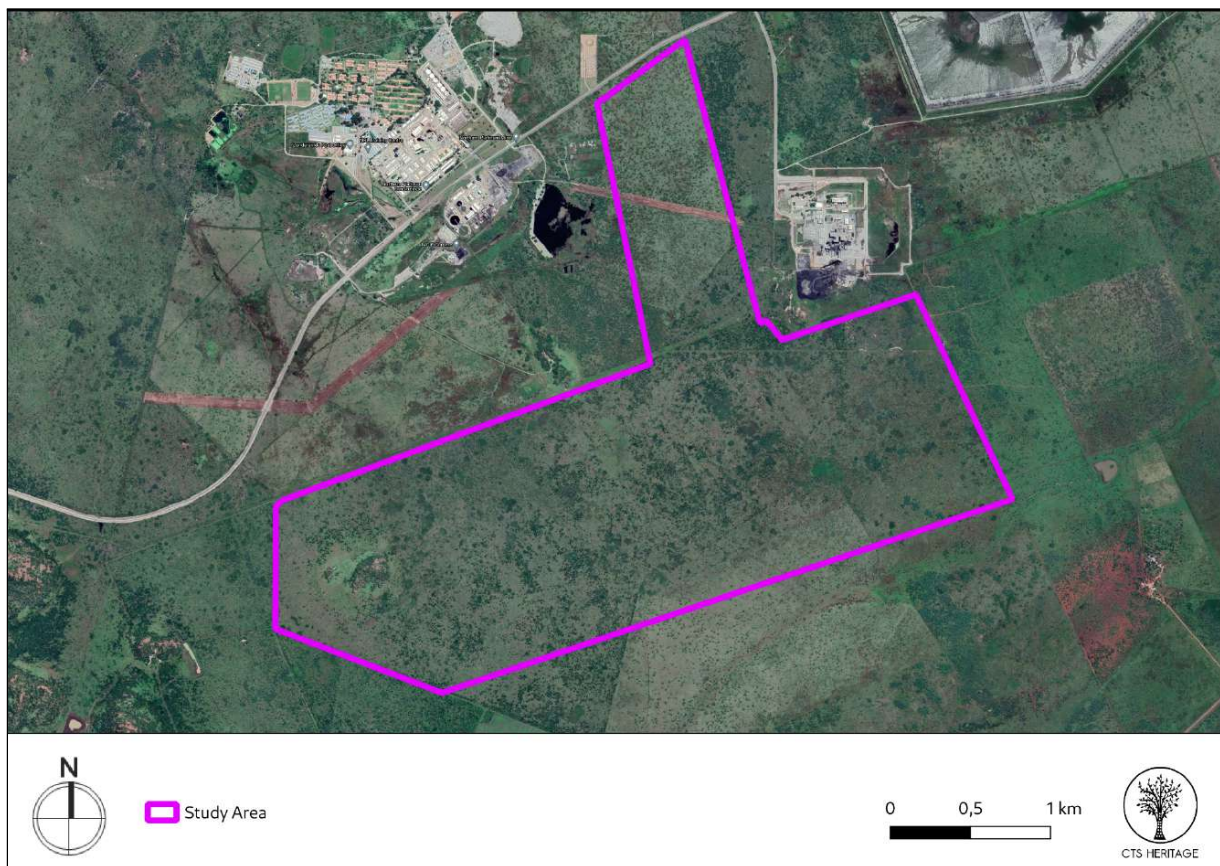


Figure 1.2: Study Area



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2. METHODOLOGY

2.1 Purpose of Archaeological Study

The purpose of this archaeological study is to satisfy the requirements of section 38(8), and therefore section 38(3) of the National Heritage Resources Act (Act 25 of 1999) in terms of impacts to archaeological resources.

2.2 Summary of steps followed

- An archaeologist conducted a survey of the site and its environs on 29 March 2021 to determine what archaeological resources are likely to be impacted by the proposed development.
- The study area was assessed on foot in transects, photographs of the context and finds were taken, and tracks were recorded using a GPS.
- The identified resources were assessed to evaluate their heritage significance in terms of the grading system outlined in section 3 of the NHRA (Act 25 of 1999).
- Alternatives and mitigation options were discussed with the Environmental Assessment Practitioner.

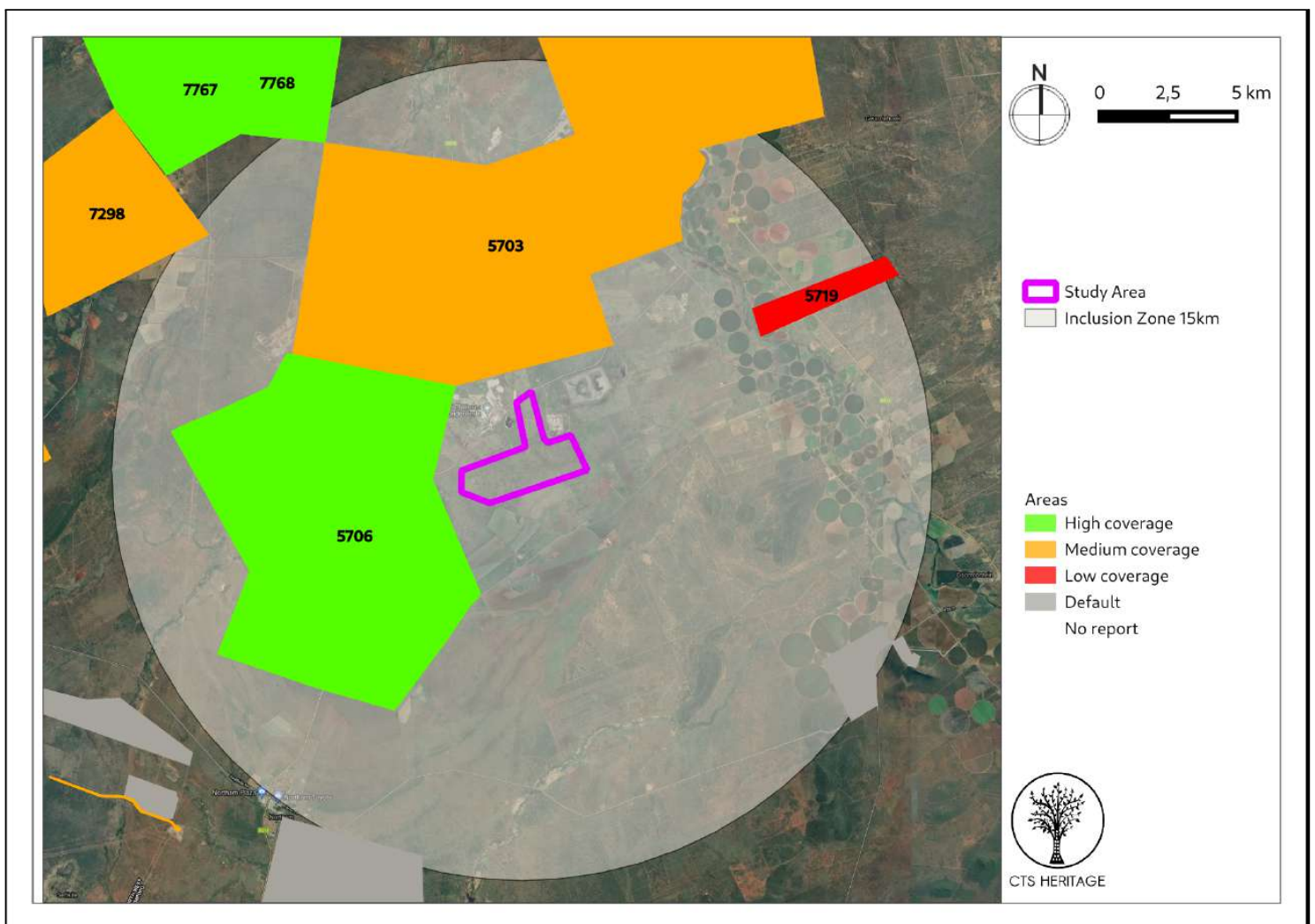


Figure 2a: Close up satellite image indicating proposed location of the study area in relation to heritage studies previously conducted



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2.3 Constraints & Limitations

The survey was conducted on 29 March 2021 towards the end of the summer rainfall season. Previous surveys had already taken place in the study area and this particular study was focused on mapping out the extent of known sites and filling in any gaps that may have existed between the various studies conducted. The grass and bush was unfortunately extremely thick and overgrown during the survey which made it difficult to identify stone walling areas at ground level. We therefore attempted to overcome this with a detailed pre- and post- GIS mapping exercise using historical satellite aerial photography and these were used to draw identifiable enclosures. Security guards also have to be assigned to the impact assessors on site as part of a mandatory security protocol run by the mine.

Given the extent of previous assessments and the work covered in this study, we feel confident in marking off a larger area of sensitivity than was previously recommended.

3. HISTORY AND EVOLUTION OF THE SITE AND CONTEXT

The area proposed for development, located 12.5km north of Northam and 60km south of Thabazimbi, is immediately adjacent to the existing Northam Platinum Mine. The area immediately surrounding both the town and the mine largely consists of agricultural lands used for crop cultivation. The name Thabazimbi means *mountain of iron* because of the large iron ore reef that was discovered in 1919 by J. H. Williams. The mine boasts one of the largest mining shafts in Africa. More than 2 million tons of ore are mined every year and hauled by train to Mittal's iron and steel works. The railway line from Rustenburg reached the area in the 1930s and full scale iron and steel production began. The town was proclaimed in 1953 and its history is intimately linked with that of the mines in the area. Much of the central landscape of the North West Province is defined by bushveld and grasslands scattered with trees and shrubs; the mountains, deep valleys, rivers and dams of the northeast; the flat and arid semi-deserts plains of the west; and the lush vegetation of areas bordering the Vaal River in the south.

A broad history of the area is included in Murimbika (2010) and is referred to here. According to Murimbika (2010), the broader region has also yielded some significant Iron Age Sites such as the Mzonjani facies Broederstroom site (AD 430 to AD 780). According to Murimbika (2010), the broader region was subject to a number of instances of migration and settlement from 450 AD. Evidence indicates that Sotho-Tswana groups migrated in and out of the Magaliesberg region, and such groups are responsible for the many early stone-walled settlements in this region. One of the most documented migrations is the Mfecane (forced migration or scattering) which was a period of widespread chaos and warfare among indigenous ethnic communities in southern Africa during the period between 1815 and about 1840. During this time, the Ndebele under Mzilikazi reached the Magaliesberg region and are responsible for introducing the Doornspruit-type walled settlements that are known from this region (the Doornspruit River drains into the project area). According to Murimbika (2010) this type of stone-walled settlement represents "typical Nguni-Sotho-Tswana acculturation". Murimbika (2010) further explains that one of the most acculturated groups in the region is known as the "Po", whose Chief Mogale lends his name to the Magaliesberg Mountains and the Mogale City Municipality. By the mid-1800's, Voortrekkers had begun to settle in the foothills of the Magaliesberg mountains and in so doing, clashed with Mzilikazi's Ndebele in 1837. These early colonial battles forced the Ndebele north of the Limpopo River and effectively



ended the independence of African Chiefdoms in the area. The Voortrekkers went on to establish the Republic of the Transvaal. As articulated by Murimbika (2010), it is in this context that the Magaliesberg area, in which the proposed development is located, is an important cultural landscape.

Previous Heritage Impact Assessments conducted in the immediate vicinity of the proposed study area (Von Vollenhoven, 2013 and van der Walt 2019) have identified a number of significant archaeological sites in the vicinity of the study area, dated to the Late Iron Age (Figure 3, 3a and 3b). Van Vollenhoven (2013) noted three clusters of Late Iron Age sites (approximately 11th Century) consisting of a number of individual features of stone walling of a variety of heights and diameters. Sites 4 and 5 identified by Van Vollenhoven (2013) fall within the broader assessment area. Similarly, Van der Walt (2019) identified clusters of stone packed kraals up to 20m in diameter and deflated middens. According to Van der Walt (2019), a number of Late Iron Age middens and stone-walled enclosures were identified as having high local significance (Grade IIIA). Van der Walt (2019) also identified individual artefacts outside of these kraal locations such as upper grindstones and undecorated ceramics. As mitigation against impacts to the identified Iron Age sites, Van der Walt (2019) recommended the implementation of buffer zones of 30m around the identified sites; however it is anticipated that this may not be sufficient for conservation of the broader cultural landscape.

