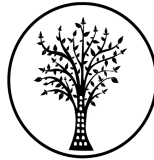


ARCHAEOLOGICAL SPECIALIST STUDY

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

Proposed development of the Quantum PV Facility and Grid Connection near Krugersdorp

Prepared by



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EXECUTIVE SUMMARY

South Africa Mainstream Renewable Power Developments (Pty) Ltd is proposing the construction and operation of a solar photovoltaic (PV) facility and associated infrastructure on Portion 285 (a portion of portion 19) of the Farm Vlakplaats 160, located approximately 7.2km west of Krugersdorp, within the Mogale City Local Municipality in the West Rand District Municipality in the Gauteng Province. The facility will have a contracted capacity of up to 10MW and will be known as Quantum 1 Solar Energy Facility.

Even though the broader area is rich in history, no significant archaeological heritage resources were identified during the field assessment. No Stone Age or Iron Age heritage resources of significance were identified during the survey. In addition, no structures of cultural value or graves were identified. As such, this development is not considered to be a sensitive archaeological landscape.

It is unlikely that the proposed development will impact significant archaeological heritage.

Recommendations

Based on the outcomes of this report, it is not anticipated that the proposed development of the solar energy facility will negatively impact on significant archaeological heritage on condition that:

- Although all possible care has been taken to identify sites of cultural importance during the investigation of the study area, it is always possible that hidden or subsurface sites could be overlooked during the assessment. If any evidence of archaeological sites or remains (e.g. remnants of stone-made structures, indigenous ceramics, bones, stone artefacts, ostrich eggshell fragments, charcoal and ash concentrations), fossils, burials or other categories of heritage resources are found during the proposed development, work must cease in the vicinity of the find and SAHRA must be alerted immediately to determine an appropriate way forward.



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1. INTRODUCTION

1.1 Background Information on Project

South Africa Mainstream Renewable Power Developments (Pty) Ltd is proposing the construction and operation of a solar photovoltaic (PV) facility and associated infrastructure on Portion 285 (a portion of portion 19) of the Farm Vlakplaats 160, located approximately 7.2km west of Krugersdorp, within the Mogale City Local Municipality in the West Rand District Municipality in the Gauteng Province. The facility will have a contracted capacity of up to 10MW and will be known as Quantum 1 Solar Energy Facility.

A preferred development area with an extent of ~94.1479ha has been identified by South Africa Mainstream Renewable Power Developments (Pty) Ltd as technically suitable for the development of the Quantum 1 Solar Energy Facility. The facility will comprise the following infrastructure:

- » Solar PV array comprising solar modules.
- » Mounting System Technology
- » Inverters and transformers.
- » Low voltage cabling between the PV modules to the inverters.
- » Overhead power lines
- » Onsite substation, switching substation and laydown areas.
- » Battery Energy Storage System (BESS) and associated infrastructure.
- » Internal access roads.
- » Fence around the project development areas.

Table 1: Details of typical infrastructure required for the 10MW Quantum 1 SEF.

Component	Description / Dimensions
District Municipality	West Rand District Municipality
Local Municipality	Mogale City Local Municipality
Ward Number (s)	Ward 30
Nearest town(s)	Krugersdorp (7.2km east)
Farm name(s) and number(s) of properties affected by the PV Facility, incl SG 21 Digit Code (s)	Portion 265 (a portion of portion 19) of the Farm Vlakplaats 160 (T0IQ0000000016000265)
Current zoning	Agriculture
Site Coordinates (centre of development area)	26° 4'8.17"S, 27°38'55.89"E
Total extent of the Affected Properties, also referred to as the project site ¹	~94.1479ha
Total extent of the Development area ²	~94.1479ha
Total extent of the Development footprint ³	To be confirmed following specialist input during the scoping phase
Contracted capacity of the PV facility	10MW
PV panels	Height: up to 5m from ground level (installed)
Power line capacity	11kV

¹ The project site is that identified area within which the development area and development footprint are located. The project site is ~93ha in extent and only consist of one affected property.

² The development area is that identified area where the 10MW PV facility is planned to be located. This area has been selected as a practicable option for the facility, considering technical preference and constraints. The development area is ~94.1479ha in extent.

³ The development footprint is the defined area (located within the development area) where the PV panel array and other associated infrastructure for the Quantum 1 Solar Energy Facility is planned to be constructed. This is the actual footprint of the facility, and the area which would be disturbed.



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Power line servitude width	Up to 18m
Grid connection	» To be evacuated from the onsite substation via 11kV Monopole or lattice structure pylons to the Eskom Tarlton 132/44/11kV substation located on the same land parcel as the proposed PV facility. This will form part of a separate EA process.
On-site Facility Substation, and O&M buildings	» Located within the development area. » Approximately 1.5ha in extent.
Battery Energy Storage System (BESS)	» The BESS area will form part of the 1.5ha allocated for other infrastructure.
Access roads and internal roads	» Existing roads will be used as far as possible. There are existing gravel roads that can be utilized for site access (width of up to 6m). Upgrading of existing roads or new roads may be required.

The Quantum 1 SEF is proposed in response to the identified objectives of the national and provincial government and local and district municipalities to develop renewable energy facilities for power generation purposes. It is the developer's intention to submit a bid in terms of a regulated power purchase procurement process (e.g., REIPPPP) with the aim of evacuating the generated power into the national grid or obtaining a commercial PPA (Power Purchase Agreement). This will aid in the diversification and stabilisation of the country's electricity supply, in line with the objectives of the Integrated Resource Plan (IRP) with the Quantum 1 SEF set to inject up to 10MW (peak AC power) into the national grid.

From a regional perspective, the area within the West Rand District Municipality identified for the project is considered favourable for the development of a commercial PV facility due to the low environmental sensitivity of the identified site, excellent solar resource, and availability of land on which the development can take place. There is also potential for evacuating the power to the national grid via a direct grid connection at the Eskom Tarlton 132/44/11kV substation which is adjacent to the proposed site. The site is also in proximity to large electricity users which opens opportunities for commercial PPAs (Behind the meter connection Or Wheeling to a 3rd party off-taker).



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1.2 Description of Property and Affected Environment

The Quantum PV project lies 10km west of Krugersdorp in Gauteng near the intersection of the N14 highway and the R24 Main road. The study site is surrounded by smallholdings in Tarlton to the north and northwest of, larger farms to the west and south west, and the Wolfelea settlement to the east over the other side of the N14 highway.

Much of the site has been developed over the years for semi-industrial activities. Quantum Foods has their offices towards the northern end of the site and a number of staff houses immediately adjacent. The Tarlton substation lies in the northeast side as well as a number of chicken broilers/egg laying buildings. A small stream flows through the southern end of the site near as stand of alien trees and bush on the fringe of the highway. Older ruins that have been completely levelled are visible using aerial satellite imagery along the western side and scattered bricks and broken concrete were observed in these areas during the survey.

Some gravel roads crisscross the property besides the current industrial farming activities, accommodation and ruined remnants of previous buildings related to Wolfelea.

