HERITAGE IMPACT ASSESSMENT FOR THE PLANNED STEELPOORT PUMPED STORAGE STATION, LYDENBURG MUNICIPAL DISTRICT, MPUMALANGA PROVINCE

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EXECUTIVE SUMMARY

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The aim of the survey was to locate, identify, evaluate and document sites, objects and structures of cultural importance found within the boundaries of the area in which it is proposed to develop the pumped storage scheme.

A number of site dating to the Late Iron Age, early historic period have been identified that would be impacted on by the proposed development. There are probably a few more that could not be located during the survey due to the current (January 2007) dense vegetation growth especially in the lower development area.

The identified sites do not present much of a problem, as current legislation allows for mitigation measures to be implemented. However, impacts on sites can be lessened by:

- Rerouting/relocating of access routes, power lines, construction yards, etc.
- Formalising sites by fencing them off

Therefore, based on what was found and its evaluation, it is recommended that the proposed development can continue in the two areas, on condition of acceptance of the following recommendations:

That the mitigation measures for each identified site, as set out in Appendix 2, is implemented before development takes place. In summary, this would be the following

- *Upper area*

  For the upper area, no sites of cultural significance were identified.
  - Construction village area: clear
  - Construction yard area: clear
  - Upper reservoir area: clear

- *Valley area*

  A variety of sites occur here (see Appendix 2 for a discussion of each of them)
  - Construction village area: clear
  - Alternative construction yard area: clear
  - Construction yard area: sites 14 & 15 can be avoided by moving the yard south. This can be determined by taking the coordinates as centre point and extending a buffer zone of 30 metres from these points. That would be sufficient to avoid the heritage sites.
  - Construction yard, powerhouse and tunnel area: site 3 date to the Late Iron Age – it should be documented and test excavations done.

- Lower reservoir area: sites 4, 5, 6, 7, 8, 9, 10, 11, 12, 13, 17 date to the Late Iron Age and early historic period - all should be documented and test excavated.

Archaeological material, by its very nature, occurs below ground. The developer should therefore keep in mind that archaeological sites might be exposed during the mining activities. If anything is noticed, work in that area should be stopped and the occurrence should immediately be reported to a museum, preferably one at which an archaeologist is available. The archaeologist should then investigate and evaluate the finds.

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GLOSSARY OF TERMS

Study area: Refers to the entire study area as indicated by the client in the accompanying Fig. 1 and 2.

Stone Age: The first and longest part of human history is the Stone Age, which began with the appearance of early humans between 3-2 million years ago. Stone Age people were hunters, gatherers and scavengers who did not live in permanently settled communities. Their stone tools preserve well and are found in most places in South Africa and elsewhere.

Early Stone Age	2 000 000 - 150 000 Before Present
Middle Stone Age	150 000 - 30 000 BP
Late Stone Age	30 000 - until c. AD 200

Iron Age: Period covering the last 1800 years, when new people brought a new way of life to southern Africa. They established settled villages, cultivated domestic crops such as sorghum, millet and beans, and they herded cattle as well as sheep and goats. These people, according to archaeological evidence, spoke early variations of the Bantu Language. Because they produced their own iron tools, archaeologists call this the Iron Age.

Early Iron Age	AD 200 - AD 1000
Late Iron Age	AD 1000 - AD 1830

Historical Period: Since the arrival of the white settlers - c. AD 1840 - in this part of the country

LIST OF ABBREVIATIONS

ADRC	Archaeological Data Recording Centre
EIA	Early Iron Age
ESA	Early Stone Age
LIA	Late Iron Age
LSA	Late Stone Age
MSA	Middle Stone Age
NHRA	National Heritage Resources Act
PHRA	Provincial Heritage Resources Agency
SAHRA	South African Heritage Resources Agency

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1. INTRODUCTION

The National Cultural History Museum[1] was contracted by **Bohlweki Environmental Consultants** to survey an area in which it is proposed to develop a pumped storage scheme for the generation of electricity. The aim of the survey was to determine the nature and potential of cultural heritage resources found within the boundaries of the area that is to be impacted by the developed.

Cultural heritage resources are broadly defined as all non-physical and physical human-made occurrences, as well as natural occurrences that are associated with human activity. These include all sites, structures and artefacts of importance, either individually or in groups, in the history, architecture and archaeology of human (cultural) development.