Table 1: Sites previously identified in and near the proposed study area

SAHRIS ID	Site No.	Site Name	Site Type	Grading
134428	ZRM003A	ZONDEREINDE MINE - Site 3	Stone walling	Grade IIIb
134431	ZRM003B	ZONDEREINDE MINE - Site 3	Stone walling	Grade IIIb
134433	ZRM004A	ZONDEREINDE MINE - Site 4	Stone walling	Grade IIIb
134434	ZRM004B	ZONDEREINDE MINE - Site 4	Stone walling	Grade IIIb
134435	ZRM004C	ZONDEREINDE MINE - Site 4	Stone walling	Grade IIIb
134436	ZRM004D	ZONDEREINDE MINE - Site 4	Stone walling	Grade IIIb
134438	ZRM004E	ZONDEREINDE MINE - Site 4	Stone walling	Grade IIIb
134443	ZRM005A	ZONDEREINDE MINE - Site 5	Stone walling	Grade IIIa
134444	ZRM005B	ZONDEREINDE MINE - Site 5	Stone walling	Grade IIIa
134445	ZRM005C	ZONDEREINDE MINE - Site 5	Stone walling	Grade IIIa
134446	ZRM005D	ZONDEREINDE MINE - Site 5	Stone walling	Grade IIIa
134448	ZRM005E	ZONDEREINDE MINE - Site 5	Stone walling	Grade IIIa
134422	ZRM001	ZONDEREINDE MINE	Burial Grounds & Graves	Grade IIIa
134425	ZRM002	ZONDEREINDE MINE	Burial Grounds & Graves	Grade IIIa



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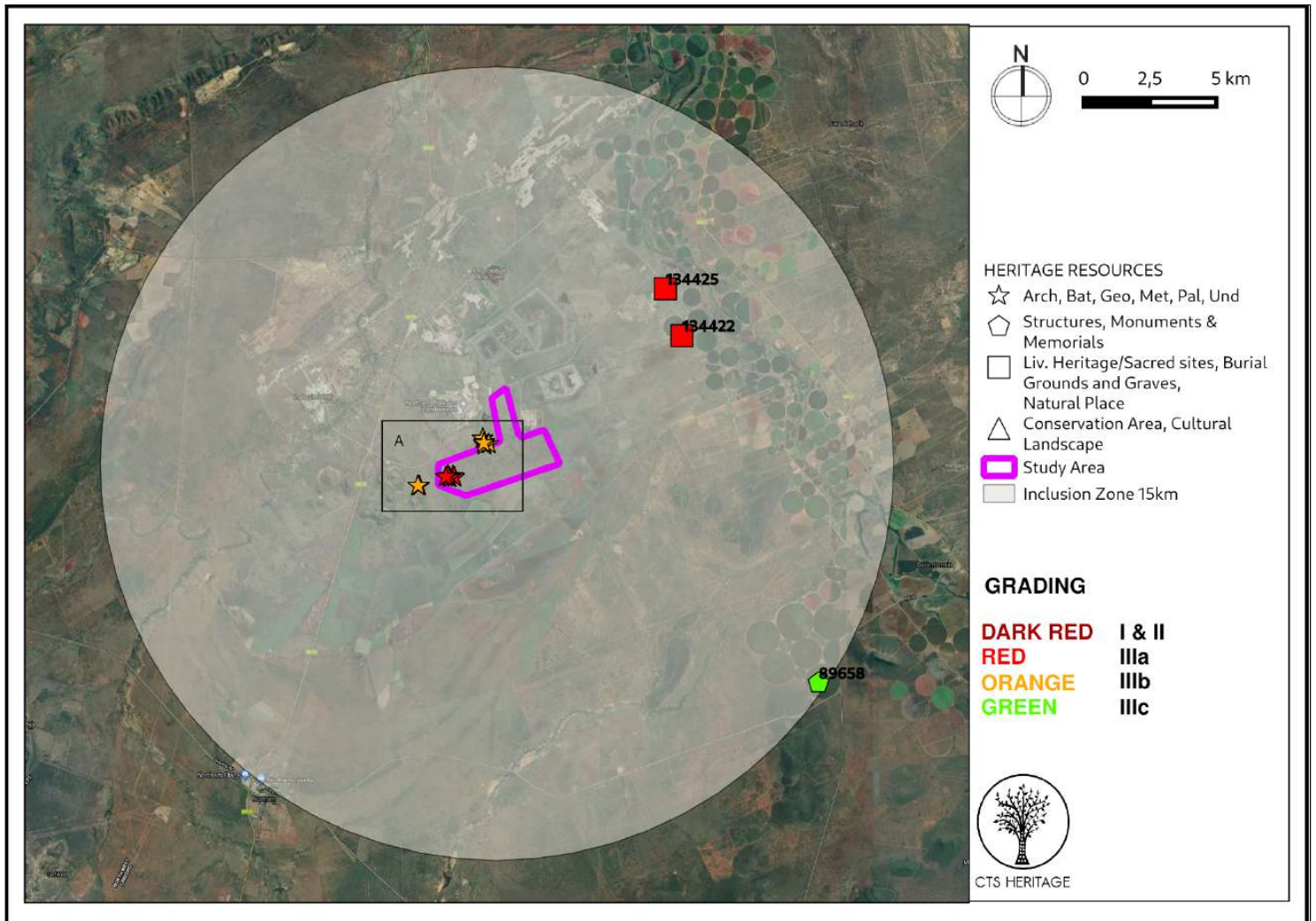


Figure 3a. Heritage Resources Map. Heritage Resources previously identified in and near the study area, with SAHRIS Site IDs indicated (see Heritage Screening Assessment for insets)



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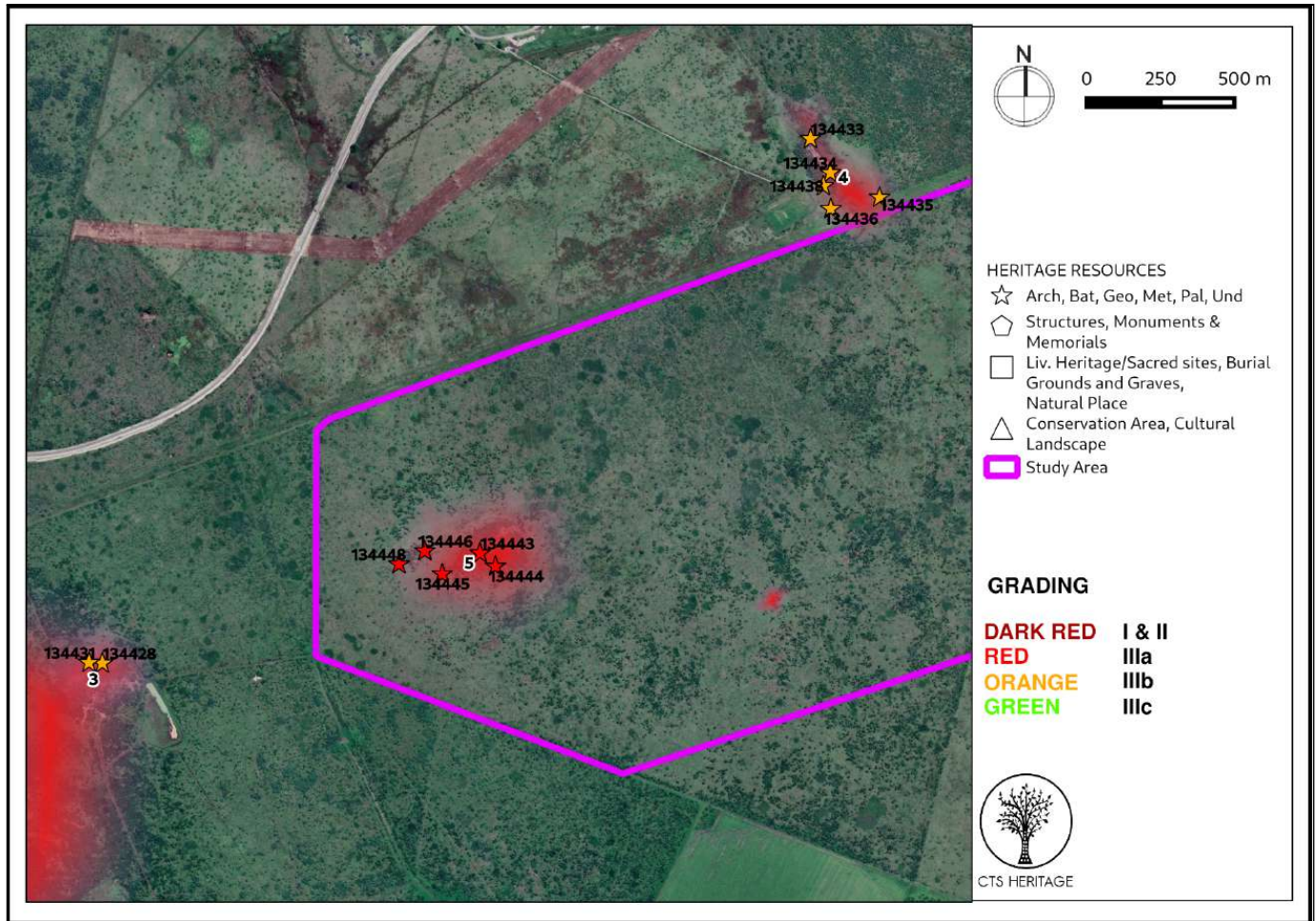


Figure 3b. Heritage Resources Map. Heritage Resources previously identified in and near the study area, with SAHRIS Site IDs indicated (see Heritage Screening Assessment for insets)

Further investigation of the broader area using available historic satellite imagery has revealed a larger Iron Age settlement located in and around the koppie complex. This evidence indicates that these three sites previously identified should not be viewed in isolation, but rather as part of a much larger Iron Age village settlement that extends beyond the boundaries of the proposed study area. According to Mason (1974); “Since 1971 we have discovered that the Magaliesberg Valley preserves one of the best records of Iron Age activity in Africa, dating from Early Iron Age times right up to the nineteenth century. The wide, gently sloping landscapes of the Magaliesberg Valley appear to have been ideal territories for Iron Age settlers, offering a wide range of environmental opportunities to these people, and offering the archaeologist good conditions for preservation by gentle deposition covering the settlements after their abandonment. The soils of the Magaliesberg Valley . made very durable plasters on the walls or floors of Iron Age huts, as well as pottery. Indeed, we have probably learned more about Iron Age hut building from Early to Late Iron Age times in the Magaliesberg Valley than anywhere else in Africa.”

The Late Iron Age sites that fall within this property (4 and 5) are clearly one small part of a much larger settlement that extends to the south east of the existing mine. We refer to this settlement as the Late Iron Age koppie complex of sites that extend beyond the koppies themselves and into the flat areas in between the koppies.



