PROPOSED EXPANSION OF KEMPDALE DAM, KOKSTAD, KWAZULU-NATAL

Phase 1 Heritage Impact Assessment

15 April 2021

FOR: **ENVIROPRO**
Chevy Smith

AUTHOR: JLB Consulting
Jean Beater

EXECUTIVE SUMMARY

The applicant, the Harry Gwala District Municipality, proposes to expand the existing Kempdale Dam located on Portions 10 of Farm Bad Fontein No. 241 and Zon-Fontein No 257. The height of the existing dam wall will be increased and the dam will have a total surface area of approximately 42ha, an increase of 29ha. The capacity of the dam will increase from 215 055m3 to 2 140 000m3 of water. The dam will primarily be used to supply water to Kokstad Town.

The total surface area of the dam will be approximately 42ha (420000 m²) hence it hence it triggers sections 41 (1)(c)(i) of the KwaZulu-Natal Amafa and Research Institute Act, 2018 (Act No 5 of 2018) which lists developments that may require a heritage impact assessment. Section 41 (1)(c) refers to any development or other activity which will change the character of a site– (i) exceeding 5000 m² in extent.

An inspection of the dam and area to be inundated was undertaken on 16 March 2021. Visibility was poor due to the dense vegetation and grass cover.

A study of early aerial images of the section of the Mzintlava River where the dam is now located shows occupation of the area since the earliest image of 1952. The image shows dwellings in the bend of the river, as well as outside the dam area and extensive cultivation within the bend of the river and immediately north of the river as well as stone walling within and without the area of expansion of the dam especially on the southern and eastern sides of the river. By 1978, images show that large sections of the stone walling on the eastern and southern banks of the river had disappeared.

During the inspection, the location of a grave was pointed out to the specialist. The grave is located below the farmhouse and is outlined with stone. It is situated on the boundary fence between the garden and fields that lead down to the dam. About 6m behind and west of the grave, the remains of stonewalling that now form part of the garden of the farmhouse were found.

More stone walling was found crossing the rocky outcrop which is located approximately 40m north of the grave. Beyond the rocky outcrop, the vegetation was so dense that no heritage sites were visible during the site inspection.

On the eastern and southern banks of the dam three stone walls were found during the inspection which were in fair condition but disturbed by human and animal activity.

The fossil sensitivity map indicates that the project area falls into a zone of insignificant/zero palaeontological sensitivity. Only a very small area of the most northern section of the expansion falls into an area of very high fossil sensitivity. Inundation should not damage fossils neither will they be accessible therefore it is recommended that no further palaeontological studies are needed.

The grave pointed out to the specialist is protected by section 39 (1) of the KwaZulu-Natal Amafa and Research Institute Act, which refers to the general protection of informal and private burial grounds. No mitigation measures are required as the grave is situated outside the proposed expansion extent of the dam. Flooding of the grave is unlikely but the location of the grave must be kept in mind when plans are made in the future to expand the dam.

The low stone walling found in the project area are protected in terms of section 40 of the above Act that refers to the protection of archaeological sites. The expansion of the dam will lead to the inundation of sections of the stone walls which will lead to damage or alteration of the walls. The application process to the Institute for permission to alter / destroy sections of the stone walling must follow the process as set out in Section 5 of the KwaZulu-Natal Heritage Regulations.

Due to the extremely dense vegetation in the area north of the rocky outcrop located near the farm houses, it is recommended that once the vegetation has been either cleared, burnt or has reduced naturally in density the specialist undertake a follow-up inspection to establish if there are any heritage sites in this area prior to inundation.

TABLE OF CONTENTS

FIGURES

TABLES

I, Jean Beater, act as an independent specialist for this project and I do not have any vested interest either business, financial, personal or other, in the proposed activity other than remuneration for work performed in terms of the Environmental Impact Assessment Regulations, 2014.

SPECIALIST DETAILS

Name	Qualification	Professional Registration
Jean Beater	MA (Heritage Studies) MSc (Environmental Management)	Member of Association of South African Professional Archaeologists (No. 349) Member of IAIAsa (No. 1538)

1. INTRODUCTION

The applicant, the Harry Gwala District Municipality, proposes to expand the existing Kempdale Dam on Portions 10 of Farm Bad Fontein No. 241 and Zon-Fontein No 257. The height of the existing dam wall will be increased from 4m to 8m and the dam will have a total surface area of approximately 42ha, an increase of 29ha. The capacity of the dam will increase from 215 055m3 to 2 140 000m3 of water. The dam will primarily be used to supply water to Kokstad Town.

