# CREIGHTON BULK WATER SUPPLY SCHEME, HARRY GWALA DISTRICT MUNICIPALITY, KWAZULU-NATAL

## Phase 1 Heritage Impact Assessment

**June 2022**

**FOR:** Gedezar Consulting

**AUTHOR: JLB Consulting**
**Jean Beater**

# EXECUTIVE SUMMARY

Harry Gwala District Municipality is proposing to construct the Creighton Bulk Water Supply Scheme (BWSS) which aims to provide a safe and reliable source of potable water to the communities living in the project area. The current water resource supplying the Creighton area is insufficient to meet projected water demands. The project aims to increase the assurance of water supply for the area of Creighton and provide a long-term bulk water supply scheme that will be able to meet the current and future water demands.

The length of the pipeline routes associated with the project trigger section 41 (1)(a) 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)(a) refers to the construction of a road, wall, power line, pipeline, canal or other similar form of linear development or barrier exceeding 300m in length.

The project is located between the small town of Creighton and the settlement of Centocow in southern KwaZulu-Natal. An inspection of the Creighton BWSS was undertaken on 31 May 2022. The pipeline routes were inspected on foot as well as the abstraction point, Centocow Water Treatment Plant (WTP) and the proposed site for the storage reservoir. Visibility was good but there were a few sections that were overgrown with vegetation.

Both pipelines from the abstraction point are located to the west of the Centocow mission station thereby avoiding impacting several protected structures that form part of the historic mission station as well as a number of memorials. However, the pipelines are located within 10m of protected structures where the pipelines turn eastwards to reach the road that runs along the northern boundary of the Centocow settlement. The structures are fenced and appears to be used for carpentry purposes.

The pipeline routes below the mission to the abstraction point cross fallow land and a sports field. There is an existing pipeline that is close to the proposed pipeline route. Near the proposed abstraction point are the existing abstraction infrastructure as well as an abandoned structure which was a pump station with the original abstraction pipes still going into the Mzimkhulu River.

From the abstraction point, the pipeline route crosses the access bridge to Centocow and runs up to the road intersection before turning towards Creighton on the northern side of the road. The pipeline route runs on the northern side of the road through cultivated farm land, tree plantations and a very small number of undeveloped areas. There are also power lines and farm dams along the route and a number of roads are crossed. No heritage sites were found during the inspection.

The site of the proposed reservoir is currently used to grow maize and rye. A power line also crosses the site. It is highly disturbed and no heritage sites were found. The pipeline route through Creighton does not pass protected structures until the end of the pipeline. A protected structure is located 10m north of the pipeline.

According to the desktop palaeontological study, the project is located in the non-fossiliferous Jurassic dolerite and potentially highly fossiliferous Volksrust Formation. The Volksrust Formation is the upper part of the Ecca Group and is argillaceous, and the grey to black silty shale with thin, usually bioturbated siltstone or sandstone lenses and beds, occur mostly in the upper and lower boundaries. Surface activities may impact upon the fossil heritage if preserved in the development footprint. The geological structures suggest that the rocks are the right age to contain fossils. However, the material to be excavated is soil that does not preserve fossils. Since there is a small chance that fossils from the Volksrust Formation may be disturbed, it is recommended that a Fossil Chance Find Protocol is included in the EMPr for the BWSS. It was assessed that the impact to fossil heritage resources is extremely low.

The two pipelines between the abstraction point on the Mzimkhulu River and the Centocow WTP are located on the western side of the historic Centocow mission complex thereby avoiding most of the protected structures that form part of the complex. These structures are over 60 years in age and are therefore protected by section 37(1)(a) of the KwaZulu-Natal Amafa and Research Institute Act, 2018, which refers to the protection of structures that are or that may reasonably be expected to be older than 60 years. The pipelines are located close to protected structures where the pipelines bend to the east to run along the northern boundary of the mission. A buffer of at least 5m must be placed around these buildings so that there are no impacts from the installation of the pipelines.

An assessment of the significance of impacts of the project on protected structures especially in relation to the Centocow buildings concluded that the pre-mitigation impact will be medium where the impact could influence the decision to develop in the area. However, with the implementation of the mitigation measures recommended in Tables 1 and 2, the significance of impact rating drops to a low impact which should not influence the decision to proceed with the project.