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Figure 3c. Heritage Resources Map. Extract from GoogleEarth (2011) indicating the koppie complex



Figure 3d. Heritage Resources Map. Extract from GoogleEarth (2011) indicating Site 4 of the koppie complex. The drier conditions at this time reveal the extensive nature of the Late iron Age site complex (circles in the veld indicate stone foundations of Late Iron Age structures)



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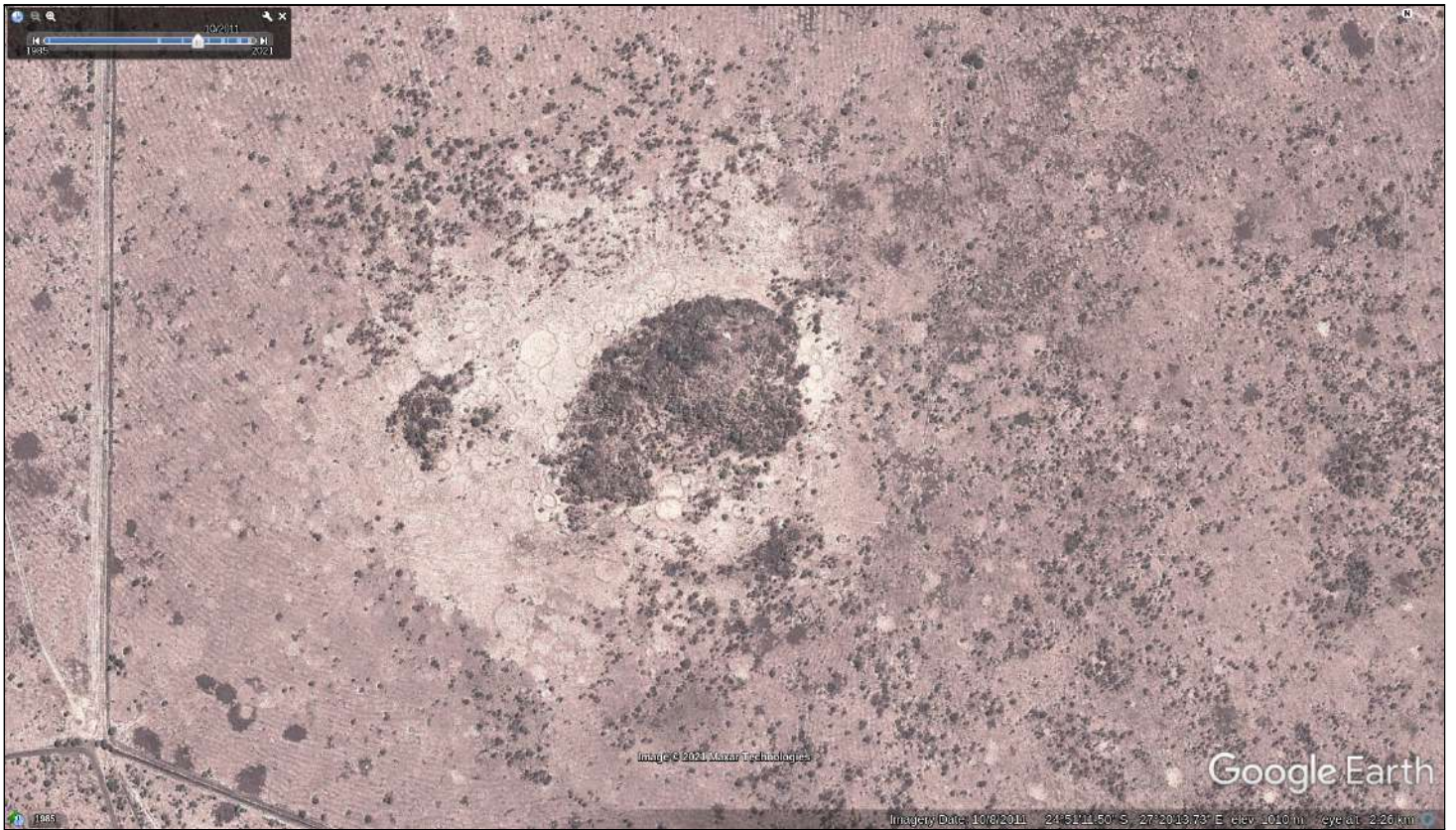


Figure 3e. Heritage Resources Map. Extract from GoogleEarth (2011) indicating Site 5 of the koppie complex. See how the stone foundations extend beyond the koppie and into the flat areas between the koppies.

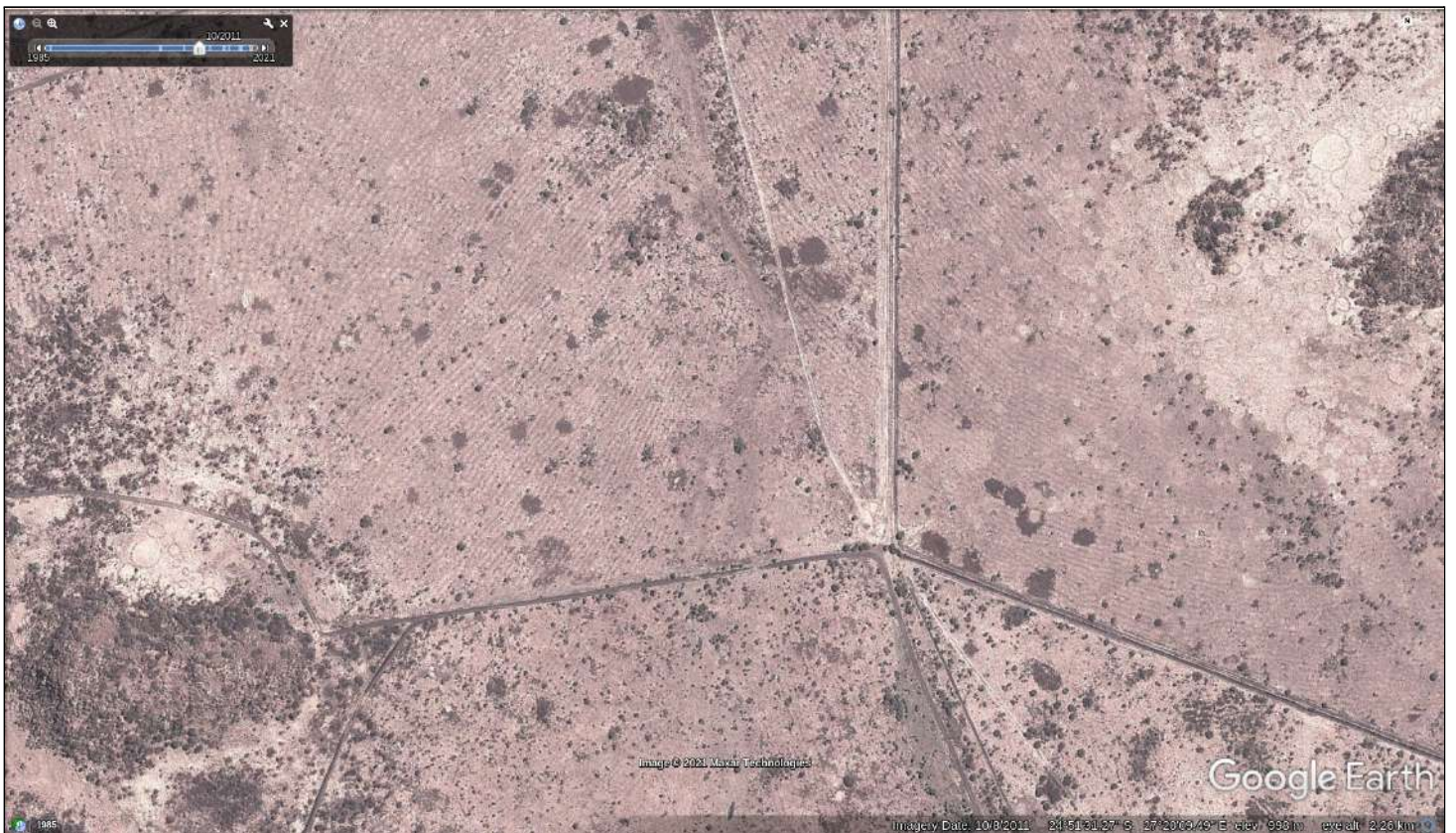


Figure 3f. Heritage Resources Map. Extract from GoogleEarth (2011) indicating the area between site 3 and site 5. See how the stone foundations extend beyond the koppie and into the flat areas between the koppies.



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Figure 3g. Heritage Resources Map. Extract from GoogleEarth (2011) indicating the area between site 3 and additional sites to the south east that have not been previously recorded. See how the stone foundations extend beyond the koppie and into the flat areas between the koppies, especially visible in areas without vegetation (appear white in the satellite imagery).

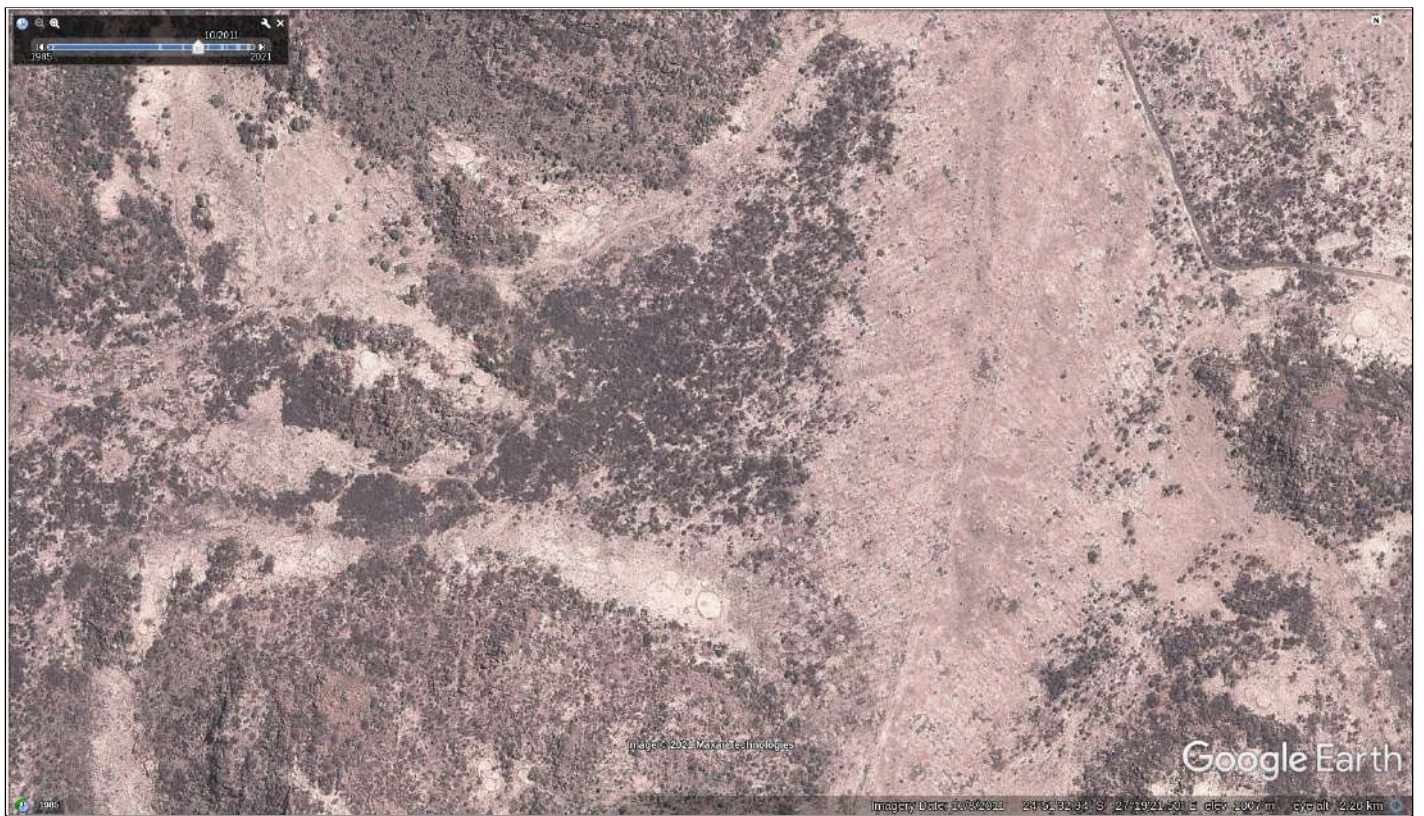


Figure 3h. Heritage Resources Map. Extract from GoogleEarth (2011) indicating the area between site 3 and additional sites to the south east that have not been previously recorded. See how the stone foundations extend beyond the koppie and into the flat areas between the koppies, especially visible in areas without vegetation (appear white in the satellite imagery).



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Figure 3i. Heritage Resources Map. Extract from GoogleEarth (2011) indicating additional sites to the south east that have not been previously recorded. See how the circular stone foundations extend beyond the koppie and into the flat areas between the koppies, especially visible in areas without vegetation (appear white in the satellite imagery).



Figure 3j. Heritage Resources Map. Extract from GoogleEarth (2011) indicating additional sites to the south east that have not been previously recorded. See how the circular stone foundations extend beyond the koppie and into the flat areas between the koppies, especially visible in areas without vegetation (appear white in the satellite imagery).



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Figure 3k. Heritage Resources Map. Extract from GoogleEarth (2011) indicating additional sites to the south east that have not been previously recorded. See how the circular stone foundations extend beyond the koppie and into the flat areas between the koppies, especially visible in areas without vegetation (appear white in the satellite imagery).

