

HERITAGE IMPACT ASSESSMENT FOR A PROPOSED 132 kV POWER LINE AND SUBSTATION AT THE KONKOONSIES II SOLAR ENERGY FACILITY, KENHARDT MAGISTERIAL DISTRICT, NORTHERN CAPE

Required under Section 38 (8) of the National Heritage
Resources Act (No. 25 of 1999).

Report for:

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EXECUTIVE SUMMARY

ASHA Consulting (Pty) Ltd was appointed by Savannah Environmental (Pty) Ltd to conduct an assessment of the potential impacts to heritage resources that might occur through the proposed construction of a 132 kV power line and substation on Portion 6 of Konkoonsies 91, near Pofadder, in the Kenhardt Magisterial District. The power line is required to link the already authorised Konkoonsies II solar energy facility with the existing Paulputs substation located immediately to the north, while the substation is being reassessed after its original position has had to move.

The site is generally level, although rocky hills exist nearby. The site is sandy with gravel in places and extremely sparse vegetation.

The only heritage resources identified were occasional Stone Age artefacts and the broader natural and cultural landscape. The artefacts are extremely ephemeral and no significant impacts are expected. The landscape is already severely compromised by existing electrical infrastructure and will be further compromised by the already authorised solar energy facility to be constructed alongside the present study area. Further impacts from the proposed power line are thus considered insignificant. The expected significance of both impacts is rated as being 'low'.

Because no significant impacts to heritage resources are expected, it is recommended that the proposed developments be allowed to proceed with no further heritage-related studies required. However, the following should be noted:

- » If any archaeological material or human burials are uncovered during the course of development then work in the immediate area should be halted. The find would need to be reported to the heritage authorities and may require inspection by an archaeologist. Such heritage is the property of the state and may require excavation and curation in an approved institution.

Glossary

Background scatter: Artefacts whose spatial position is conditioned more by natural forces than by human agency

Early Stone Age: Period of the Stone Age extending approximately between 2 million and 20 000 years ago.

Later Stone Age: Period of the Stone Age extending over the last approximately 20 000 years.

Middle Stone Age: Period of the Stone Age extending approximately between 200 000 and 20 000 years ago.

Abbreviations

ASAPA: Association of Southern African Professional Archaeologists

BAR: Basic Assessment Report

CRM: Cultural Resources Management

ECO: Environmental Control Officer

ESA: Early Stone Age

GPS: global positioning system

HIA: Heritage Impact Assessment

LSA: Later Stone Age

MSA: Middle Stone Age

NEMA: National Environmental Management Act (No. 107 of 1998)

NHRA: National Heritage Resources Act (No. 25) of 1999

REIPPP: Renewable Energy Independent Power Producer Program

SAHRA: South African Heritage Resources Agency

SAHRIS: South African Heritage Resources Information System

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1. INTRODUCTION

ASHA Consulting (Pty) Ltd was appointed by Savannah Environmental (Pty) Ltd to conduct an assessment of the potential impacts to heritage resources that might occur through the proposed construction of a 132 kV power line and a substation on Portion 6 of Konkoonsies 91, near Pofadder, in the Kenhardt Magisterial District (Figure 1). The power line is required to link the already authorised Konkoonsies II solar energy facility with the existing Paulputs substation located immediately to the north. An on-site substation for the solar energy facility was earlier approved but has had to shift with the new location being considered here.