2. BACKGROUND AND BRIEF

The scope of work consisted of conducting a Phase 1 archaeological survey of the site in accordance with the requirements of Section 38(3) of the National Heritage Resources Act (Act 25 of 1999).

This include:

- Conducting a desk-top investigation of the area;
- A visit to the proposed development site.

The objectives were to

- Identify possible archaeological, cultural and historic sites within the proposed development areas;
- Evaluate the potential impacts of construction, operation and maintenance of the proposed development on archaeological, cultural and historical resources;
- Indicated which would be the preferred site for the proposed development;
- Recommend mitigation measures to ameliorate any negative impacts on areas of archaeological, cultural or historical importance.

[1] The National Cultural History Museum is affiliated to the Northern Flagship Institution, which act as parent body for a number of museums, all of which resorts under the Department of Arts and Culture.

3. STUDY APPROACH

3.1 Information base (sources)

Only a few sources are known to exist about the area specifically, and most of these deal with the larger region on a very generalised basis.

3.2 Methodology

3.1 *Preliminary investigation*

3.1.1 Survey of the literature

A survey of the relevant literature was conducted with the aim of reviewing the previous research done and determining the potential of the area. In this regard, various reports, anthropological, archaeological and historical sources were consulted - see the list of references below. A few large-scale surveys have been done in the region, e.g. for the De Hoop Dam and the Richmond Dam. However, with reference to the study area specifically, only one survey is known. A few general sources, dealing with topics and events on a regional basis, are available. See list of references below.

3.1.2 Data bases

The *Heritage Sites Database* and the *Environmental Potential Atlas* was consulted.

3.1.3 Other sources

Topocadastral and other maps were also studied - see the list of references below.

3.2 *Field survey*

The area was divided into blocks by using natural (e.g. streams) as well as manmade (e.g. roads, fences) boundaries, and each block was surveyed walking a number of transects across it. Fences and rivers obviously necessitated a deviation from this strategy.

3.3 *Documentation*

Sites, objects and structures that are identified are documented according to the general minimum standards accepted by the archaeological profession. Coordinates of individual localities are

determined by means of the *Global Positioning System* (GPS)[2] and plotted on a map. This information is added to the description in order to facilitate the identification of each locality.

Map datum used: Hartebeeshoek 94 (WGS84).

3.4 *Limitations*

In the lower valley area, dense vegetation encountered during the survey period, made it difficult to identify sites, as well as to establish their extent (size).

[2] According to the manufacturer a certain deviation may be expected for each reading. Care was, however, taken to obtain as accurate a reading as possible, and then to correlate it with reference to the physical environment before plotting it on the map.

4. STUDY AREA

4.1. Description of the study area

The location and extent of the study area can be determined from the map in Figure 1. It is to the west of the R555, between the towns of Roossenekal and Steelpoort, in the Lydenburg district of Mpumalanga (Fig. 1). The centre point of the area is c.: S 25.12000, E 29.81000. It includes portions of the following farms: Keerom 151JS, Luipershoek 149JS and Steynsdrift 145JS.