4. IDENTIFICATION OF HERITAGE RESOURCES

4.1 Field Assessment

The survey was conducted on foot and by vehicle with a high clearance to move through the tracks along the fence lines that are maintained as firebreaks. A more detailed photographic record was taken of the koppie complex lying just to the southeast of the study area along with the outcrops containing sites 4 and 5 previously recorded by Van Vollenhoven (2013). This has significantly improved the appreciation of the sense of place and nature of the area containing an extensive Late Iron Age settlement that we believe should be conserved and carefully managed for the remaining period of mining in the area.

With previous studies in mind, this field assessment sought to clarify the extent of sites 4 and 5 in more detail and to provide guidance as to the areas that should be avoided by development activities associated with the proposed 10MWp PV facility. The distribution of artifactual material was noted on the ground and this was found in large numbers surrounding sites 4 and 5 in an amongst extensive stone walling enclosures and ruined remains. We were aware of the likely locations of the stone walls using satellite imagery and once the fieldwork was concluded we mapped out the areas with the benefit of historical and current satellite imagery. We are certain that even more detail would be possible should surveys be conducted during winter and with the use of drone footage - however, our main objective was to identify a substantial buffer area around these sites where no stone walling or significant artefact distributions would be found beyond the boundaries.



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Figure 4.1: View of Koppie Complex before the entrance to Northam Mine



Figure 4.2: View 600m from koppie complex, 1.3km from Koppie Site 5



Figure 4.3: View on Koppie Site 4 and reservoir, stonewalled ruins



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Figure 4.4: View on Koppie Site 4



Figure 4.5: View of shooting range and more ruined stonewalling Site 4



Figure 4.6: View of koppie Site 5 from the north; Smelter smoke stack to the east



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Figure 4.7: View of koppie Site 5 from the north; Smelter smoke stack to the east



Figure 4.8 View on Koppie Site 4 from southwest end



Figure 4.9 View of koppie Site 5 from the east



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Figure 4.10 View of koppie site 5 around northern side in amidst ruins



Figure 4.11 View of koppie site 5 around northern side in amidst ruins



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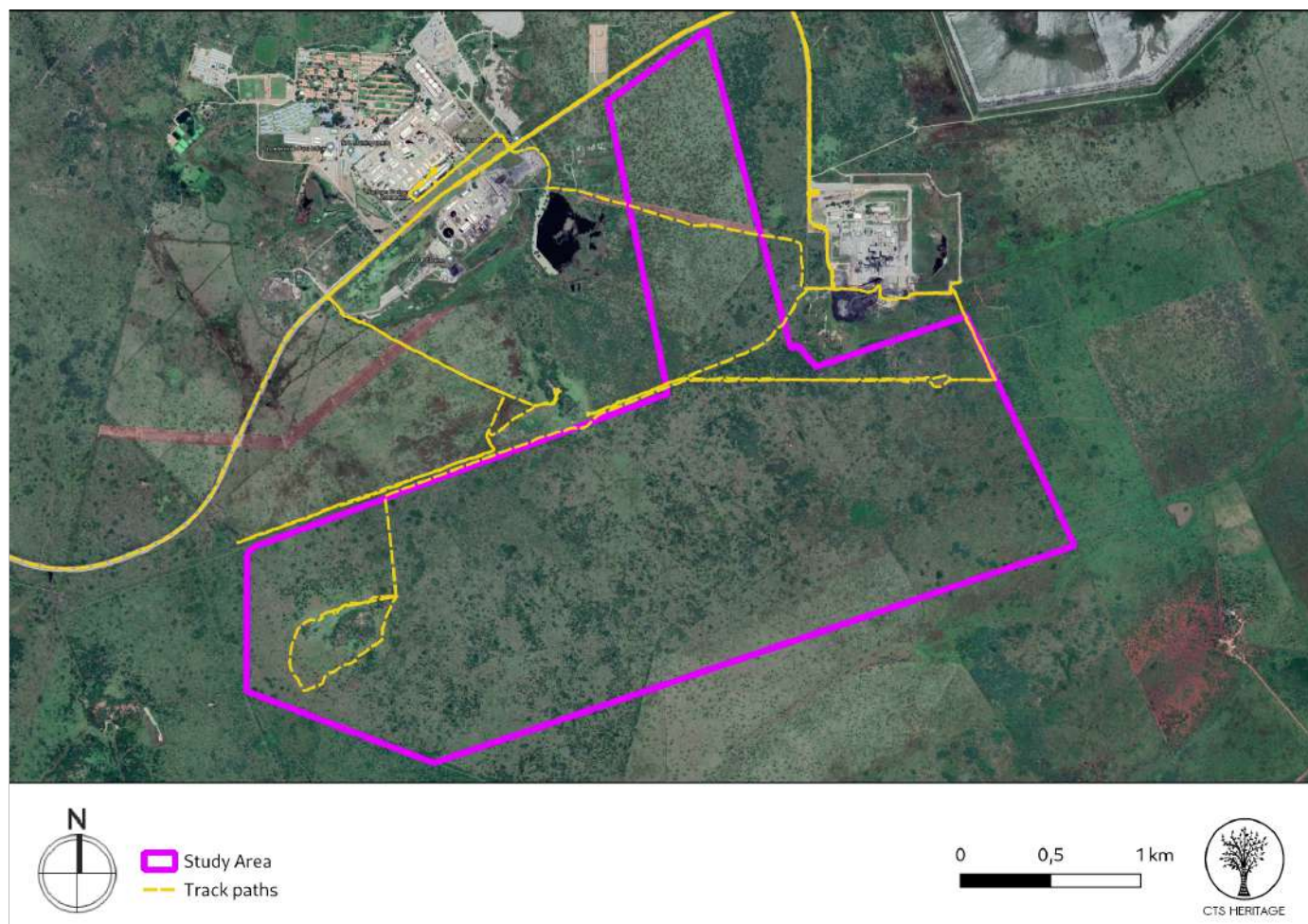


Figure 5: Overall track paths of foot survey

4.2 Archaeological Resources identified

Table 1: Observations noted during the field assessment

Site No.	Site Name	Description	Co-ordinates		Grading	Mitigation
	Northam Site 4 complex	LIA Site complex identified by Van Vollenhoven (2013)	-24.841944	27.348333	IIIA	The site must be conserved and no impact is permitted. The site must be noted for scientific excavation.
OBS001	Northam Site 5 complex	View of ruined kraal, vertical branch still remains, stonewalling, quartz & quartzite flakes, undecorated pottery, LIA	-24.85241	27.33583	IIIA	The site must be conserved and no impact is permitted. The site must be noted for scientific excavation.
OBS002	Northam Site 5 complex	Large circular kraal wall, less than half a metre high, completely grass covered, LIA	-24.85241714	27.33527552	IIIA	The site must be conserved and no impact is permitted. The site must be noted for scientific excavation.
OBS003	Northam Site 5 complex	Small stonewalled kraals, grass cover thick, LIA	-24.8524287	27.33583603	IIIA	The site must be conserved and no impact is permitted. The site must be noted for scientific excavation.



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4.3 Selected photographic record

(a full photographic record is available upon request)



Figure 6.1: Image of Northam Site 5 complex (IIIA)



Figure 6.2: Artefacts including quartz and pottery from Northam Site 5 complex (IIIA)



Figure 6.3: Artefacts including quartz and pottery from Northam Site 5 complex (IIIA)



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Figure 6.4: Quartzite flake from Northam Site 5 complex (IIIA)



Figure 6.5 Northam Site 5 complex (IIIA)



Figure 6.6 Northam Site 5 complex (IIIA)



Figure 6.7 Northam Site 5 complex (IIIA)

5. ASSESSMENT OF THE IMPACT OF THE DEVELOPMENT

5.1 Assessment of impact to Archaeological Resources

The field assessment has revealed that there is a large section of the study area that is highly sensitive for impacts to very significant archaeological resources. Although these significant archaeological resources have been previously identified by Van Vollenhoven (2013) and Van der Walt (2019), little proactive conservation interventions seem to have taken place.

Although the exposed stone walling associated with these LIA sites is located on top and immediately surround the granite koppies, it is clear that these sites were historically connected and as such form part of a complex of sites that stretches east-west. It is therefore very likely that archaeological evidence of this connection is located in the spaces between these granite koppies however this was not able to be verified during the field assessment due the dense vegetation. Despite this, we are confident that the areas located between the granite koppies are as archaeologically



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sensitive as the koppies themselves. Any development of the proposed PV facilities in the areas between the granite koppies is likely to negatively impact on significant archaeological heritage.

As such, we have provided a map of the areas of very high archaeological sensitivity within the broader study area in order to inform the appropriate siting of the proposed PV facilities. The area shaded in red in Figures 7.1 and 7.2 should be avoided entirely as the two LIA sites (Sites 4 and 5) lie within this stretch with archaeological material found in areas connecting these outcrops and associated archaeological exposures. The remaining unshaded ground consists of undeveloped and relatively undisturbed bushveld with no known archaeological sites found during the various assessments conducted.

The site visit also revealed that the location of the heritage resources and ways to manage them have not formed part of the mine's environmental management plan to-date despite the proximity of mining activities to sites of known high local significance. This has resulted in negative impacts to the LIA complex through various developments such as the water reservoir which was built after the mine was established and the development of the shooting range.

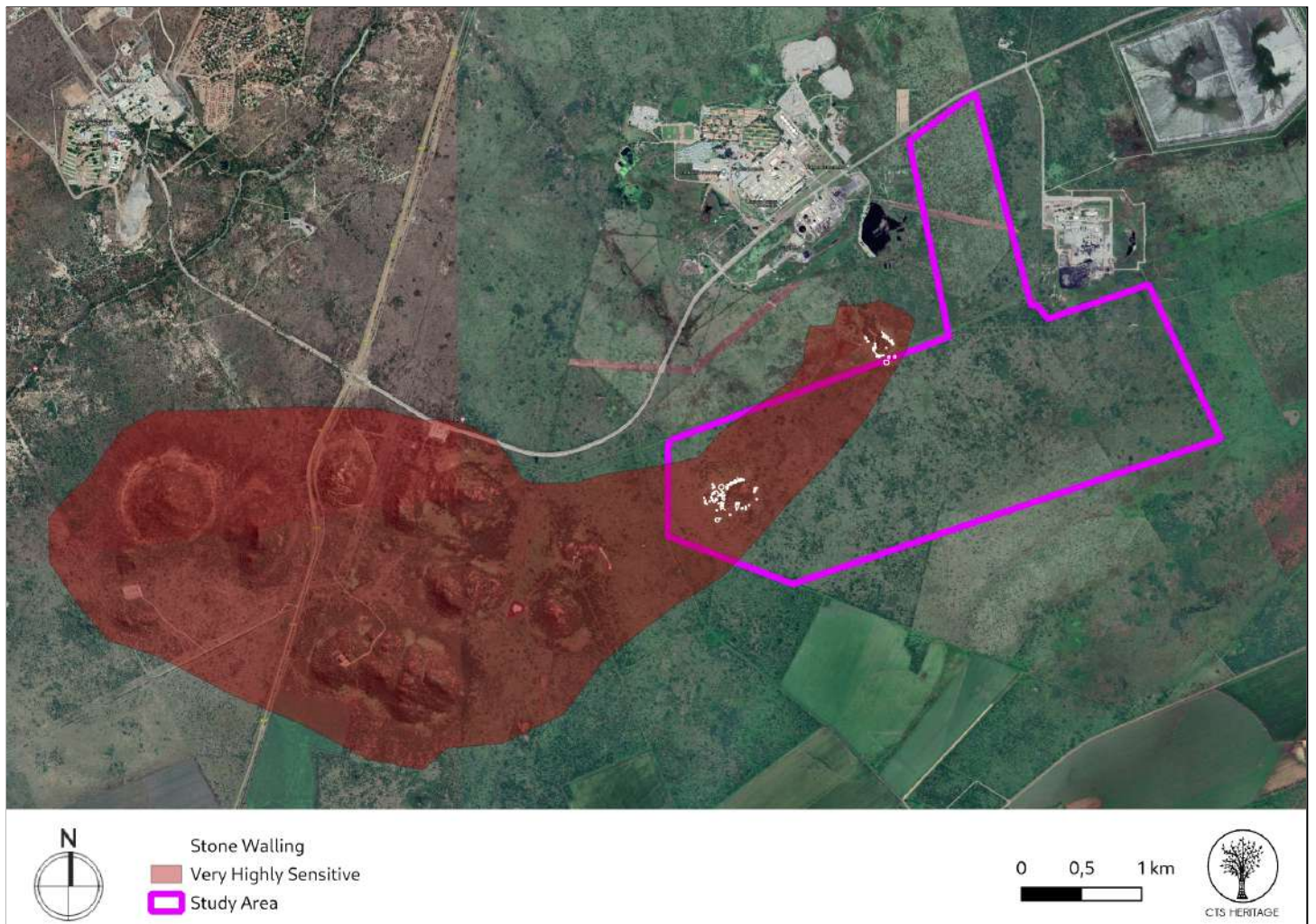


Figure 7.1: Map of heritage resources identified during the field assessment, relative to the proposed study area and associated archaeological sensitivity