The inspection of the pipeline route between Centocow and Creighton revealed no heritage resources apart from a protected structure that is located 10 m from the pipeline in Creighton. A buffer of at least 5m must be placed around the structure to avoid impacts to it by the construction of the BWSS.

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### Desktop palaeontological study

I, **Jean Lois 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)<br><br>MSc (Environmental Management) | Member of Association of South African Professional Archaeologists (No. 349)<br><br>Member of IAIAsa (No. 1538) |

# 1. INTRODUCTION

According to Gedezar Consulting (2022:1-2), Harry Gwala District Municipality is proposing to construct the Creighton Bulk Water Supply Scheme (BWSS) which aims to provide a safe and reliable source of potable water to the communities living in the project area. The current water resource supplying the Creighton area is insufficient to meet the projected water demands. The project aims to increase the assurance of water supply for the area of Creighton and provide a long-term bulk water supply scheme that will be able to meet the current and future water demands. The project intends to increase the level of infrastructure in the area in terms of water supply to meet the growing demands. The project will consist of the following:

| | |
|---|---|
| Centocow abstraction works upgrade | • Upgrade from 1.5 Mℓ/d to 5.0 Mℓ/d<br>• Existing intake structure and pump to sump<br>• New sump<br>• New high-lift pump station |
| Rising main (abstraction point to Centocow WTP) | • Raw water pipeline: 500mm Ø (Class 20)<br>• 1.2 km long @ 90m pumping head |
| Upgrade of Centocow WTP | • Upgrade from 1.5 Mℓ/d to 5.0 Mℓ/d |
| Clear water balancing and storage reservoir | • New water balancing and storage facility for Creighton<br>• Capacity: 3Mℓ<br>• Position: @ 1060mAMSL |
| Gravity main | • Clear water pipeline: 300mm Ø (Class 16)<br>• 11 km long (Centocow to balancing reservoir)<br>• 3 km long (balancing reservoir to Creighton)<br>• 90m Head (Negative surge pressure) |

The Phase 1 Heritage Impact Assessment (HIA) was undertaken to establish if any heritage resources would be impacted by the proposed Creighton BWSS.

# 2. LEGISLATIVE BACKGROUND

The length of the pipeline routes between the Centocow Water Treatment Plant (WTP) and the abstraction point; from the abstraction point to the storage reservoir and from the reservoir to Creighton all trigger section 41 (1)(a) 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)(a) refers to the construction of a road, wall, power line, **pipeline**, canal or other similar form of linear development or barrier exceeding 300m in length.

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 National Heritage Resources Act 1999 (Act No 25 of 1999), 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 project is located between the small town of Creighton and the settlement of Centocow in southern KwaZulu-Natal. Creighton is located approximately 37km north-west from the town of Ixopo.

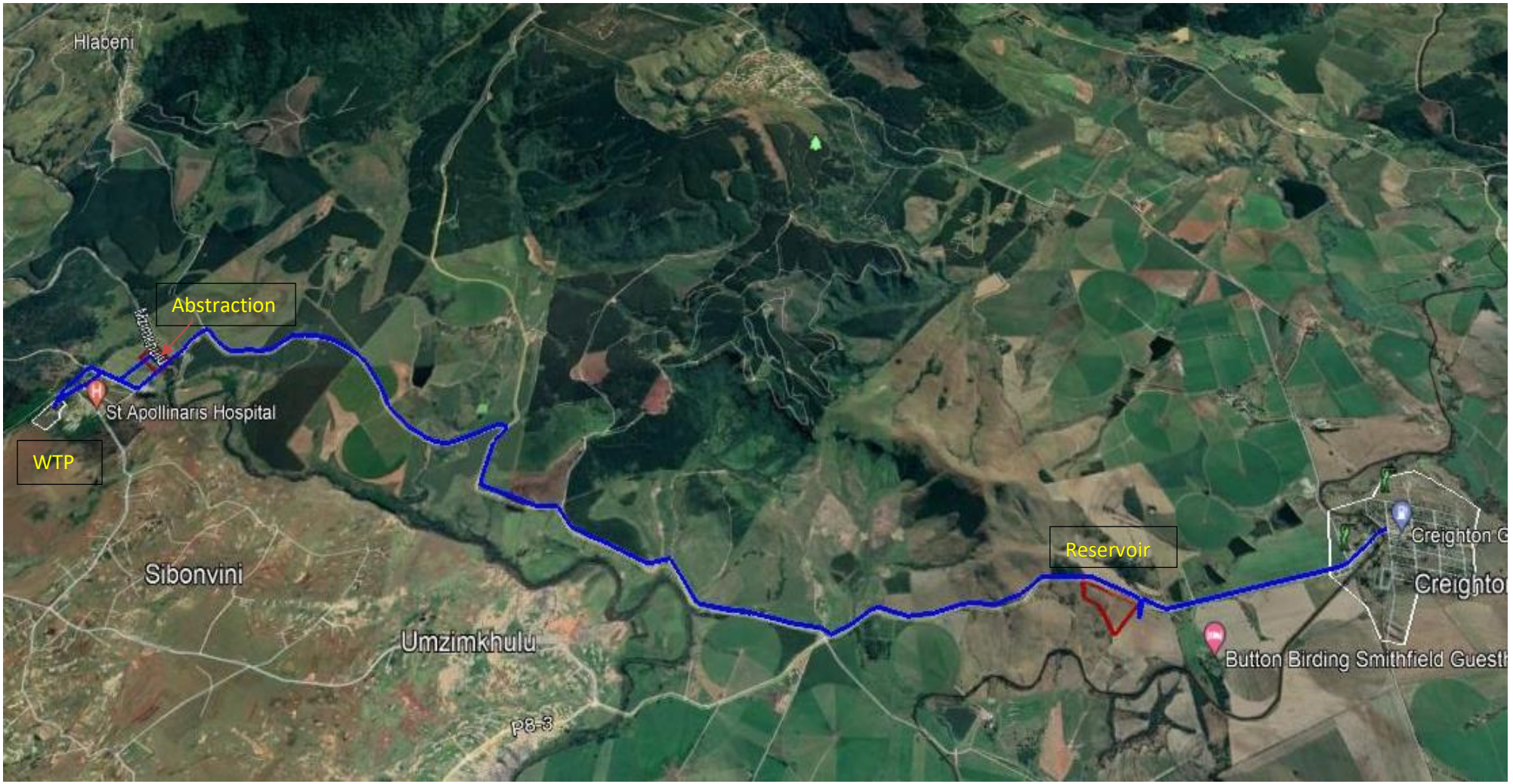


**Figure 1: Bulk water pipeline indicated in blue**

# 4. TERMS OF REFERENCE

Undertake a Phase 1 HIA in order to determine the possible existence of heritage resources, as listed above, that could be impacted by the proposed Creighton BWSS. 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 consideration and comment.

# 5. METHODOLOGY

A survey of literature, including other heritage impact assessment reports 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.

An inspection of the Creighton BWSS was undertaken on 31 May 2022. The pipeline routes were inspected on foot as well as the abstraction point, Centocow WTP and the proposed site for the storage reservoir. Visibility was, in general, good but there were some sections that were overgrown with vegetation.

# 6. HISTORICAL BACKGROUND OF AREA

According to Prins (2017:3), the greater Creighton area has never been intensively surveyed for heritage sites. However, some sites have been recorded over the last two decades. The available evidence indicates that the greater Creighton area contains a wide spectrum of archaeological sites covering different time-periods and cultural traditions including Stone Age and Iron Age sites as well as historical sites.

According to Prins (2017:4), during the colonial era (1840s onwards) many African groups were settled in this area by the native administrator of the Colony of Natal, Lord Shepstone. It is known from oral history that the Umzimkhulu area was occupied by the Nhlangwini, amaWushe, amaHlubi, amaBhaca, amaZizi, amaNqolo, amaCunu and various other Zulu-speaking and Xhosa-speaking groups.

In March 1865, a Dr. Sutherland surveyed a town at a place known as Dronkvlei from the semi-poisonous grass growing there which seemed to make grazing animals lightheaded. Nothing developed until March 1906 when the area was thrown open for settlement and named Creighton after Lady McCallum, wife or the Governor of Natal from 1901 to 1907 (Bulpin undated: 268-269).

Centocow is one of 22 mission stations established by the Mariannhill Monastery mother house near Pinetown and was founded in 1888 by Abbot- Francis Pfanner. A Polish princess had given a donation to buy the land, so Pfanner named the station after the shrine of Our Lady of Czestochowa in Poland. Czestochowa became simplified into Centocow. A rare reproduction of the Black Madonna- icon hangs in the church of the Sacred Heart at the Centocow Mission (Coan 2012:1). The Sacred Heart Church was consecrated in 1913. In its heyday, the mission housed 17 brothers and 100 labourers and a convent of the Sisters of the Precious Blood was also part of the mission station (Derwent 2006:79).

Centocow Mission served as the starting point for the internationally recognised artist Gerard Bhengu. As a young man, Bhengu suffered from tuberculosis and was treated at the medical clinic attached to the Centocow Mission. It was here that he was first encouraged to paint by staff at the Mission, which resulted in further training at Edendale Teachers Training College. Gerard Bhengu went on to have a long career as an artist from 1937 to his death in 1990 (Dr Nkosazana Dlamini Zuma Municipality 2017:56-57).

The 1954 aerial image of Centocow area shows the mission buildings, cultivated land between the mission and the Mzimkhulu River and abstraction point, the road out of Centocow and cultivated land on the northern side of the road to Creighton.

**Figure 2: 1954 aerial photograph of Centocow and surroundings**

The 1954 aerial photograph of the road between Centocow and some distance from Creighton shows cultivation of on either side of the road as well as the uMzimkhulu River with little evidence of structures and homesteads.

**Figure 3: 1954 aerial image of road and surroundings between Centocow and Creighton**

The 1954 image below of the proposed reservoir site (outlined in yellow) and of Creighton shows the area to be partly cultivated with some farmsteads located off the road.

**Figure 4: Aerial image of proposed reservoir site and town of Creighton**

# 7. RESULT OF SITE INSPECTION

The site inspection started at the Centocow WTP. The area was investigated on foot as well as the two proposed pipeline routes between the WTP and the abstraction works that are indicated in blue and red in **Fig. 5** below.


**Figure 5: Pipelines depicted in blue and red from WTP to abstraction works**

**Figure 6: Centocow water treatment works**

**Figure 7: Road towards Centocow from WTP**

During the inspection, a resident told the specialist that the cemetery for the Centocow settlement is located to the east of the hospital therefore a far distance from the proposed project.

Both pipelines from the abstraction point are located to the west of the Centocow mission station and thereby avoid impacting several protected structures that form part of the mission station as

well as a number of memorials that depict the stages of the crucifixion of Jesus as well as a cross depicting the crucifixion with steps leading up to it.

**Figure 8: Crucifixion cross**


**Figure 9: Stage of the crucifixion**

**Figure 10: Protected structure**

**Figure 11: Protected structures located well away from the pipelines**

However, the pipelines are located within 10m of protected structures where the pipelines turn eastwards to reach the road that runs along the northern boundary of the Centocow settlement. This complex of structures is fenced and appears to be used for carpentry purposes.

**Figure 12: Protected structures close to pipeline route**

**Figure 13: Protected structures**

The pipeline routes below the mission to the abstraction point cross fallow land and a sports field (**Fig.14**). There is an existing pipeline that is close to the proposed pipeline route. Near the proposed abstraction point are the existing abstraction infrastructure as well as an abandoned structure (**Fig. 16**) which was a pump station with the original abstraction pipes still going into

the Mzimkhulu River. The structure appears to be less than 60 years but if the structure is to be demolished then a built heritage specialist should confirm the age of the structure.


**Figure 14: Abstraction point and associated pipelines**

**Figure 15: Area crossed by pipelines towards abstraction point**

**Figure 16: Abandoned pumpstation**

From the abstraction point the pipeline then crosses the access bridge to Centocow and runs up to the road intersection before turning towards Creighton on the northern side of the road.

**Figure 17: Pipeline route towards road intersection with Mission structures in background**

The pipeline route runs on the northern side of the road through cultivated farm land, tree plantations and a very small number of undeveloped areas. There are also power lines and farm dams along the route and a number of roads are crossed. No heritage sites were found during the inspection.

**Figure 18: Rye fields along pipeline route**

**Figure 19: Undeveloped section of pipeline route**

**Figure 20: Farm land along pipeline route**

During the inspection, the specialist spoke to Siphiwe Zulu and Nhlanhla Mkhize who said that to their knowledge there were no graves along the pipeline route as people buried their dead near their homesteads. There were no homesteads in the vicinity of the pipeline.

**Figure 21: Pipeline route next to plantation of trees**

**Figure 22: Pipeline route between plantations of trees**

During the inspection a dilapidated crop silo was found close to the pipeline route. The silo is not a protected structure.

**Figure 23: Dilapidated silo on pipeline route**

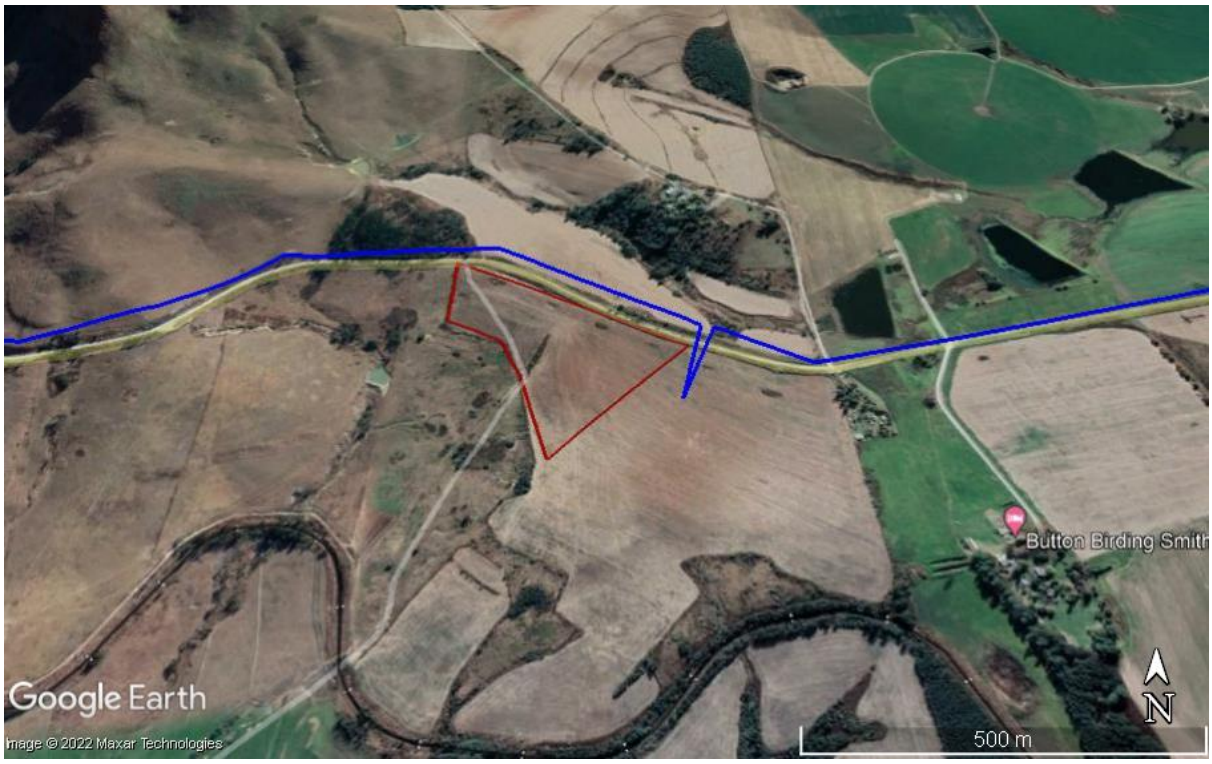


**Figure 24: Site of proposed reservoir outlined in red**

The site of the proposed reservoir is currently used to grow maize and rye with a power line crossing it. It is highly disturbed and no heritage sites were found.

**Figure 25: Site or proposed reservoir**

**Figure 26: Pipeline route through thick vegetation and close to dam**

The pipeline route through Creighton does not pass protected structures apart from a structure at the end of the pipeline route. It is located 10m north of the pipeline (see **Fig. 27**).

**Figure 27: Protected structure in Creighton**

Heritage sites found during the site inspection are listed in **Table 1**.

**Table 1: Heritage resources found during site inspection**

| COORDINATES | HERITAGE RESOURCE | SIGNIFICANCE + MITIGATION MEASURES |
|---|---|---|
| 30°00'49.54"S 29°43'27.11"E | Protected structure located over 40m east of closest pipeline | High heritage significance as forms part of Centocow mission complex. It should not be impacted by installation of pipelines |
| 30°00'47.84"S 29°43'27.70"E | Protected structures located 10m east of western pipeline route | High heritage significance as forms part of Centocow mission complex. A 5m buffer must be placed around all the structures to ensure that the installation of the pipelines has no impact on buildings. |
| 30°00'40.67"S 29°43'46.52"E | Abandoned pumphouse located close to proposed abstraction upgrade | Low heritage significance as structure appears to be less than 60 years. If it is to be altered or demolished then a built heritage specialist must confirm the age of the structure prior to alteration / demolition |
| 30°01'36.90"S 29°50'19.60"E | Protected structure; located 10m north of the end of the pipeline in Creighton | Low to medium heritage significance; the structure is used by several businesses; a 5m buffer must be placed around the structure to avoid impacts by the installation of the pipeline |

The Centacow structures are indicated in the Google Earth image below.

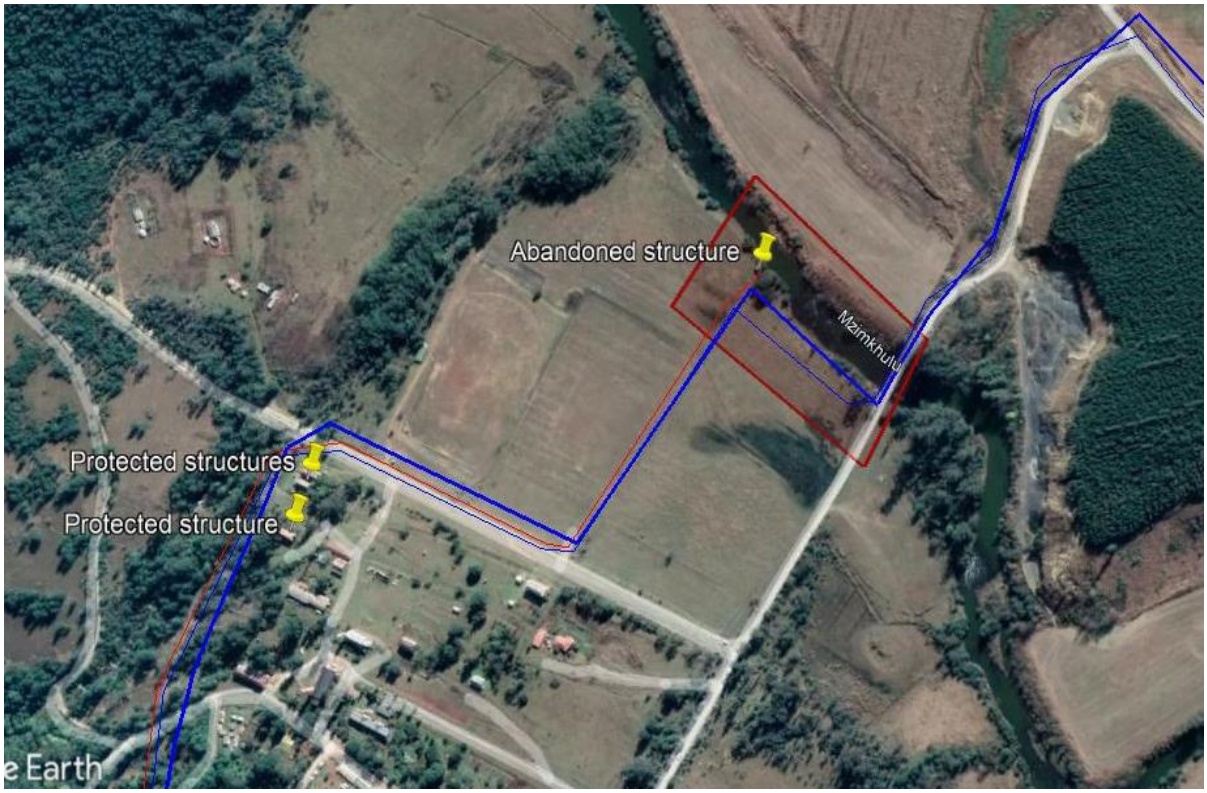


**Figure 28: Centacow structures**

The Creighton structures is indicated below.

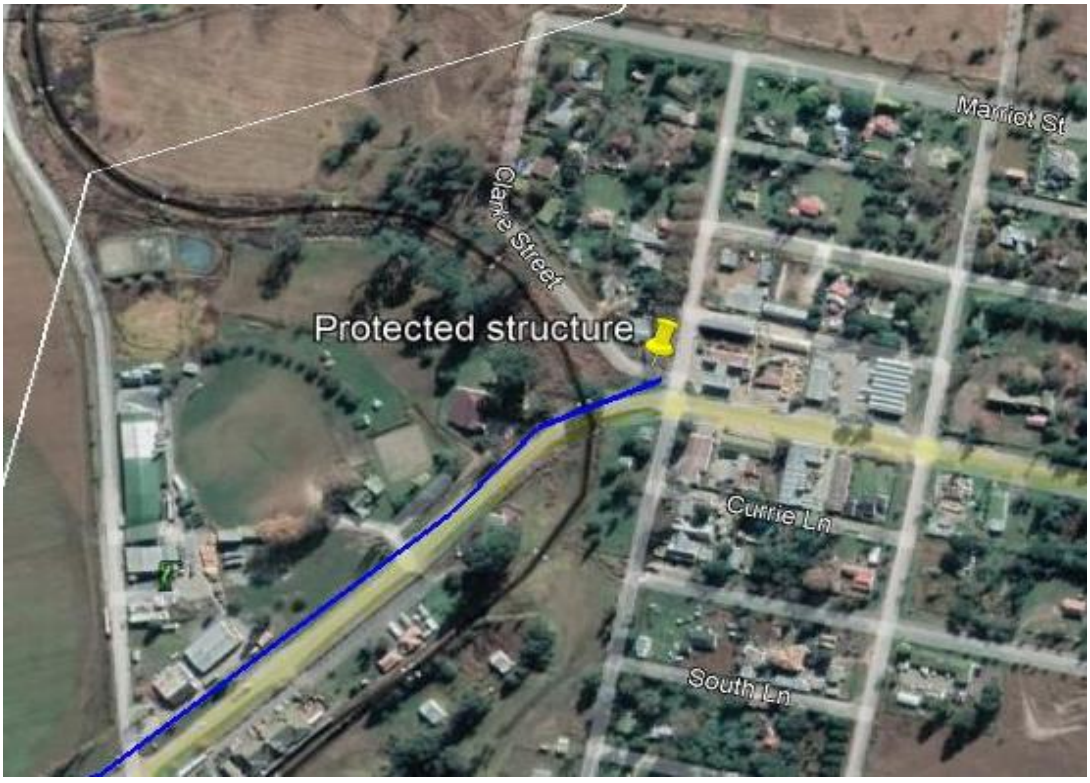


**Figure 29: Creighton structure**

According to the desktop palaeontological study (**Appendix 1**), the project is located in the non-fossiliferous Jurassic dolerite and the potentially fossiliferous Volksrust Formation. The Volksrust Formation is the upper part of the Ecca Group and is predominantly argillaceous, and the grey to black silty shale with thin, usually bioturbated siltstone or sandstone lenses and beds, occur mostly in the upper and lower boundaries. The very thick and fine-grained sediments represent an open shelf environment where muds were deposited from suspension in a deep-water environment. It is not known if this was an inland sea or open marine setting but the discovery of the marine bivalve, Megadesmus about 25km west southwest of Newcastle in Volksrust Formation shales, points to a marine influence for at least part of the sequence. Surface activities may impact upon the fossil heritage if preserved in the development footprint. The geological structures suggest that the rocks are the right age to contain fossils. However, the material to be excavated is soil and this does not preserve fossils. Since there is an extremely small chance that fossils from the Volksrust Formation may be disturbed, it is recommended that a Fossil Chance Find Protocol is included in the Environmental Management Programme (EMPr) for the Creighton BWSS. It was assessed that the potential impact to fossil heritage resources by the proposed project is extremely low (Bamford 2022:10-12).