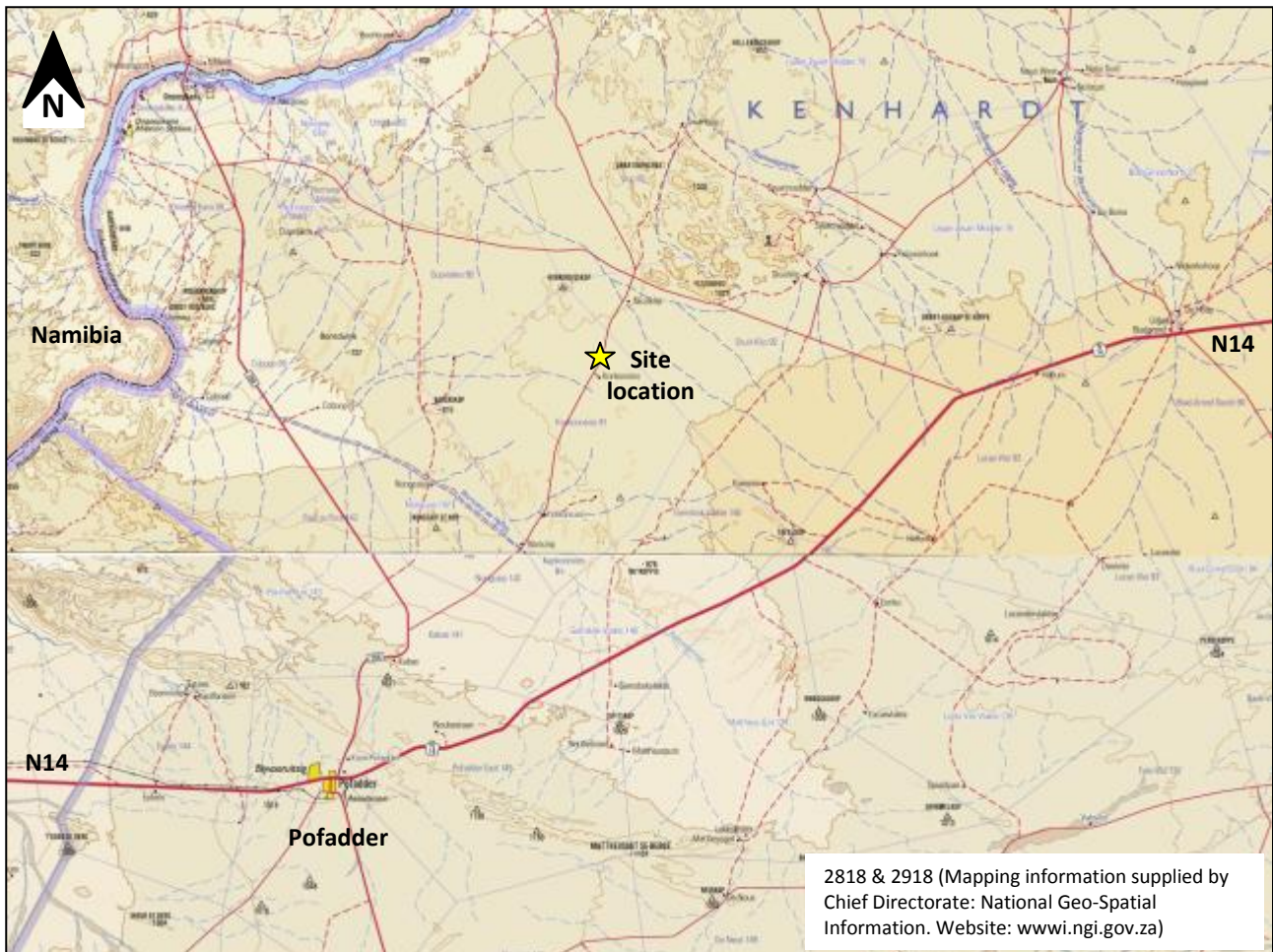


Figure 1: Map showing the location of the site.

1.1. Project description

The project will entail the construction and operation of a 33/132 kV substation over 0.8 ha that will collect the energy generated by the Konkoonsies II solar energy facility and a 132 kV power line that will serve to link the Konkoonsies II solar energy facility to the grid via the existing Paulputs Substation. The facility has already been assessed and authorised and has been selected as a preferred bidder under the Department of Energy's Renewable Energy Independent Power Producer Program (REIPPP). Although only one substation position and one power line alignment are being considered because of restrictions imposed by ESKOM, two technology alternatives exist for the proposed power line:

- » Alternative 1 entails an overhead power line supported on either concrete mono-poles or a self-supporting lattice tower depending on the founding conditions; and
- » Alternative 2 entails laying an electrical cable beneath the ground.

The substation will require a short access road to link it to the existing gravel road located immediately to the north, an operation and maintenance building and an outdoor switching yard.

1.2. Terms of reference

ASHA Consulting was requested to conduct a field assessment and produce a heritage impact assessment report that would meet the requirements of the Heritage Authorities.

1.3. Scope and purpose of the report

A heritage impact assessment (HIA) is a means of identifying any significant heritage resources before development begins so that these can be managed in such a way as to allow the development to proceed (if appropriate) without undue impacts to the fragile heritage of South Africa. This HIA report aims to fulfil the requirements of the heritage authorities such that a comment can be issued for consideration by the Department of Environmental Affairs who will review the Basic Assessment (BAR) and grant or withhold authorisation. The HIA report will outline any mitigation requirements that will need to be complied with from a heritage point of view and that should be included in the conditions of authorisation should this be granted.