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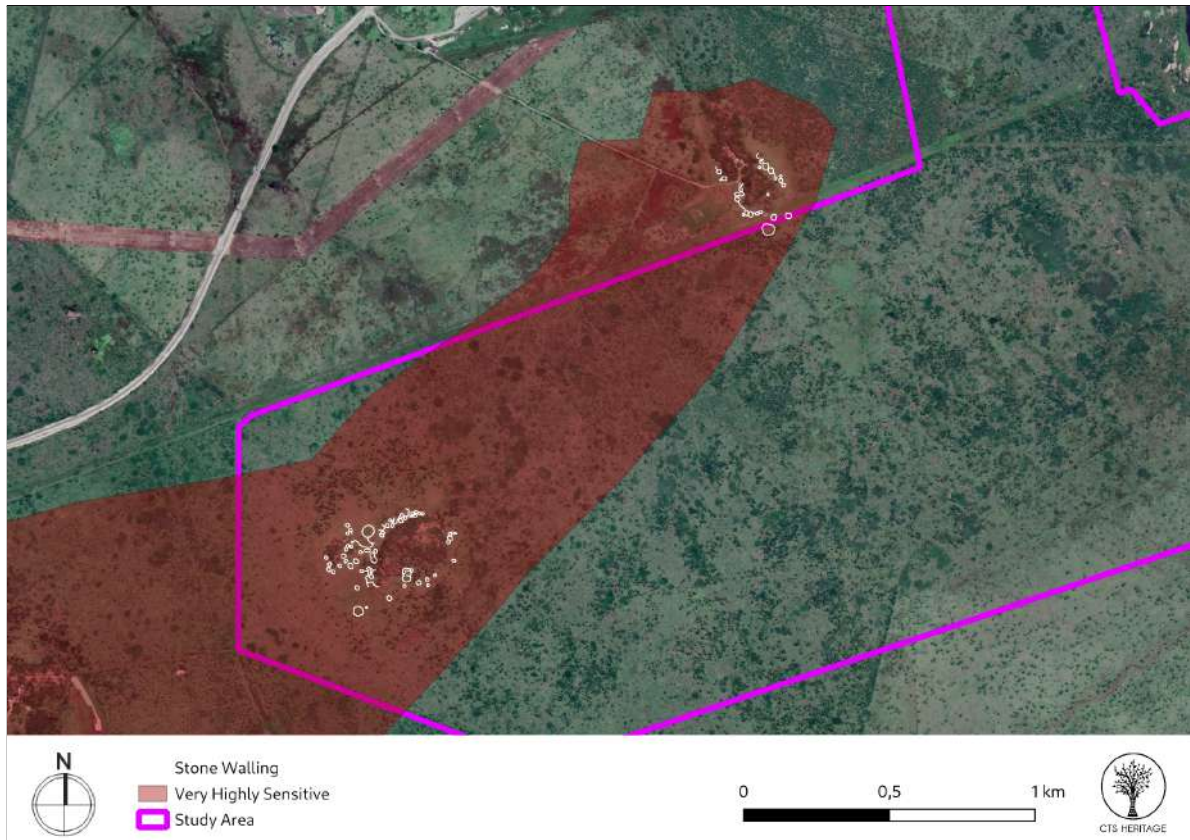


Figure 7.2: Map of heritage resources identified during the field assessment

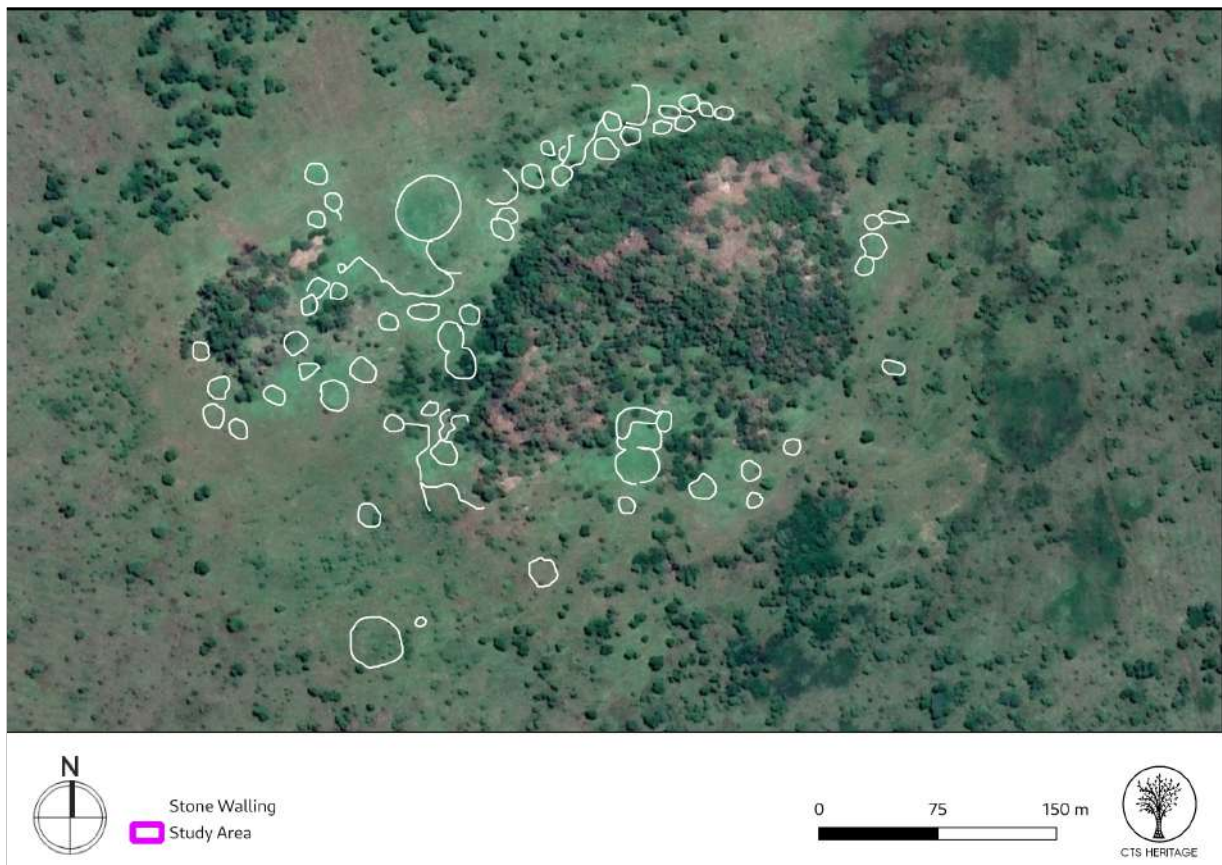


Figure 7.3: Detailed map of stone walling evident at Site 5 complex from satellite imagery



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Figure 7.4: Detailed map of stone walling evident at Site 4 complex from satellite imagery located adjacent to the shooting range

6. CONCLUSION AND RECOMMENDATIONS

Due to the significance of the LIA site complex, it is recommended that no impact to these sites or their associated archaeological deposit should take place. As such, we have mapped out areas of high archaeological sensitivity that must be avoided by the development of the proposed PV facilities. A detailed mapping exercise using ground truthing and satellite imagery was conducted to establish the boundaries of the Late Iron Age site complexes at sites 4 and 5. This was combined into a shaded red sensitivity area in figures 7.1 and 7.2 to delineate an area of no development.

Due to the significance of this complex of LIA sites, it is recommended that on-going archaeological management interventions are implemented. As the LIA complex is located on land that is privately owned, it is recommended that SAHRA enter into discussions with Northam Mine in order to develop a Heritage Agreement in terms of section 42 of the NHRA. Appended to this agreement should be a Conservation Plan for the LIA site complex which will outline the relevant roles and responsibilities of SAHRA and the landowners in terms of ongoing management and conservation of these significant sites.



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Recommendations

There is no objection to the proposed development of the proposed Northam PV facility and its associated infrastructure on condition that:

- The areas marked as having high archaeological sensitivity are avoided and no development activities associated with the proposed PV development take place within this area (Figure 7.1)
- Should any previously unrecorded archaeological resources or possible burials be identified during the course of construction activities, work must cease in the immediate vicinity of the find, and SAHRA must be contacted regarding an appropriate way forward.

Additional Recommendations for the proactive conservation of the significant LIA complex:

- A Conservation Plan is developed for the LIA site complex which will outline the relevant roles and responsibilities of SAHRA and the landowners in terms of ongoing management and conservation of these significant sites. This Conservation Plan must be appended to a Heritage Agreement signed between the landowners and SAHRA in terms of section 42 of the NHRA.



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7. REFERENCES

Heritage Impact Assessments				
Nid	Report Type	Author/s	Date	Title
5703	AIA Phase 1	Johnny Van Schalkwyk	01/09/1994	A Survey of Archaeological and Cultural Historical Resources in the Amandelbult Mining Lease Area
5706	AIA Phase 1	Johnny Van Schalkwyk, Frank Teichert, Anton Pelser	01/06/2003	A Survey of Archaeological Sites for the Amandelbult Platinum Mine Seismic Exploration Program
5719	AIA Phase 1	Johnny Van Schalkwyk	28/08/2007	Heritage Impact Assessment: Portion 6 Aapieskraal
7298	AIA Phase 1	Udo Kusel	30/07/2008	Cultural Heritage Resources Impact Assessment for Portions 1, 4, 5, 6, 7, 18, 19, 27 and 28 of the Farm Maroeloesfontein 366 KQ, Limpopo Province
7767	AIA Phase 1	Thomas Huffman	01/12/2004	Archaeological Assessment for the Rhino Andalusite Mine Second Report
7768	AIA Phase 1	Thomas Huffman	01/05/2007	Further Reconnaissance for the Rhino Andalusite Mine, Thabazimbi, Limpopo Province
534905	HIA Phase 1	McEdward Murimbika	05/02/2010	Phase 1 Archaeological and Heritage Impact Assessment Specialist Study Report for Proposed Installation of New Antennae and Associated Infrastructure at Farm Hartebeesthoek 502 JQ, Gauteng Province
530577	HIA Phase 1	Jaco van der Walt	16/10/2019	Heritage Impact Assessment for the proposed Northam Zondereinde Platinum Mine 3 Shaft, Thabazimbi Local Municipality
557639	HIA Phase 1	Anton van Vollenhoven	01/03/2013	A REPORT ON A CULTURAL HERITAGE IMPACT ASSESSMENT FOR THE PROPOSED PHOTOVOLTIC POWER PLANT AND EMP AMENDMENT FOR THE NORTHAM PLATINUM ZONDEREINDE MINE CLOSE TO NORTHAM, NORTHWEST PROVINCE