# 8. ASSESSMENT OF SIGNIFICANCE OF IMPACTS

The assessment of significance of impacts on heritage resources identified during the site inspection has been undertaken 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 footprint (1) (limited to the immediate area), site of development (2), local (3), regional (4) or national (5).
- 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).

**Table 2: Assessment of impacts on protected structures**

| ***Nature: Alteration, damage, destruction of protected structures*** | | |
|---|---|---|
| | ***Without mitigation*** | ***With mitigation*** |
| ***Extent*** | *Local (3)* | *Local (3)* |
| ***Duration*** | *Permanent (5)* | *Permanent (5)* |
| ***Magnitude*** | *High (8)* | *Moderate (6)* |
| ***Probability*** | *Probable (3)* | *Improbable (2)* |
| ***Significance*** | ***48 (Medium)*** | ***28 (Low)*** |
| ***Status (positive or negative)*** | *Negative* | *Negative* |
| ***Reversibility*** | *None* | *Low* |
| ***Irreplaceable loss of resources*** | *Yes* | *Yes* |
| ***Can impacts be mitigated?*** | *Yes* | |

***Mitigation measures***

- *The structures associated with the mission should be left intact as they comprise the history of the mission as a holistic entity.*
- *A buffer of at least 5m must be placed around all protected structures located near the pipeline routes to avoid damage to the structures. The buffer must be visible and made from durable material or fencing.*
- *If any structures that form part of the mission are to altered or demolished, then application must be made to the Institute for permission to do so. Written application must be made to the Institute according to the procedure stipulated in section 3 of the Draft KwaZulu-Natal & Research Institute Regulations, 2021 that refers to applications for the demolition, alteration or addition to structures which are, or which may reasonably be expected to be older than 60 years.*
- *If a protected structure is damaged accidently during the installation of the Creighton BWSS, then all work must stop in the immediate vicinity of the damage structure, the Institute informed and a qualified specialist appointed to repair the building once all necessary permits have been obtained from the Institute.*

***Cumulative impacts:*** *Low - Medium*

# 9. DISCUSSION AND CONCLUSION

The two pipelines between the abstraction point on the Mzimkhulu River and the Centocow WTP are located on the western side of the historic Centocow mission complex thereby avoiding most of the protected structures that form part of the complex. These structures are over 60 years in age and are therefore protected by section 37(1)(a) of the KwaZulu-Natal Amafa and Research Institute Act, 2018, which refers to the protection of structures that are or that may reasonably be expected to be older than 60 years. The pipelines are, however, located close to protected structures where the pipelines bend to the east to run along the northern boundary of the mission. A buffer of at least 5m must be placed around the buildings so that they are not impacted in any way by the installation of the pipelines.

An assessment of the significance of impacts of the project on protected structures especially in relation to the Centocow buildings concluded that the pre-mitigation impact will be medium where the impact could influence the decision to develop in the area. However, with the implementation of the mitigation measures recommended in Tables 1 and 2, the significance of impact rating drops to a low impact which should not influence the decision to proceed with the project.

The inspection of the pipeline route between Centocow and Creighton revealed no heritage resources apart from a protected structure that is located 10 m from the end of the pipeline in Creighton. A buffer of at least 5m must be placed around the structure to avoid impacts to it by the construction of the BWSS.

# 10. MITIGATION MEASURES

- For any chance heritage finds, all work must cease in the area affected and the Contractor must immediately inform the Project Manager. A 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 specialist will assess the significance of the resource/s 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 or heritage sites be destroyed or removed from the project 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.
- A Fossil Chance Find Protocol must be included in the EMPr for the proposed installation of the Creighton BWSS.

# 11. REFERENCES

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