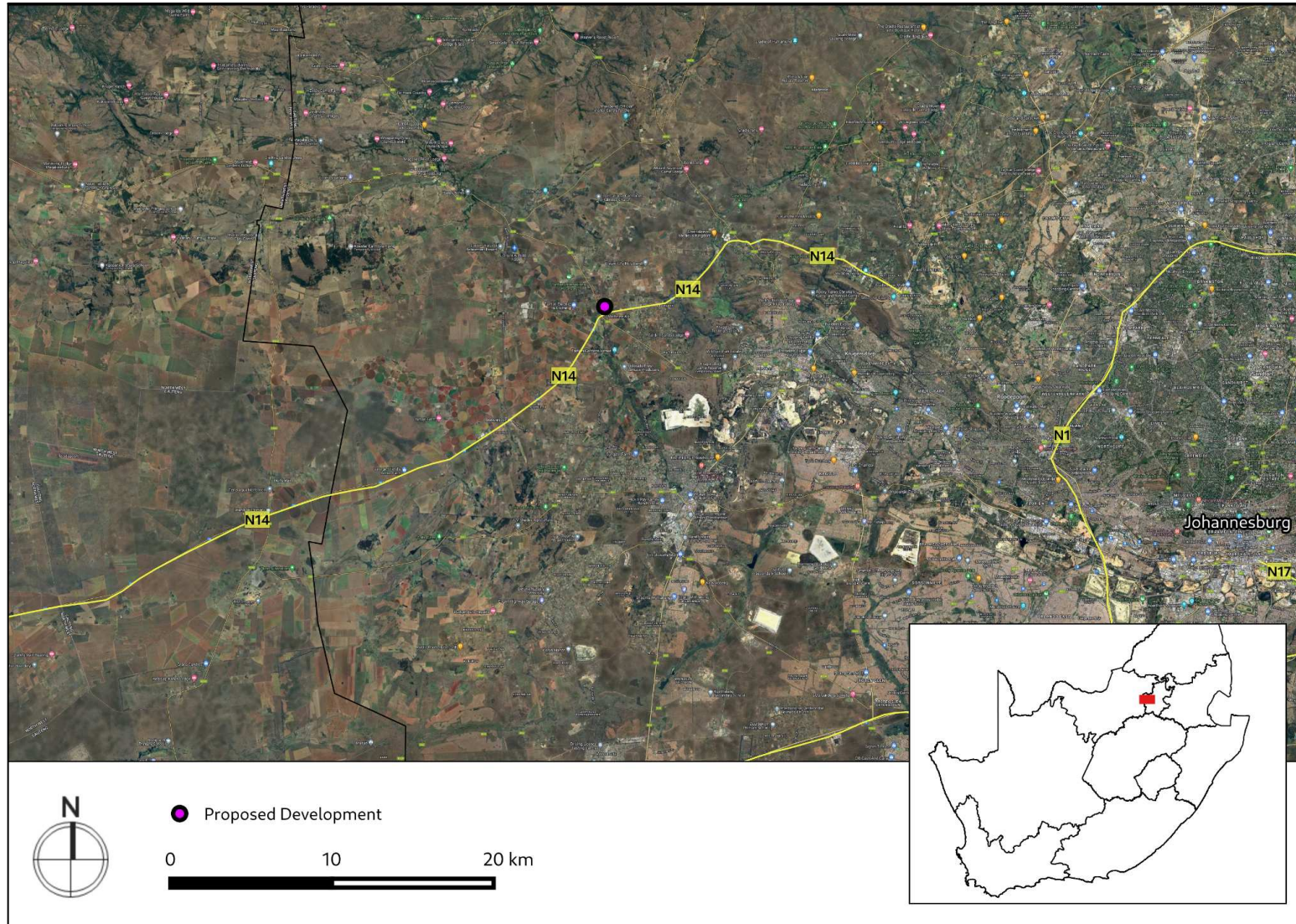
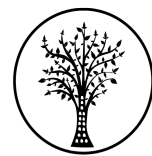


Figure 1.1: Satellite image indicating proposed location of development



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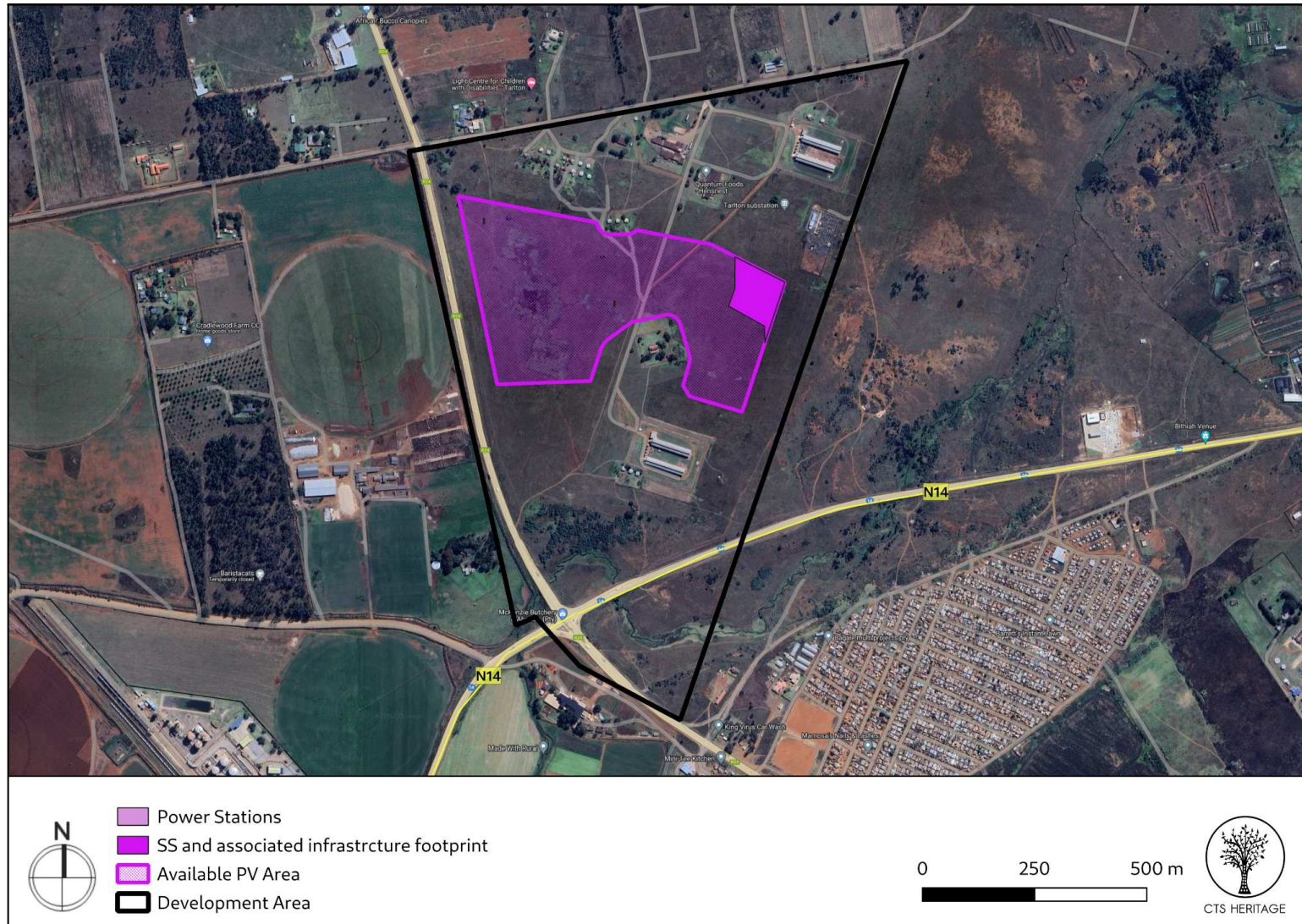


Figure 1.2: Project boundary with proposed layout

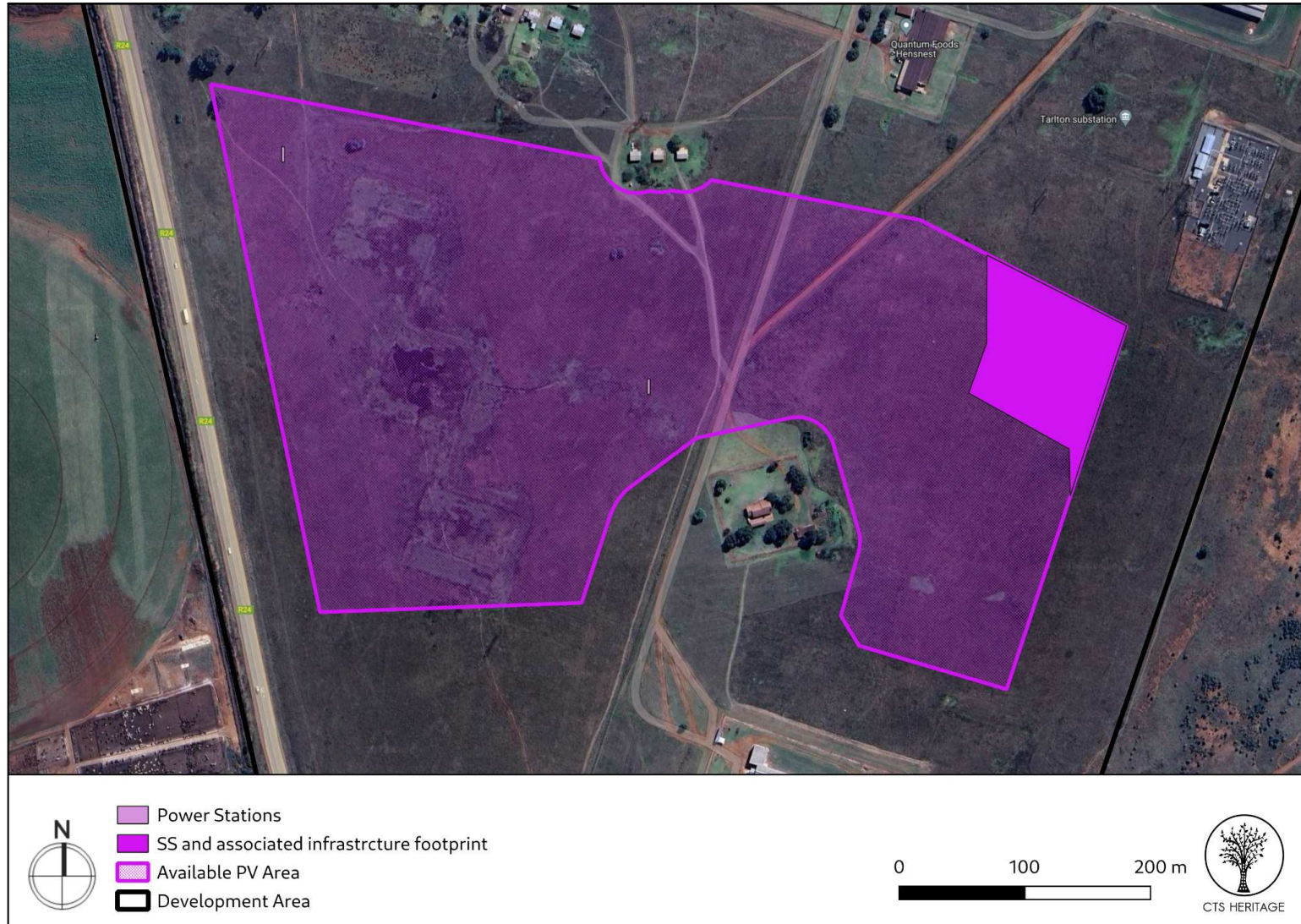
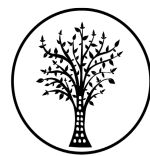


Figure 1.3: Project boundary with proposed layout



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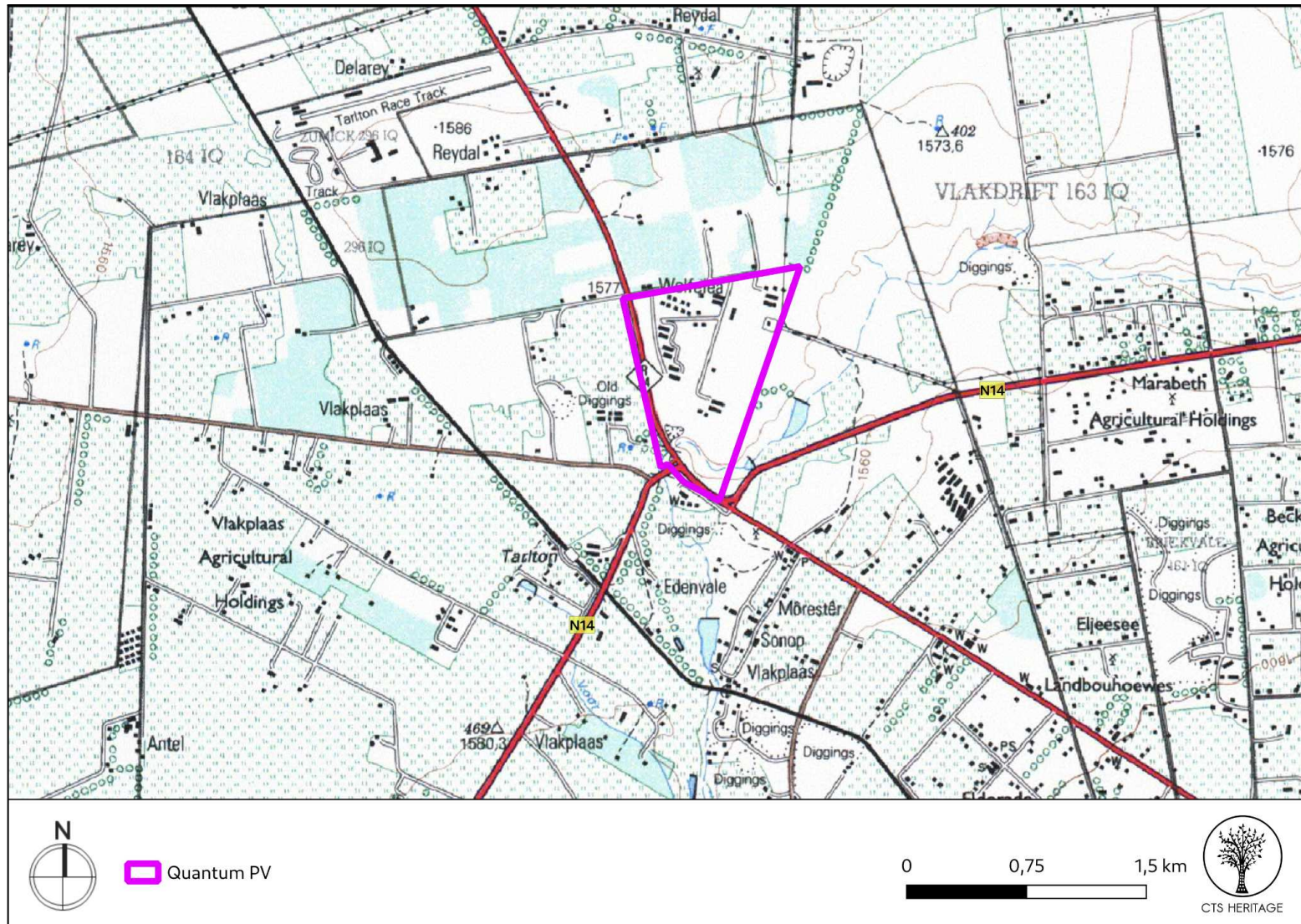


Figure 1.4: Project boundary on the 1:50 000 Topo Map



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2. METHODOLOGY

2.1 Purpose of Archaeological Study

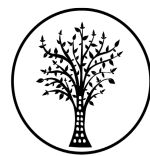
The purpose of this archaeological study is to satisfy the requirements of section 38(8), and therefore section 38(3) of the National Heritage Resources Act (Act 25 of 1999) in terms of impacts to archaeological resources.

2.2 Summary of steps followed

- An archaeologist conducted a survey of the site and its environs on 09 June 2023 to determine what archaeological resources are likely to be impacted by the proposed development.
- The area proposed for development was assessed on foot, 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.

2.3 Constraints & Limitations

There were no major constraints experienced during the survey. The property is very small compared to many of the PV developments surveyed by CTS and the access roads through the site provided easy points from which to walk the area proposed for the facility. The ground has been completely levelled for farming and building foundations in the past and is highly transformed as a result. Some higher stands of veld grass cover the eastern side but did not pose too many issues in terms of assessing the heritage impacts expected by this proposed development.



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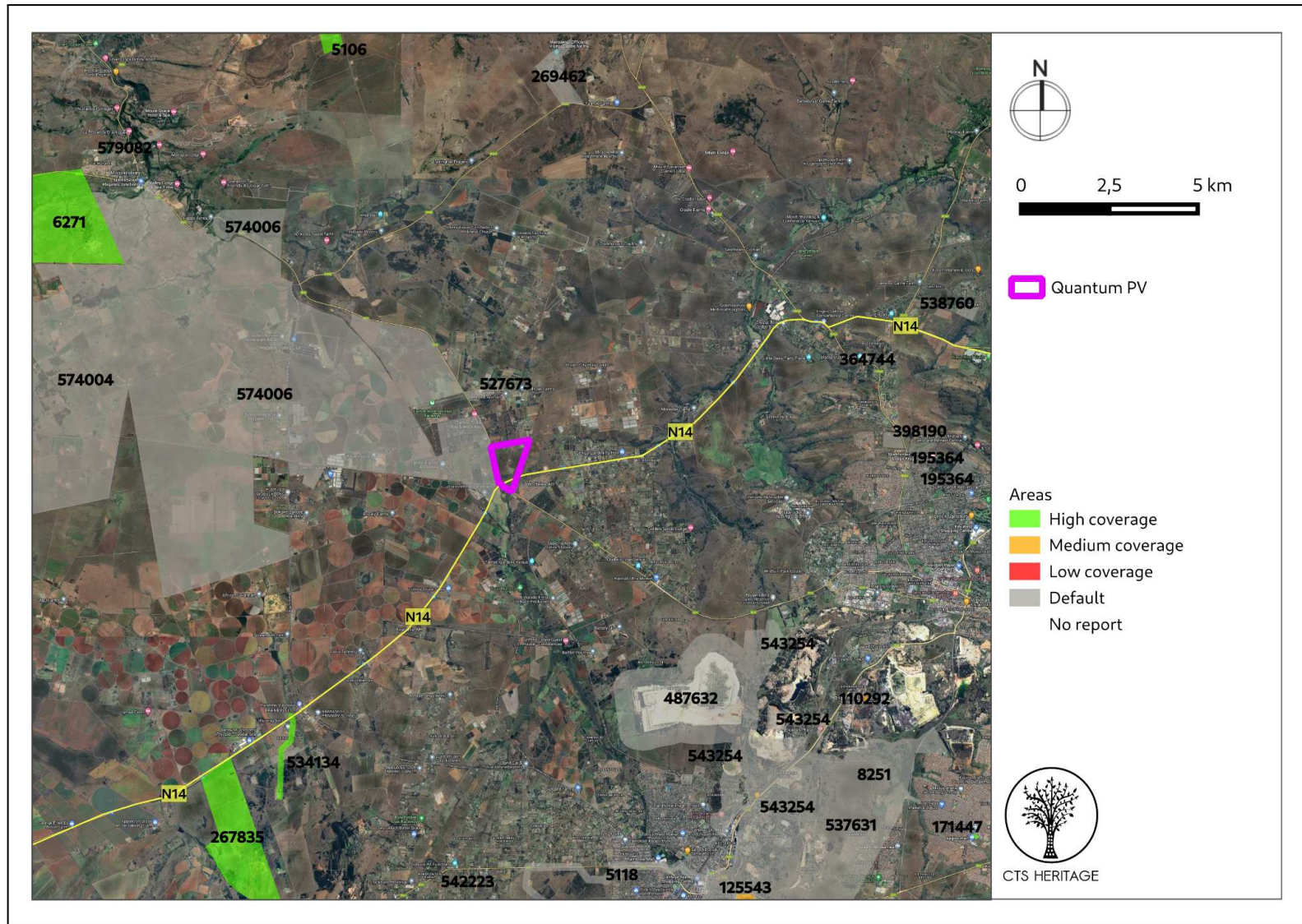


Figure 2: Close up satellite image indicating proposed location of development in relation to heritage studies previously conducted



3. HISTORY AND EVOLUTION OF THE SITE AND CONTEXT

The study area borders Magaliesburg to the south, while Krugersdorp is located 15 km to the east and Carletonville 32 km to the southwest. Krugersdorp was established on the farm Paardekraal in 1887 after the discovery of gold in the area. The discovery of gold and the mining boom had an impact on the establishment of all the towns in the area and on the evolution and development of South Africa more generally. Krugersdorp also played a significant role in the Transvaal War of Independence and the Second Boer War, during which the British established a concentration camp on the then outskirts of the city. The exact location of the site of the concentration camp is unknown however it is expected that the camp was located at the site of the present Coronation Park, located far from the area proposed for development here.