APPENDIX 2: Heritage Screening Assessment



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HERITAGE SCREENER

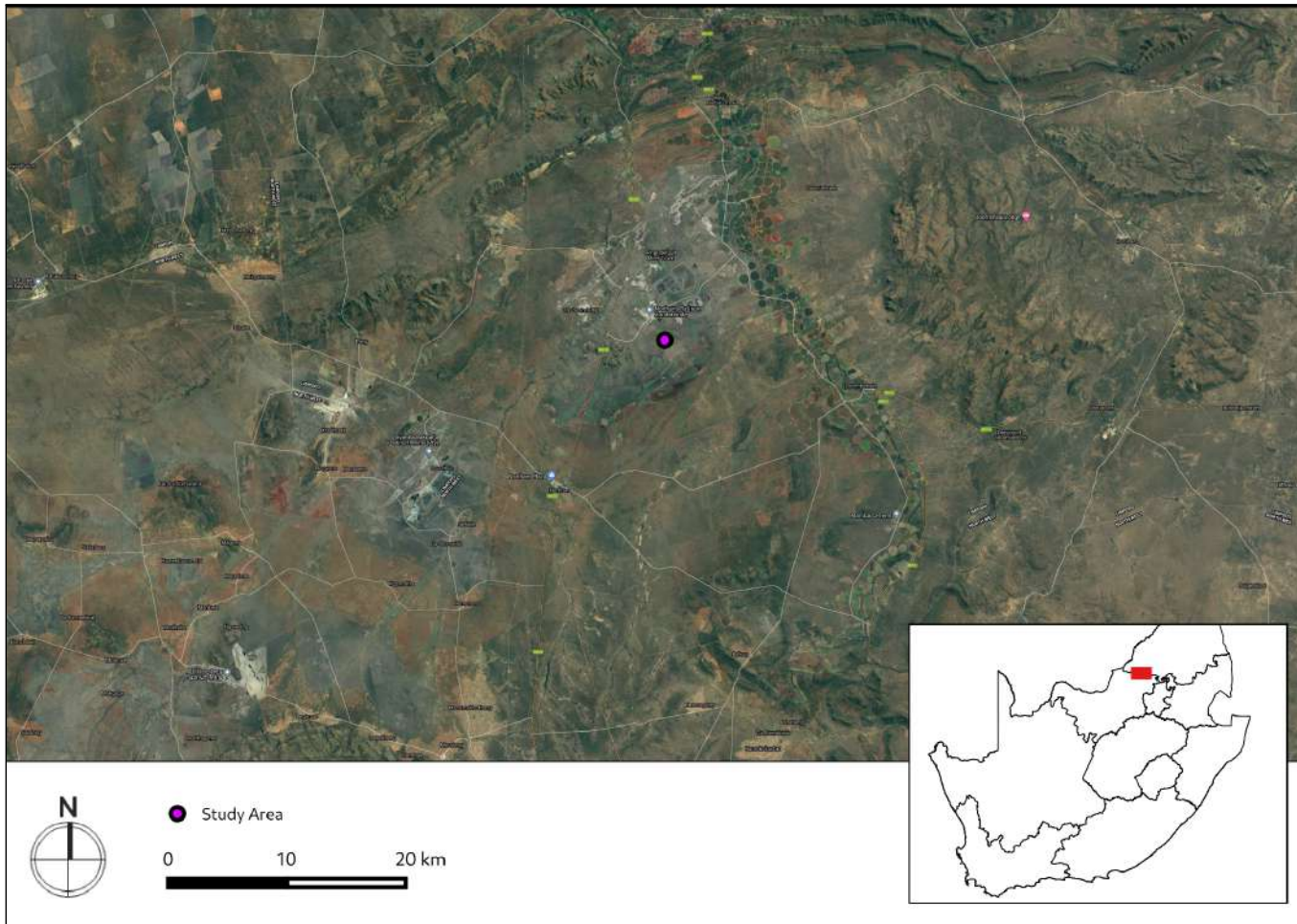
CTS Reference Number:	CTS21_010	
SAHRA Case No.	TBA	
Client:	Savannah	
Date:	March 2021	
Title:	Proposed development of the Northam PV facility near Thabazimbi, North West Province	
Recommendation:	<p>RECOMMENDATION</p> <p>It is likely that the proposed development will impact on significant archaeological heritage and its associated Iron Age cultural landscape. As such, an HIA is required to assess impacts to these identified heritage resources and to provide appropriate mitigation measures to prevent negative impact.</p>	

Figure 1a. Satellite map indicating the location of the proposed development in the North West Province

CTS Heritage

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1. Proposed Development Summary

Northam Platinum Pty Ltd proposes the construction of a 10MW solar PV facility and associated ancillaries within the Zondereinde Mine Area, the extent of which will be up to 20 ha. The proposed project is located near Thabazimbi, within jurisdiction of the Thabazimbi Local Municipality in the Limpopo Province, on various properties, all of which are owned by the proponent:

The development footprint includes the following:

- » Solar PV array comprising PV modules and mounting structures.
- » Inverters and transformers.
- » Cabling between the project components.
- » On-site facility substation between the solar PV facility and the Eskom substation
- » Site offices and maintenance buildings, including workshop areas for maintenance and storage.
- » Laydown areas.
- » Access roads, internal distribution roads and fencing around the development area

2. Application References

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

3. Property Information

Latitude / Longitude	24°51'2.82"S 27°21'5.06"E
Erf number / Farm number	Portion 1 of the Farm Kopje Alleen 422 and Portion 2 of the Farm Zondereinde 384
Local Municipality	Thabazimbi
District Municipality	Waterberg
Province	North West
Current Use	Fallow land owned and operated by Northam Platinum Ltd
Current Zoning	Industrial

4. Nature of the Proposed Development

Total Surface Area	Up to 20ha
Depth of excavation (m)	5m Maximum Depth
Height of development (m)	4m Maximum Height

5. Category of Development

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

6. Additional Infrastructure Required for this Development

Storage up to 30m ³ of lubricants and transformer oil on site
--

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

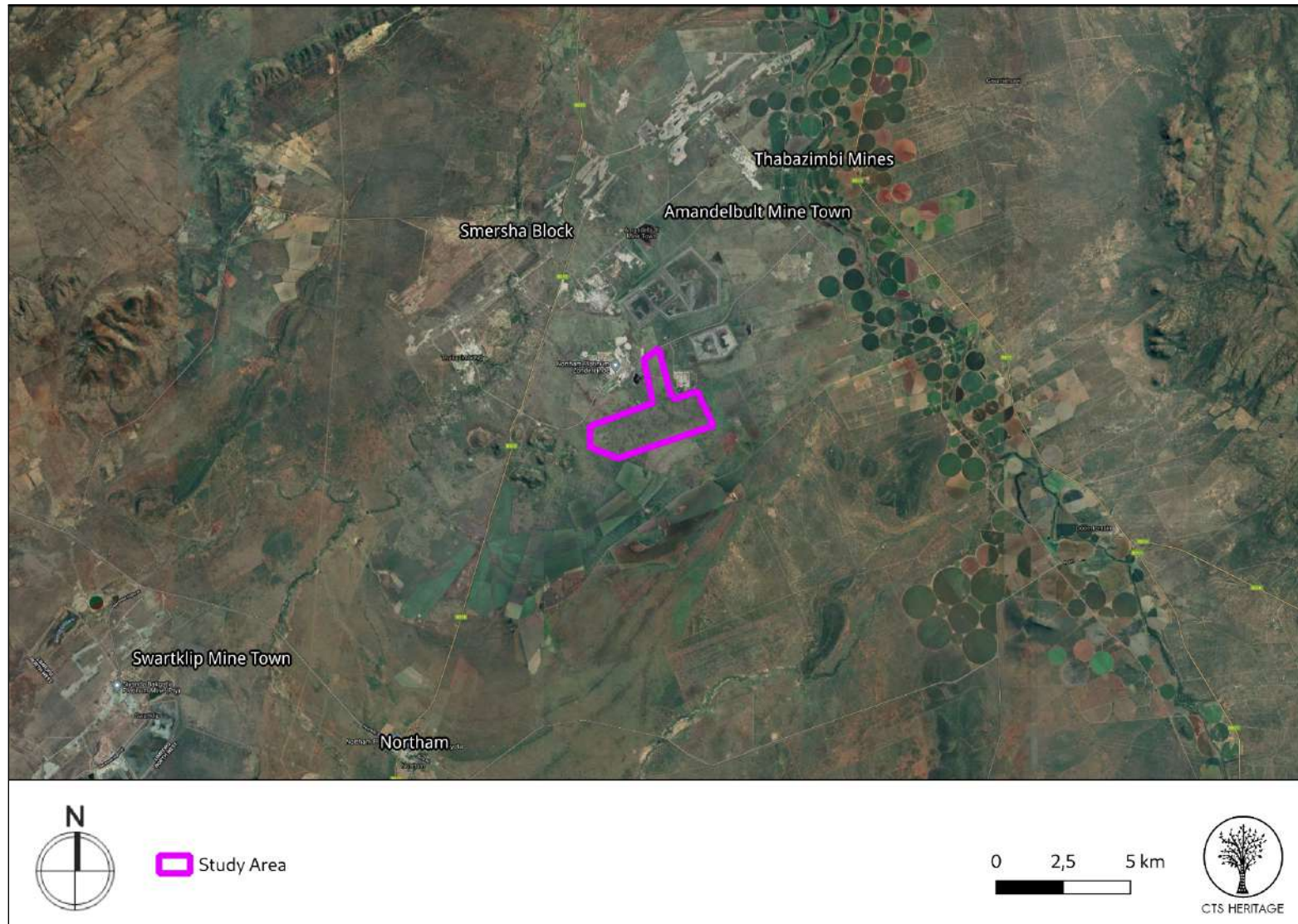


Figure 1b Overview Map. Satellite image (2019) indicating the proposed study area

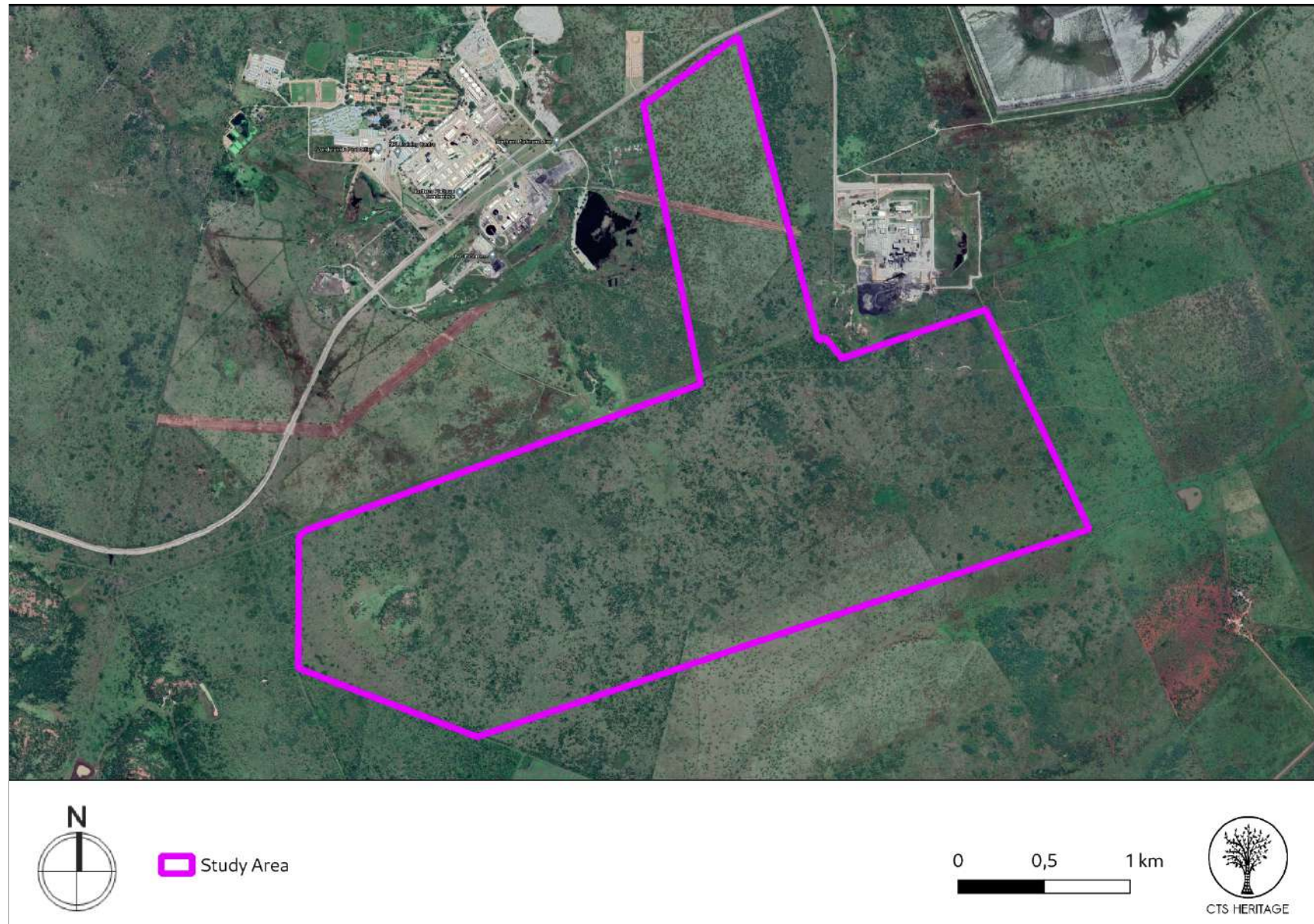


Figure 1c. Overview Map. Satellite image (2019) indicating the proposed study area at closer range.

