4a Old Main Road, Judges Walk, Kloof, Kwazulu-Natal, South Africa, 3610
PO Box 819, Gillitts, 3603, South Africa
**Tel:** +27 (0) 31 764 7130 **Fax:** +27 (0) 31 764 7140 **Web:** www.gcs-sa.biz

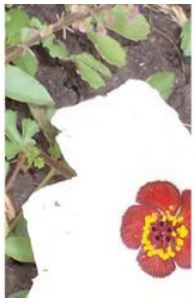
# AQUATIC COMPLIANCE STATEMENT FOR THE SECTION 102 EXTENSION OF THE MINING RIGHT AREA ASSOCIATED WITH STONEWELL QUARRY (PTY) LTD OPERATIONS NEAR KOKSTAD, KWAZULU-NATAL

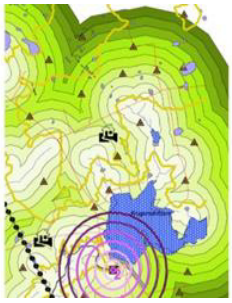
**Version – final**

**October 2022**

**GCS Project Number: 22-0864**

**Client Reference:**

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**Version – final**

**October 2022**

## DOCUMENT ISSUE STATUS

| | | | |
|---|---|---|---|
| **Report Issue** | Final | | |
| **GCS Reference Number** | GCS Ref – 22-0864 | | |
| **Client Reference** | | | |
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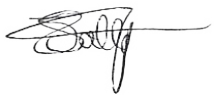
| | **Name** | **Signature** | **Date** |
| **Author** | Magnus van Rooyen |  | October 2022 |
| **Reviewer** | Janice Callaghan |  | October 2022 |
| **Director** | Magnus van Rooyen |  | October 2022 |

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## LIST OF PLATES

# Declaration

I, Magnus van Rooyen, in my capacity as a specialist consultant, hereby declare that I –

Act as an independent consultant;

Do not have any financial interest in the undertaking of the activity, other than remuneration for the work performed in terms of the National Environmental Management Act (Act No. 107 of 1998);

Have and will not have vested interest in the proposed activity proceeding;

Have no, and will not engage in, conflicting interests in the undertaking of the activity;

Undertake to disclose, to the competent authority, any material information that has or may have the potential to influence the decision of the competent authority or the objectivity of any report, plan or document required in terms of the National Environmental Management Act (Act No. 107 of 1998);

As a registered member of the South African Council for Natural Scientific Professions, will undertake my profession in accordance with the Code of Conduct of the Council, as well as any other societies to which I am a member;

Based on information provided to me by the project proponent and in addition to information obtained during the course of this study, have presented the results and conclusion within the associated document to the best of my professional ability; and

Reserve the right to modify aspects pertaining to the present investigation should additional information become available through ongoing research and/or further work in this field.

Magnus van Rooyen (Pr.Sci.Nat) October 2022

SACNASP reg. no. 400335/11 Date

# AQUATIC COMPLIANCE STATEMENT FOR THE SECTION 102 EXTENSION OF THE MINING RIGHT AREA ASSOCIATED WITH STONEWELL QUARRY (PTY) LTD OPERATIONS NEAR KOKSTAD, KWAZULU-NATAL

## 1 INTRODUCTION

GCS Water and Environment (Pty) Ltd has been appointed by the Stonewell Quarry (Pty) Ltd to conduct an Aquatic Assessment of the area associated with the Mining Right extension application on the Portion 21 of the Farm Waai Fontein No. 301 ES near Kokstad in KwaZulu-Natal. The assessment will be submitted in support of the Application for Environmental Authorisation that will be conducted in accordance with the requirements of the National Environmental Management Act (Act No. 107 of 1998): Environmental Impact Assessment Regulations (2014), as amended.

## 2 BACKGROUND

The Stonewell Quarry is a dolerite quarry located approximately 5km south of the town of Kokstad in the Greater Kokstad Local Municipality and Sisonke District Municipality, KwaZulu-Natal. The quarry has been operational since 1991. The site is located on Portion 21 of the Farm Waai Fontein No. 301 ES with the centre point coordinate of the site being S 30° 22' 30.00" ; E 28° 57' 40.00".

The extension of the Mining Right area is subject to a Section 102 application lodged in terms of the Mineral and Petroleum Resources Development Act (Act No. 28 of 2002). The Section 102 application has been accepted by the Department of Mineral Resources and Energy (DMRE).

The Mining Right extension makes provision for the extension of the existing Mining Right Area by approximately 31ha in an easterly direction (see Figure 2-2). The extension will allow for the extension of the quarry pit in a southerly direction to increase the life of mine (LOM) (See Figure 2-3). The total pit extension area will be approximately 3ha.


**Figure 2-1: Location of the Stonewell Quarry operations in relation to the town of Kokstad**

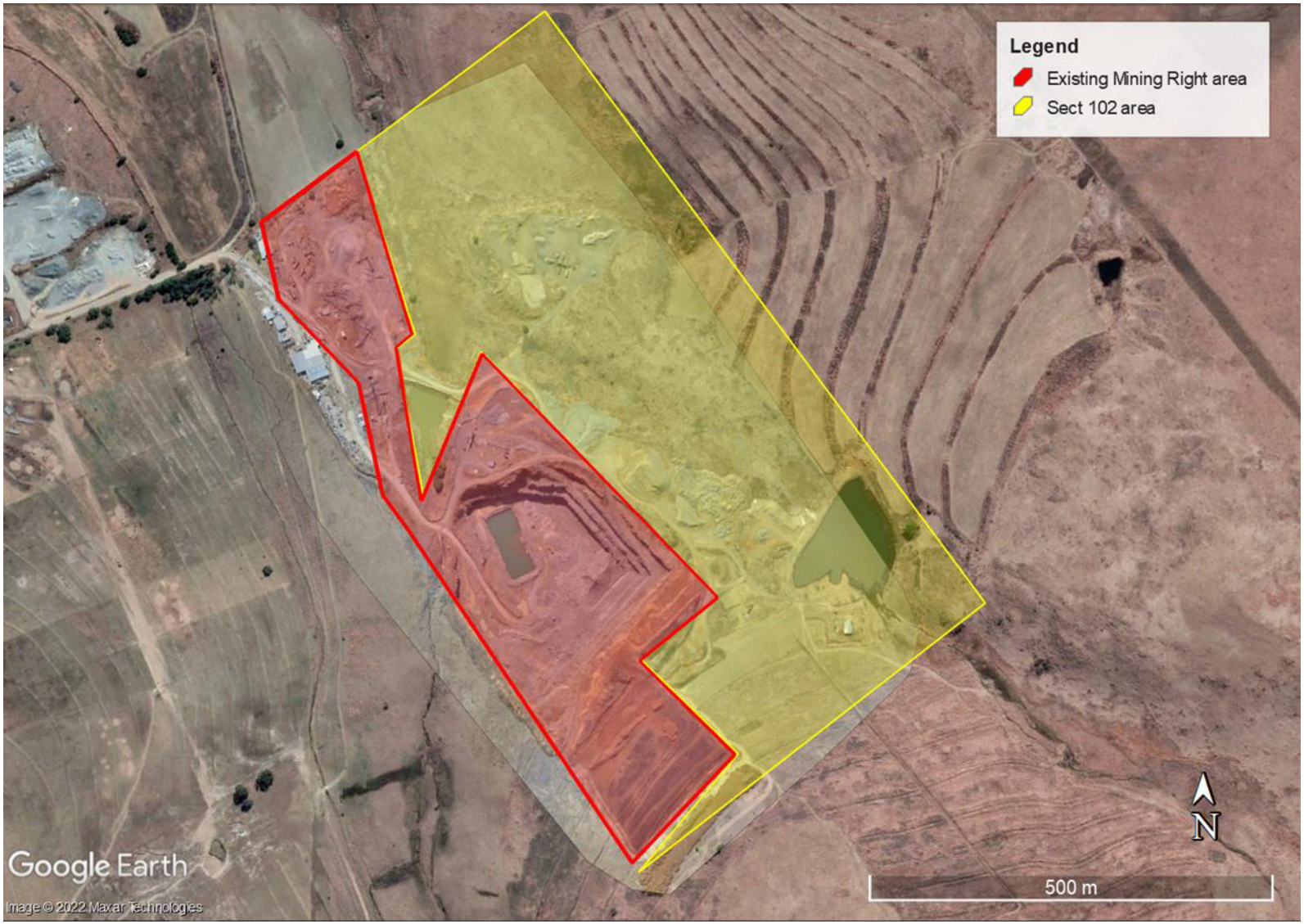


**Figure 2-2: Location and extent of the Mining Right extension (Section 102 area) in relation to the existing Mining Right area**

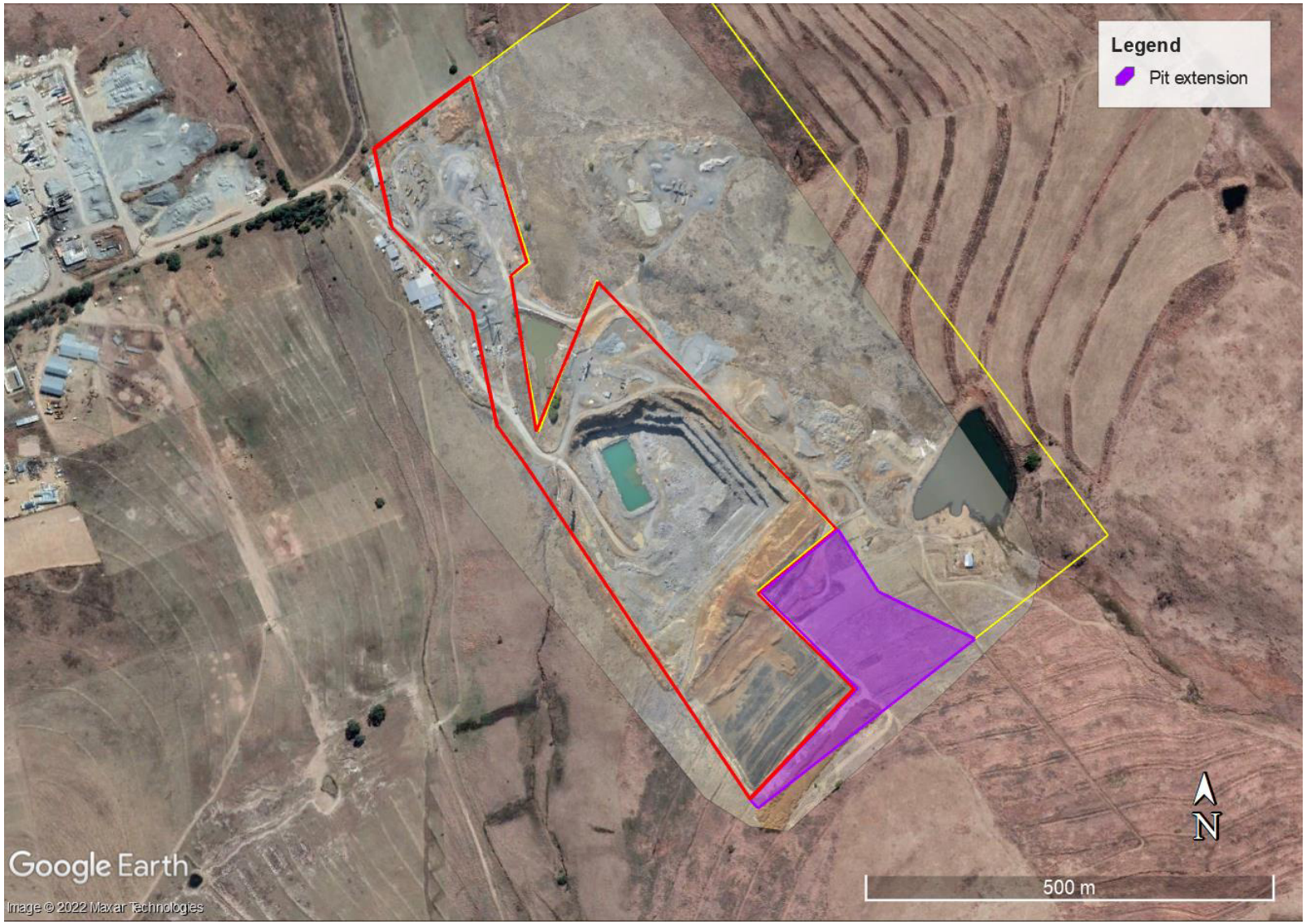


**Figure 2-3: Location and extent of the quarry pit extension**

# 3 SCOPE OF WORK

The Department of Forestry, Fisheries and Environment's online Screening Tool has indicated that the aquatic conditions on the site has a **"low sensitivity"** and as such the assessment that deals with this aspect will take the form of a compliance statement. The content of the compliance statement and which sections of the report it can be found is detailed in Table 1-1 below.

**Table 3-1: Contents of the compliance statement and the applicable sections**

| Content | Section |
|---|---|
| Contact details of the specialist, the registration details with the South African Council for Natural Scientific Professions (SACNASP), their field of expertise and a curriculum vitae. | Appendix A |
| A signed statement of independence. | Appendix B |
| A statement on the duration, date and season of the site inspection and the relevance of the season to the outcome of the assessment. | Section 4 |
| A baseline profile description of the biodiversity and ecosystems on site. | Section 5 |
| The methodology used to verify the sensitivities of the aquatic biodiversity features on the site, including the equipment and modelling used where relevant. | Section 4 |
| In the case of a linear activity, confirmation from the aquatic biodiversity specialist that, in their opinion, based on the mitigation and remedial measures proposed, the land can be returned to the current state within two years of completion of the construction phase. | NA |
| Where required, proposed impact management outcomes or any monitoring requirements for inclusion in the Environmental Management Programme (EMPr). | Section 7 |
| A description of the assumptions made as well as any uncertainties or gaps in knowledge or data. | Section 4 |
| Any conditions to which this statement is subjected. | Section 7 |

# 4 ASSUMPTIONS AND KNOWLEDGE GAPS

The following are assumptions made in the completion of the report:

- The assessment of the potential impacts of the proposed operations, is based on the aquatic features on the site and the operational activities provided. If the development layout and operations is amended, the impact identification and assessment contained in this report may also change.

- The findings of the report are based on a number of site visits conducted to the operations. The most recent of these visits took place on 26 August 2022. Based on the observations made during the previous site visits, the seasonality of the most recent site assessment is not considered to be a limitation to the findings of the study.
- The identification and possible delineation of the wetland and riparian areas within the development site was conducted in terms of the procedures as specified by the Department of Water and Sanitation.
- The determination of the Present Ecological State and the Ecological Importance and Sensitivity of the wetland and watercourses that may have been identified would have been conducted by using the WET-Assess Models.
- The classification of any identified aquatic features would have been conducted in accordance with the classification system of inland aquatic ecosystem as prescribed by Ollis *et al.*, 2013.
- The following desktop information was used to augment the finding of the assessment:
    - Electronic biodiversity databases managed by the South African National Biodiversity Institute (SANBI);
    - Available provincial electronic biodiversity databases;
    - Wetland and Riparian Habitat Delineation Document (Department of Water and Sanitation report);
    - Classification system for wetlands and other aquatic ecosystems in South Africa (Inland Systems) (Ollis et al., 2013 – SANBI Biodiversity Series 22).

# 5 BASELINE PROFILE OF THE STUDY SITE

The section below deals with the baseline conditions on the assessment site and makes provision for desktop findings as well as observations made during the site assessment.

## 5.1 Topography

The study site is located on the northern slope of a west – east running ridge that forms the southern border between the KwaZulu-Natal and Eastern Cape Provinces (see Figure 5-1 for a profile of the area).

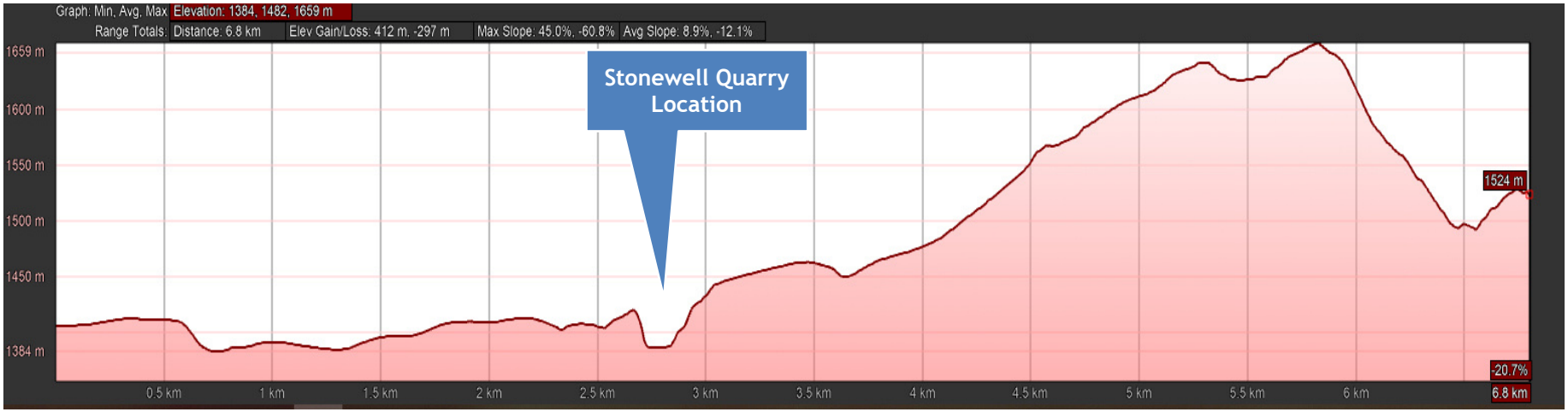


**Figure 5-1: North – south topographical profile of the study area (southern extent to the right of figure)**

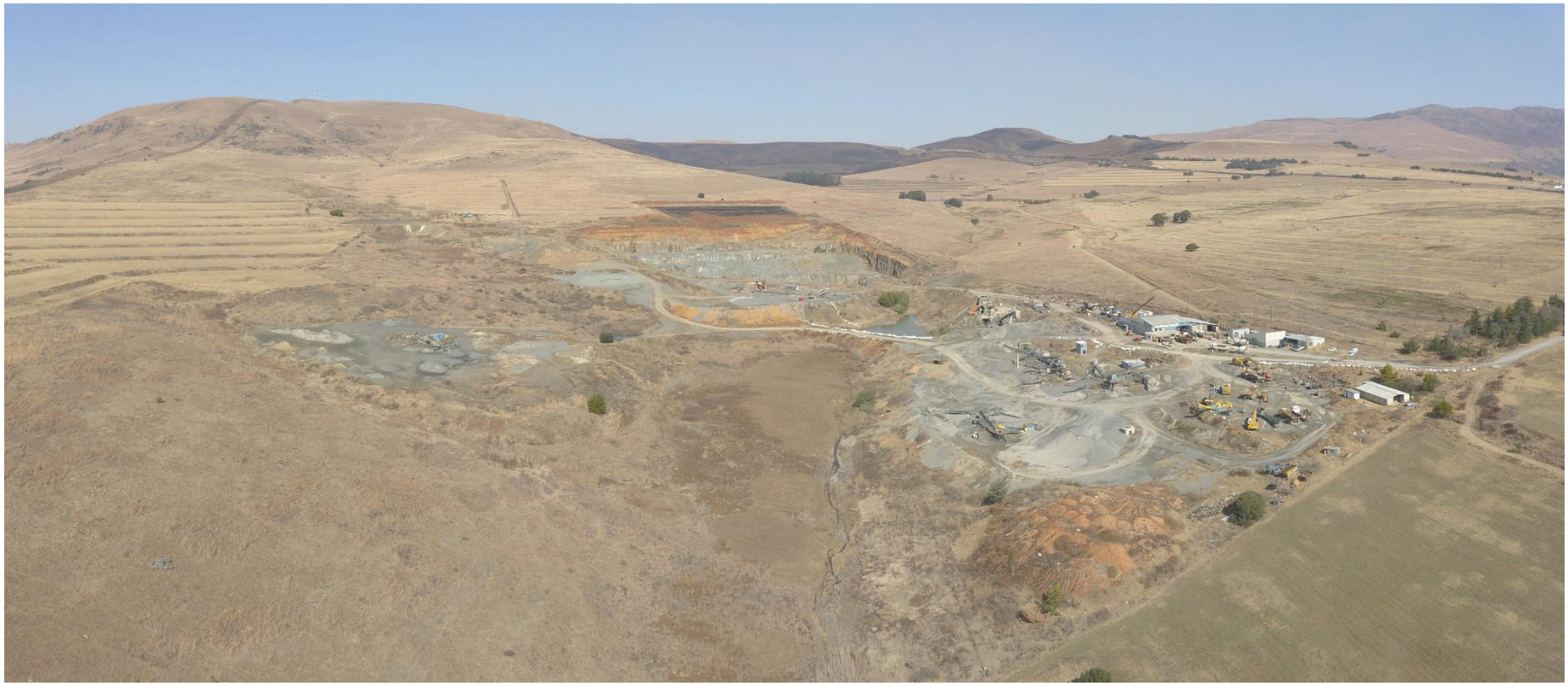

**Plate 5-1: Aerial view of the topography surrounding the Stonewell Quarry operations, looking in a southerly direction**

## 5.2 Drainage

The drainage from the site is in a northern direction via two unnamed watercourses that pass through and is within close proximity of the current mining operations. The unnamed watercourses are seasonal in nature and will only flow during and immediately after periods of heavy rains. Three existing farm dams and one dam within the existing quarry operations are associated with the with the site. Three of the dams are located upstream of the Mining Right area in one of each of the unnamed tributaries with the fourth downstream of the quarry downstream of the confluence of the two unnamed tributaries. The location of these dams and unnamed tributaries are provided in Figure 5-2.

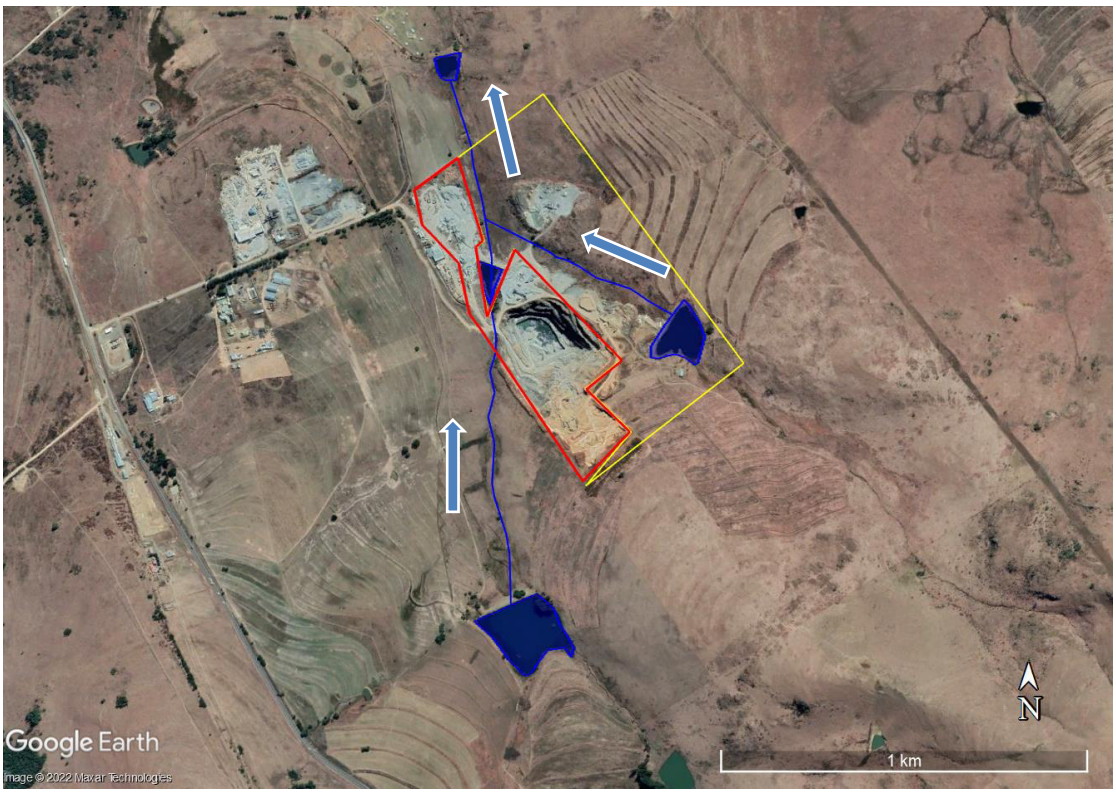


**Figure 5-2: Location of the drainage features associated with the study site as well as an indication of the drainage direction**

The two unnamed tributaries forms part of the Mzintlava River catchment that drains in a southerly direction to eventually drain into the uMzimvubu River. As such the unnamed watercourses form part of the Mzimvubu – Tsitsikama Water Management Area.

## 5.3 Soils

The soils in the study area are typically high in clay content. The soils in the northern portion of the study area falls within the Fa851 landform that typically has an average clay content of 35.7% while the soils to the south of the site falls within the Fa845 landform with an average clay content of 41%. The National Department of Agriculture has classified the soils on the study site as being undifferentiated and shallow with the limitation of being susceptible to erosion, excessive drainage and low natural fertility. Soil types that will typically occur on the site consists of Glenrosa and/or Mispah types.

**Plate 5-2: View of the shallow soils that are stripped above the mining front**

## 5.4 Aquatic features

The interrogation of the NFEPA Wetland Database (2011) has indicated the presence of three wetland areas associated with the study area (see Figure 5-3). These three wetlands are classified as artificial in nature as they are directly associated with the presence of farm dams as identified earlier in the report.


**Figure 5-3: Location of the NFEPA Wetland areas**

In addition, the Ezemvelo KwaZulu-Natal Wildlife Wetland Dataset (2011) has not identified any wetland areas within the study area.

## 5.5 Vegetation

The vegetation on the study area is classified as East Griqualand Grassland (Gs12) by the National Vegetation Map (2018) managed by the South African National Biodiversity Institute (SANBI). The SANBI reference places the vegetation type in the Sub-escarpment Grassland Bioregion within the Grassland Biome. The total area under this vegetation type is in excess of 260 000ha. The vegetation type has a conservation status classification of "least threatened".

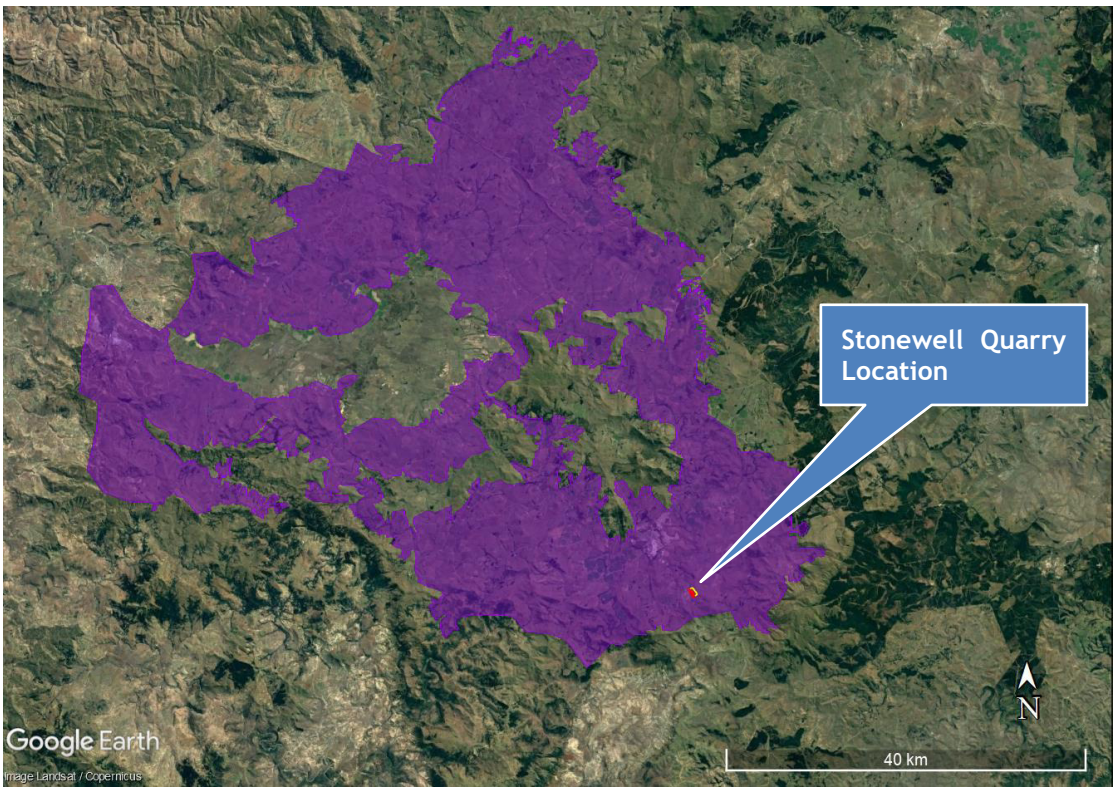


**Figure 5-4: Location of the site in the larger distribution of the East Griqualand Grassland (Gs12) vegetation type and the location of the study site**

### 5.6 Land use

The current land use on the property is activities associated with the operations of the quarry as well as agriculture (plant of grazing and grazing of livestock).

## 6 AQUATIC FEATURE COMPLIANCE STATEMENT

As the reason for the Section 102 application is to make provision for the extension of the quarry pit area by approximately 3ha, the Aquatic Compliance Statement relates to the area and impacts associated with the extension of the quarry pit only. No part of the larger Section 102 area will be changed from its current state.

No drainage features that have been identified through this assessment occurs within or will be impacted by the quarry pit extension. In addition, no part of the quarry pit extension occurs within the "regulated area of a watercourse" as defined by the National Water Act (Act No. 36 of 1998). Figure 6-1 provides the location of the quarry pit extension in relation to the "regulated area of a watercourse", aka 100m from the edge of a watercourse.

A small natural wetland feature is located approximately 400m to the north of the proposed quarry pit expansion area. As such, the quarry pit extension is within a 500m radius of the wetland feature which puts it in the "regulated area of a watercourse". However, it is important to note that the wetland feature is sustained by water from the two unnamed watercourse identified earlier. As the quarry pit extension does not impact on the flow of water in either of these watercourses, the extension will have no impact on the Present Ecological State (PES), the Ecosystem Services provision or the Ecological Importance and Sensitivity (EIS) of the wetland. The location of the wetland area is indicated in Figure 6-2.

**Plate 6-1: View of the wetland feature identified to the north of the quarry pit extension**

The Department of Forestry, Fishers and Environment (DFFE) online screening tool has indicated that the Aquatic Theme for the study area is "very high" based on site being located in a Strategic Water Resource Area (SWRA) and a NFEPA Quinary Catchment.

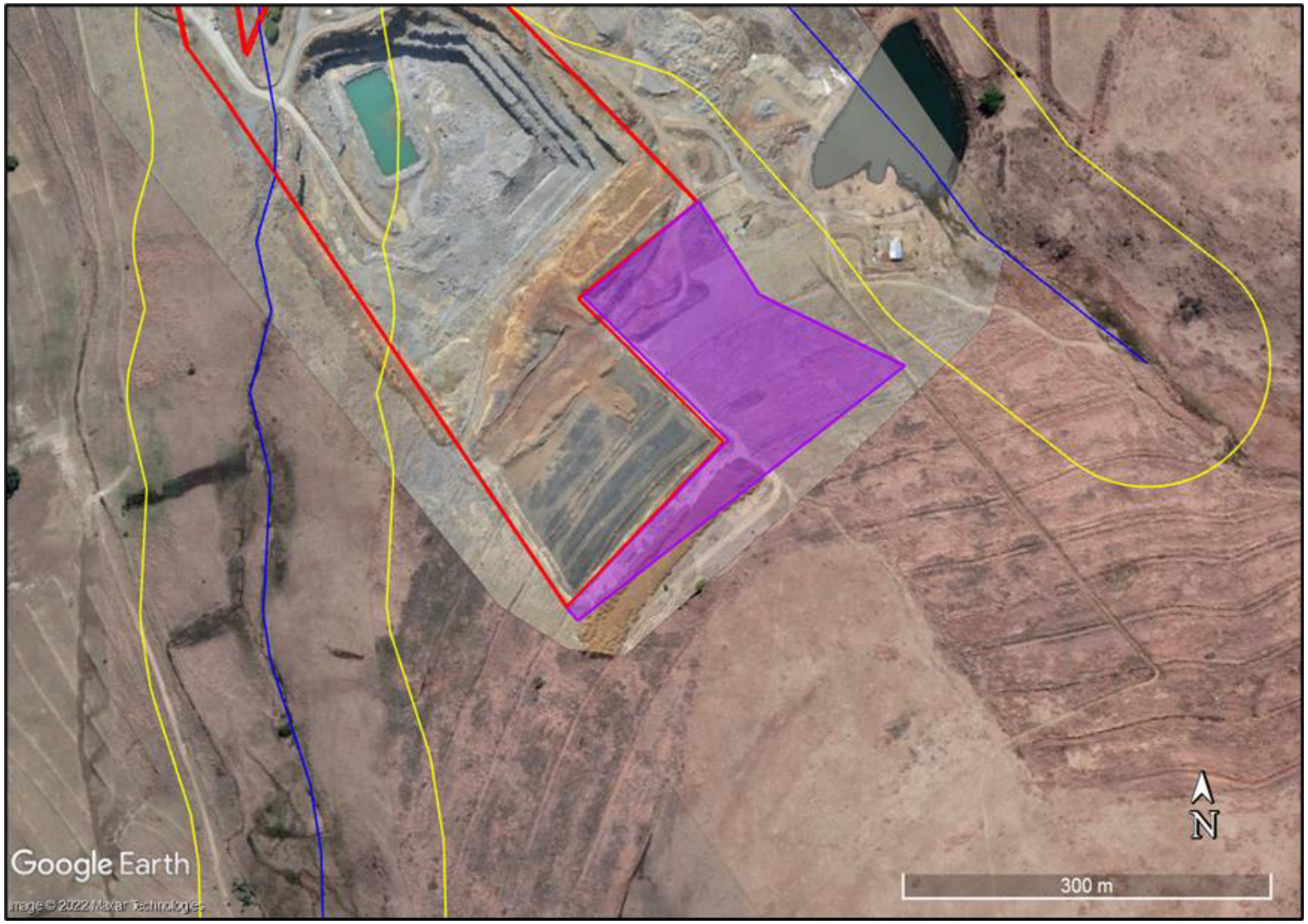


**Figure 6-1: Location of the quarry pit extension in relation to the defined "regulated area of a watercourse"**

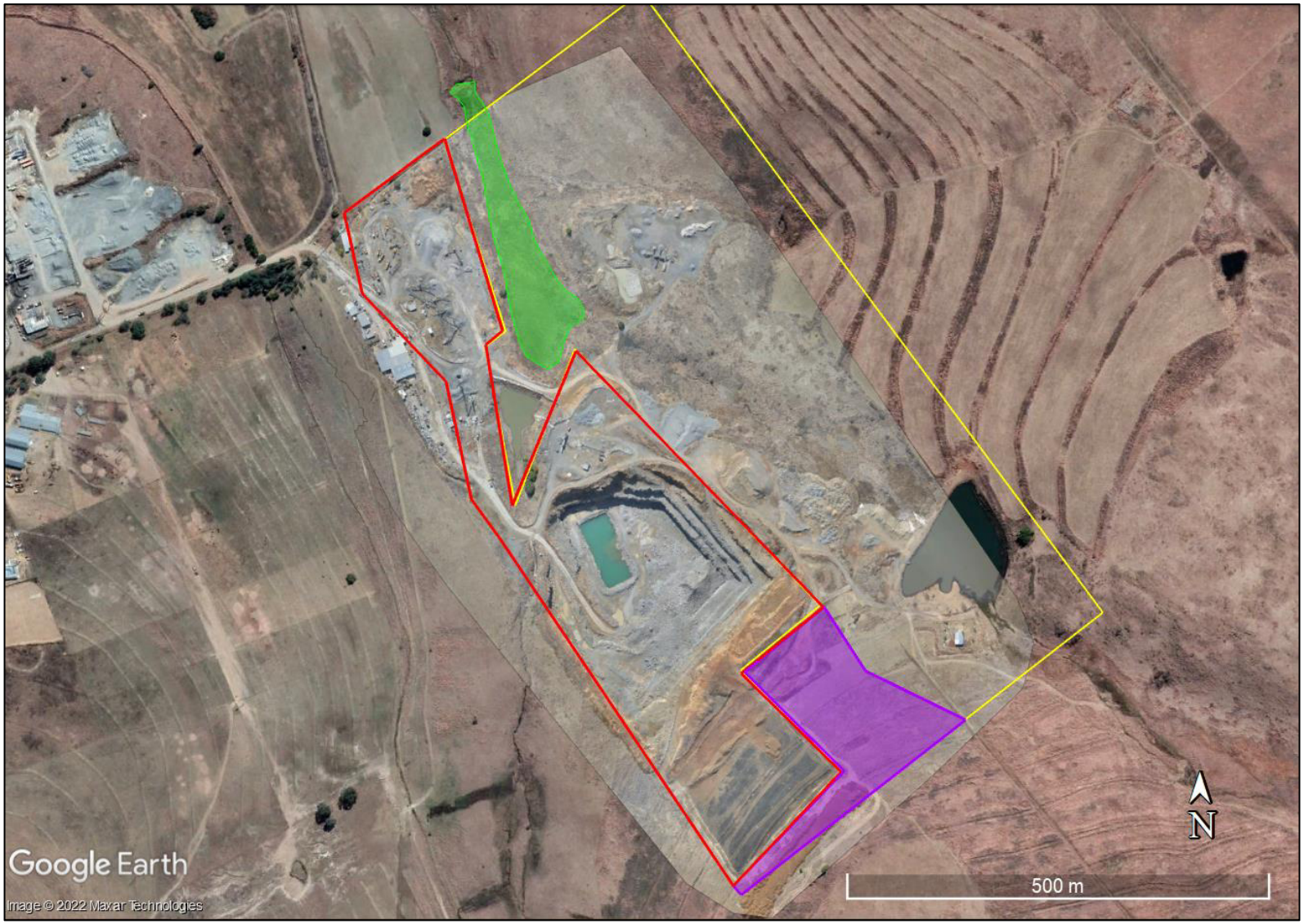


**Figure 6-2: Location and extent of the natural wetland area (in green) to the north of the quarry pit extension area (in purple)**

# 7 IMPACT ASSESSMENT

The assessment of the portion of the Section 102 application area that will be disturbed by the extension of the quarry pit contains no aquatic features (wetlands or watercourses). As such, no physical impact to any such features are envisaged by the extension of the quarry pit, or areas downstream of the quarry pit.

As a natural wetland feature that is supplied by water from the two unnamed watercourse identified is located within 400m of the quarry pit extension, the following management measures must be implemented when the pit extension commences:

- The 100m distance from the two unnamed watercourse must be survey and clearly demarcated. The pit extension in its current extent may not encroach into this 100m area.
- All stormwater that falls within the quarry pit extension area must be allowed to drain into the existing sump in the quarry pit.
- No stormwater runoff from the quarry pit extension area may be discharged into the environment without the appropriate approvals.

# 8 CONCLUSION

The DFFE Online Screening Tool has indicated that the Aquatic Theme has a “very high” sensitivity based on the study site’s presence within a Strategic Water Resource Area (SWRA) and a NFEPA Quinary Catchment, however, as the proposed activities associated with the quarry pit extension will not impact on the current functioning of the identified unnamed watercourses or natural wetland feature, the impact of the project on the aquatic theme is considered low.

As such, the information provided in this Compliance Statement does not support the “very high” sensitivity for the aquatic theme. The sensitivity rating for this particular theme should be “low”.

**APPENDIX A**

**SPECIALIST CURRICULUM VITAE**

**Summary CV**

## Name Surname

Magnus van Rooyen

## Personal summary

**Year of birth:**

4 September 1976

**Nationality:**

South African

**Languages**:

- Afrikaans
- English
- German

**Qualifications:**

- MPhil (Environmental Management)
- Post Graduate Certificate in Education (Biology and Science)
- BSc Hons (Botany)
- BSc (Botany and Zoology)

**Key skills:**

- Aquatic Ecologist
- Terrestrial Ecologist

Magnus van Rooyen is a professionally registered Environmental Scientist with the South African Council for Natural Scientific Professions (SACNASP) (Reg. No. 400335/11). Mr van Rooyen has more than 15 years' experience in the environmental sector, both as an terrestrial and aquatic specialist as well as an environmental assessment practitioner. He holds a post-graduate qualification in Botany as well as Environmental Management and an undergraduate degree in Botany and Zoology.

- **GCS Water and Environment (Pty) Ltd (2021 – present)**
- **JG Afrika (Pty) Ltd (2005 – 2020)**
- **University of Stellenbosch (2002 – 2005)**

## Selected projects

| | |
|---|---|
| **Project Name:** | **Durban Dig-out Port Biodiversity Baseline Assessment** |
| **Client:** | Transnet Capital Project |
| **Location:** | Durban, South Africa |
| **Date:** | 2012 – 2014 |

**Activities Performed:** Conducted the biodiversity baseline assessment of the site identified for the new Durban Dig-out Port. The biodiversity assessment made provision for the assessment of the terrestrial ecology (mammals, birds, reptiles and vegetation) and the aquatic ecology (wetlands and watercourses occurring on the site to determine the baseline status of these aspects. Specific duties included the assessment of the aquatic features (wetlands and watercourses) as well as the amphibians.

| | |
|---|---|
| **Project Name:** | **Riversdale Anthracite Mine Biodiversity and Wetland Assessment** |
| **Client:** | Canyon Shared Services |
| **Location:** | Vryheid, South Africa |
| **Date:** | 2019 |

**Activities Performed:** Undertaking the wetland and biodiversity specialist study in support of the Application for Environmental Authorisation and the Water Use Licence Application for the Riversdale Anthracite Mine near Vryheid.

| | |
|---|---|
| **Project Name:** | **Southport Development Estuarine and Vegetation Assessment** |
| **Client:** | Royston Chapman |
| **Location:** | Southport, South Africa |
| **Date:** | 2020 |

**Activities Performed:** Undertaking of the estuarine and vegetation specialist study in support of the Application for Environmental Authorisation and the Water Use Licence Application for the development of a housing complex in Southport, KwaZulu-Natal.

| | |
|---|---|
| **Project Name:** | **KwaHlokohloko Bulk Water Supply Scheme Wetland and Vegetation Assessment** |
| **Client:** | Terratest (Pty) Ltd |
| **Location:** | KwaHlokohloko Community, South Africa |
| **Date:** | 2020 |

**Activities Performed:** Undertaking the wetland and vegetation specialist study in support of the Application for Environmental Authorisation for the implementation of the KwaHlokohloko Bulk Water Supply Scheme near Eshowe in the KwaZulu-Natal.

| | |
|---|---|
| **Project Name:** | **Kilimon Bulk Water Supply Wetland and Vegetation Assessment** |
| **Client:** | Terratest (Pty) Ltd |
| **Location:** | Kilimon Community, South Africa |
| **Date:** | 2020 |

**Activities Performed:** Undertaking the wetland and biodiversity specialist study in support of the Application for Environmental Authorisation for the Kilimon Bulk Water Supply Scheme near Ixopo in KwaZulu-Natal.

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PO Box 819, Gillitts, 3603, South Africa
**Tel:** +27 (0) 31 764 7130 **Fax:** +27 (0) 31 764 7140 **Web:** www.gcs-sa.biz

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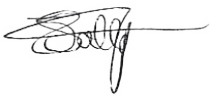
| | **Name** | **Signature** | **Date** |
| **Author** | Magnus van Rooyen |  | October 2022 |
| **Reviewer** | Janice Callaghan |  | October 2022 |
| **Director** | Magnus van Rooyen |  | October 2022 |

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Have no, and will not engage in, conflicting interests in the undertaking of the activity;

Undertake to disclose, to the competent authority, any material information that has or may have the potential to influence the decision of the competent authority or the objectivity of any report, plan or document required in terms of the National Environmental Management Act (Act No. 107 of 1998);

As a registered member of the South African Council for Natural Scientific Professions, will undertake my profession in accordance with the Code of Conduct of the Council, as well as any other societies to which I am a member;

Based on information provided to me by the project proponent and in addition to information obtained during the course of this study, have presented the results and conclusion within the associated document to the best of my professional ability; and

Reserve the right to modify aspects pertaining to the present investigation should additional information become available through ongoing research and/or further work in this field.

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|---|---|
| Magnus van Rooyen (Pr.Sci.Nat) | October 2022 |
| SACNASP reg. no. 400335/11 | Date |

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## 2 BACKGROUND

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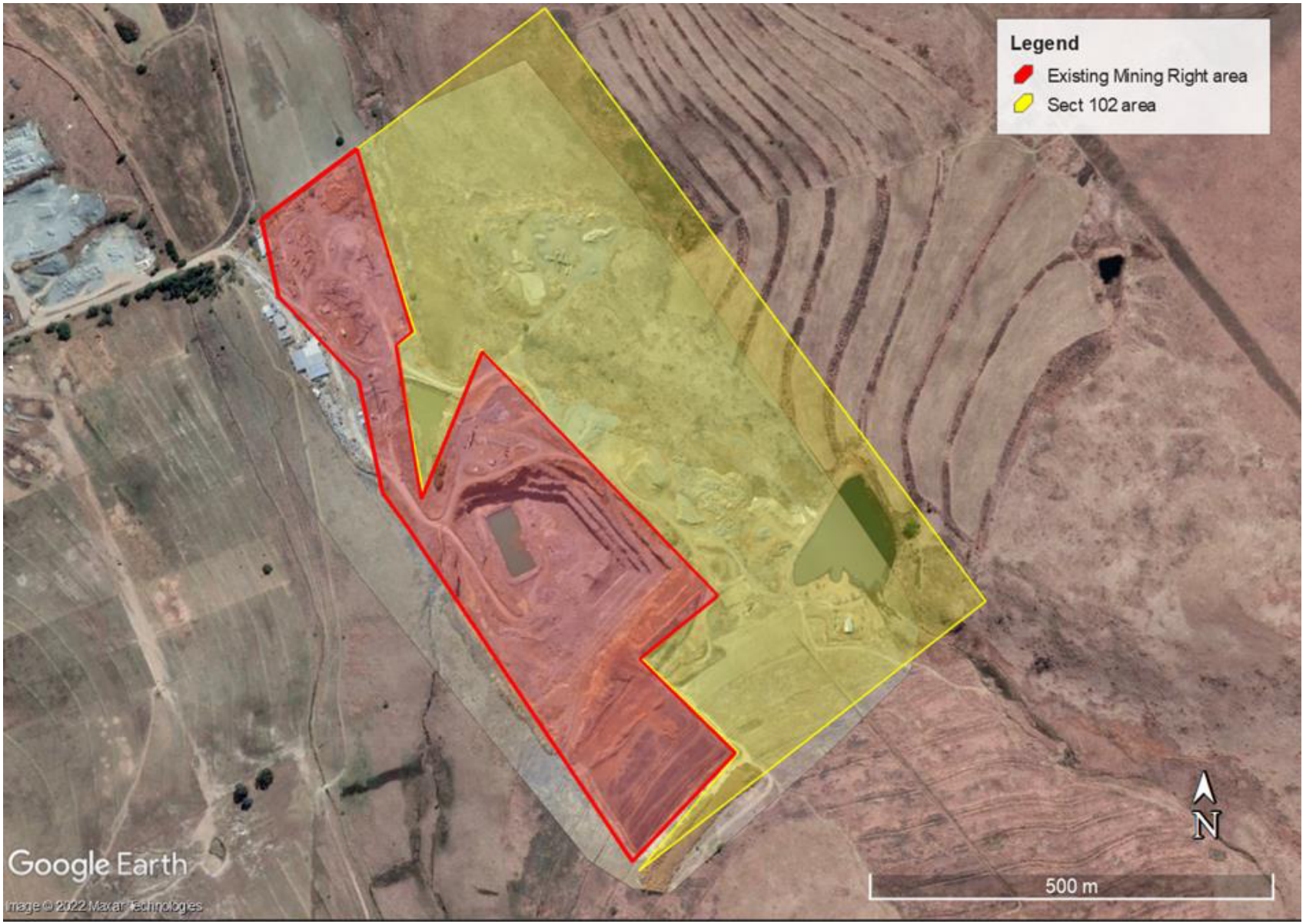
**Figure 2-1: Location of the Stonewell Quarry operations in relation to the town of Kokstad**

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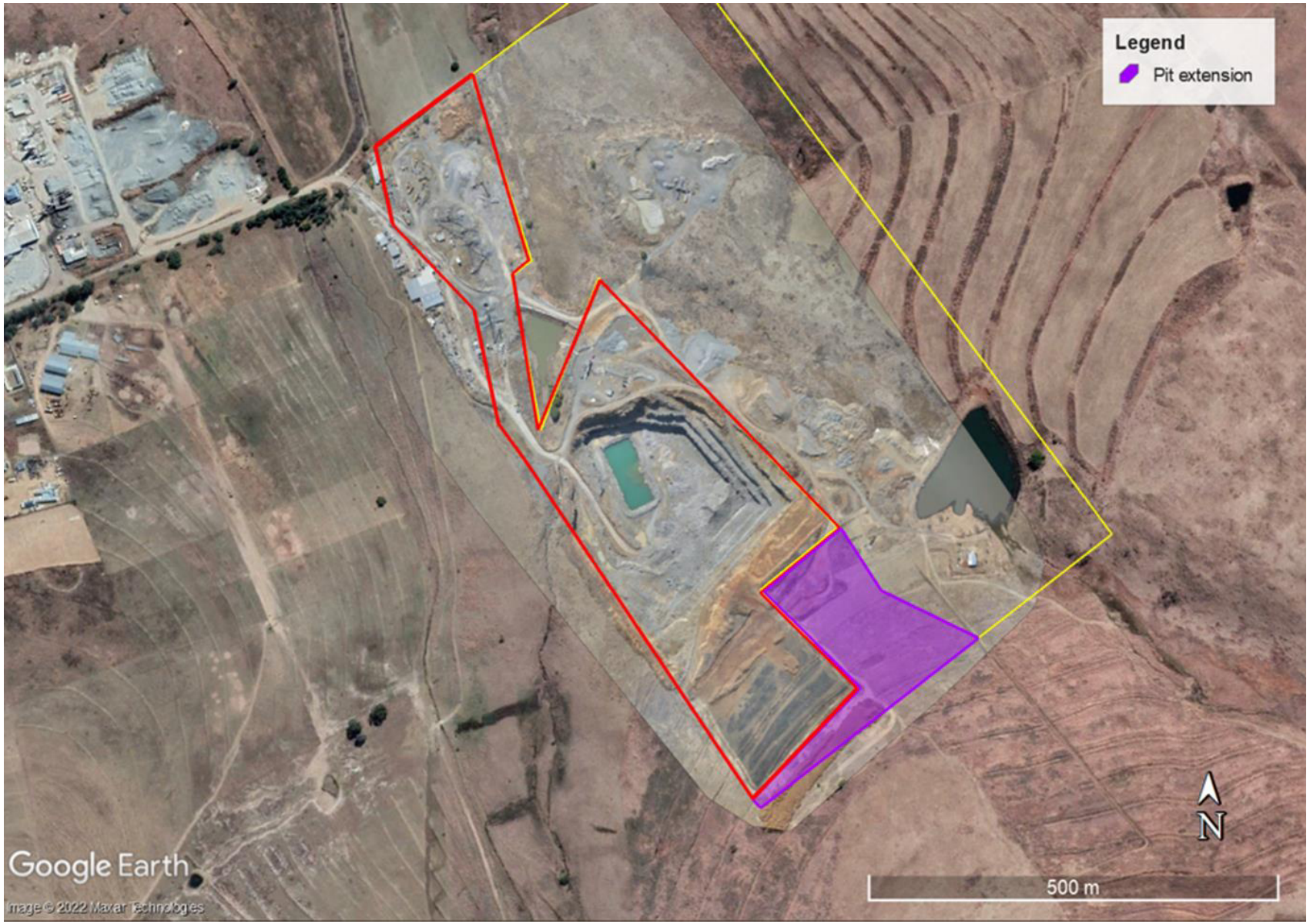


**Figure 2-3: Location and extent of the quarry pit extension**

# 3 SCOPE OF WORK

This report will be submitted in support of the Application for Enviromental Authorisation in accordance with the requirements of the National Environmental Management Act (Act No. 107 of 1998): Environmental Impact Assessment Regulations (2014), as amended. As such, the scope of works associated with this report makes provision for compliance with the requirements of these regulations.

The terrestrial biodiversity site sensitivity rating provided by the Department of Forestry, Fisheries and Environment's (DFFE) online Screening Tool is provided in the table below.

**Table 3-1: Site sensitivity ratings as per the DFFE Online Screening Tool**

| Theme | Sensitivity | Comments |
|---|---|---|
| Animal species | Medium | Aves – *Sagittarius serpentarius*<br>Mammalia – *Ourebia ourebi ourebi* |
| Plant species | Medium | *Dierama tysonii*<br>*Berkheya griquana*<br>Sensitive species 1076<br>Sensitive species 1248 |
| Terrestrial biodiversity | Low | |

A site sensitivity verification assessment was conducted and has largely refuted the various sensitivity ratings due to the significant transformation that the terrestrial biodiversity on the site has undergone. This transformation has been as a result of the historical clearance of the overburden from the area as part of the mining operations and historical agricultural activities in the area.

In accordance with the Gazetted protocol for specialist assessment and minimum report content requirements for environmental impacts terrestrial biodiversity components Compliance Statements must be completed for the biodiversity themes that are identified in the DFFE Online Screening Tool.

The sections below provide the Compliance Statements that relate to the terrestrial biodiversity aspects (animals, plants and biodiversity) of the site.

# 4 METHODOLOGY

A literature review and desktop analysis were undertaken prior to the site assessment, utilizing various sources including the South African National Biodiversity Institute (SANBI) data and other relevant sources. Recent and historical aerial imagery of the site was reviewed in order to identify points of investigation during the site assessment.

Based on the information generated through the desktop assessment, a site assessment was undertaken to identify the following:

- Sites of geomorphological or topographical variance were identified and subjected to an evaluation of species present identified during the site walkover.

- Signs of Species of Conservation Concern (SCC) identified in the DFFE Online Screening Tool were noted, if present.
- Any additional species of significance, not identified within the DFFE Online Screening Tool were noted.

The site assessment was conducted on 26 August 2022 by Mr Magnus van Rooyen from GCS Water and Environment (Pty) Ltd, who is a registered professional with the South African Council for Natural Scientific Professions (Reg. No. 400335/11).

All data was collected and subjected to evaluation in order to:

- Give overall consideration of the status of the habitat on the study site;
- Identify any habitat anomalies or impacts on the study site that will impact on the habitat status;
- Enable the interpretation of the data in order to prioritize and evaluate the habitat status on the study area.

## 5 ASSUMPTIONS AND KNOWLEDGE GAPS

The following are assumptions made in the completion of the report:

- The assessment of the potential impacts of the proposed development is based on the terrestrial biodiversity features on the development site is based on the project description provide in the sections above. If the project description is amended, the impact identification and assessment contained in this report may also change.
- The findings of the report are limited to a single day long site visit conducted on 24 August 2022 which is considered to be late winter / early spring. The seasonal timing of the site assessment is not considered to influence / compromise the findings of the assessment.
- The following desktop information was used to augment the finding of the assessment:
    - Electronic biodiversity databases managed by the South African National Biodiversity Institute (SANBI);
    - Available provincial electronic biodiversity databases;
    - Wetland and Riparian Habitat Delineation Document (Department of Water and Sanitation report);

# 6 BASELINE PROFILE OF THE STUDY SITE

The section below deals with the baseline conditions on the assessment site and makes provision for desktop findings as well as observations made during the site assessment.

## 6.1 Topography

The study site is located on the northern slope of a west – east running ridge that forms the southern border between the KwaZulu-Natal and Eastern Cape Provinces (see Figure 6-1 for a profile of the area).


**Figure 6-1: North – south topographical profile of the study area (southern extent to the right of figure)**

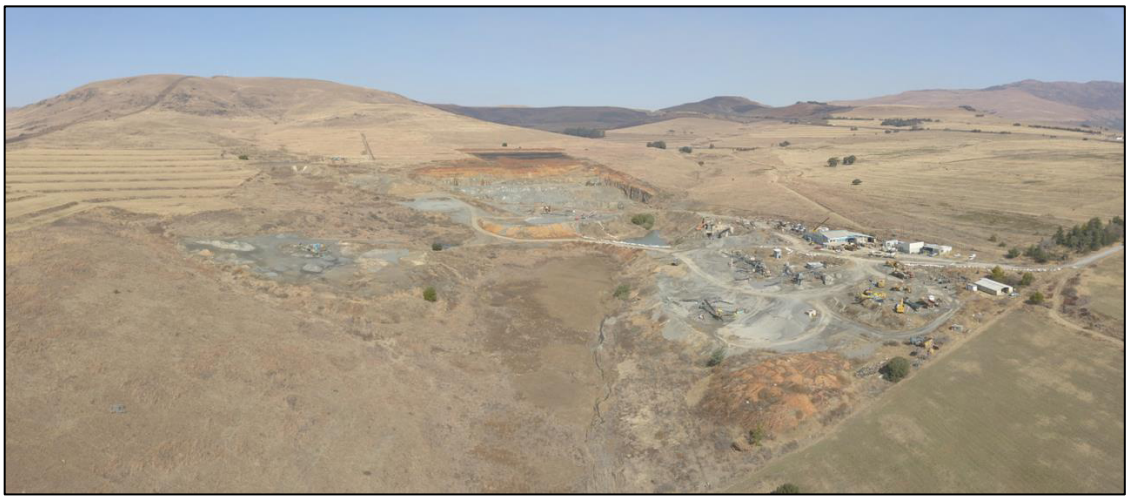

**Plate 6-1: Aerial view of the topography surrounding the Stonewell Quarry operations, looking in a southerly direction**

## 6.2 Drainage

The drainage from the site is in a northern direction via two unnamed watercourses that pass through and is within close proximity of the current mining operations. The unnamed watercourses are seasonal in nature and will only flow during and immediately after periods of heavy rains. Three existing farm dams and one dam within the existing quarry operations are associated with the with the site. Three of the dams are located upstream of the Mining Right area in one of each of the unnamed tributaries with the fourth downstream of the quarry downstream of the confluence of the two unnamed tributaries. The location of these dams and unnamed tributaries are provided in Figure 6-2.

The two unnamed tributaries forms part of the Mzintlava River catchment that drains in a southerly direction to eventually drain into the uMzimvubu River. As such the unnamed watercourses form part of the Mzimvubu – Tsitsikama Water Management Area.


**Figure 6-2: Location of the drainage features associated with the study site as well as an indication of the drainage direction**

## 6.3 soils

The soils in the study area are typically high in clay content. The soils in the northern portion of the study area falls within the Fa851 landform that typically has an average clay content of 35.7% while the soils to the south of the site falls within the Fa845 landform with an average clay content of 41%. The National Department of Agriculture has classified the soils on the study site as being undifferentiated and shallow with the limitation of being susceptible to erosion, excessive drainage and low natural fertility. Soil types that will typically occur on the site consists of Glenrosa and/or Mispah types.

**Plate 6-2: View of the shallow soils that are stripped above the mining front**

## 6.4 Aquatic features

The interrogation of the NFEPA Wetland Database (2011) has indicated the presence of three wetland areas associated with the study area (see Figure 5-3). These three wetlands are classified as artificial in nature as they are directly associated with the presence of farm dams as identified earlier in the report.


**Figure 6-3: Location of the NFEPA Wetland areas**

## 6.5 Vegetation

The vegetation on the study area is classified as East Griqualand Grassland (Gs12) by the National Vegetation Map (2018) managed by the South African National Biodiversity Institute (SANBI). The SANBI reference places the vegetation type in the Sub-escarpment Grassland Bioregion within the Grassland Biome. The total area under this vegetation type is in excess of 260 000ha. The vegetation type has a conservation status classification of "least threatened".

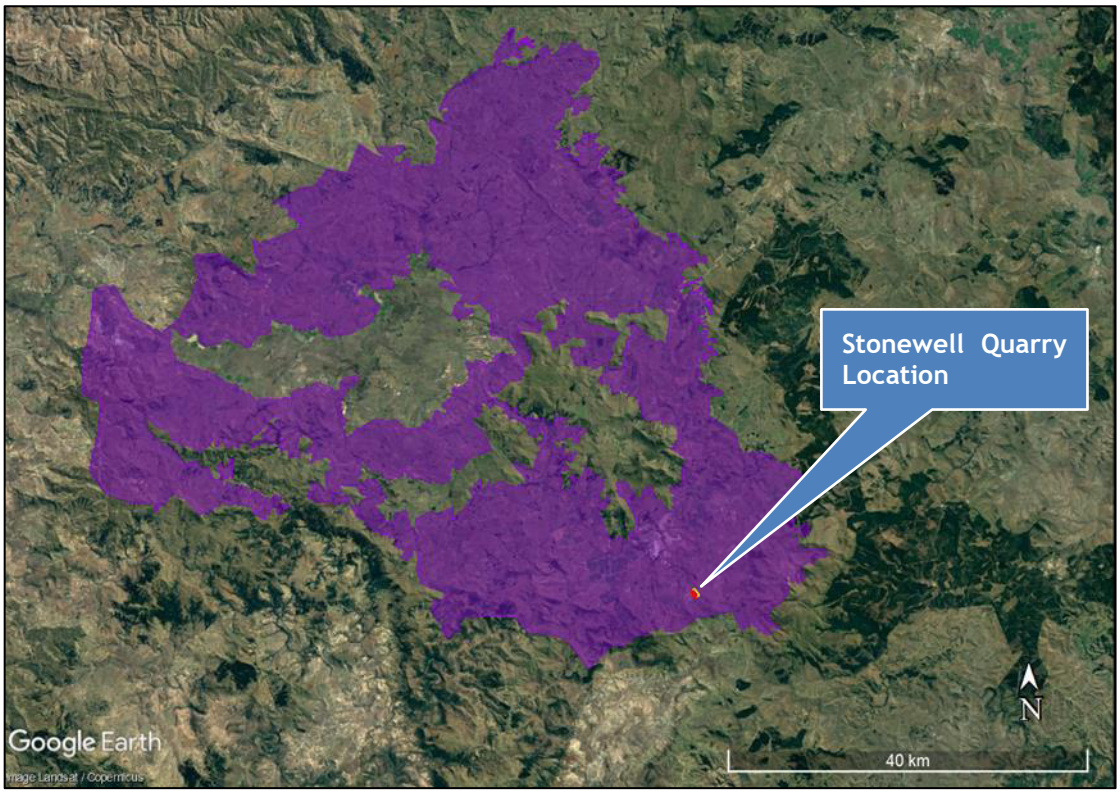


**Figure 6-4: Location of the site in the larger distribution of the East Griqualand Grassland (Gs12) vegetation type and the location of the study site**

### 6.6 Land use

The current land use on the property is activities associated with the operations of the quarry as well as agriculture (plant of grazing and grazing of livestock).

## 7 PLANT SPECIES COMPLIANCE STATEMENT

As per the DFFE Online Screening Tool, the terrestrial plant theme has been rated with a MEDIUM rating. This rating is based on the following:

- Suspected habitat for Species of Conservation Concern (SCC) based either on there being records for this species collected in the past, prior to 2002, or being a natural area included in a habitat sustainability model; and
- SCC listed on the IUCN Red List of Threatened Species or South Africa's National Red List website as Critically Endangered, Endangered or Vulnerable according to the IUCN Red List 3.1. Categories and Criteria and under the national category as Rare.

The plant species that have been identified in the DFFE Online Screening Tool that may occur on the study site are provided in the table below.

**Table 7-1: Sensitive plant species identified as potentially present within the study site**

| Scientific name | Sensitivity | Present on site (Y/N) |
|---|---|---|
| *Dierama tysonii* | Medium | N |
| *Berkheya griquana* | Medium | N |
| Sensitive species 1076* | Medium | N |
| Sensitive species 1248* | Medium | N |

*These species are indicated as specific numbers due to their collectable nature

It can be confirmed that the study site falls within the natural distribution of these plant species, but due to the historic clearance of the study site for agricultural and mining activities none of these species are present on the site.

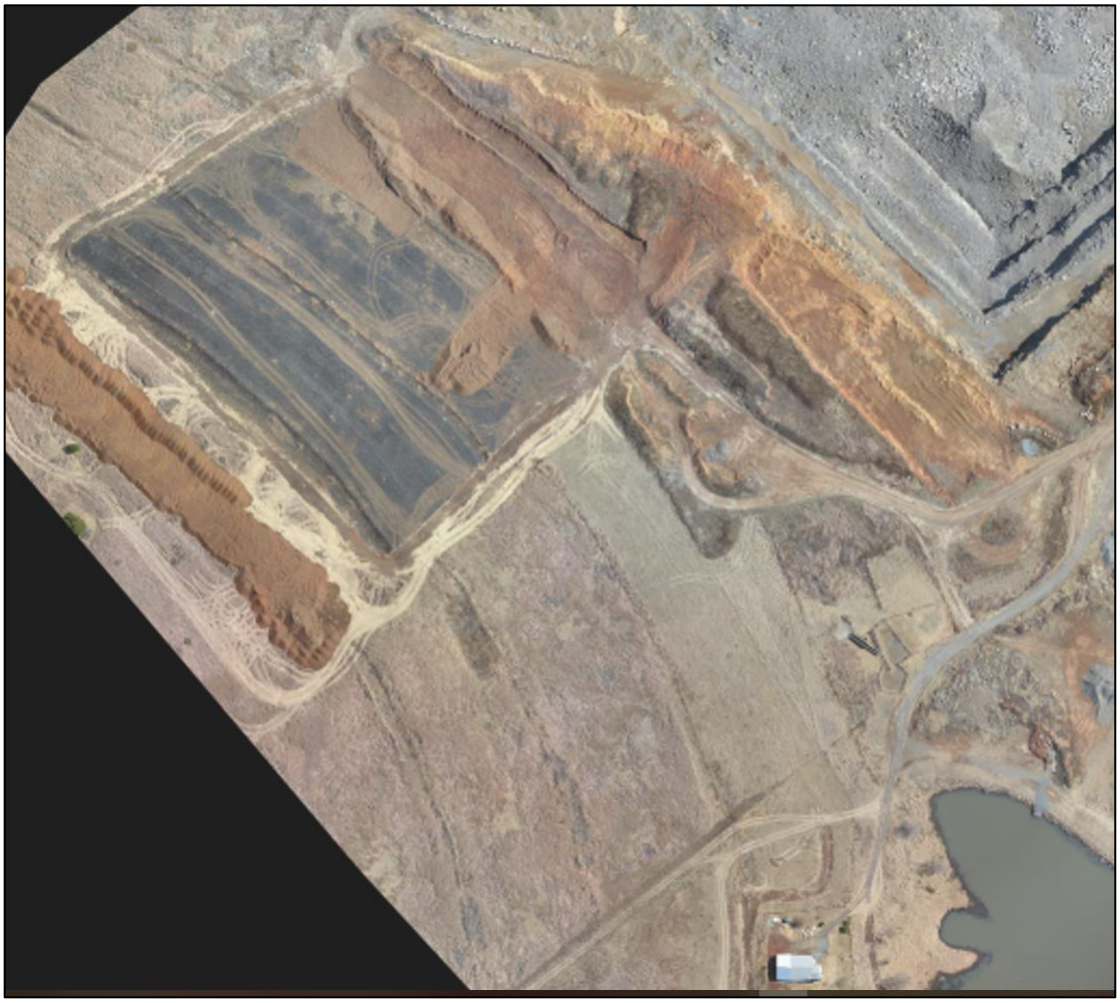

**Plate 7-1: Zoomed in aerial view of the study area with the agricultural contouring clearly visible**

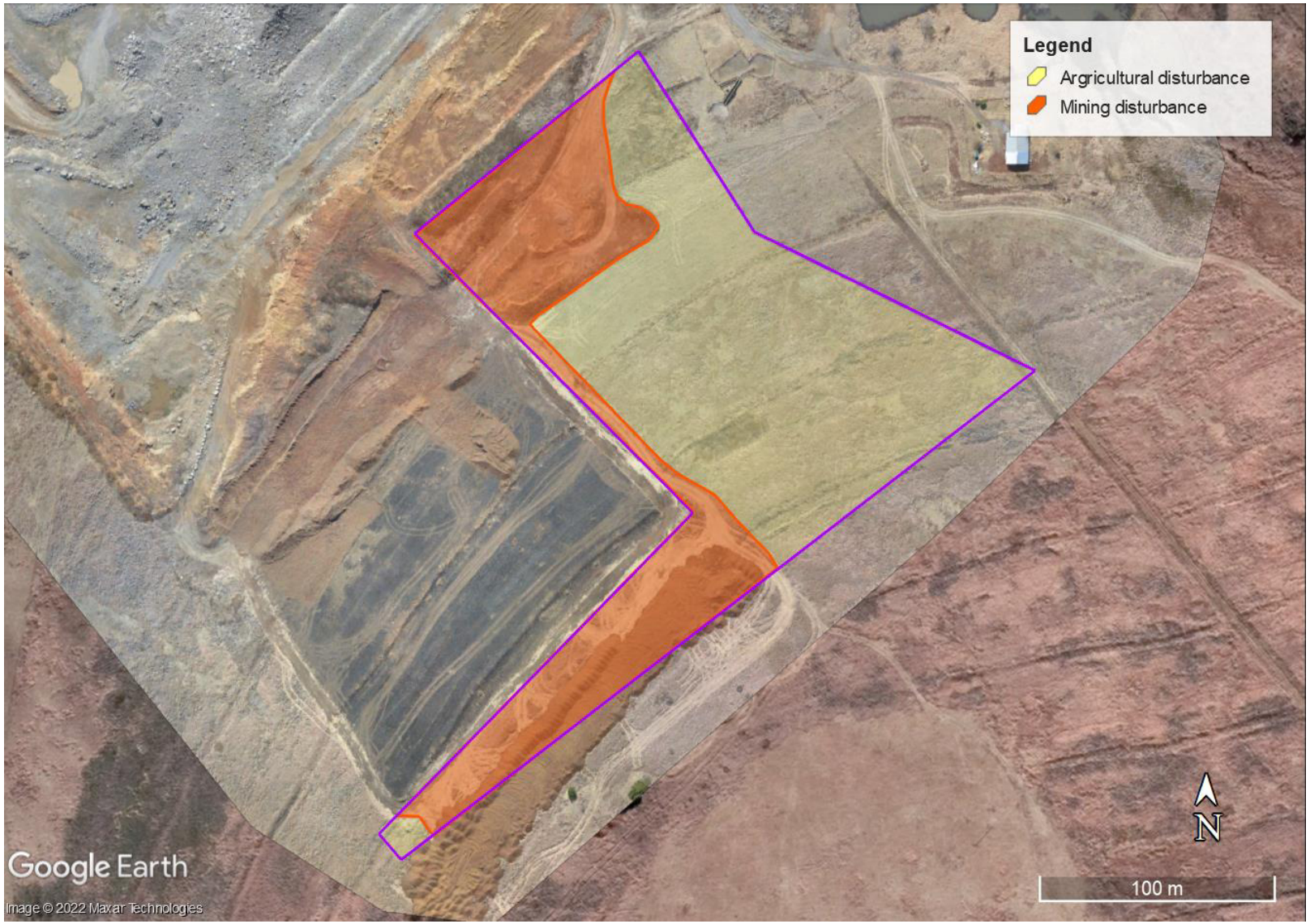


**Figure 7-1: Distribution of the disturbed areas within the quarry pit extension area**

The areas that have been altered through the agricultural activities have reverted back to a monoculture of *Elionurus muticus* (Wire Grass). This grass species is typical to disturbed areas and is an indication of disturbance from the natural state. The relatively bitter taste of leaves makes this species highly unpalatable to animals.

The plant sensitivity of the study site is therefore considered to be LOW.

# 8 ANIMAL SPECIES COMPLIANCE STATEMENT

As per the DFFE Online Screening Tool, the terrestrial animal theme has been rated with a MEDIUM rating. This rating is based on the following:

- Suspected habitat for Species of Conservation Concern (SCC) based either on there being records for this species collected in the past, prior to 2002, or being a natural area included in a habitat sustainability model; and
- SCC listed on the IUCN Red List of Threatened Species or South Africa's National Red List website as Critically Endangered, Endangered or Vulnerable according to the IUCN Red List 3.1. Categories and Criteria and under the national category as Rare.

The animal species that have been identified in the DFFE Online Screening Tool that may occur on the study site are provided in the table below.

**Table 8-1: Sensitive plant species identified as potentially present within the study site**

| Class | Scientific name | Common name | Sensitivity | Present on site (Y/N) | Comment |
|---|---|---|---|---|---|
| Aves | *Sagittarius serpentarius* | Secretary bird | Medium | N | The species favours short grassland at various altitudes. Even though this habitat is present on the study area, the continuous presence of the quarry operations will likely scare this animal off. No signs of the bird was viewed during the site visit. |
| Mammalia | *Ourebia ourebi ourebi* | Oribi | Medium | N | The site falls in the distribution range of the species, however the presence f this animal is unlikely dur to the continuous disturbance of the quarry as well as the rarity of the species. The site is also located at the southern most distribution range of the species. |

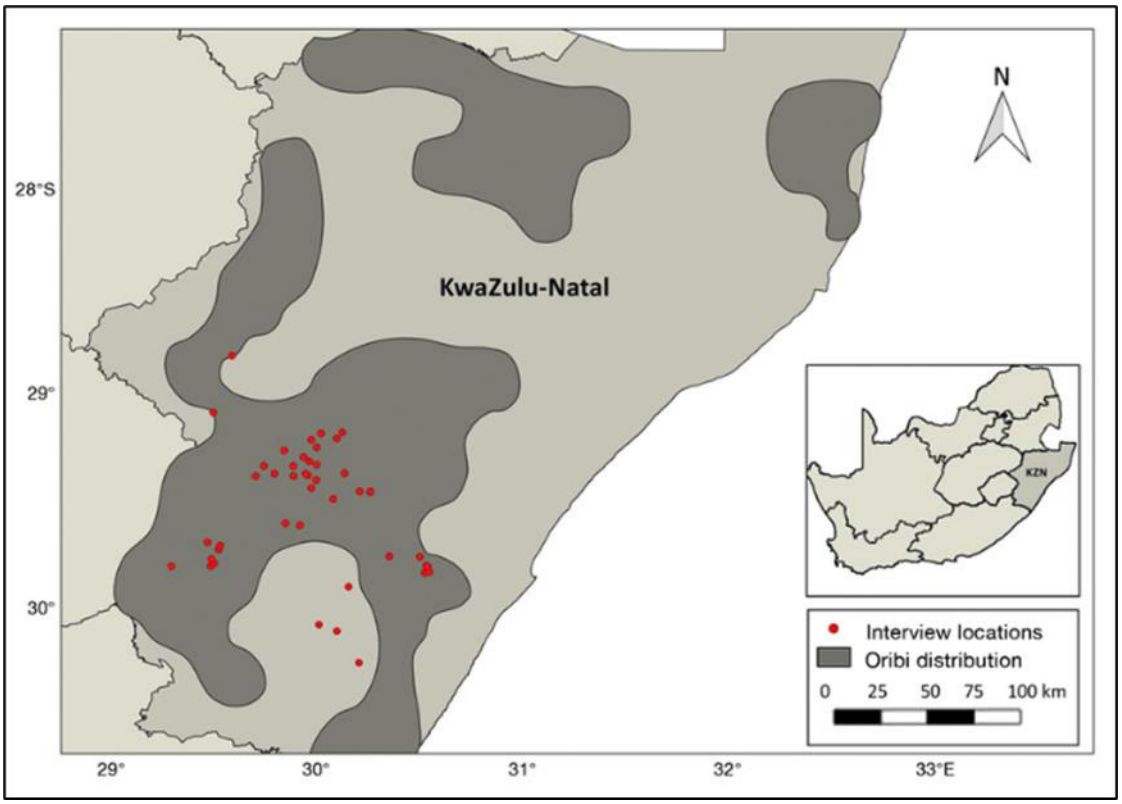


**Figure 8-1: Distribution of the *Ourebia ourebi ourebi in KwaZulu-Natal***

It can be confirmed that the study site falls within the natural distribution of these animal species, but due to the historic clearance of the study site for agricultural activities and the presence of the quarry in close proximity of the study site, these species will not occur on the site.

# 9 IMPACT ASSESSMENT

Likely impacts associated with the proposed extension of the quarry pit on the identified terrestrial and biodiversity baseline have been identified through the undertaking of site visits, consultation of published information, comments from the relevant authority and independent assessment by the Environmental Project Team. Impacts have also been identified by the specialist assessments undertaken.

The impact assessment will make provision for the assessment of the following impacts:

- No-go impacts;
- Construction phase impacts;
- Operational phase impacts;
- Decommissioning phase impacts; and

- Cumulative impacts.

Impacts identified were assessed according to the criteria outlined in Appendix B. Each impact was ranked according to extent, duration, magnitude and probability. These criteria are based on the Department of Environmental Affairs and Tourism (DEAT) (now the Department of Environmental Affairs, Forestry and Fisheries) Guideline Document to the EIA Regulations(1998). Where possible, mitigatory measures were recommended for the impacts identified.

## 9.1 No-go impacts

To contextualise the potential impacts of the project's activities and associated infrastructure, the existing impacts (or *status quo*) associated with current terrestrial biodiversity conditions need to be described in terms of the vegetation patterns, structure and composition. This *status quo* should be used as the comparison against which the other project impacts are assessed. The main issues identified with the existing impacts are:

- The current levels of disturbance will persist on the study site.

Since these existing impacts will continue even if the project is not implemented, they are considered to be "no-go" impacts.

## 9.2 Construction and operational phase impacts

This section will assess the impacts associated with the implementation of the proposed development on the terrestrial biodiversity on the Mining Permit area. As the construction and operational activities are directly aligned, they are similar and will be assessed as such. The following impacts have been identified:

- Loss of indigenous vegetation.
- Spreading of alien invasive plant species.
- Contamination of the area by petrochemical spillages.
- Contamination of the area by domestic waste.

## 9.3 Decommissioning phase impacts

The mining permit area will be closed and rehabilitated with the expiry of the Mining Permit. The impacts associated with the rehabilitation are as follows:

- Spreading of alien invasive vegetation.

## 9.4 Cumulative impacts

The following cumulative impacts associated with the mining activities have been identified:

- Loss of indigenous vegetation.
- Spread of alien invasive plant species.
- Disruption of an open space corridor.

**Table 9-1: No-go impacts associated with the mining activities**

| Nature of impact | Impact summary | Without mitigation | | | | | Significance rating (pre-mitigation) | Proposed mitigation and management measures | With mitigation | | | | | Significance rating (post-mitigation) |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | S = Status; E = Spatial extent; D = Duration; P = Probability; M = Magnitude | | | | | | | S = Status; E = Spatial extent; D = Duration; P = Probability; M = Magnitude | | | | | |
| | | S* | E | D | M | P | | | S | E | D | M | P | |
| Habitat degradation | The current land use management will persist. | - | 2 | 4 | 8 | 4 | Score: 56 Medium Negative | None, as the no-go option reflects the *status quo*. | - | 1 | 4 | 6 | 4 | Score: 56 Medium Negative |

**Table 9-2: Construction and operational impacts associated with the mining activities**

| Nature of impact | Impact summary | Without mitigation | | | | | Significance rating (pre-mitigation) | Proposed mitigation and management measures | With mitigation | | | | | Significance rating (post-mitigation) |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | S = Status; E = Spatial extent; D = Duration; M = Magnitude P = Probability | | | | | | | S = Status; E = Spatial extent; D = Duration; M = Magnitude P = Probability | | | | | |
| | | S* | E | D | M | P | | | S | E | D | M | P | |
| Loss of indigenous vegetation. | The opening of the quarry pit will require the removal of vegetation from the area. The vegetation that will be removed consists of *Elionurus muticus* (Wire Grass) which is a common, unpalatable grass with a wide distribution. | - | 1 | 2 | 8 | 4 | **Score: 44 Medium Negative** | Provision must be made for concurrent rehabilitation of the mining operations which will ensure that the area is mined in designated sections.<br><br>The EMPR for the quarry operations will make provision for the rehabilitation measures to be implemented at the operations. These must be made applicable to the proposed quarry pit extension. | - | 1 | 2 | 6 | 2 | **Score: 18 Low Negative** |
| Spreading of alien invasive plant species. | The clearance of vegetation from the mining area will provide an opportunity for alien invasive species to settle on the site. | - | 2 | 3 | 6 | 3 | **Score: 44 Medium Negative** | A seedbed of alien plants will be present within the cleared soils. This seedbed and the plants that originate from the seedbed must be managed as follows:<br><br>• The quarry pit extension area must be clearly survey and | - | 1 | 2 | 3 | 3 | **Score: 18 Low Negative** |

| Nature of impact | Impact summary | Without mitigation<br>S = Status; E = Spatial extent; D = Duration; M = Magnitude P = Probability | | | | | Significance rating (pre-mitigation) | Proposed mitigation and management measures | With mitigation<br>S = Status; E = Spatial extent; D = Duration; M = Magnitude P = Probability | | | | | Significance rating (post-mitigation) |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | S* | E | D | M | P | | | S | E | D | M | P | |
| | | | | | | | | demarcated before any construction or operations is to commence.<br>• This must be done to ensure that areas to be cleared limited to only the areas that are necessary for the mining activities.<br>• The cleared areas must be regularly monitored for the establishment of alien plant species. These must be cleared when they appear.<br>• If alien invasive plant species become a problem on the mining area site, a formal Alien Invasive Management Plan must be set up and implemented. This plant must make provision for the identification and eradication of these species.<br>• The rehabilitation of these cleared areas must commence as soon as practically possible after construction activities have ceased and be conducted in accordance with the requirements of the EMPR for the quarry operations. | | | | | | |
| Contamination of the area by petrochemical spillages. | The presence of plant and equipment on the mining area poses a risk to contamination | - | 1 | 1 | 4 | 3 | **Score: 18<br>Low<br>Negative** | Even though the impact pre-mitigation is considered to be low, the following mitigation measures must | **-** | **1** | **1** | **4** | **1** | **Score: 6<br>Low<br>Negative** |

| Nature of impact | