



## PHASE 1 AIA FIELD REPORT

PROPOSED DEVELOPMENT OF A SOLAR PHOTOVOLTAIC (PV) ENERGY FACILITY AND ASSOCIATED INFRASTRUCTURE WITH A GENERATION CAPACITY OF UP TO 10MW, LOCATED NEAR SASOLBURG, IN THE METSIMAHOLO LOCAL MUNICIPALITY, FEZILE DABI DISTRICT MUNICIPALITY FREE STATE PROVINCE.

**PREPARED FOR:**  
CTS HERITAGE

**PREPARED BY:**  
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16 FEBRUARY 2022

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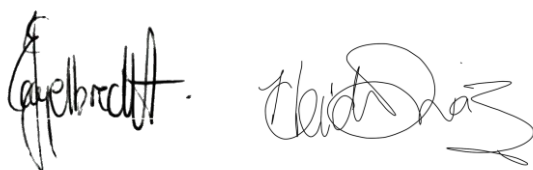
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**Declaration of independence:**

UBIQUE Heritage Consultants hereby confirm our independence as heritage specialists and declare that:

- we are suitably qualified and accredited to act as independent specialists in this application;
- we do not have any vested interests (either business, financial, personal or other) in the proposed development project other than remuneration for the heritage assessment and heritage management services performed;
- the work was conducted in an objective and ethical manner, in accordance with a professional code of conduct and within the framework of South African heritage legislation.



Signed:

J.A.C. Engelbrecht, H. Fivaz

UBIQUE Heritage Consultants

Date: 2022-02-16

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## SUMMARY OF SPECIALIST EXPERTISE

### HEIDI FIVAZ

#### CRM ARCHAEOLOGIST & OBJECT CONSERVATOR

Heidi Fivaz has been a part of UBIQUE Heritage Consultants since 2016 and took over ownership in 2018. She is responsible for project management, surveys, research and report compilation. She holds a B.Tech. Fine Arts degree (2000) from Tshwane University of Technology, a BA Culture and Arts Historical Studies degree (2012) from UNISA and received her BA (Hons) Archaeology in 2015 (UNISA). She has received extensive training in object conservation from the South African Institute of Object Conservation and specialises in glass and ceramics conservation. She is also a skilled artefact and archaeological illustrator. Ms Fivaz was awarded her MA in Archaeology (with distinction) in 2021 by the University of South Africa (UNISA), focusing on historical and industrial archaeology. She is a professional member of the Association of South African Archaeologists with CRM accreditation and has worked on numerous archaeological excavation and surveying projects over the past ten years.

### SKY-LEE FAIRHURST

#### ARCHAEOLOGIST

Sky-Lee Fairhurst has been informally part of UBIQUE Heritage Consultants since 2019. She is responsible for research and desktop studies. Miss Fairhurst obtained her BA in Archaeology and Biblical archaeology in 2016 and her BA Hons in Archaeology (*cum laude*) at the University of South Africa (UNISA) in 2018, focussing on research themes such as gender, households and Late Iron Age settlements. She is currently pursuing her interest in southern African agropastoral societies as an MA Archaeology student at the University of South Africa (UNISA). She is skilled at artefacts and archaeological illustrations. Over the past nine years, she has obtained considerable excavation experience and has worked on various sites, including Historical, Iron Age sites and Palaeontological.

## EXECUTIVE SUMMARY

### Project description

CTS Heritage appointed UBIQUE Heritage Consultants as independent heritage specialists per Section 38 of the NHRA and the National Environmental Management Act 107 of 1998 (NEMA) to conduct a field survey on their behalf. UBIQUE surveyed the development footprint to determine the impact of the proposed development of a Solar Photovoltaic (Pv) energy facility and associated infrastructure on any sites, features, or objects of cultural heritage significance. The project is located near Sasolburg, in the Metsimaholo Local Municipality, Fezile Dabi District Municipality Free State Province,

### Findings and Impact on Heritage Resources

No heritage resources were identified during the survey. The proposed development footprint has been disturbed by various mining and agricultural activities. Sigma Pv Site 1 is predominantly waterlogged towards the middle of the area, with scattered heaps of building rubble. Sigma Pv Site 2 has been cultivated in the past. Both Sigma Pv Sites 1 and 2 have impassable areas due to the recent heavy rains, and the vegetation is very dense, obscuring the visibility of surface areas. These conditions may have concealed heritage resources, though we are confident that the anthropogenic disturbances in the area would have disturbed any in-situ heritage resources if present. Therefore, we do not foresee any impact on heritage resources, and from an archaeological viewpoint, the development can continue.

### Recommendations

Based on the assessment of the potential impact of the development on the identified heritage, the following recommendations are made, taking into consideration any existing or potential sustainable social and economic benefits:

1. No significant heritage sites or features were identified within the surveyed sections of the areas earmarked for agricultural developments. Therefore the proposed development can continue.
2. Although all possible care has been taken to identify sites of cultural importance during the investigation of study areas, it is always possible that hidden or sub-surface sites could be overlooked during the assessment, especially considering the environmental conditions encountered during the survey. Therefore, we recommend that a Protocol of Finds accompany the Heritage Impact Assessment to assist the ECO in managing any archaeological resources uncovered during development.

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# 1. INTRODUCTION

## 1.1 Scope of study

The project involves the proposed development of a 10MW ac Solar Photovoltaic (PV) Energy Facility and associated infrastructure on Portion 1 of the Farm Saltberry Plain 137 and the Remaining Extent of the Farm Zamdela 449, and Portion 7 of Roseberry Plain No. 250 located near Sasolburg in the Metsimaholo Local Municipality, which forms part of the Fezile Dabi District Municipality in the Free State Province. UBIQUE Heritage Consultants were appointed by CTS Heritage as independent heritage specialists per the National Environmental Management Act 107 of 1998 (NEMA), and in compliance with Section 38 of the National Heritage Resources Act 25 of 1999 (NHRA), to conduct a cultural heritage assessment field survey (AIA/HIA) of the development area.

Becrux Solar PV Project One (Pty) Ltd's project purpose will be to generate electricity for exclusive use by Sasol Limited. A 33kV overhead power line will be established to connect the proposed 33kV onsite MV substation to the existing Sigma Substation to facilitate the evacuation of the generated power to Sasol Limited. Two alternative sites (i.e., Site Alternative 1 and Site Alternative 2) have been identified to place the solar facility infrastructure. For each site, grid connection corridors have been identified for the assessment and suitable placement of the grid connection infrastructure within the corridor. For Site Alternative 1, the grid connection corridor will be up to 200m wide, extending to ~400m around the footprint of the Sigma substation, and up to 500m long. For Site Alternative 2, the grid connection corridor will be up to 70m wide, extending up to ~400m around the footprint of the existing Sigma Substation, and up to 2.1km long.

The field assessment aimed to identify and report heritage resources within the development footprint. Furthermore, it aims to determine the impact of the proposed development on any sites, features, or objects of cultural heritage significance; to assess the significance of any identified resources; and to assist the developer in managing the documented heritage resources in an accountable manner, within the framework provided by the National Heritage Resources Act (Act 25 of 1999) (NHRA).

South Africa's heritage resources are rich and widely diverse, encompassing sites from all periods of human history. Resources may be tangible, such as buildings and archaeological artefacts, or intangible, such as landscapes and living heritage. Their significance is based on their aesthetic, architectural, historical, scientific, social, spiritual, linguistic, economic or technological values; their representation of a time or group; their rarity; and sphere of influence.

Natural (e.g. erosion) and human (e.g. development) activities can jeopardise the integrity and significance of heritage resources. In the case of human activities, a range of legislation exists to ensure the timely and accurate identification and effective management of heritage resources for present and future generations.

## 1.2 Assumptions and limitations

It is assumed that the client's description of the proposed project is accurate as provided by the client. Furthermore, it is assumed that the public consultation process undertaken as part of the Environmental Impact Assessment (EIA) is comprehensive and does not have to be repeated as part of the heritage impact assessment.

All possible care has been taken during the comprehensive field survey to identify sites of cultural importance within the development areas. However, it is essential to note that some heritage sites may have been missed due to their subterranean nature or dense vegetation cover. No subsurface investigation (i.e. excavations or sampling) was undertaken since a SAHRA permit is required for such activities. Therefore, should any heritage features and/or objects such as architectural features, stone tool scatters, artefacts, human remains, or fossils be uncovered or observed during construction, operations must be stopped, and a qualified archaeologist contacted for an assessment of the find. Observed or located heritage features and/or objects may not be disturbed or removed in any way until such time that the heritage specialist has been able to assess the significance of the site (or material) in question.





## 2. FIELD ASSESSMENT

### 2.1 Methodology

#### 2.1.1 Systematic survey

A systematic survey of the proposed project area to locate, identify, record, photograph, and describe archaeological, historical or cultural interest sites were completed.

UBIQUE Heritage Consultants inspected the proposed development corridors and surrounding areas on the 11<sup>th</sup> of February, 2022. The areas surveyed for the impact assessment were dictated by the Google Earth maps of the development footprints provided by the client and the Heritage Screener compiled by CTS Heritage. Sigma Pv Alternative Site 1 was surveyed by a two-person team from the east to the north and southeast to the southwest. In addition, the connection corridor of Alternative 1 was surveyed to where it continued into the Sigma substation. The connection corridor to Sigma Pv Alternative Site 2 was followed from the Sigma substation in the east until the way became blocked by deep pools of stagnant water from recent rains. The rest of the connection corridor was approached from the west, from the Sigma Pv Alternative Site 2 boundary. Alternative 2 was surveyed from the northern, eastern and western site boundaries. The site was extremely overgrown with tall and dense grasses and cosmos plants.

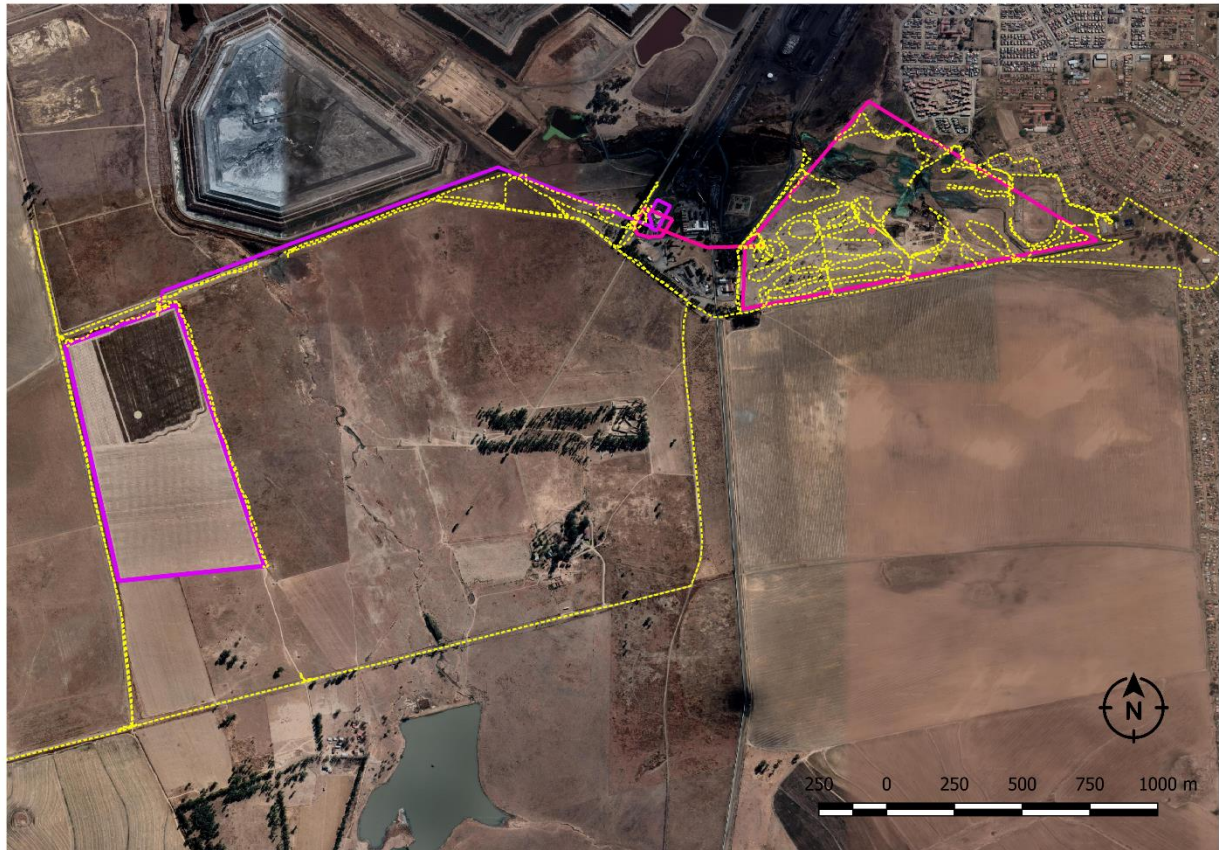
We inspected the ground's surface, wherever the surface was visible. The archaeological survey was done with no substantial attempt to clear brush, sand, deadfall, leaves or other material that may cover the surface and with no attempt to look beneath the surface beyond the inspection of rodent burrows, cut banks and other exposures fortuitously observed.

#### 2.1.2 Recording significant areas

GPS points of significant areas were recorded with handheld Garmin global positioning units (Garmin eTrex 10) and the Android Locus Maps application on a Samsung smartphone. Photographs were taken with a Panasonic Lumix digital camera. Detailed field notes were taken to describe observations (Appendix B).

#### 2.1.3 Determining significance

Levels of the significance of the various types of heritage resources observed and recorded in the project area have been determined according to criteria set out in Appendix A.



**Figure 1** Recorded tracks of the survey along the proposed development footprint

## 2.2 Description of the affected environment

### 2.2.1 Sigma Pv Site Alternative 1 with connection corridor

The landscape of the study area is Central Free State Grassland, which is a broad vegetation zone from Sasolburg in the north to Dewetsdorp in the south. Other significant settlements within this unit include Kroonstad, Ventersburg, Steynsrus, Winburg, Lindley and Edenville. The Central Free State Grassland features undulating plains supporting short grassland, which in its natural condition is dominated by red grass (red oat grass) while weeping lovegrass and blue lovegrass become dominant in degraded habitats (Mucina & Rutherford 2006, SANBI 2022).

The site footprint is predominantly grassland with rushes and reeds towards the middle and west, along the waterline. Due to the recent rainfall, the area was very muddy, with dark, clayey soil and, in some areas, deep pools of stagnant water. There are mounds of rubble, with tar and concrete blocks and bricks and tiles in the northern parts of the terrain. To the southeast is a dilapidated sports stadium, still in use, even though the infrastructure has been broken down and used as an informal shelter. In the south, a small-scale subsistence farm is situated. Towards the southwest of the footprint is a series of modern cement foundations with building rubble. Historical imagery



on Google Earth shows that the structures in this area were demolished in 2017. The whole area is further utilised for grazing, as cows, goats, and pigs were encountered. The connection corridor runs through highly disturbed industrial Sasol grounds.



**Figure 2.** Views of Alternative Site 1 from the north.



**Figure 3.** Views of Alternative Site 1 from the east.





**Figure 4.** Views of Alternative Site 1 from the south.



**Figure 5.** Views of Alternative Site 1 connection corridor towards the west.



### 2.2.2 Sigma Pv Site Alternative 2 with connection corridor

The Site Alternative 2 landscape is predominantly Central Free State Grassland bordering Soweto Highveld Grassland in the west. Soweto Highveld Grassland is characterised by short to medium-high, dense, tufted grassland. It is dominated almost entirely by red grass and accompanied by various other grasses such as wiregrass, narrow heart lovegrass, spear grass, and hairy trident grass (Mucina & Rutherford 2006, SANBI 2022).

The site footprint is currently densely overgrown with grass types and cosmos plants. Google Earth historical imagery shows the area has been consistently cultivated for crops over the last decade at least. The connection corridor straddles the fence between the mining area and open veldt. Excavation mounds from mining activity and heavy vehicle use are visible to the corridor's north. Crushed building rubble like concrete, bricks and the remains of bathroom tiles and plumbing fixtures are present along the dirt road that follows the corridor's trajectory. Similar to Pv Site Alternative 1, the route of the connection corridor to Site 2 was waterlogged along waterlines and lower-lying areas at the time of the field visit due to recent rains.



**Figure 6.** Views of Alternative Site 2 from the southern and northwestern corners of the footprint.





**Figure 7.** Views of the connection corridor from Alternative Site 2 towards the northeast.





**Figure 8.** Views of the connection corridor from Alternative Site 2 towards the Sigma substation.

## 2.3 Archaeological resources identified

### 2.3.1 Heritage resources within the development corridor

No archaeological resources were recorded on the two alternative site footprints or connection corridors.

### 2.3.2 Other

On the development footprint of Alternative Site 1, the small-scale subsistence farm and the sports stadium are areas currently in use by community members. Therefore, they should be taken into consideration as areas of some significance to the surrounding community.

## 3. ASSESSMENT OF THE IMPACT OF THE DEVELOPMENT

| Description   | Development Impact                            |     | Mitigation             | Field rating/<br>Significance |
|---|---|-----|------------------------|-------------------------------|
| 1. No archaeological, cultural, or intangible heritage resources were recorded. | Nature  | N/A | No mitigation required | N/A                           |
|   | Extent  | N/A |                        |                               |
|   | Duration                                      | N/A |                        |                               |
|   | Intensity                                     | N/A |                        |                               |
|   | Potential of impact on irreplaceable resource | N/A |                        |                               |
|   | Consequence                                   | N/A |                        |                               |
|   | Probability of impact                         | N/A |                        |                               |
|   | Significance                                  | N/A |                        |                               |

## 4. RECOMMENDATIONS AND CONCLUSIONS

No heritage resources were identified during the survey. The proposed development footprint has been disturbed by various mining and agricultural activities. Sigma Pv Site 1 is predominantly waterlogged towards the middle of the area, with scattered heaps of building rubble. Sigma Pv Site 2 has been cultivated in the past. Both Sigma Pv Sites 1 and 2 have impassable areas due to the recent heavy rains, and the vegetation is very dense, obscuring the visibility of surface areas. These conditions may have concealed heritage resources, though we are confident that the anthropogenic disturbances in the area would have disturbed any in-situ heritage resources if



present. Therefore, we do not foresee any impact on heritage resources, and from an archaeological viewpoint, the development can continue.

## Recommendations

Based on the assessment of the potential impact of the development on the identified heritage, the following recommendations are made, taking into consideration any existing or potential sustainable social and economic benefits:

1. No significant heritage sites or features were identified within the surveyed sections of the areas earmarked for agricultural developments. Therefore the proposed development can continue.
2. Although all possible care has been taken to identify sites of cultural importance during the investigation of study areas, it is always possible that hidden or sub-surface sites could be overlooked during the assessment, especially considering the environmental conditions encountered during the survey. Therefore, we recommend that a Protocol of Finds accompany the Heritage Impact Assessment to assist the ECO in managing any archaeological resources uncovered during development.
3. 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 or other categories of heritage resources are found during the proposed development, SAHRA APM Unit (Natasha Higgitt/Phillip Hine 021 462 5402) must be alerted as per section 35(3) of the NHRA.
4. If unmarked human burials are uncovered, the SAHRA Burial Grounds and Graves (BGG) Unit (Thingahangwi Tshivhase/Mimi Seetelo 012 320 8490) must be alerted immediately as per section 36(6) of the NHRA. Depending on the nature of the finds, a professional archaeologist or palaeontologist must be contacted as soon as possible to inspect the findings. If the newly discovered heritage resources prove archaeological or palaeontological significance, a Phase 2 rescue operation may be required, subject to permits issued by SAHRA.

## 5. REFERENCES

- Mucina, L. & Rutherford, M.C. (eds) 2006. *The vegetation of South Africa, Lesotho and Swaziland*. Strelitzia 19. SANBI: Pretoria.
- SANBI 2022. *South African National Biodiversity Institute, Biodiversity GIS*. <http://bgisviewer.sanbi.org/> (Accessed 2022-02-15).

# APPENDIX A

## Determining significance and development impact

Heritage resources are considered of value if the following criteria apply:

|    |   |
|----|---|
| a. | It is important in the community or pattern of South Africa's history;  |
| b. | It has uncommon, rare or endangered aspects of South Africa's natural or cultural heritage;   |
| c. | It has the potential to yield information that will contribute to an understanding of South Africa's natural or cultural heritage;            |
| d. | It is vital in demonstrating the principal characteristics of a particular class of South Africa's natural or cultural places or objects;     |
| e. | It exhibits particular aesthetic characteristics valued by a community or cultural group;   |
| f. | It is essential in demonstrating a high degree of creative or technical achievement at a particular period;                                   |
| g. | It has a strong or unique association with a particular community or cultural group for social, cultural or spiritual reasons;                |
| h. | It has a strong or special association with the life or work of a person, group or organisation of importance in the history of South Africa; |
| i. | It is of significance relating to the history of slavery in South Africa.   |

Levels of significance of the various types of heritage resources observed and recorded are determined by the following criteria:

| CULTURAL & HERITAGE SIGNIFICANCE |  |
|----------------------------------|--|
| LOW                              | A cultural object found out of context, not part of a site or without any related feature/structure in its surroundings.   |
| MEDIUM                           | Any site, structure or feature is regarded as less important due to several factors, such as date, frequency and uniqueness. Likewise, any important object found out of context.                                |
| HIGH                             | Any site, structure or feature is regarded as important because of its age or uniqueness. Graves are always categorised as of a high importance. Likewise, any important object found within a specific context. |

Field Ratings or Gradings are assigned to indicate the level of protection required and who is responsible for national, provincial, or local protection.

| FIELD RATINGS & GRADINGS            |   |
|-------------------------------------|---|
| <b>National Grade I</b>             | Heritage resources with exceptional qualities to the extent that they are of national significance and should therefore be managed as part of the national estate.            |
| <b>Provincial Grade II</b>          | Heritage resources with qualities provincial or regional importance, although it may form part of the national estate, it should be managed as part of the provincial estate. |
| <b>Local Grade IIIA</b>             | Heritage resources are of local importance and worthy of conservation. Therefore, it should be included in the heritage register and not be mitigated (high significance).    |
| <b>Local Grade IIIB</b>             | Heritage resources are of local importance and worthy of conservation. Therefore, it should be included in the heritage register and mitigated (high/ medium significance).   |
| <b>General Protection Grade IVA</b> | The site/resource should be mitigated before destruction (high/ medium significance).   |
| <b>General protection Grade IVB</b> | The site/resource should be recorded before destruction (medium significance).  |
| <b>General protection Grade IVC</b> | Phase 1 is considered as sufficient recording, and it may be demolished (low significance).   |

A heritage resource impact may be defined broadly as the net change, either beneficial or adverse, between the integrity of a heritage site with and without the proposed development. Beneficial impacts occur wherever a proposed development actively protects, preserves, or enhances a heritage resource by minimising natural site erosion or facilitating non-destructive public use. More commonly, development impacts are of an adverse nature and can include:

- destruction or alteration of all or part of a heritage site;
- isolation of a site from its natural setting; and / or
- introduction of physical, chemical or visual elements out of character with the heritage resource and its setting.

Beneficial and adverse impacts can be direct or indirect and cumulative, as implied by the examples. Although indirect impacts may be more difficult to foresee, assess and quantify, they must form part of the assessment process. Therefore, the following assessment criteria have been used to assess the impacts of the proposed development on possible identified heritage resources:

| CRITERIA  | RATING SCALES | NOTES   |
|---|---------------|---|
| Nature  | POSITIVE      | An evaluation of the type of effect the construction, operation and management of the proposed development would have on the heritage resource.   |
|   | NEGATIVE      |   |
|   | NEUTRAL       |   |
| Extent  | LOW           | Site-specific affects only the development footprint.   |
|   | MEDIUM        | Local (limited to the site and its immediate surroundings, including the surrounding towns and settlements within a 10 km radius);  |
|   | HIGH          | Regional (beyond a 10 km radius) to national.   |
| Duration  | LOW           | 0-4 years (i.e. duration of construction phase).  |
|   | MEDIUM        | 5-10 years.   |
|   | HIGH          | More than 10 years to permanent.  |
| Intensity   | LOW           | Where the impact affects the heritage resource in such a way that its significance and value are minimally affected.  |
|   | MEDIUM        | Where the heritage resource is altered, and its significance and value are measurably reduced.  |
|   | HIGH          | Where the heritage resource is altered or destroyed to the extent that its significance and value cease to exist.   |
| Potential for impact on irreplaceable resources         | LOW           | No irreplaceable resources will be impacted.  |
|   | MEDIUM        | Resources that will be impacted can be replaced, with effort.   |
|   | HIGH          | There is no potential for replacing a particular vulnerable resource that will be impacted.   |
| Consequence   | LOW           | A combination of any of the following: <ul style="list-style-type: none"> <li>Intensity, duration, extent and impact on irreplaceable resources are all rated low.</li> <li>Intensity is low and up to two of the other criteria are rated medium.</li> <li>- Intensity is medium, and all three other criteria are rated low.</li> </ul> |
|   | MEDIUM        | Intensity is medium, and at least two of the other criteria are rated medium.   |
|   | HIGH          | Intensity and impact on irreplaceable resources are rated high, with any combination of extent and duration.<br><br>Intensity is rated high, with all the other criteria being rated medium or higher.  |
| Probability<br>(the likelihood of the impact occurring) | LOW           | It is highly unlikely or less than 50 % likely that an impact will occur.   |
|   | MEDIUM        | It is between 50 and 70 % certain that the impact will occur.   |
|   | HIGH          | It is more than 75 % certain that the impact will occur, or it is definite that the impact will occur.  |

| CRITERIA   | RATING SCALES | NOTES                                      |
|--|---------------|--|
| Significance<br>(all impacts<br>including<br>potential<br>cumulative<br>impacts) | LOW           | Low consequence and low probability.       |
|  |               | Low consequence and medium probability.    |
|  |               | Low consequence and high probability.      |
|  | MEDIUM        | Medium consequence and low probability.    |
|  |               | Medium consequence and medium probability. |
|  |               | Medium consequence and high probability.   |
|  | HIGH          | High consequence and low probability.      |
|  |               | High consequence and medium probability.   |
|  |               | High consequence and high probability.     |

# APPENDIX B



## FIELD NOTES

### Phase 1 Archaeological/Heritage Impact Assessment

Site ID: SIGMA PV1 & SIGMA PV2, Sasolburg, Free State Province

| Phase 1 survey conducted |                      |                            |           |                       |
|--------------------------|----------------------|----------------------------|-----------|-----------------------|
| CRM Archaeologist        | Heidi Fivaz          |                            | Date/s    | 2022-02-11            |
| Additional surveyors     | Sky-Lee Fairhurst    |                            |           |                       |
| Type of survey           | Pedestrian/Vehicular |                            | Transects | Dictated by landscape |
| Technical equipment      | GPS                  | Locus App, Garmin E-Trex10 | Camera    | Panasonic Lumix       |

### PROJECT PARTICULARS

#### Technical information

| Project description         |  |
|-----------------------------|--|
| Project name                | CTS21_283 Savannah Sigma PV Sasolburg  |
| Description                 | Proposed development of a solar photovoltaic (PV) energy facility and associated infrastructure with a generation capacity of up to 10MW, located near Sasolburg in the Free State Province. |
| Developer                   |  |
| Becrux Solar                |  |
| Development type            | Solar Power Infrastructure   |
| Consultants                 |  |
| Environmental               | Savannah   |
| Heritage and archaeological | CTS ( Fieldwork by UBIQUE Heritage Consultants)  |
| Paleontological             |  |
| Property details            |  |
| Province                    | Free State   |
| District municipality       | Fezile Dabi District Municipality  |
| Local municipality          | Metsimaholo Local Municipality   |

|   |   |
|---|---|
| Topo-cadastral map  | 1: 50 000 2627DD  |
| Farm name   | Portion 1 of the Farm Saltbery Plain 137 and the Remaining Extent of the Farm Zamdela 449 |
| Closest town  | Sasolburg   |
| GPS Co-ordinates  | Alt 1: 26° 50'52.74"S 27° 50'22.45"E<br>Alt 2: 26° 51'29.22"S 27° 48'46.81"E              |
| Property size   |   |
| Development footprint size  |   |
| Land use  |   |
| Previous  | Agriculture   |
| Current   | Agriculture and mining  |
| Rezoning required   | No  |
| Sub-division of land  | No  |
| Development criteria in terms of Section 38(1) NHRA   |   |
|   | Yes/No  |
| Construction of a road, wall, power line, pipeline, canal or other linear forms of development or barrier exceeding 300m in length. | Yes   |
| Construction of bridge or similar structure exceeding 50m in length.  | No  |
| Construction exceeding 5000m <sup>2</sup> .   | Yes   |
| Development involving three or more existing erven or subdivisions.   | No  |
| Development involving three or more erven or divisions that have been consolidated within the past five years.                      | No  |
| Rezoning of site exceeding 10 000m <sup>2</sup> .   | No  |
| Any other development category, public open space, squares, parks, recreation grounds.  | No  |

## GENERAL ENVIRONMENT, INFRASTRUCTURE AND LANDSCAPE

### Site description

|   |
|---|
| Description of the general area affected by development   |
| Type of environment   |
| Sigma Pv site 1: Grassland.<br>Sigma Pv site 2: Grassland.  |
| Terrain description   |
| Alternative Site 1: Empty field in an urban environment with building rubble, rubbish, grazing animals.<br>Connection corridor 1: Industrial terrain, coal mounds.<br>Alternative Site 2: Overgrown previously cultivated/ploughed land.<br>Connection corridor 2: Disturbed grassland, mining activity disturbances, old tar road. |
| Geology   |
| Visible dolerite towards the centre of Alternative Site 1.  |
| Vegetation  |
| Very dense vegetation, knee-height and taller in both alternatives.   |
| Waterways/sources   |
| Alternative Site 1: small tributary flowing from northwest to northeast, waterlogged marshy area towards the middle. Most of the footprint is muddy with stagnant water pools due to recent rains.  |

|   |  |
|---|--|
| Alternative Site 2: one tributary and marshy area across the connection corridor, approx. 0.49 km east from site 2.               |  |
| <b>Site boundaries</b>  |  |
| Alternative Site 1: Houses to the north-southeast, donga and open field to the south, mining to the northwest, Sigma to the west. |  |
| Alternative Site 2: Mining to the north, open field to the east and south, dirt road to the west.                                 |  |
| <b>Site access</b>  | <b>GPS Co-ordinates</b>  |
| Alternative Site 1: access from the northeast   | 26° 50' 44.71" S<br>27° 50' 35.13" E                                     |
| Alternative Site 2 access from the west   | 26° 51' 07.27" S<br>27° 48' 32.00" E                                     |
| <b>Disturbances</b>   |  |
| Natural erosion   | Flooding   |
|   |  |
| Human-made  | Demolition of structures, rubbish dumping, mining, possible over-grazing |
|   |  |
| <b>Notes</b>  |  |
| The whole area within the development footprints show signs of disturbance.   |  |

## Environmental recording

See photographs

## HERITAGE RESOURCES RECORDING

### Stone Age Resources Identified

| Point ID & Site # | Photo # | Description   | Period | Location | Field rating/ Significance/ Recommended Mitigation |
|-------------------|---------|---------------|--------|----------|--|
| NONE RECORDED     |         | Type lithic/s |        |          |  |
|                   |         | Raw material  |        |          |  |
|                   |         | N in m².      |        |          |  |
|                   |         | Context       |        |          |  |
|                   |         | Additional    |        |          |  |

### Historical Period Resources Identified

| Point ID & Site # | Photo # | Description     | Period | Location | Field rating/ Significance/ Recommended Mitigation |
|-------------------|---------|-----------------|--------|----------|--|
| NONE RECORDED     |         | Type of feature |        |          | No Mitigation Required                             |
|                   |         | Material        |        |          |  |



|  |  |                       |  |  |  |  |
|--|--|-----------------------|--|--|--|--|
|  |  | N in m <sup>2</sup> . |  |  |  |  |
|  |  | Context               |  |  |  |  |
|  |  | Additional            |  |  |  |  |

## Iron Age/ Agri-pastoral Early Farming Communities Resources Identified

| Point ID & Site # | Photo # | Description           | Period | Location | Field rating/ Significance/ Recommended Mitigation |
|-------------------|---------|-----------------------|--------|----------|--|
| NONE RECORDED     |         | Type of feature       |        |          |  |
|                   |         | Material              |        |          |  |
|                   |         | N in m <sup>2</sup> . |        |          |  |
|                   |         | Context               |        |          |  |
|                   |         | Additional            |        |          |  |

## Graves Identified

| Point ID & Site # | Photo # | Description         | Period | Location | Field rating/ Significance/ Recommended Mitigation |
|-------------------|---------|---------------------|--------|----------|--|
| NONE RECORDED     |         | Grave markers       |        |          |  |
|                   |         | Inscription         |        |          |  |
|                   |         | Graves' Orientation |        |          |  |
|                   |         | Dimensions/ Extent  |        |          |  |
|                   |         | Additional          |        |          |  |

## Intangible Heritage Resources/ Cultural Landscape Identified

| Point ID & Site # | Photo # | Description        | Period | Location | Field rating/ Significance/ Recommended Mitigation |
|-------------------|---------|--------------------|--------|----------|--|
| NONE RECORDED     |         | Nature             |        |          |  |
|                   |         | Cultural evidence  |        |          |  |
|                   |         | Access             |        |          |  |
|                   |         | Affected community |        |          |  |
|                   |         | Additional         |        |          |  |

## IDENTIFIED HERITAGE RESOURCES DISCUSSION

### Specialist comments

|  |
|--|
| Stone Age finds  |
| N/A  |
| Iron Age/ Agri-pastoralist Early Farming communities finds                                 |
| N/A  |
| Historical finds   |
| N/A  |
| Identified graves  |
| N/A  |
| Intangible Heritage/ Cultural Landscape  |
| N/A  |
| Other  |
| Sports stadium currently still being used by the community. 26° 50'51.35"S; 27° 50'42.98"E |
| Small-scale subsistence farm. 26° 50'53.36"S; 27° 50'27.00"E                               |

## IDENTIFIED HERITAGE RESOURCES MITIGATION

### Specialist recommendations

|  |
|--|
| Stone Age finds  |
| Due to the dense vegetation and recent rains obscuring the surface of the study areas, we recommend a Protocol of Finds for the development. |
| Iron Age/ Agri-pastoralist Early Farming communities finds   |
| Due to the dense vegetation and recent rains obscuring the surface of the study areas, we recommend a Protocol of Finds for the development. |
| Historical finds   |
| Due to the dense vegetation and recent rains obscuring the surface of the study areas, we recommend a Protocol of Finds for the development. |
| Identified graves  |
| Due to the dense vegetation and recent rains obscuring the surface of the study areas, we recommend a Protocol of Finds for the development. |
| Intangible Heritage/ Cultural Landscape  |
| Due to the dense vegetation and recent rains obscuring the surface of the study areas, we recommend a Protocol of Finds for the development. |

## Other

We recommend that the sports stadium and farm space be avoided during the development as the community uses these spaces.

## ADDITIONAL NOTES AND RESOURCES

### Attached Field Data

| Filename                | File type | Description                     |
|-------------------------|-----------|---------------------------------|
| Sigma Pv Alt 1          | Folder    | Photos                          |
| Sigma Pv Alt 2          | Folder    | Photos                          |
| Sigma Pv Alt 2 corridor | Folder    | Photos                          |
| SIGMA Waypoints         | kmz       | Waypoints with added placemarks |
| SASOL SIGMA tracks      | kml       | Combined tracks of two devices  |
|                         |           |                                 |
|                         |           |                                 |
|                         |           |                                 |
|                         |           |                                 |
|                         |           |                                 |
| Additional Notes        |           |                                 |
|                         |           |                                 |