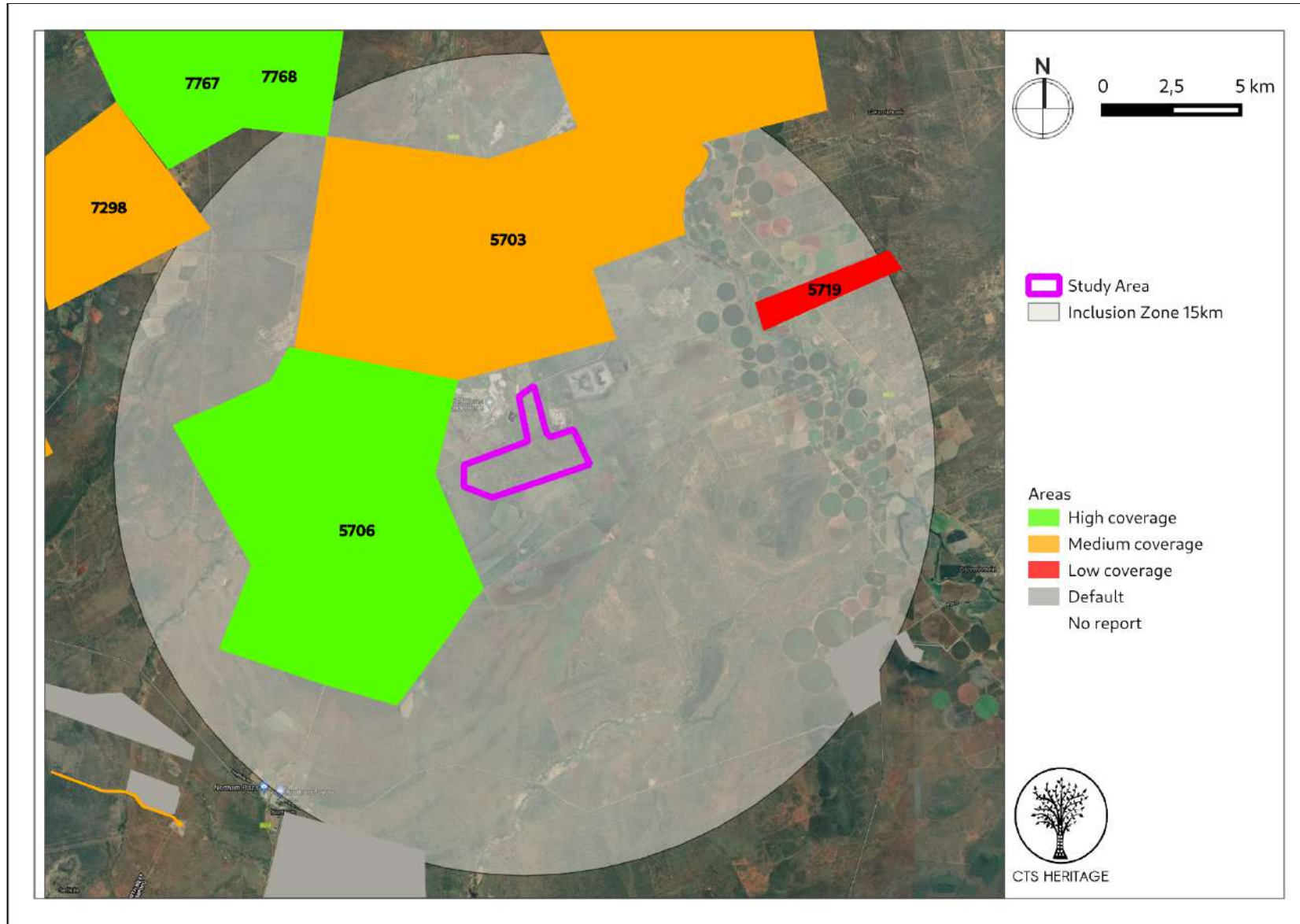


Figure 2. Previous HIAs Map. Previous Heritage Impact Assessments surrounding the proposed study area within 15km, with SAHRIS NIDS indicated. Please see Appendix 2 for a full reference list.

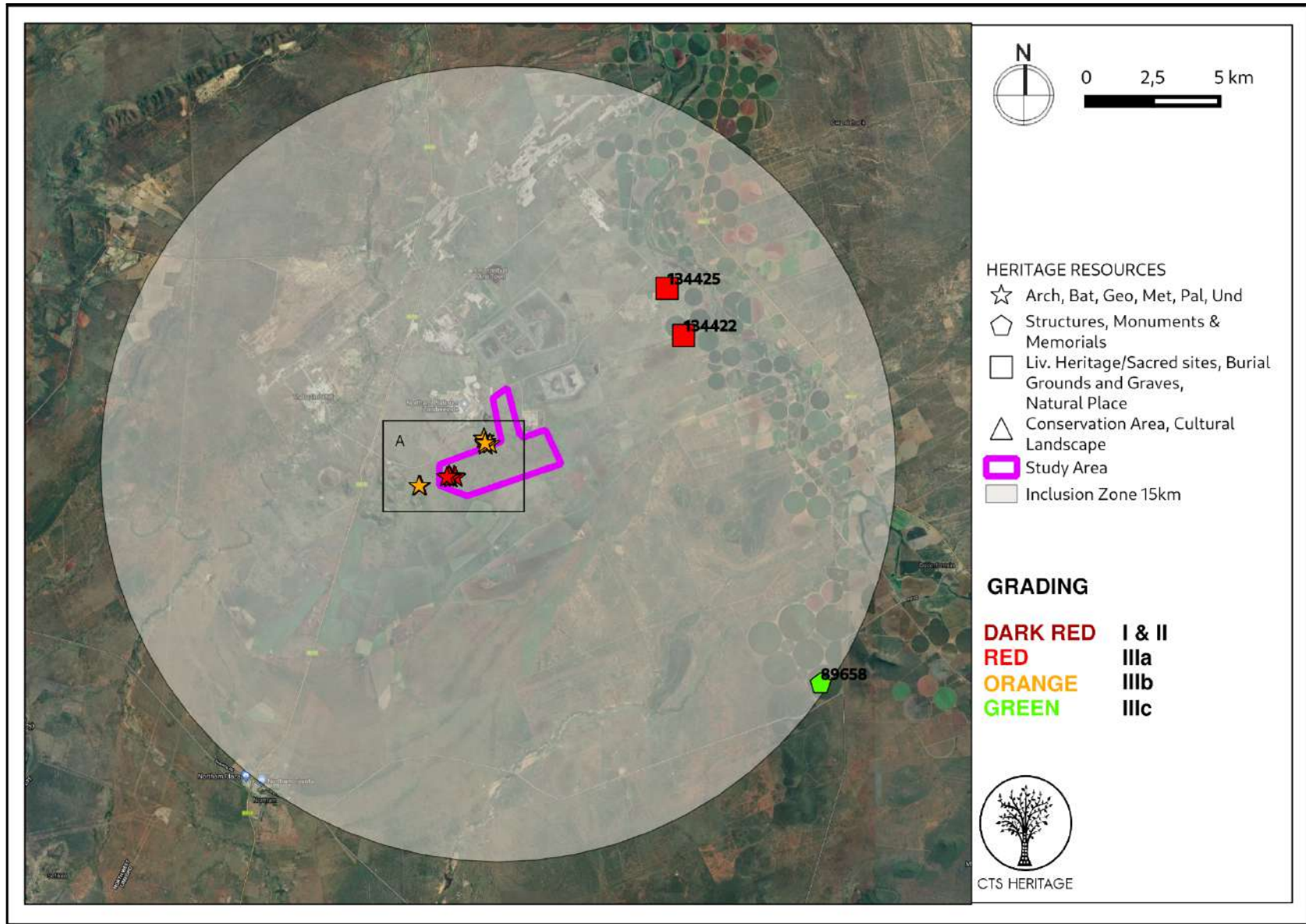


Figure 3. Heritage Resources Map. Heritage Resources previously identified in and near the study area, with SAHRIS Site IDs indicated. Please See Appendix 4 for full description of heritage resource types.

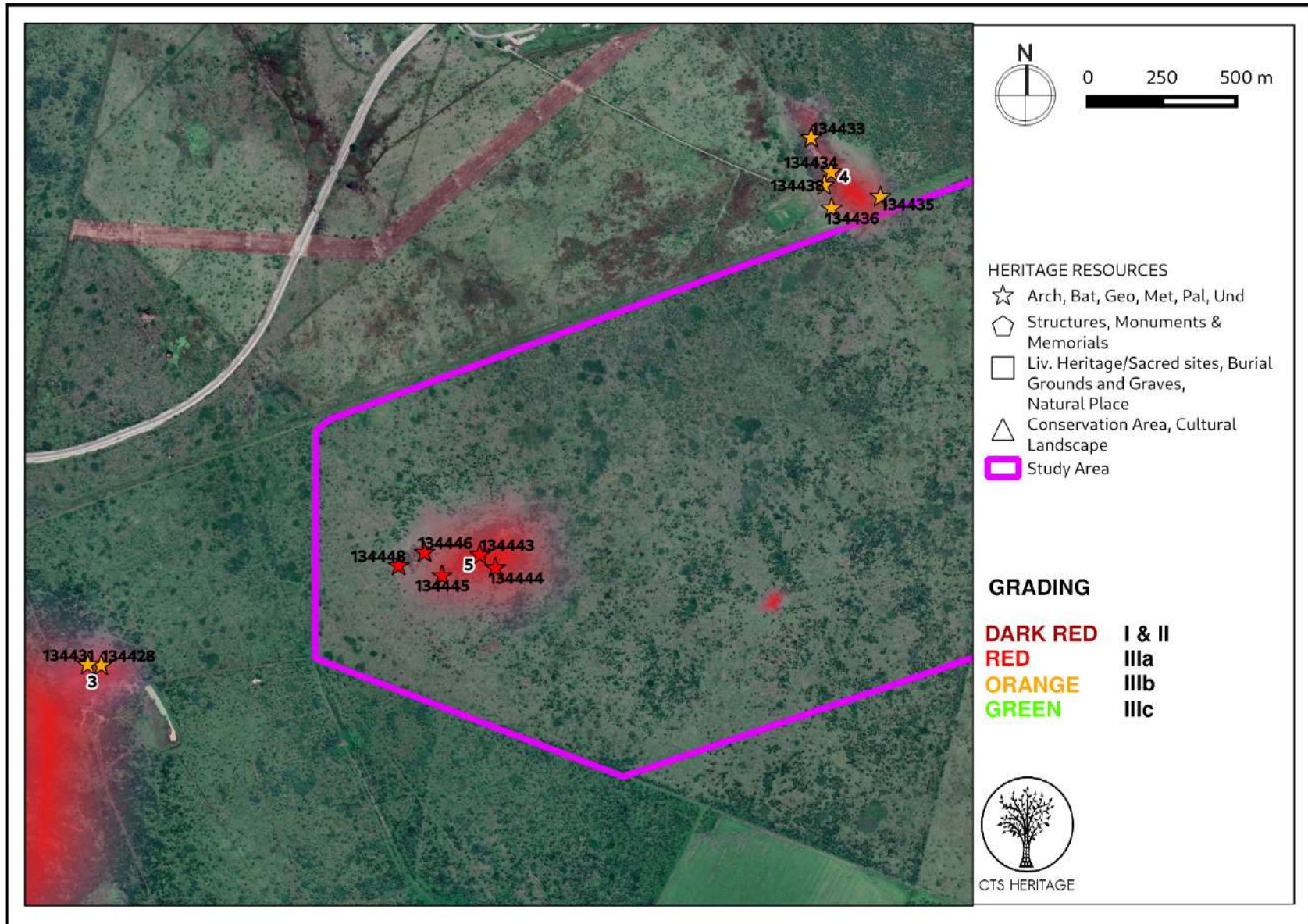


Figure 3a. Heritage Resources Map. Inset A

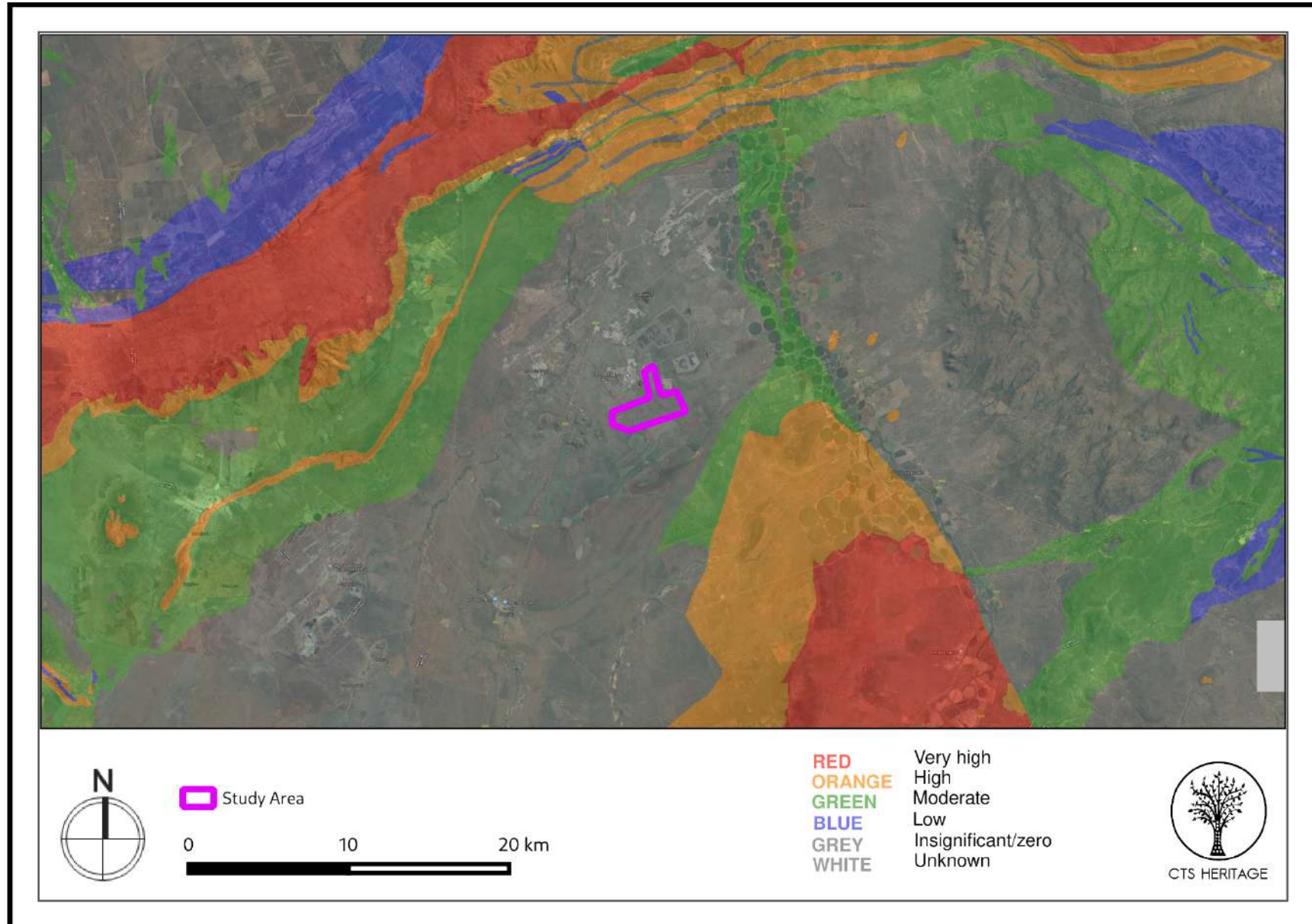


Figure 4. Palaeosensitivity Map. Indicating varied fossil sensitivity underlying the study area. Please See Appendix 3 for full guide to the legend.

8. Heritage statement and character of the area

The area proposed for development is located immediately adjacent to the town of Thabazimbi and the existing Northam Platinum Mine. The area immediately surrounding both the town and the mine largely consists of agricultural lands used for crop cultivation. The name Thabazimbi means *mountain of iron* because of the large iron ore reef that was discovered in 1919 by J. H. Williams. The mine boasts one of the largest mining shafts in Africa. More than 2 million tons of ore are mined every year and hauled by train to Mittal's iron and steel works. The railway line from Rustenburg reached the area in the 1930s and full scale iron and steel production began. The town was proclaimed in 1953 and its history is intimately linked with that of the mines in the area. Much of the central landscape of the North West Province is defined by bushveld and grasslands scattered with trees and shrubs; the mountains, deep valleys, rivers and dams of the northeast; the flat and arid semi-deserts plains of the west; and the lush vegetation of areas bordering the Vaal River in the south.

A broad history of the area is included in Murimbika (2010) and is referred to here. According to Murimbika (2010), the broader region has also yielded some significant Iron Age Sites such as the Mzonjani facies Broederstroom site (AD 430 to AD 780). According to Murimbika (2010), the broader region was subject to a number of instances of migration and settlement from 450 AD. Evidence indicates that Sotho-Tswana groups migrated in and out of the Magaliesberg region, and such groups are responsible for the many early stone-walled settlements in this region. One of the most documented migrations is the Mfecane (forced migration or scattering) which was a period of widespread chaos and warfare among indigenous ethnic communities in southern Africa during the period between 1815 and about 1840. During this time, the Ndebele under Mzilikazi reached the Magaliesberg region and are responsible for introducing the Doornspruit-type walled settlements that are known from this region (the Doornspruit River drains into the project area). According to Murimbika (2010) this type of stone-walled settlement represents “typical Nguni-Sotho-Tswana acculturation”. Murimbika (2010) further explains that one of the most acculturated groups in the region is known as the “Po”, whose Chief Mogale lends his name to the Magaliesberg Mountains and the Mogale City Municipality. By the mid-1800s, Voortrekkers had begun to settle in the foothills of the Magaliesberg mountains and in so doing, clashed with Mzilikazi's Ndebele in 1837. These early colonial battles forced the Ndebele north of the Limpopo River and effectively ended the independence of African Chiefdoms in the area. The Voortrekkers went on to establish the Republic of the Transvaal. As articulated by Murimbika (2010), it is in this context that the Magaliesberg area, in which the proposed development is located, is an important cultural landscape.

Previous Heritage Impact Assessments conducted in the immediate vicinity of the proposed development area (Von Vollenhoven, 2013 and van der Walt 2019) have identified a number of significant archaeological sites in the vicinity of the development area, dated to the Late Iron Age (Figure 3, 3a and 3b). Van Vollenhoven (2013) noted three clusters of Late Iron Age sites consisting of a number of individual features of stone walling of a variety of heights and diameters. Similarly, Van der Walt (2019) identified clusters of stone packed kraals up to 20m in diameter and deflated middens. According to Van der Walt (2019), a number of Late Iron Age middens and stone-walled enclosures were identified as having high local significance (Grade IIIA). Van der Walt (2019) also identified individual artefacts outside of these kraal locations such as upper grindstones and undecorated ceramics. As mitigation against impacts to the identified Iron Age sites, Van der Walt (2019) recommended the implementation of buffer zones of 30m around the identified sites however it is anticipated that this may not be sufficient for conservation of the broader cultural landscape.

According to the SAHRIS Palaeosensitivity Map (Figure 4), the area proposed for development of the PV facilities is underlain by sediments that have zero palaeontological sensitivity. As such, no palaeontological resources will be impacted by the proposed development and no further specialist palaeontological assessment is recommended.

RECOMMENDATION

It is likely that the proposed development will impact on significant archaeological heritage and its associated Iron Age cultural landscape. As such, an HIA is required to assess impacts to these identified heritage resources and to provide appropriate mitigation measures to prevent negative impact.



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

Site ID	Site no	Full Site Name	Site Type	Grading
134422	ZRM001	ZONDEREINDE MINE	Burial Grounds & Graves	Grade IIIa
134425	ZRM002	ZONDEREINDE MINE	Burial Grounds & Graves	Grade IIIa
134428	ZRM003A	ZONDEREINDE MINE	Stone walling	Grade IIIb
134431	ZRM003B	ZONDEREINDE MINE	Stone walling	Grade IIIb
134433	ZRM004A	ZONDEREINDE MINE	Stone walling	Grade IIIb
134434	ZRM004B	ZONDEREINDE MINE	Stone walling	Grade IIIb
134435	ZRM004C	ZONDEREINDE MINE	Stone walling	Grade IIIb
134436	ZRM004D	ZONDEREINDE MINE	Stone walling	Grade IIIb
134438	ZRM004E	ZONDEREINDE MINE	Stone walling	Grade IIIb
134443	ZRM005A	ZONDEREINDE MINE	Stone walling	Grade IIIa
134444	ZRM005B	ZONDEREINDE MINE	Stone walling	Grade IIIa
134445	ZRM005C	ZONDEREINDE MINE	Stone walling	Grade IIIa
134446	ZRM005D	ZONDEREINDE MINE	Stone walling	Grade IIIa
134448	ZRM005E	ZONDEREINDE MINE	Stone walling	Grade IIIa
89658	KWK001	Kwikstaart Agricultural Development 001	Structures	Grade IIIc

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APPENDIX 2: Reference List

Heritage Impact Assessments				
Nid	Report Type	Author/s	Date	Title
5703	AIA Phase 1	Johnny Van Schalkwyk	01/09/1994	A Survey of Archaeological and Cultural Historical Resources in the Amandelbult Mining Lease Area
5706	AIA Phase 1	Johnny Van Schalkwyk, Frank Teichert, Anton Pelser	01/06/2003	A Survey of Archaeological Sites for the Amandelbult Platinum Mine Seismic Exploration Program
5719	AIA Phase 1	Johnny Van Schalkwyk	28/08/2007	Heritage Impact Assessment: Portion 6 Aapieskraal
7298	AIA Phase 1	Udo Kusel	30/07/2008	Cultural Heritage Resources Impact Assessment for Portions 1, 4, 5, 6, 7, 18, 19, 27 and 28 of the Farm Maroeloefontein 366 KQ, Limpopo Province
7767	AIA Phase 1	Thomas Huffman	01/12/2004	Archaeological Assessment for the Rhino Andalusite Mine Second Report
7768	AIA Phase 1	Thomas Huffman	01/05/2007	Further Reconnaissance for the Rhino Andalusite Mine, Thabazimbi, Limpopo Province
534905	HIA Phase 1	McEdward Murimbika	05/02/2010	Phase 1 Archaeological and Heritage Impact Assessment Specialist Study Report for Proposed Installation of New Antennae and Associated Infrastructure at Farm Hartebeesthoek 502 JQ, Gauteng Province
530577	HIA Phase 1	Jaco van der Walt	16/10/2019	Heritage Impact Assessment for the proposed Northam Zondereinde Platinum Mine 3 Shaft, Thabazimbi Local Municipality
557639	HIA Phase 1	Anton van Vollenhoven	01/03/2013	A REPORT ON A CULTURAL HERITAGE IMPACT ASSESSMENT FOR THE PROPOSED PHOTOVOLTIC POWER PLANT AND EMP AMENDMENT FOR THE NORTHAM PLATINUM ZONDEREINDE MINE CLOSE TO NORTHAM, NORTHWEST PROVINCE

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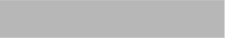

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APPENDIX 3 - Keys/Guides

Key/Guide to Acronyms

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

Full guide to Palaeosensitivity Map legend

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

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APPENDIX 4 - Methodology

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

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

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

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

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

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

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

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

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

DETERMINATION OF THE PALAEOONTOLOGICAL SENSITIVITY

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

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

DETERMINATION OF THE COVERAGE RATING ASCRIBED TO A REPORT POLYGON

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

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Low coverage will be used for:

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

Medium coverage will be used for

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

High coverage will be used for

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

RECOMMENDATION GUIDE

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

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

This recommendation is made when:

- enough work has been undertaken in the area
- it is the professional opinion of CTS that the area has already been assessed adequately from a heritage perspective for the type of development proposed

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

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

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

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- undertaking mitigation measures requested in previous assessments/records of decision.

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

Note:

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

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