1.4. The author

Dr Jayson Orton has an MA (UCT, 2004) and a D.Phil (Oxford, UK, 2013), both in archaeology, and has been conducting Heritage Impact Assessments and archaeological specialist studies in the Western Cape and Northern Cape provinces of South Africa since 2004. He has also conducted research on aspects of the Later Stone Age in these provinces and published widely on the topic. He is accredited with the Association of Southern African Professional Archaeologists (ASAPA) CRM section (Member #233) as follows:

- » Principal Investigator: Stone Age, Shell Middens & Grave Relocation; and
- » Field Director: Colonial Period & Rock Art.

1.5. Declaration of independence

ASHA Consulting (Pty) Ltd and its consultants have no financial or other interest in the proposed development and will derive no benefits other than fair remuneration for consulting services provided.

2. HERITAGE LEGISLATION

The National Heritage Resources Act (NHRA) No. 25 of 1999 protects a variety of heritage resources as follows:

- » Section 34: structures older than 60 years;
- » Section 35: palaeontological, prehistoric and historical material (including ruins) more than 100 years old;
- » Section 36: graves and human remains older than 60 years and located outside of a formal cemetery administered by a local authority; and
- » Section 37: public monuments and memorials.

Following Section 2, the definitions applicable to the above protections are as follows:

- » Structures: "any building, works, device or other facility made by people and which is fixed to land, and includes any fixtures, fittings and equipment associated therewith";
- » Palaeontological material: "any fossilised remains or fossil trace of animals or plants which lived in the geological past, other than fossil fuels or fossiliferous rock intended for industrial use, and any site which contains such fossilised remains or trace";
- » Archaeological material: a) "material remains resulting from human activity which are in a state of disuse and are in or on land and which are older than 100 years, including

artefacts, human and hominid remains and artificial features and structures”; b) “rock art, being any form of painting, engraving or other graphic representation on a fixed rock surface or loose rock or stone, which was executed by human agency and which is older than 100 years, including any area within 10m of such representation”; c) “wrecks, being any vessel or aircraft, or any part thereof, which was wrecked in South Africa, whether on land, in the internal waters, the territorial waters or in the maritime culture zone of the Republic, as defined respectively in sections 3, 4 and 6 of the Maritime Zones Act, 1994 (Act No. 15 of 1994), and any cargo, debris or artefacts found or associated therewith, which is older than 60 years or which SAHRA considers to be worthy of conservation”; and d) “features, structures and artefacts associated with military history which are older than 75 years and the sites on which they are found”;

- » Grave: “means a place of interment and includes the contents, headstone or other marker of such a place and any other structure on or associated with such place”; and
- » Public monuments and memorials: “all monuments and memorials a) “erected on land belonging to any branch of central, provincial or local government, or on land belonging to any organisation funded by or established in terms of the legislation of such a branch of government”; or b) “which were paid for by public subscription, government funds, or a public-spirited or military organisation, and are on land belonging to any private individual.”

While landscapes with cultural significance do not have a dedicated Section in the NHRA, they are protected under the definition of the National Estate (Section 3). Section 3(2)(c) and (d) list “historical settlements and townscapes” and “landscapes and natural features of cultural significance” as part of the National Estate. Furthermore, Section 3(3) describes the reasons a place or object may have cultural heritage value; some of these speak directly to cultural landscapes.

Section 38 (2a) states that if there is reason to believe that heritage resources will be affected then an impact assessment report must be submitted. This report fulfils that requirement.

Under the National Environmental Management Act (No. 107 of 1998; NEMA), as amended, the project is subject to a BAR. Ngwao-Boswa Ya Kapa Bokoni (Heritage Northern Cape; for built environment and cultural landscapes) and the South African Heritage Resources Agency (SAHRA for archaeology and palaeontology) are required to provide comment on the proposed project in order to facilitate final decision making by the Department of Environmental Affairs (DEA).

3. METHODS

3.1. Literature survey

A survey of available literature was carried out to assess the general heritage context into which the development would be set. This literature included published material, unpublished commercial reports and online material, including reports sourced from the South African Heritage Resources Information System (SAHRIS).

3.2. Field survey

The site was subjected to a detailed foot survey on 20th June 2015 in conjunction with the final archaeological survey for the already authorised Konkoonies II solar energy facility (Figure 2). At the time of the survey other alignments were still under consideration and were also examined. During the survey the positions of finds were recorded on a hand-held GPS receiver set to the WGS84 datum. Photographs were taken at times in order to capture representative samples of both the affected heritage and the landscape setting of the proposed development.