The area proposed for development is located approximately 32km northeast of Carltonville within the Merafong Municipality. Carltonville was developed by various mining companies from 1937 onwards, but was not officially incorporated until 1959, and was subsequently recognised as a provincial town in 1967. Surrounding Carltonville are a number of privately owned gold-mining township villages and contractor labour quarters established by the mining companies on land owned by the mines. The area surrounding Carltonville is dominated by a cultural landscape that is shaped and defined by the historic and on-going mining activities associated with the Witwatersrand. A detailed archaeological background of the area is provided by Du Pisanie and Nel (2012, SAHRIS NID 104305) and is therefore not repeated here. It is sufficient to note that no significant Early, Middle or Later Stone Age sites are known from this broader area, however sites representing the Iron Age occupation of the region are present in the broader context.

Archaeology and the Cultural Landscape

Tobais (2021) notes that “the general region is significant from a heritage perspective. Heritage sites are likely to include cemeteries/graves, Stone Age Sites, Iron Age and historical sites. Since gold mining can be dated to at least 1874 on the Farm Blaauwbank that is located directly north of the study area, it can be assumed that similar mining activities took place in the general area during the same time. Remnants of the South African War of 1899 – 1902 are also likely to be encountered within the study area.”

Birkholtz and Groenewald (2016, SAHRIS NID 369805) describe the broader areas as “generally undulating with a number of extensive pans located within this area... While the overall study area is mostly utilised for agricultural activities, the proposed development bulk sample area that was assessed in the field is characterised by agricultural fields (maize), a large number of small livestock camps associated with stud farming (cattle) as well as Eskom power lines.” The N14 is an historic scenic route that runs between Ventersdorp and Pretoria and is likely based on the original wagon route used for this journey. This route is located immediately adjacent to the proposed development area. In general, for the development of PV infrastructure and its associated grid connection infrastructure, it is preferred for such development to be clustered with existing development, such as mining or residential development, in order to reduce the perception of urban and infrastructure sprawl across an otherwise agricultural landscape and a no-development buffer of 500m for PV infrastructure is recommended along significant access routes such as the N14. However, in this instance, due to the already transformed nature of the broader area, a 250m buffer is appropriate



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(Figure 6).

Birkholtz and Groenewald (2016) go on to note that examples of published excavated archaeological sites from the general surroundings of the study area include the Later Stone Age and Iron Age sites located along the Magaliesberg Mountains and sites of international palaeoanthropological significance such as Sterkfontein and Kromdraai, both located within the Cradle of Humankind World Heritage Site. The area proposed for the PV development is located within the buffer area of the COHWHS (Figure 5). The COHWHS site is managed by a Management Authority on behalf of the State Party represented by the South African Minister of Environmental Affairs. The Management Authority is responsible for day to day management and falls under the MEC for Economic Development in Gauteng Province. To achieve long term sustainability and effectiveness, a Master Plan was developed in 2000 and has since then guided all conservation, development and research work at the site. According to the COHWHS Management Plan (2014-2017), the primary aim of the Management Authority is to protect and preserve the site, promote further scientific research, encourage community participation and stimulate tourism development that will benefit local communities and ultimately contribute to Local Economic Development (LED). Specific engagement with the MA for the COHWHS should take place regarding development within the identified WHS buffer.

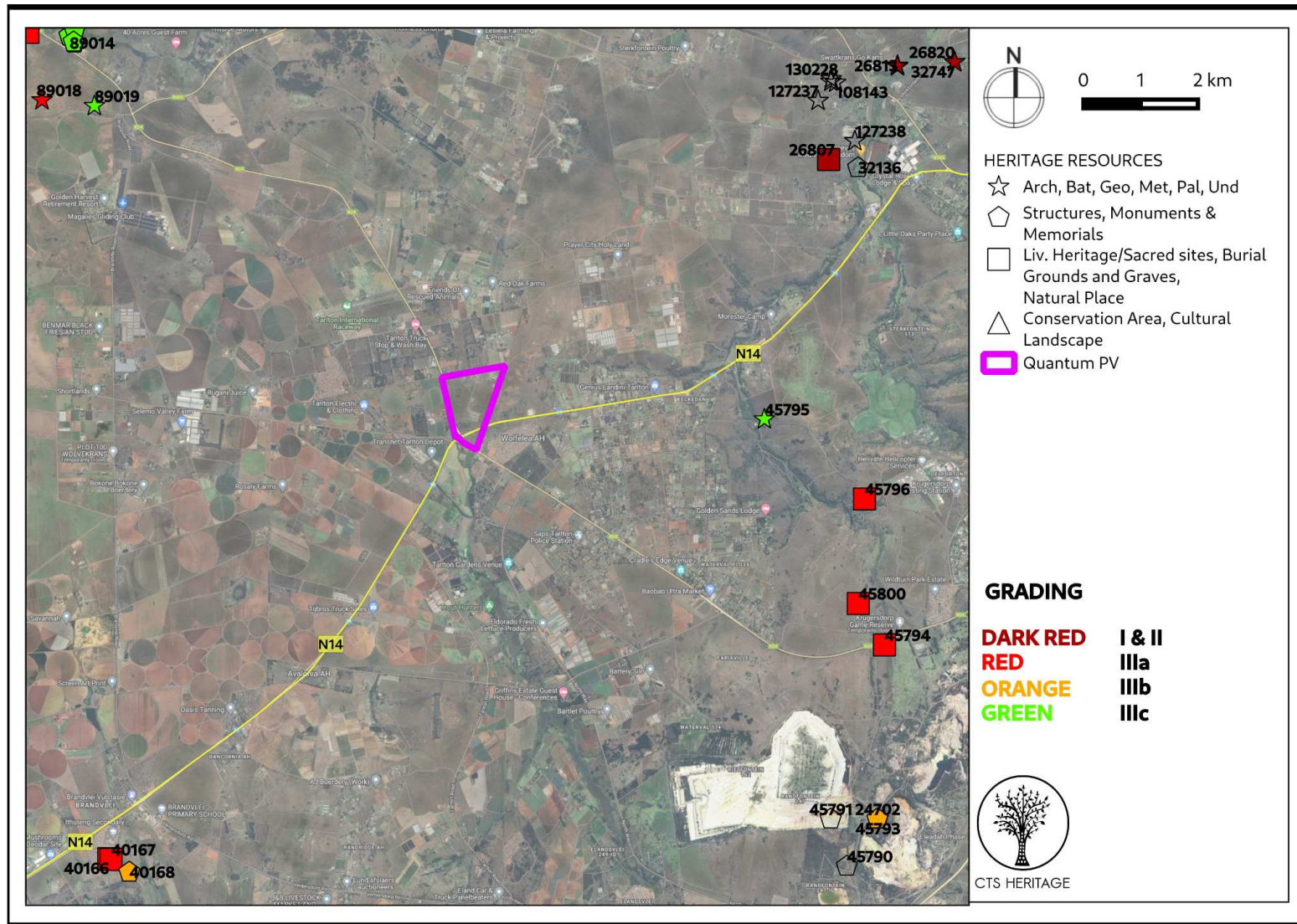
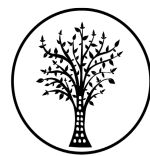