The Phase I HIA was undertaken to assess whether any heritage resources will be impacted by the proposed expansion of the dam.

2. LEGISLATIVE BACKGROUND

The total surface area of the dam will be approximately 42ha (420000 m²) hence it hence it triggers sections 41 (1)(c)(i) of the KwaZulu-Natal Amafa and Research Institute Act, 2018 (Act No 5 of 2018) which lists developments or activities that may require an HIA. Section 41 (1)(c) refers to: "any development or other activity which will change the character of a site– (i) exceeding 5000 m² in extent".

The project may also impact graves, structures, archaeological and palaeontological resources that are protected in terms of sections 37, 38, 39, and 40 of the KwaZulu-Natal Amafa and Research Institute Act, 2018.

In terms of section 3 of the NHRA, heritage resources are:
(a) places, buildings, structures and equipment of cultural significance;
(b) places to which oral traditions are attached or which are associated with living heritage;
(c) historical settlements and townscapes;
(d) landscapes and natural features of cultural significance;
(e) geological sites of scientific or cultural importance;
(f) archaeological and paleontological sites;
(g) graves and burial grounds, including—
    (i) ancestral graves;
    (ii) royal graves and graves of traditional leaders;
    (iii) graves of victims of conflict;
    (iv) graves of individuals designated by the Minister by notice in the *Gazette*;
    (v) historical graves and cemeteries; and

(vi) other human remains which are not covered in terms of the Human Tissue Act, 1983 (Act No. 65 of 1983);

(h) of significance relating to the history of slavery in South Africa;

(i) movable objects, including:

(i) objects recovered from the soil or waters of South Africa, including archaeological and palaeontological objects and material, meteorites and rare geological specimens;

(ii) objects to which oral traditions are attached or which are associated with living heritage;

(iii) ethnographic art and objects;

(iv) military objects;

(v) objects of decorative or fine art;

(vi) objects of scientific or technological interest; and

(vii) books, records, documents, photographic positives and negatives, graphic, film or video material or sound recordings, excluding those that are public records as defined in section 1(xiv) of the National Archives of South Africa Act, 1996 (Act No. 43 of 1996).

3. LOCATION

The dam is located on the Mzintlava River and is situated approximately 4km east of the centre of Kokstad Town (**Figure 1**). **Figure 2** shows a closer image of the dam with the proposed expansion / dam level outlined in yellow.

4. TERMS OF REFERENCE

Undertake a Phase 1 Heritage Impact Assessment in order to determine the possible existence of heritage resources, as listed above, that could be impacted by the proposed expansion of the dam. Provide mitigation measures to limit or avoid the impact of the proposed project on heritage resources (if any).

Submit the HIA report to the provincial heritage resources authority, the KwaZulu-Natal Amafa and Research Institute (hereafter referred to as the Institute), for their assessment and comment

Figure 1: Overview of Kempdale Dam in relation to Kokstad Town

Figure 2: View of dam and proposed expansion

5. METHODOLOGY AND CONSTRAINTS

A survey of literature, including other heritage impact assessment reports that may have been completed for the larger area, was undertaken in order to ascertain the history of the area and what type of heritage resources have or may be found in the area of development.

In addition, historical aerial images and topographic maps of the dam were consulted. These images and maps were obtained from the Department of Rural Development and Land Reform's CDNGI Geospatial Portal (www.cdngiportal.co.za).

An inspection of the dam and area to be inundated was undertaken on 16 March 2021. Visibility was poor due to the dense vegetation and grass cover.

6. HISTORICAL BACKGROUND OF PROJECT SITE AND SURROUNDING AREA

According to Active Heritage (2017:6-7), the occurrence of Early Stone Age tools such as hand axes in areas below the 1 800 m contour suggests that the first inhabitants of the wider area predated modern humans by at least 800 000 years. Early Stone Age sites have been recorded in the foothills of the southern Drakensberg. One site occurs at Kruisspruit in the Greater Kokstad area. Kruisspruit is situated north-east of and several kilometres from the Kempdale Dam.