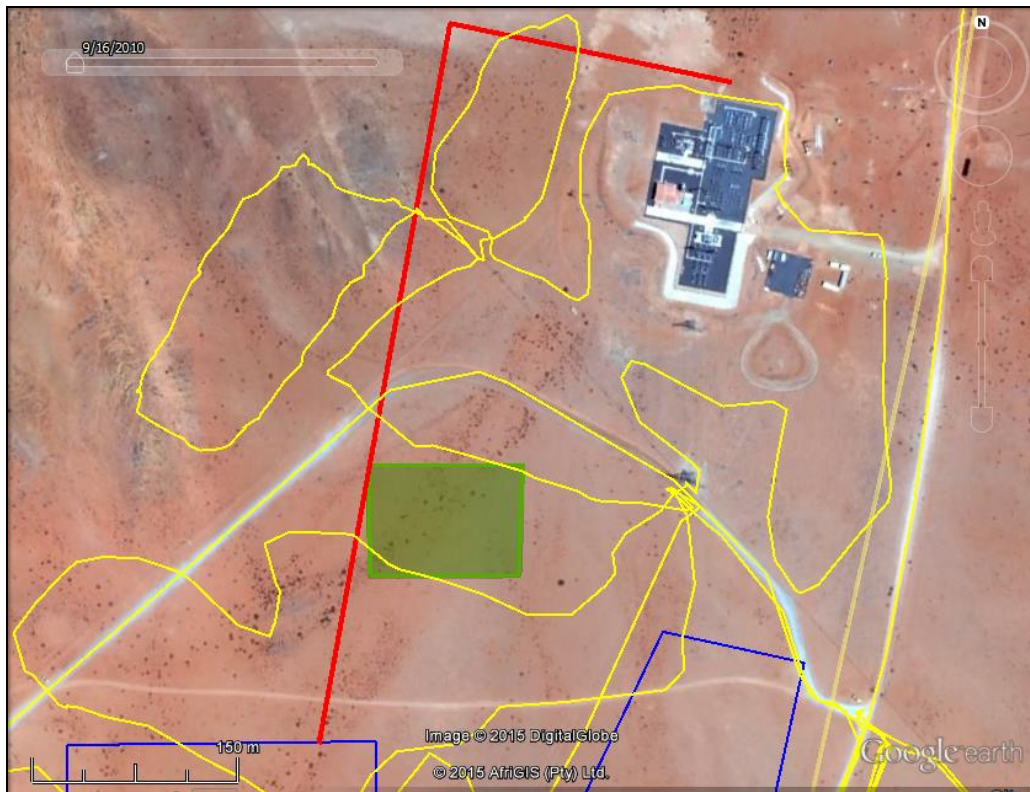


Figure 2: Aerial view of the study area showing the proposed power line (red), the proposed substation (green), the survey tracks (yellow), the proposed solar energy facility layout extending to the south (blue) and the existing Paulputs Substation in the northeast.

3.3. Impact assessment

For consistency, the impact assessment was conducted through application of a scale supplied by Savannah Environmental.

3.4. Grading

Section 7 of the NHRA provides for the grading of heritage resources into those of National (Grade 1), Provincial (Grade 2) and Local (Grade 3) significance. Grading is intended to allow for the identification of the appropriate level of management for any given heritage resource. Grade 1 and 2 resources are intended to be managed by the national and provincial heritage resources authorities, while Grade 3 resources would be managed by the relevant local planning authority. These bodies are responsible for grading, but anyone may make recommendations for grading – something that is, at times, required in HIAs.

It is intended that the various provincial authorities formulate a system for the further detailed grading of heritage resources of local significance but this is generally yet to happen. Heritage Western Cape (2012), however, uses a system in which resources of local significance are divided into Grade 3A, 3B and 3C. These approximately equate to high, medium and medium-low local significance, while sites of low or very low significance (and generally not requiring mitigation or other interventions) are referred to as ungradeable.

3.5. Assumptions and limitations

The study is carried out at the surface only and hence any completely buried archaeological sites will not be readily located. Similarly, it is not always possible to determine the depth of archaeological material visible at the surface. The nature of the site suggests that these limitations are highly unlikely to be relevant here and it is assumed that the relatively stony substrate while not obscure any archaeological resources.

4. PHYSICAL ENVIRONMENTAL CONTEXT

4.1. Site context

Most of the study area is, at present, grazing land, but a small part of it falls within the fence enclosing the existing Paulputs Substation. Two other solar energy facilities are already present in the area, both within 1.5 km of the substation, as is a power line extending in a south-south-westerly direction from the substation. As such, there is a precedent for electrical development in the area.