Figure 3.1 Heritage Resources Map. Heritage Resources previously identified in and near the study area, with SAHRIS Site IDs indicated



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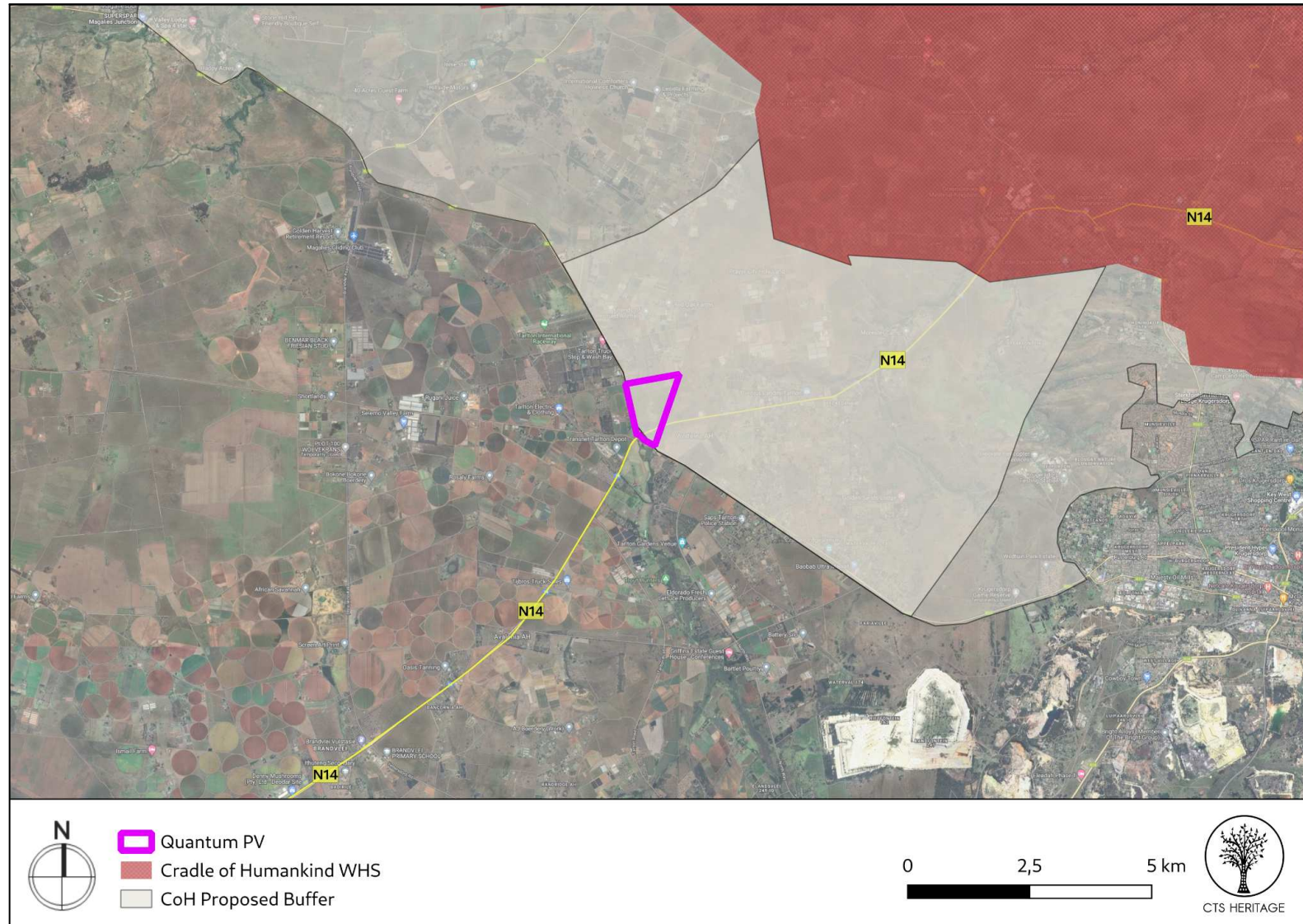


Figure 3.2. Heritage Resources Map. Proximity of the development to the COH WHS



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4. IDENTIFICATION OF HERITAGE RESOURCES

4.1 Field Assessment

As can be seen from the photo deck, the area is completely transformed and lies very much within a smallholding/semi-industrial pocket of ground on the outskirts of Krugersdorp. The existing large scale food production facilities owned and run by Quantum foods will be immediately alongside the new PV facility. Foundations of buildings along the western side have been completely levelled and demolished and likely dated to the mid 20th century when more intensive commercial activities were established on this property. The buildings that are still intact are not conservation-worthy and the foundations have therefore been given a similar assessment (NCW).

A few quartz flakes were found near the stream in the southern portion as well as some isolated flakes in the middle of the property - these lie in highly disturbed areas. The site is otherwise sterile of any heritage resources.



Figure 4.1: View of the grounds in front of the residence in the middle of the site looking to the south.



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Figure 4.2: View of a patch of higher grass between the substation and the residence.



Figure 4.3: View of the large overhead powerlines running through the site onto and onwards from Tarlton substation.



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Figure 4.4: View of Tarlton substation



Figure 4.5: View of the burnt veld near the ruined foundations of earlier factory buildings.



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Figure 4.6: View of Tarlton substation and the Quantum factories to the left.



Figure 4.7: View of the residential home in the middle of the site flanked by the broilers/egg-laying buildings.



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Figure 4.8: View of some of the staff buildings and chicken factory production facilities in the southern end.



Figure 4.9: View of a mining dump in the distance beyond Wolfelea.



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Figure 4.10: View along the northern side of the study site.



Figure 4.11: View of staff accommodation in the northern section.

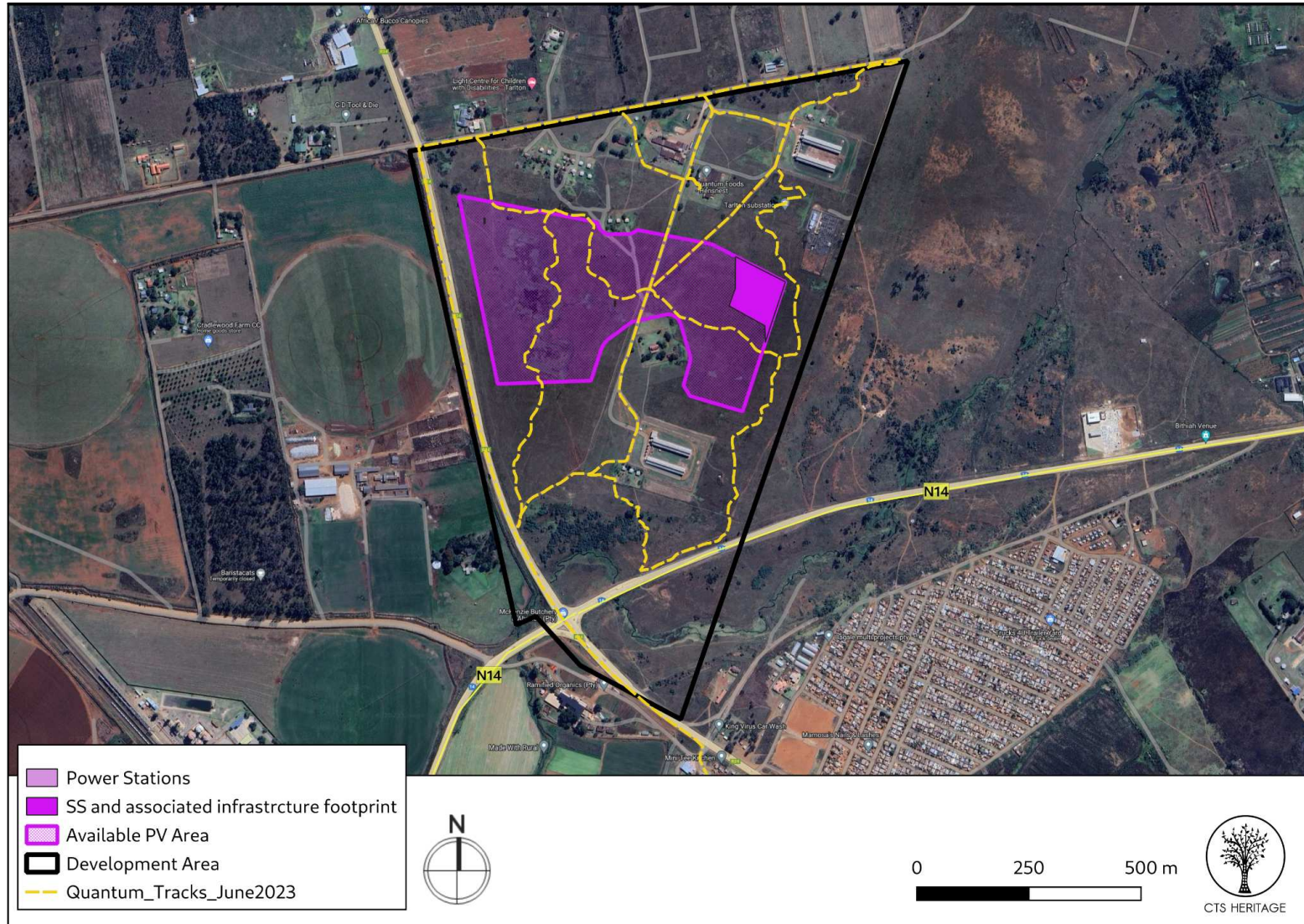


Figure 5.1: Overall track paths of foot survey for the proposed development

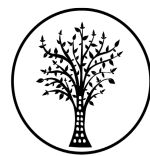


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4.2 Archaeological Resources identified

Table 2: Observations noted during the field assessment

Obs#	Description	Type	Period	Density	Latitude	Longitude	Grade	Mitigation
001	Wolfelea staff accommodation, modern	Structure	Modern	n/a	-26.067507	27.648648	NCW	NA
001	Wolfelea staff accommodation, modern	Structure	Modern	n/a	-26.066482	27.647328	NCW	NA
002	Quantum Foods offices, latter 20th century buildings	Structure	Modern	n/a	-26.06626	27.649631	NCW	NA
003	Another Wolfelea residence, larger, modern	Structure	Modern	n/a	-26.070183	27.649346	NCW	NA
004	Tarltan substation	Structure	Modern	n/a	-26.067588	27.652862	NCW	NA
005	Feed lots	Structure	Modern	n/a	-26.066379	27.652951	NCW	NA
006	In burnt area on western side, underground water works/sewerage infrastructure, ground appears to have been cultivated before as it is entirely levelled. Some bricks also seen, appears that some structures have been demolished and cleared.	Ruin	Modern, Historic	n/a	-26.06865	27.646965	NCW	NA
007	Quartz flakes in little rocky patch	Artefacts	LSA	0 to 5	-26.068612	27.647881	NCW	NA
008	Feed lots	Structure	Modern	n/a	-26.072168	27.649598	NCW	NA
009	Some more quartz material, some flaked	Artefacts	LSA	0 to 5	-26.073811	27.649164	NCW	NA



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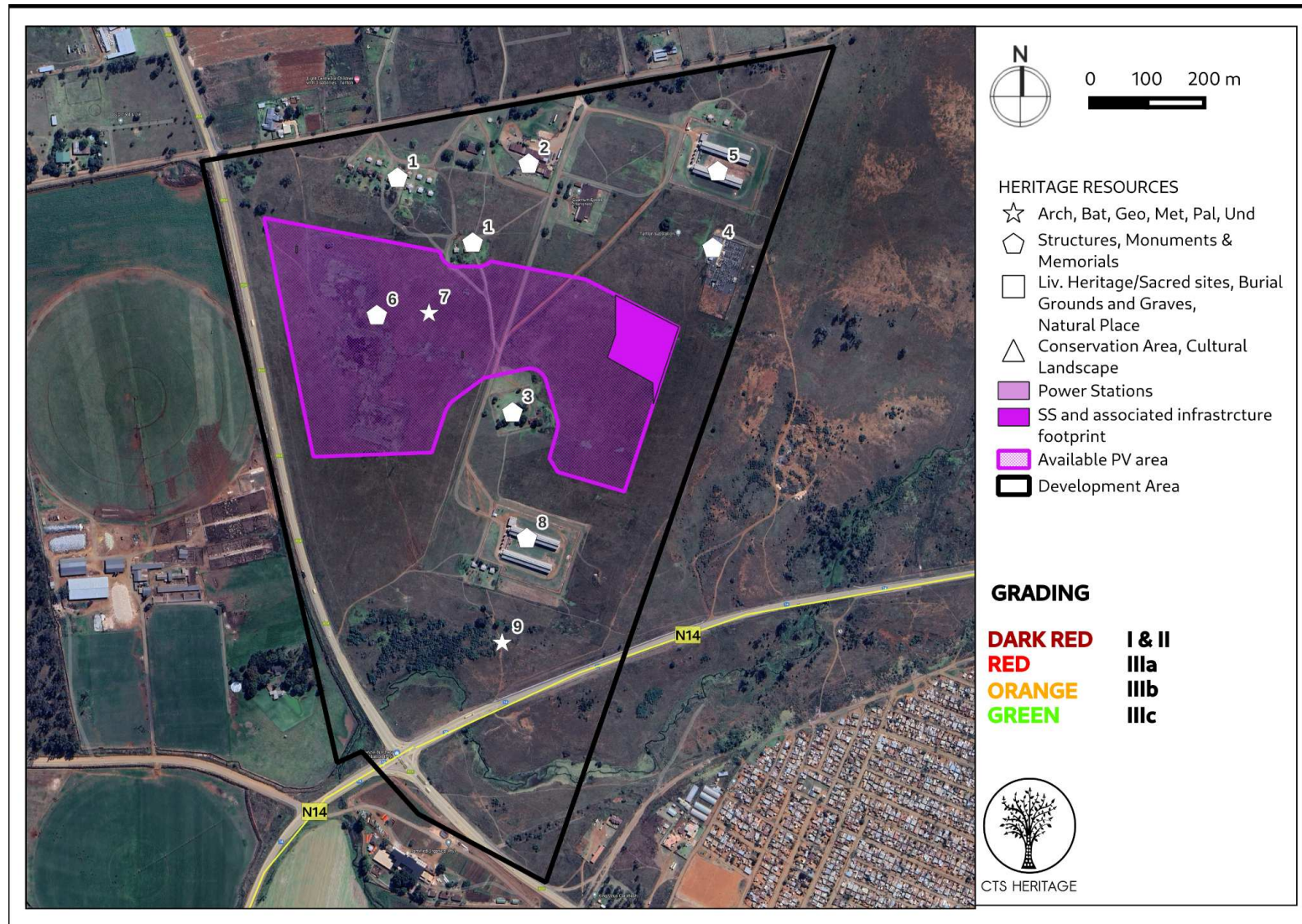


Figure 6: Map of all sites and observations noted within the development area



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4.3 Selected photographic record

(a full photographic record is available upon request)



Figure 6.1: Observation 001 - Staff Accommodation



Figure 6.2: Observation 002 - Quantum Offices



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Figure 6.3: Observation 003 - Wolfelea Residence



Figure 6.4: Observation 004 - Tarlton Substation



Figure 6.5: Observation 005 - Feedlots



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Figure 6.6: Observation 006 - Demolished Infrastructure in burnt area



Figure 6.7: Observation 007 - Quartz Flakes



Figure 6.8: Observation 008 - Feedlots



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Figure 6.9: Observation 009 - Quartz material and flakes



Figure 6.10: Observation 009 - Quartz material and flakes



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5. ASSESSMENT OF THE IMPACT OF THE DEVELOPMENT

5.1 Assessment of impact to Archaeological Resources

No significant archaeological heritage resources were identified within the area proposed for development. This is likely a result of the extensive and intensive agricultural activities that have taken place here in the past. As a result, the development area is not considered to be a sensitive archaeological landscape.

Two examples of quartz flakes were identified during the assessment, these are isolated artefacts with no stratigraphic association. As such, these artefacts have limited scientific value and their recording herein is considered sufficient. These artefacts are determined to be not conservation-worthy. It is likely that these artefacts were visible due to the recent burning in the vicinity and as such, similar artefacts may be present within the development area where burning has not recently occurred. However, it is very likely that any artefacts that are present will also be of limited scientific value and will be considered to be not conservation-worthy.

6. CONCLUSION AND RECOMMENDATIONS

Even though the broader area is rich in history, no significant archaeological heritage resources were identified during the field assessment. No Stone Age or Iron Age heritage resources of significance were identified during the survey. In addition, no structures of cultural value or graves were identified. As such, this development is not considered to be a sensitive archaeological landscape.

It is unlikely that the proposed development will impact significant archaeological heritage.

Recommendations

Based on the outcomes of this report, it is not anticipated that the proposed development of the solar energy facility will negatively impact on significant archaeological heritage on condition that:

- Although all possible care has been taken to identify sites of cultural importance during the investigation of the study area, it is always possible that hidden or subsurface sites could be overlooked during the assessment. If any evidence of archaeological sites or remains (e.g. remnants of stone-made structures, indigenous ceramics, bones, stone artefacts, ostrich eggshell fragments, charcoal and ash concentrations), fossils, burials or other categories of heritage resources are found during the proposed development, work must cease in the vicinity of the find and SAHRA must be alerted immediately to determine an appropriate way forward.



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7. REFERENCES

Heritage Impact Assessments				
Nid	Report Type	Author/s	Date	Title
5106	AIA Phase 1	Johnny Van Schalkwyk	01/11/2003	Heritage Impact Assessment for the Waterval West 510 JQ Development, Krugersdorp District, Gauteng Province
5114	AIA Phase 1	Anton van Vollenhoven, Anton Pelser	01/09/2007	A Report on a Cultural Heritage Impact Assessment on Erf 85, Chamdor, Krugersdorp for the William Tell Particle Boards and Medium Density Manufacturing Plant
5118	AIA Phase 1	Johnny Van Schalkwyk	01/02/2008	Heritage Survey Report for the Development of Water Pipelines for the Droogeheuvel and Middelvlei Townships, Randfontein, Gauteng Province
6271	AIA Phase 1	Wouter Fourie, M Ramsden	01/08/2002	Blaauwbank Historic Gold Mine, Magaliesberg: Cultural Heritage Scoping
6340	AIA Phase 1	Wouter Fourie, Jaco van der Walt	08/12/2005	Portion of the Proposed Pipeline from Brandvlei to Krugersdorp on the Farm Brandvlei 261 IQ, District Mogale City, Gauteng Province
6402	AIA Phase 1	Wouter Fourie	03/09/2007	Archaeological Impact Assessment: Proposed Township - Chancliff Ridge Extension 34, Mogale City
7795	AIA Phase 1	Johnny Van Schalkwyk, Frank Teichert	04/06/2007	Heritage Impact Assessment for the Planned Rietvallei 180 IQ Development, Krugersdorp Municipal District, Gauteng Province
8056	AIA Phase 1	Polke Birkholtz	23/06/2008	Heritage Scoping: Proposed Second Dwelling, Thorny Valley Estate 240 (Portion 240 a Portion of 264) of the Farm Honingklip 178 IQ, Mogale City, Gauteng Province
8251	AIA Phase 1	Johnny Van Schalkwyk	01/11/2007	Heritage Survey Report for the Proposed West Village Outfall Sewer, Mogale City Local Municipality, Gauteng
110292	AIA Phase 1		13/02/2013	Ntshona Heritage Reports
195364	HIA Phase 1	Wouter Fourie	26/01/2015	THE RAND EN DAL EXT13 PROPOSED DEVELOPMENT ON PORTION 29 OF THE FARM PAARDEPLAATS 177 IQ, KRUGERSDORP, MOGALE CITY DISTRICT, GAUTENG PROVINCE
195364	HIA Phase 1	Wouter Fourie	26/01/2015	THE RAND EN DAL EXT13 PROPOSED DEVELOPMENT ON PORTION 29 OF THE FARM PAARDEPLAATS 177 IQ, KRUGERSDORP, MOGALE CITY DISTRICT, GAUTENG PROVINCE
269462	Heritage Impact Assessment Specialist Reports	Dominic Stratford	20/11/2014	Basic Heritage Impact Assessment for the proposed upgrades to the Maropeng Interpretive Centre
364744	AIA Phase 1	Jaco van der	17/05/2016	ARCHAEOLOGICAL IMPACT ASSESSMENT FOR THE PROPOSED PROTEA



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		Walt		RIDGE DEVELOPMENT, GAUTENG PROVINCE
375227	AIA Phase 1	Jaco van der Walt	04/10/2016	ARCHAEOLOGICAL IMPACT ASSESSMENT For the Proteadal Mixed Use Township, Proteadal Extension 1, Portion 216 (a Portion of Portion 214) , Paardeplaats 177 IQ, Gauteng Province
375715	HIA Phase 2	Jaco van der Walt, Sidney Miller	04/10/2016	2nd Phase documentation report of the Farmyard On Portion 216 Of Paardekraal 177 IQ, Proteadal Extension 1. Mogale City/Krugersdorp, Gauteng Province.