Four Middle Stone Age sites occur within the greater Kokstad area and eleven Later Stone Age sites occur within the Kokstad area. None are known to be located close to the dam. A total of fifty-five rock art sites have been recorded in the greater Kokstad area with the vast majority of these occurring to the west of Kokstad in the foothills of the Maloti Drakensberg mountains (Active Heritage 2017:9).

Although the archaeology of the Kokstad area in the KwaZulu Natal province has not been fully studied but is associated with Nguni speakers. Therefore, in order to comprehend the archaeology, reference has to made to the archaeology of the greater KwaZulu Natal Province. The Iron Age communities (also referred to as farming communities) only arrived in modern day South Africa approximately 2000 years ago. In KwaZulu-Natal, farming communities only arrived around AD1300. The subsistence of these communities was partly anchored on iron tool production and the resulting tools were either used domestically or as trade goods. The farming communities typically built stone walled sites in low lying areas such as of the foot of hills or cliffs.

In KwaZulu-Natal, the stone walled structured have been designated the “Moor Park” stone structures and have been associated with Nguni speakers (Muroyi 2020:16). Rough stone walling where often used by farming communities to enclose areas of several hectares for cattle keeping and cultivation of crops (Mitchell 2002:348).

Under Adam Kok III, the Griqua trekked from the vicinity of Philippolis in the Free State after losing their lands to the Voortrekkers. In 1862, after crossing the Drakensberg they settled on the slopes of a mountain which they named after Sir Walter Currie who had supported them in settling in the area. The site of Kok’s laager when he first settled in the area is about 5km north-west of the dam. The area where they settled was referred to as ‘No-Man’s’ land located between the then Cape and Natal colonies (Bulpin 1986: 480; Reader’s Digest 1992:190). In September 1869, Adam Kok founded Kokstad as the capital of Griqualand East on the banks of the Mzintlava River. The Griqua’s independence was short-lived as East Griqualand area was annexed in 1874 by the Cape Colony. On the 5th of April 1892, Kokstad became a municipality.

7. RESULT OF SITE INSPECTION

A study of early aerial images of the section of the Mzintlava River where the dam is now located shows occupation of the area since the earliest image of 1952 (ref: 220_019_38524), the relevant section of which is shown below. The image shows dwellings in the area in the bend of the river, as well as outside the dam area and extensive cultivation within the bend of the river and immediately north of the river. The image also shows stone walling within and without the area of expansion of the dam especially on the southern and eastern sides of the river. The stone walling is even more visible in the 1955 image of the area as shown in **Figure 4** below (ref.: 358_009_05254).

By 1978, much of the stone walling on the eastern and southern banks of the river has disappeared as can be seen in **Figure 5** and more structures are visible within the bend of the river. Extensive cultivation of the area is ongoing.

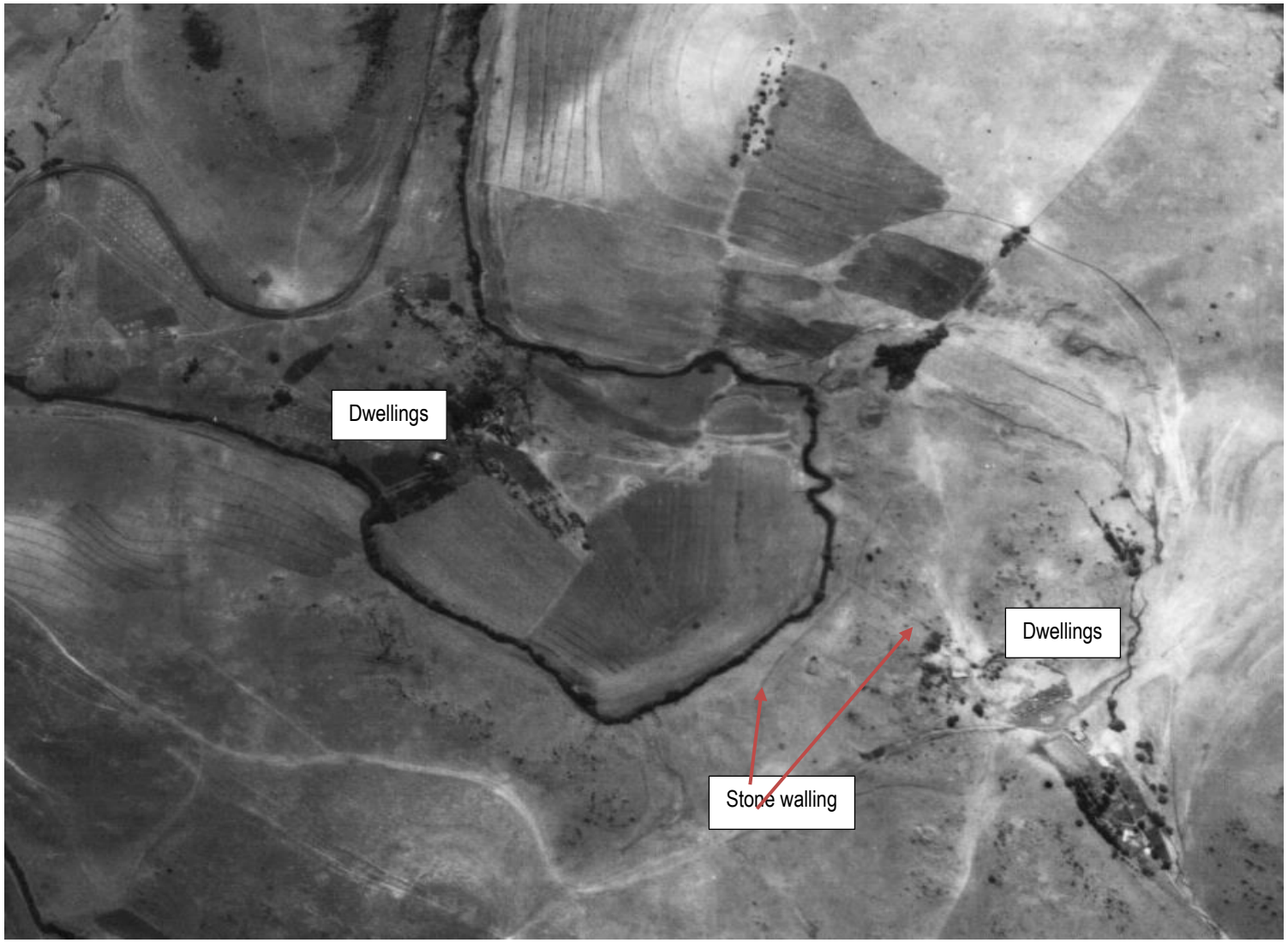


Figure 3: 1952 aerial image of Mzintlava River where dam now stands and surrounding area

Figure 4: 1955 aerial photograph of Mzintlava River and surrounding area

Figure 5: 1978 aerial image of Mzintlava River and surroundings

Mrs Bosman, who has lived on the farm for over 22 years, said that the stone walling and the grave mentioned below were there when her father-in-law bought the farm about 50 years ago. The 1963 topographical map (3029CB) (**Figure 7**) of the area of the dam shows a number of structures in the bend of the river as well as a kraal / homestead north of the farmhouses and the rocky outcrop. According to the Mrs Bosman, the remains of a kraal can be found on the top of the rocky outcrop north of the farmhouses but this was not found during the inspection due to the thick vegetation cover. The site of this kraal is situated well away from the proposed expansion level.

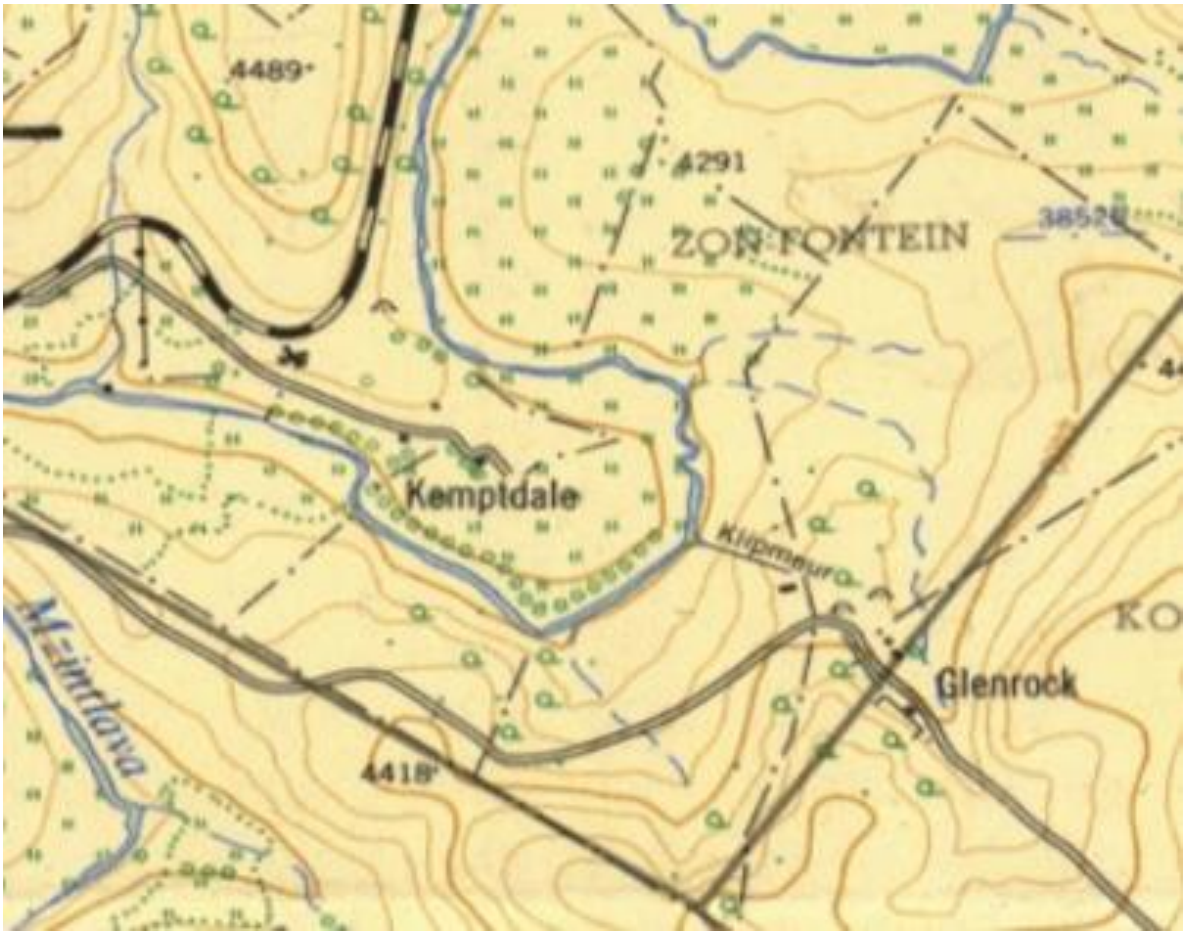


Figure 6: Relevant section of topographical map showing area where dam is now located

During the inspection, the location of a grave was pointed out to the specialist by the landowner of the property. The grave (**Figure 7**) is located below the farmhouse and is outlined with stone. It is situated on the boundary fence between the garden and fields that lead down to the dam.

About 6m behind and west of the grave, the remains of stonewalling that now form part of the garden of the farmhouse were found. The wall stretches for several metres in a roughly north-south direction.

Figure 7: Single grave outlined with stone

Figure 8: Remains of stonewalling in garden

More stone walling was found crossing the rocky outcrop which is located approximately 40m north of the grave described above. Beyond the rocky outcrop, the vegetation was so dense that

no heritage sites were observed; however, due to the presence of a kraal / homestead as indicated in **Figure 6**, as well as the presence of a single grave in fairly close proximity, it is recommended that prior to inundation and once the vegetation is less dense or has been burnt or cleared, the specialist return to the area in order to establish if there are any heritage resources (such as graves, or remains of the homestead) in the area north of the rocky outcrop until the northern end of the dam.

Figure 9: Northern banks of dam

Figure 10: Quarry located close to dam wall

Figure 11: View of dam wall

On the southern bank of the dam, there has been cultivation of a portion of the area about 180m east of the dam wall. The remains of the terracing of the fields can still be seen. Further east of this area, three stone walls were found during the inspection which were in fair condition but with disturbance from human and animal activity.

Figure 12: Section of stone walling

Figure 13: View of section of stone walling

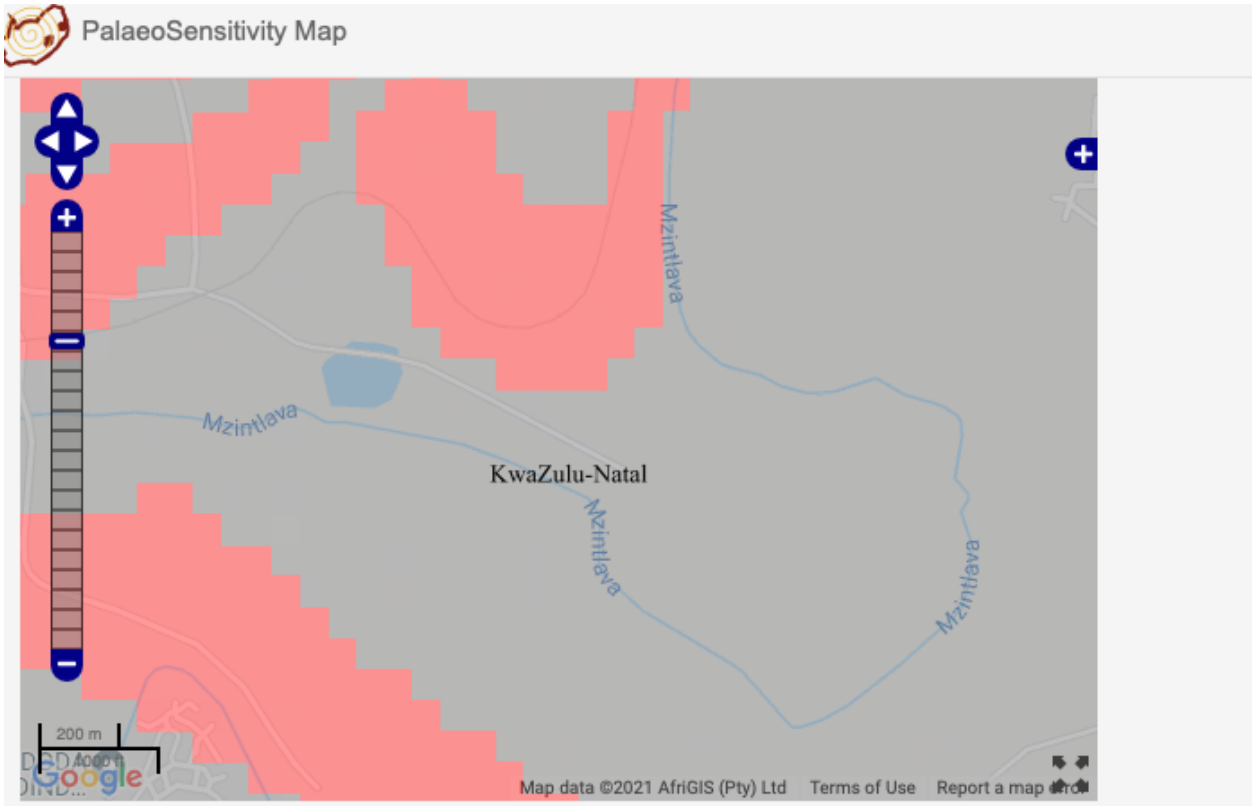
The heritage sites found during the site inspection are listed in **Table 1** below.

Table 1: Heritage sites found during inspection

COORDINATES	DESCRIPTION	MITIGATION
30˚32'04.1'' S 29˚27'55.1'' E	Single grave (**Figure 7**); high heritage significance	At this stage, no mitigation as grave falls outside dam expansion level
30˚32'04.5'' S 29˚27'54.8'' E	Stone walling (**Figure 8**); low heritage significance	None required as stone walling falls outside dam expansion level
30˚32'01.2'' S 29˚27'53.4'' E	Stone walling crossing rocky outcrop towards dam / river; low heritage significance	None required as stone walling falls outside dam expansion level
30˚31'59.3'' S 29˚27'50.6'' E	Stone walling crossing rocky outcrop towards dam / river; low heritage significance	None required as stone walling falls outside dam expansion level
30˚32'17.3'' S 29˚27'44.9'' E	Remains of stone walling (**Figure 12**). Low heritage significance but protected by KZN Heritage Act	A section of the wall falls within dam expansion level hence this section will be inundated; permit to be obtained from the Institute prior to inundation.
30˚32'26.7'' S 29˚28'00.4'' E	Remains of stone walling (**Figure 13**). Low heritage significance, protected by KZN Heritage Act	A section of the wall falls within dam expansion level hence will be inundated; permit to be obtained prior to inundation.

30˚32'15.9'' S 29˚28'18.2'' E	Fairly intact stone wall about 180 m in length. Low to moderate heritage significance, protected by KZN Heritage Act	Small section of wall will be inundated by dam. Permit to be obtained prior to inundation

The fossil sensitivity map of the South Africa indicates that the project area falls into a zone of insignificant/zero palaeontological sensitivity as indicated with the grey colour on **Figure 14**. Only a very small area of the most northern section of the expansion falls into an area of very high fossil sensitivity. Inundation should not damage fossils neither will they be accessible therefore it is recommended that no further palaeontological studies are needed.



1 in 250 000 geological formation layers are courtesy of the Council for GeoScience

For more information, go to How to Use the Palaeontological (fossil) Sensitivity Map

Colour	Sensitivity	Required Action
RED	VERY HIGH	field assessment and protocol for finds is required
ORANGE/YELLOW	HIGH	desktop study is required and based on the outcome of the desktop study, a field assessment is likely
GREEN	MODERATE	desktop study is required
BLUE	LOW	no palaeontological studies are required however a protocol for finds is required
GREY	INSIGNIFICANT/ZERO	no palaeontological studies are required
WHITE/CLEAR	UNKNOWN	these areas will require a minimum of a desktop study. As more information comes to light, SAHRA will continue to populate the map.

Figure 14: Fossil sensitivity of dam expansion

8. ASSESSMENT OF SIGNIFICANCE

The assessment of impacts has considered the direct, indirect and cumulative impacts of heritage resources identified during the Phase 1 HIA study in terms of the following criteria:

- The **nature**, which shall include a description of what causes the effect, what will be affected and how it will be affected.
- The **extent**, wherein it will be indicated whether the impact will be local (limited to the immediate area or site of development) or regional, and a value between 1 and 5 will be assigned as appropriate (with 1 being low and 5 being high).
- The **duration**, wherein it will be indicated whether:
    - the lifetime of the impact will be of a very short duration (0–1 years) – assigned a score of 1;
    - the lifetime of the impact will be of a short duration (2-5 years) - assigned a score of 2;
    - medium-term (5–15 years) – assigned a score of 3;
    - long term (> 15 years) - assigned a score of 4; or
    - permanent - assigned a score of 5;
- The **magnitude**, quantified on a scale from 0-10, where 0 is small and will have no effect on the environment, 2 is minor and will not result in an impact on processes, 4 is low and will cause a slight impact on processes, 6 is moderate and will result in processes continuing but in a modified way, 8 is high (processes are altered to the extent that they temporarily cease), and 10 is very high and results in complete destruction of patterns and permanent cessation of processes.
- The **probability** of occurrence, which shall describe the likelihood of the impact occurring. Probability will be estimated on a scale of 1–5, where 1 is very improbable (probably will not happen), 2 is improbable (some possibility, but low likelihood), 3 is probable (distinct possibility), 4 is highly probable (most likely) and 5 is definite (impact will occur regardless of any prevention measures).
- The **significance**, which shall be determined through a synthesis of the characteristics described above and can be assessed as low, medium or high; and
- The **status**, which will be described as either positive, negative or neutral.
- The degree to which the impact can be mitigated.

The following formula was applied to calculate the impact significance after the factors were ranked for each impact: SP = (magnitude + duration + scale) x probability.

The significance weightings for each potential impact are as follows:

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

It should be noted that the assessment below is based on the sites found during the site inspection. Any follow-up inspections may reveal sites, such as graves, that may be directly impacted by the dam expansion which will in turn lead to the assessment below changing.

Table 2: Impact on graves

Nature: Alteration, damage, destruction or inundation of graves		
	Without mitigation	***With mitigation***
Extent	*Local (1)*	*Local (1)*
Duration	*Permanent (5)*	*Permanent (5)*
Magnitude	*Minor (2)*	*Minor (2)*
Probability	*Improbable (2)*	*Improbable (2)*
Significance	***16 (Low)***	***16 (Low)***
Status (positive or negative)	*Negative*	*Negative*
Reversibility	*None*	*Low*
Irreplaceable loss of resources	*Yes*	*Yes*
Can impacts be mitigated?	*Yes*	
Mitigation measures • *The location of the grave must be kept in mind when future plans are made to expand the dam further.*		
Cumulative impacts: *Low*		

Table 3: Impact on archaeological sites

Nature: Alteration, damage, destruction or inundation of graves		
	Without mitigation	***With mitigation***
Extent	*Local (1)*	*Local (1)*
Duration	*Permanent (5)*	*Permanent (5)*
Magnitude	*Moderate (6)*	*Low (4)*
Probability	*Definite (5)*	*Definite (5)*
Significance	***60 (Medium/high)***	***50 (Medium)***
Status (positive or negative)	*Negative*	*Negative*
Reversibility	*None*	*Low*
Irreplaceable loss of resources	*Yes*	*Yes*
Can impacts be mitigated?	*Yes*	
Mitigation measures • *Application to the Institute for permission to inundate sections of the stone walling. Inundation can only occur once permission is granted* • *Prior to inundation, the affected section of the stone wall must be documented and photographed and this record must be provided to the Institute for record keeping or any other institution as directed by the Institute.*		
Cumulative impacts: *Medium*		

9. DISCUSSION AND CONCLUSIONS

The grave pointed out to the specialist is protected by section 39 (1) of the KwaZulu-Natal Amafa and Research Institute Act, which refers to the general protection of informal and private burial grounds. In terms of sub-section (1) that states that no grave or burial ground older than 60 years, or deemed to be of heritage significance by a heritage authority –

(a) not otherwise protected by this Act; and

(b) not located in a formal cemetery managed or administered by a local authority, may be damaged, altered, exhumed, inundated, removed from its original position, or otherwise disturbed without the prior written approval of the Institute having been obtained on written application to the Institute and in terms of the regulations to this Act.

No mitigation measures are required as the grave is situated 67m from the expansion extent of the dam. Flooding of the grave is unlikely but the location of the grave must be kept in mind, when plans are made in the future to again expand the dam.

The low stone walling found in the project area are protected in terms of section 40 of the above Act that refers to the protection of archaeological sites. In terms of section 40 (1), no person may destroy, damage, excavate, alter, write or draw upon or otherwise disturbed any battlefield, archaeological site, rock art site, palaeontological site, historic fortification, meteorite or meteorite impact site without written permission of the Institute having been obtained on written application to the Institute. This refers the inundation of sections of the stone walls as inundation will lead to damage or alteration of the walls.

The application process to the Institute for permission to alter / destroy sections of the stone walling must follow the process as set out in Section 5 of the KwaZulu-Natal Heritage Regulations of 2012.

Due to the extremely dense vegetation in the area north of the rocky outcrop located near the farm houses, it is recommended that once the vegetation has been either cleared, burnt or has reduced naturally in density the specialist undertake a follow-up inspection to establish if there are any heritage sites in this area prior to inundation.

10. MITIGATION MEASURES

- For any chance heritage finds (graves, etc.), all work must cease in the area affected and the Contractor must immediately inform the Project Manager. A registered heritage specialist must be called to site to inspect the finding/s. The relevant heritage resource agency (the Institute) must be informed about the finding/s.
- The heritage specialist will assess the significance of the resource and provide guidance on the way forward.
- Permits must be obtained from the Institute if heritage resources are to be removed, destroyed or altered.
- Under no circumstances may any heritage material be destroyed or removed from site unless under direction of a heritage specialist.
- Should any recent remains be found on site that could potentially be human remains, the South African Police Service as well as the Institute must be contacted. No SAPS official may remove remains (recent or not) until the correct permit/s have been obtained.

11. REFERENCES

Bulpin, T.V. 1986. *Discovering Southern Africa*. Muizenberg: Treasury of Travel

Active Heritage. 2017. *Cultural Heritage Impact Assessment of the proposed R56 housing development 20MVA 132/22/11kV substation and 132kV turn-off lines at Kokstad, KwaZulu-Natal*

Department of Rural Development and Land Reform's CDNGI Geospatial Portal (www.cdngiportal.co.za)

Muroyi, R. 2020. *Phase 1 Heritage Impact Assessment for the proposed development of Makhoba cemetery site within Kokstad, Greater Kokstad Local Municipality, KwaZulu-Natal*

Reader's Digest. 1992. *Illustrated History of South Africa. The Real Story*. The Reader's Digest Association: Cape Town