4.2. Site description

The site lies on an extensive sandy plain, although low stony rises lie just west of the proposed power line alignment (Figures 3 & 4). Further afield (more than 2.5 km away) there are some granite hills which provide relief in the landscape. The surface has much fine gravel and thin grass cover is ubiquitous. Larger bushes are very sparse.



Figure 3: View towards the east from a stony rise lying just to the west of the study area. The dotted white line indicates the approximate alignment of the proposed power line and the star the proposed substation. The existing power line running south from the substation is visible.



Figure 4: View towards the northeast from a stony rise lying just to the southwest of the study area. The dotted white line indicates the approximate alignment of the proposed power line and the star the proposed substation.

5. CULTURAL HERITAGE CONTEXT

This section of the report establishes what is already known about heritage resources in the vicinity of the study area. What is found during the field survey may then be compared with what is already known in order to gain an improved understanding of the significance of the newly reported resources.

5.1. Archaeological aspects

The two surveys by Pelser (2011, 2012) and that by Orton (2015), all for the Konkoonies I and II solar energy facilities, are most relevant. These surveys recorded a number of ephemeral scatters of ostrich eggshell as well as scatters of quartz artefacts. All were ascribed to the Later Stone Age (LSA). They occurred in open areas as well as around the foot of the small rocky koppies located to the northwest of the study area. Although Pelser (2011, 2012) found nothing in the southern part of the facility area, Orton (2015) located several areas of granite bedrock exposure that held pools of water. There were many grinding patches on these rocks and some of them were surrounded by scatters of artefacts of varying density. A few quartz outcrop quarries were also located. Morris (2012) worked just to the east of the present study area and found ostrich eggshell fragments, a small quartz outcrop quarry and a scatter of Early (ESA) and Middle Stone Age (MSA) artefacts. Bedrock grinding patches are a particular feature of Bushmanland and are always located alongside sources of water, be they ephemeral streams, pans or, as in this case, small holes in the bedrock that trap rain water. They are assumed to have functioned as lower grindstones for the processing of food. Orton & Webley (2012) also recorded such patches to the southwest of Pofadder.

Examination of the SAHRIS database shows that many small scale mining operations have been applied for and approved in the mountains to the northeast of the study area. For the most part, heritage studies do not appear to have been requested for these projects. However, a survey of certain areas in and around these granite mountains and the larger koppies further to the northeast yielded a variety of Stone Age sites. These included artefact scatters, sometimes with pottery, ostrich eggshell and bone and also granite bedrock outcrops with a number of grinding grooves (Orton & Webley 2013). Historical sites were also found including some stone-packed graves and a stone-built animal trap ('*tierhok*').

More generally, it can be noted that archaeological sites in the area tend to be more commonly encountered around the fringes of granite hills, on sand dunes or around pans (Beaumont *et al.* 1995). Other surveys in the region support this contention (Halkett 2010; Morris 2011).

5.2. Historical aspects and the built environment

This part of South Africa is very remote and was settled comparatively late. As such, there tends to be far less colonial period heritage present than pre-colonial. The vast majority of buildings are quite recent. Konkoonies was only surveyed in 1893 which suggests that any use of the land up until the late 19th century would not have resulted in permanent structures being built.

6. FINDINGS OF THE HERITAGE STUDY

6.1. Archaeology

No archaeological sites or artefact scatters were recorded in the study area. Occasional isolated artefacts are certainly present but their density is very low and they carry no heritage value. They are part of the broader background scatter present throughout the region.

6.2. Cultural landscape

The cultural landscape in the area is very weakly developed and is characterised only by rare farmsteads, gravel roads and fence lines. This landscape has been severely compromised by the development of electrical infrastructure. The natural landscape does have some aesthetic value but has also been compromised by development.

6.3. Statement of significance

Section 38(3)(b) of the NHRA requires an assessment of the significance of all heritage resources. In terms of Section 2(vi), "cultural significance" means aesthetic, architectural, historical, scientific, social, spiritual, linguistic or technological value or significance.

The archaeological resources and landscape are both deemed to have low cultural significance for their scientific and aesthetic value respectively.

6.4. Summary of heritage indicators and provisional grading

There are no significant heritage indicators. The archaeological resources are ungradeable, while the landscape could possibly be considered as being worthy of a 3C grading.

7. ASSESSMENT OF IMPACTS

7.1. Archaeology

Although direct impacts to archaeological resources will occur, these resources are of very low heritage significance and do not warrant any further attention. There are no fatal flaws and no mitigation is suggested. Although power line Alternative 1 would result in less disturbance to the ground, the density of archaeological resources is so low that there is unlikely to be any difference in the significance of impact. As such, neither power line alternative is preferred from an archaeological point of view, and the substation location is similarly unproblematic. The impact assessment is indicated in Table 1. The system of calculation of impacts probably makes them seem worse than what they are actually likely to be.

Table 1: Assessment of archaeological impacts for Alternatives 1 and 2.

<i>Nature: Archaeological stone artefacts will be directly impacted by construction and maintenance vehicles during construction and operation.</i>		
	Without mitigation	With mitigation
<i>Extent</i>	Local (1)	n/a
<i>Duration</i>	Permanent (5)	n/a
<i>Magnitude</i>	Small (1)	n/a
<i>Probability</i>	Improbable (2)	n/a
<i>Significance</i>	14 (Low)	n/a
<i>Status (positive or negative)</i>	Negative	n/a
<i>Reversibility</i>	Low	n/a
<i>Irreplaceable loss of resources?</i>	Yes	n/a
<i>Can impacts be mitigated?</i>	Yes (but not required)	
<i>Mitigation:</i> No mitigation measures are suggested because the heritage resource does not warrant such actions.		
<i>Cumulative impacts:</i> No significant cumulative impacts are expected.		
<i>Residual Impacts:</i> No different to the original impacts since no mitigation is required.		

7.1.1. Measures for inclusion in the draft Environmental Management Plan:

OBJECTIVE: Minimise impact on archaeological resources	
Project component/s	Pylon footings (Alt. 1) or cable trench (Alt. 2) and substation
Potential Impact	Destruction of and damage to archaeological stone artefacts
Activity/risk source	Movement of vehicles and excavation during construction and/or maintenance
Mitigation: Target/Objective	Because of the very low density of artefacts present, no measureable outcome is feasible to assess

Mitigation: Action/control	Responsibility	Timeframe
Ensure that construction vehicles do not traverse areas where no development is planned	Environmental Control Officer (ECO), site foreman	Throughout construction and operation.

Performance Indicator	Areas outside of the construction footprint remain undisturbed
Monitoring	Given the very low significance of the heritage resources, monitoring need not happen frequently. It can occur as and when the ECO is required to visit the site

7.2. Cultural and natural landscape

Although the broader landscape has visual qualities worthy of a potential 3C grading, the local landscape has been heavily compromised by electrical infrastructure development. As such the significance of impacts to this landscape is minimal in heritage terms and, even though Alternative 2 offers less impact, the context suggests that neither alternative be favoured. There are no fatal flaws and no mitigation is required. Table 2 indicates the impact assessment. Once more it is considered that the rating is higher than what the impacts imply; this is because of the 'probability' rating.

Table 2: Assessment of landscape impacts for Alternatives 1 and 2.

<i>Nature: the addition of further electrical infrastructure to the landscape will reduce its aesthetic qualities</i>		
	Without mitigation	With mitigation
Extent	Local (1)	n/a
Duration	Long term (4)	n/a
Magnitude	Small (0)	n/a
Probability	Definite (5)	n/a
Significance	25 (Low)	n/a
Status (positive or negative)	Negative	n/a
Reversibility	Low	n/a
Irreplaceable loss of resources?	Yes	n/a
Can impacts be mitigated?	Yes	

Mitigation: No mitigation is suggested as the impacts do not warrant such actions.
Cumulative impacts: The power line would add very slightly to the visual clutter of electrical infrastructure but because of the existing and authorised developments surrounding the site the cumulative impacts from this small project are considered insignificant.
Residual Impacts: None expected.

7.2.1. Measures for inclusion in the draft Environmental Management Plan:

There are no measures related to landscape impacts that require inclusion in the draft Environmental Management Plan.

8. CONCLUSIONS

This assessment has found no significant impacts to heritage resources that might occur through construction of the proposed power line (through either alternative) and substation.

9. RECOMMENDATIONS

Because no significant impacts to heritage resources are expected, it is recommended that the proposed developments be allowed to proceed with no further heritage-related studies required. However, the following should be noted:

- » If any archaeological material or human burials are uncovered during the course of development then work in the immediate area should be halted. The find would need to be reported to the heritage authorities and may require inspection by an archaeologist. Such heritage is the property of the state and may require excavation and curation in an approved institution.

10. REFERENCES

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