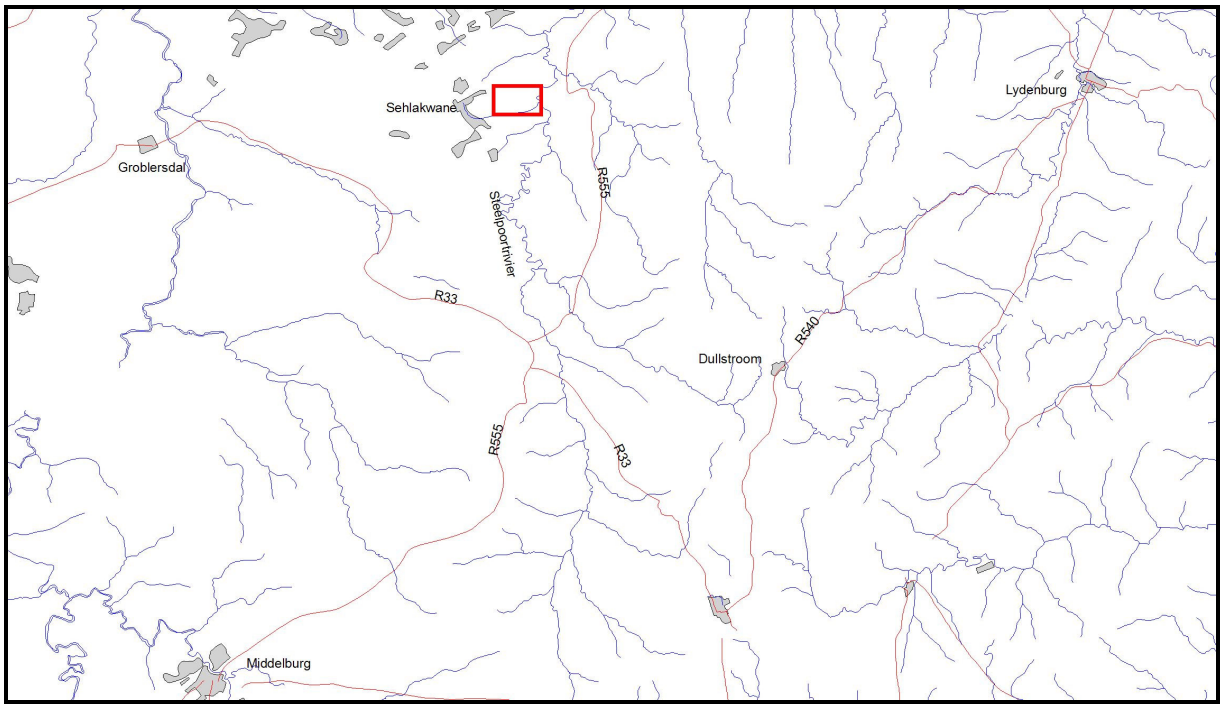

Figure 1. Location of the study area (red rectangle) in regional context.

As a result of the specific technology to be implements on the site, the study area falls into two very different zones: an upper area on the so-called Sekhukhune plateau, and a lower area in the Steelpoort Valley.

The geology of the upper area is made up of granite, whereas the lower area is mainly gabbro, with a rhyolite intrusion separating the two formations. The original vegetation for the upper area is classified as Moist Sandy Highveld, whereas down below in the valley it changes to Mixed Bushhveld.

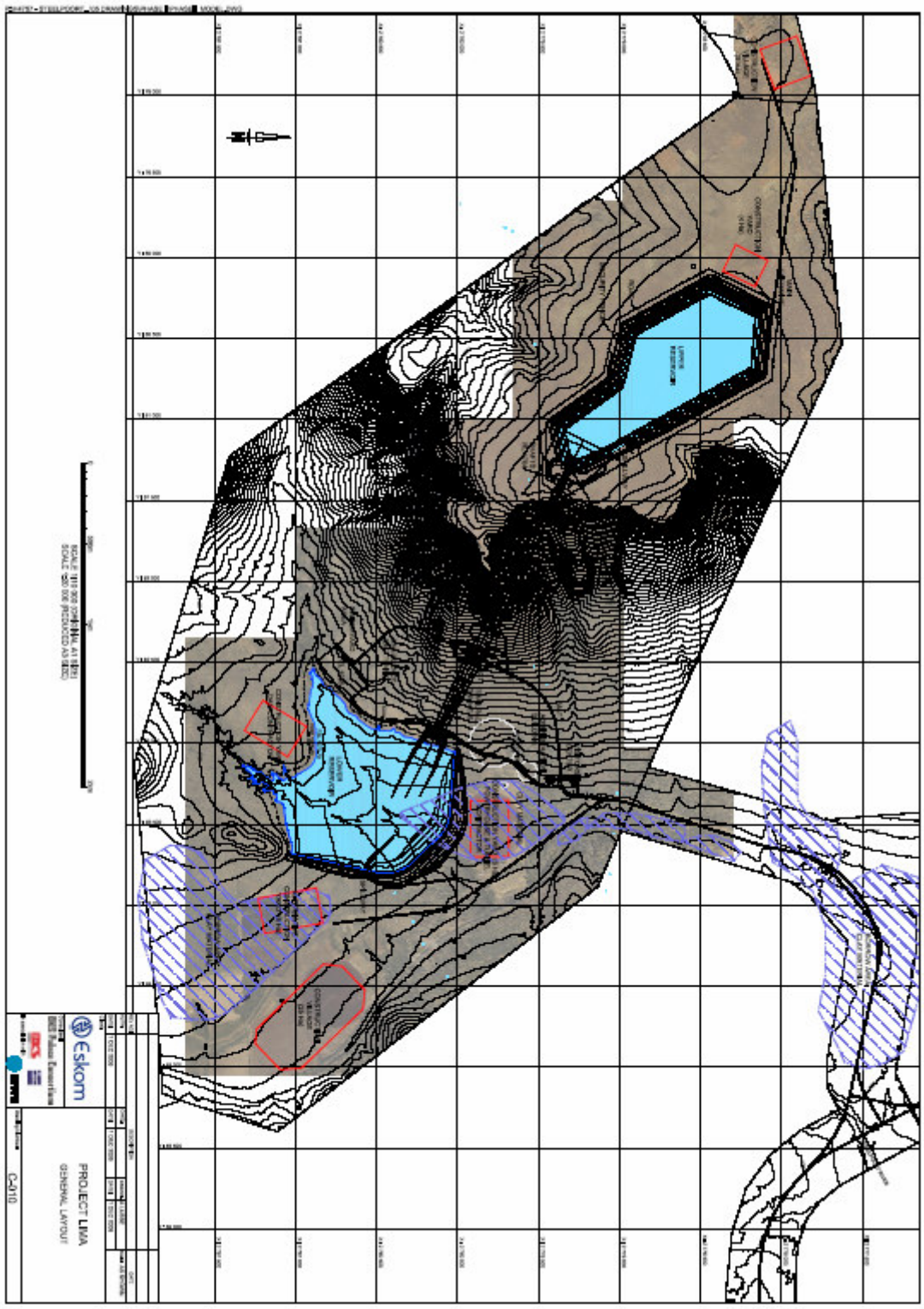

Fig. 2. Layout of the pumped storage scheme, showing the principle of letting water form an upper storage area flow downhill, though turbines, to a lower storage area.

4.2 Description of region

Habitation of the larger geographical area took place since Stone Age times. One of the more important sites, known as Bushman Rock Shelter, is located at Echo Caves north of Ohrigstad. Early humans lived here, discontinuously, for thousands of years, from the Early Stone Age, through what is known as the Middle Stone Age, and well into the Late Stone Age.

That Stone Age people occupied the Steelpoort valley is confirmed by the occurrence of stone tools dating to the Early, Middle and Late Stone Age. The majority of finds are classified as isolated surface occurrences, and mostly date to the Middle Stone Age. Consequently, such finds are judged to have a low significance and they require no mitigation measures.

Iron Age people moved into southern Africa by c. AD 200, entering the area either by moving down the coastal plains, or by using a more central route. It seems more likely that the first option was what brought people into the study area. From the coast they followed the various rivers inland. Being cultivators, they preferred the rich alluvial soils to settle on. One of the earliest dated sites are located near Tzaneen (Silver Leaves).

Iron Age occupation of the region seems to have taken place on a significant scale and at least three different phases of occupation have been identified.

Sites dating to the Early Iron Age are found in the Steelpoort River valley. Preliminary identification of the pottery indicates that it belong to the Doornkop phase of the Early Iron Age, and should have a date of between AD 600 – 900. These are the same group of people that produced the remarkable clay masks found near Lydenburg in the 1960s.

These settlements seems to have been followed at a slightly later date by settlements linked to the Eiland Phase of the EIA (c. AD 1000).

The last period of pre-colonial occupation consisted of Pedi-related and Swazi-speaking and Ndebele-speaking people that settled on stone-walled terraced sites at the foot on the mountains. At present it is not clear, but, judged on the pottery found here, these sites might even date to early historic times.

As this was a period of population movement, conflict and change, it in large part set the scene for the current population situation in the country. Considering the time period that they were occupied, they also feature in the early historic period. These sites are therefore viewed to have medium significance and would require mitigation.

The historic period started c. 1840s, with the arrival of the first white settlers. Negotiations between the trekkers and the Pedi resulted in the Steelpoort River becoming the border between the two groups. Later, tension developed between the two groups, giving rise to armed conflict. One of the better-

known incidents is the so-called Sekhukhune Wars (1876, 1879). Remains if this event can still be found in the larger geographical region. Another event that took place in the area, was the so-called Mapoch Wars (1863, 1883)

As time went by, the area was divided into farms. At first people were slow to undertake any development, preferring to use the farms for winter grazing as to summers were to hot. In such cases, they established extensive camps and existed by hunting. It was only later that they started with crop farming. This was followed by a period when farmsteads developed, as well as infrastructure (e.g. roads). Many of these farms have been in the ownership of the same families for generations. As a result, they possess a large corpus of information with regarding to the area and

4.3 **Description of affected environment**

Upper area

For the upper area, probably because it is much colder in winter, no sites of cultural significance were identified. Currently, this area is mostly used for grazing, with small sections that was used as agricultural fields.

- Construction village: clear
- Construction yard: clear
- Upper reservoir area: clear

Valley area

A variety of sites occur here (see Appendix 2 for a discussion of each of them)

- Construction village: clear
- Alternative construction yard: clear
- Construction yard: sites 14 & 15
- Construction yard, powerhouse and tunnel: site 3
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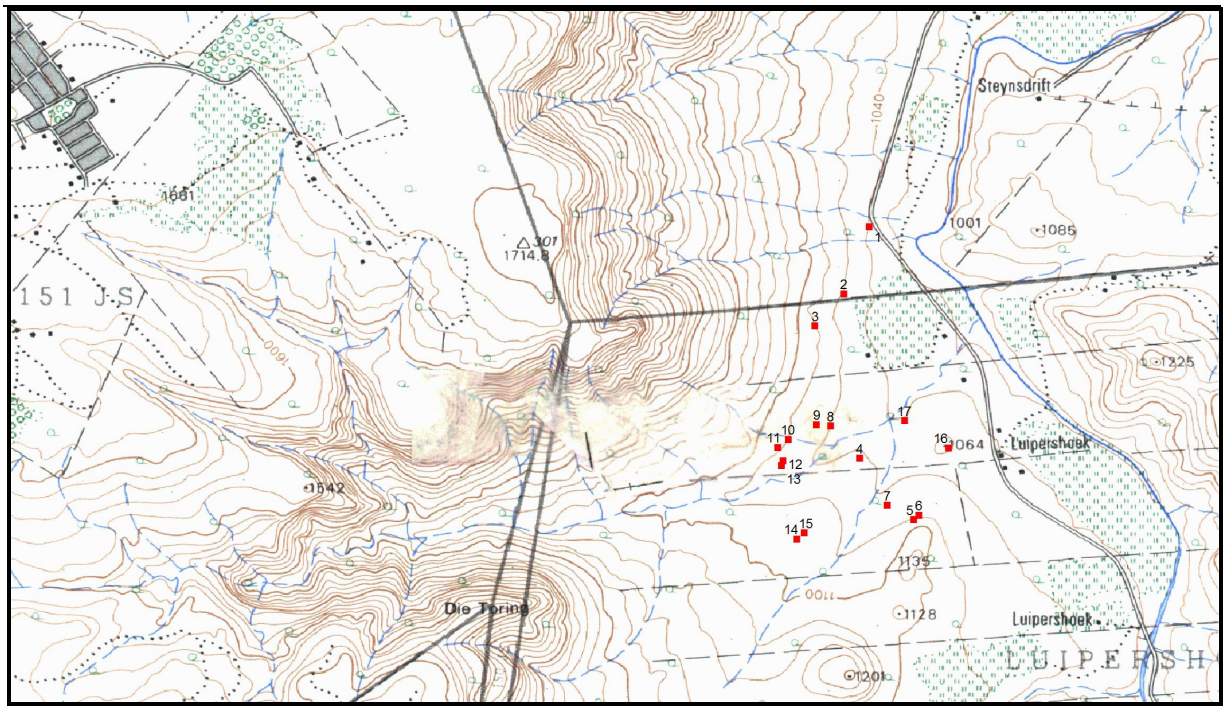

Figure 3. The study area, showing the identified sites (Map, courtesy of the Government Printer)

5. SITE SIGNIFICANCE AND ASSESSMENT

Impact analysis of cultural resources under threat of the proposed development, are based on the present understanding of the development.

The **significance** of a heritage site and artefacts is determined by it historical, social, aesthetic, technological and scientific value in relation to the uniqueness, condition of preservation and research potential. It must be kept in mind that the various aspects are not mutually exclusive, and that the evaluation of any site is done with reference to any number of these.

Sites regarded as having low significance are viewed as been recorded in full after identification and would require no further mitigation. Impact from the development would therefore be judged to be low. Sites with a medium to high significance would therefore require mitigation. Mitigation, in most cases the excavation of a site, is in essence destructive and therefore the impact can be viewed as high and as permanent.

6. IDENTIFICATION OF RISK RESOURCES

An Environmental Impact Assessment is focused on two phases of a proposed development: **the construction** and **operation phases**. However, from a cultural heritage perspective, this distinction does not apply. Heritage sites are fixed features in the environment, occurring within specific spatial confines. Any impact upon them is permanent and non-reversible. Those resources that cannot be avoided and that are directly impacted by the development can be excavated/recorded and a management plan can be developed for future action. Those sites that are not impacted, can be written into the management plan, whence they can be avoided or cared for in the future.

Construction phase:

Possible Risks	**Source of the risk**
Actually identified risks	
- damage to sites	Construction work
Anticipated risks	
- looting of sites	Curios workers

Operation phase:

Possible Risks	**Source of the risk**
Actually identified risks	
- damage to sites	Not keeping to management plans
Anticipated risks	
- damage to sites	Unscheduled construction/developments

7. CONCLUSION

The aim of the survey was to locate, identify, evaluate and document sites, objects and structures of cultural importance found within the boundaries of the area in which it is proposed to develop the pumped storage scheme.

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8. REFERENCES

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9. PROJECT TEAM

J van Schalkwyk: principal investigator
S Moifatswane: field surveyor

APPENDIX 1: STANDARDIZED SET OF CONVENTIONS USED TO ASSESS THE IMPACT OF PROJECTS ON CULTURAL RESOURCES

Significance

The *significance* of the sites and artefacts are determined by means of their historical, social, aesthetic, technological and scientific value in relation to their uniqueness, condition of preservation and research potential. It must be kept in mind that the various aspects are not mutually exclusive, and that the evaluation of any site is done with reference to any number of these.

Matrix used for assessing the significance of each identified site/feature

1. Historic value			
Is it important in the community, or pattern of history			
Does it have strong or special association with the life or work of a person, group or organisation of importance in history			
Does it have significance relating to the history of slavery			
2. Aesthetic value			
It is important in exhibiting particular aesthetic characteristics valued by a community or cultural group			
3. Scientific value			
Does it have potential to yield information that will contribute to an understanding of natural or cultural heritage			
Is it important in demonstrating a high degree of creative or technical achievement at a particular period			
4. Social value			
Does it have strong or special association with a particular community or cultural group for social, cultural or spiritual reasons			
5. Rarity			
Does it possess uncommon, rare or endangered aspects of natural or cultural heritage			
6. Representivity			
Is it important in demonstrating the principal characteristics of a particular class of natural or cultural places or objects			
Importance in demonstrating the principal characteristics of a range of landscapes or environments, the attributes of which identify it as being characteristic of its class			
Importance in demonstrating the principal characteristics of human activities (including way of life, philosophy, custom, process, land-use, function, design or technique) in the environment of the nation, province, region or locality.			
7. Sphere of Significance	High	Medium	Low
International			
National			
Provincial			
Regional			

Local				
Specific community				
8. Significance rating of feature				
1.	Low			
2.	Medium			
3.	High			

Significance of impact:

- low where the impact will not have an influence on or require to be significantly accommodated in the project design
- medium where the impact could have an influence which will require modification of the project design or alternative mitigation
- high where it would have a "no-go" implication on the project regardless of any mitigation

Certainty of prediction:

- Definite: More than 90% sure of a particular fact. Substantial supportive data to verify assessment
- Probable: More than 70% sure of a particular fact, or of the likelihood of that impact occurring
- Possible: Only more than 40% sure of a particular fact, or of the likelihood of an impact occurring
- Unsure: Less than 40% sure of a particular fact, or the likelihood of an impact occurring

Recommended management action:

For each impact, the recommended practically attainable mitigation actions which would result in a measurable reduction of the impact, must be identified. This is expressed according to the following:

1 = no further investigation/action necessary

2 = controlled sampling and/or mapping of the site necessary

3 = preserve site if possible, otherwise extensive salvage excavation and/or mapping necessary

4 = preserve site at all costs

5 = formalise cemetery or, alternatively, relocate graves if need be

Legal requirements:

Identify and list the specific legislation and permit requirements which potentially could be infringed upon by the proposed project, if mitigation is necessary.

APPENDIX 2. LIST OF IDENTIFIED SITES

1. Location: Steynsdrift 145JS: S 25.11573; E 29.82616
Description: Stone walled site, with terracing and a cattle kraal in front. It probably dates to the Late Iron Age, early historic period.
Discussion: This site is located outside the development area. However, as it is close to the road, it would have to be considered if the road is upgraded.
Evaluation of significance: Low on a regional basis
Significance of impact: Low
Certainty of prediction: Possible
Recommended management action: 1 = no further investigation/action necessary
Legal requirements: SAHRA permit

2. Location: Steynsdrift 145JS: 25.11971; E 29.82468
Description: This is a small site but shows similar characteristics that the first. Its centres around the above coordinate, from where it stretches in all directions for at least 60 metres. It probably dates to the early historic period.
Discussion: It is not sure if this site would be impacted on by the proposed development
Evaluation of significance: Low on a regional basis
Significance of impact: Medium
Certainty of prediction: Possible
Recommended management action: 2 = controlled sampling and/or mapping of the site necessary
Legal requirements: SAHRA permit

3. Location: Luipershoek 149JS: S 25.12160; E 29.82296
Description: This site is very large, containing a number of terraces, a gathering place or courtyard for men and a cattle kraal. It centres around the above coordinates for at least 150 metres in all directions, i.e. it has a north-south as well as east-west axis of at least 300 metres. It probably dates to the Late Iron Age, early historic period.
Discussion: This site would probably be impacted on during construction activities.
Evaluation of significance: Medium on a regional basis
Significance of impact: High
Certainty of prediction: Possible
Recommended management action: 2 = controlled sampling and/or mapping of the site necessary
Legal requirements: SAHRA permit

Figure 4. Some of the stone walled features found on the site.

4. Location: Luipershoek 149JS: S 25.12944; E 29.82561

Description: Stone walled site, with cattle kraal and courtyard. It is quite extensive. The above coordinate indicated the centre of the site, which extends in all directions for approximately 40 metres. It probably dates to the Late Iron Age, early historic period.

Discussion: This site would be impacted on by the development of the lower reservoir.

Evaluation of significance: Medium on a regional level

Significance of impact: High

Certainty of prediction: Definite

Recommended management action: 2 = controlled sampling and/or mapping of the site necessary

Legal requirements: SAHRA permit

5. Location: Luipershoek 149JS: S 25.13308; E 29.82882

Description: Two or three graves, one with a marble headstone that was added only recently. The dates indicated are 1801 to 1900. These graves can probably be associated with the site described in no. 6 below. Due to the dense vegetation, it is difficult to determine the exact number.

Discussion: This site is probably located just outside of the area of impact

Evaluation of significance: High for a specific community

Significance of impact: High

Certainty of prediction: Possible

Recommended management action: 5 = formalise cemetery or, alternatively, relocate graves if need be

Legal requirements: Notification, consultation, permits, SAHRA permit

(Photo, courtesy of Bohlweki)

6. Location: Luipershoek 149JS: S 25.13282; E 2982912

Description: The above coordinate is approximate in the centre of the site, which stretched in an east-west direction, following the contour, around the hill for at least 200 metres in both directions. It is approximately 50 metres wide. The graves identified in no. 5 above, can probably be associated with this site. It probably dates to the Late Iron Age, early historic period.

Discussion: This site is probably on the edge of the lower reservoir development and would therefore be impacted on.

Evaluation of significance: Medium on a regional basis

Significance of impact: High

Certainty of prediction: Possible

Recommended management action: 2 = controlled sampling and/or mapping of the site necessary

Legal requirements: SAHRA permit

7. Location: Luipershoek 149JS: S 25.13223, E 29.82725

Description: Two lower grinding stones. No other context; it is located in a small stream bed.
Discussion: These two stones were probably removed by somebody from their original context and then dumped.
Evaluation of significance: Low on a regional level
Significance of impact: High
Certainty of prediction: Definite
Recommended management action: 1 = no further investigation/action necessary
Legal requirements: None

8. Location: Luipershoek 149JS: S 25.12753; E 29.82388
Description: An ash midden with potsherds. However, it is difficult to determine its extent and significance due to the dense vegetation.
Discussion: This site will be impacted on by the lower reservoir
Evaluation of significance: Low on a regional basis
Significance of impact: High
Certainty of prediction: Definite
Recommended management action: 2 = controlled sampling and/or mapping of the site necessary
Legal requirements: SAHRA permit

9. Location: Luipershoek 149JS: S 25.12746; E 29.82305
Description: An ash midden with potsherds. However, it is difficult to determine its extent and significance due to the dense vegetation.
Discussion: This site will be impacted on by the lower reservoir
Evaluation of significance: Low on a regional basis
Significance of impact: High
Certainty of prediction: Definite
Recommended management action: 2 = controlled sampling and/or mapping of the site necessary
Legal requirements: SAHRA permit

10. Location: Luipershoek 149JS: S 25.12833; E 29.82137
Description: An ash midden with potsherds. Some terracing occurs in front of it. However, it is difficult to determine its extent and significance due to the dense vegetation.
Discussion: This site will be impacted on by the lower reservoir
Evaluation of significance: Low on a regional basis
Significance of impact: High
Certainty of prediction: Definite
Recommended management action: 2 = controlled sampling and/or mapping of the site necessary
Legal requirements: SAHRA permit

Showing the terracing on the site.

11. Location: Luipershoek 149JS: S 25.12880; E 29.82075

Description: Terracing, with some potsherds. However, it is difficult to determine its extent and significance due to the dense vegetation.
Discussion: This site will be impacted on by the lower reservoir
Evaluation of significance: Low on a regional basis
Significance of impact: High
Certainty of prediction: Definite
Recommended management action: 2 = controlled sampling and/or mapping of the site necessary
Legal requirements: SAHRA permit

12. Location: Luipershoek 149JS: S 25.12960; E 29.82107
Description: Terracing with some potsherds. However, it is difficult to determine its extent and significance due to the dense vegetation.
Discussion: This site will be impacted on by the lower reservoir
Evaluation of significance: Low on a regional basis
Significance of impact: High
Certainty of prediction: Definite
Recommended management action: 2 = controlled sampling and/or mapping of the site necessary
Legal requirements: SAHRA permit

13. Location: Luipershoek 149JS: S 25.12987; E 29.82096
Description: Terracing, with additional stone walling and some potsherds. However, it is difficult to determine its extent and significance due to the dense vegetation.
Discussion: This site will be impacted on by the lower reservoir
Evaluation of significance: Low on a regional basis
Significance of impact: High
Certainty of prediction: Definite
Recommended management action: 2 = controlled sampling and/or mapping of the site necessary
Legal requirements: SAHRA permit

14. Location: Luipershoek 149JS: S 25.13423; E 29.82188
Description: An ash midden with potsherds. However, it is difficult to determine its extent and significance due to the dense vegetation.
Discussion: This site will be impacted on by the construction yard
Evaluation of significance: Low on a regional basis
Significance of impact: High
Certainty of prediction: Definite
Recommended management action: 2 = controlled sampling and/or mapping of the site necessary
Legal requirements: SAHRA permit

15. Location: Luipershoek 149JS: S 25.13387; E 29.82231

Description: An ash midden with potsherds. However, it is difficult to determine its extent and significance due to the dense vegetation.
Discussion: This site will be impacted on by the construction yard
Evaluation of significance: Low on a regional basis
Significance of impact: High
Certainty of prediction: Definite
Recommended management action: 2 = controlled sampling and/or mapping of the site necessary
Legal requirements: SAHRA permit

16. Location: Luipershoek 149JS: S 25.12884; E 29.83087
Description: An ash midden with potsherds. However, it is difficult to determine its extent and significance due to the dense vegetation.
Discussion: This site probably falls just outside the lower reservoir
Evaluation of significance: Low on a regional basis
Significance of impact: High
Certainty of prediction: Possible
Recommended management action: 2 = controlled sampling and/or mapping of the site necessary
Legal requirements: SAHRA permit

17. Location: Luipershoek 149JS: S 25.12722; E 29.82828
Description: Section of an old water furrow.
Discussion: This site will be impacted on by the lower reservoir
Evaluation of significance: Low on a regional basis
Significance of impact: High
Certainty of prediction: Definite
Recommended management action: 2 = controlled sampling and/or mapping of the site necessary
Legal requirements: SAHRA permit

APPENDIX 3: IMPACT ASSESSMENT RATINGS

Rating matrix for heritage impacts	
Criteria	Rating
Extent	2
Duration	4
Intensity	3
Probability of occurrence	3
Total	12
Mitigation and management measures - excavation and mapping of sites - shifting of development/infrastructure to avoid sites - formalising sites by fencing them in	
Criteria	Rating
Extent	2
Duration	4
Intensity	2
Probability of occurrence	3
Total	11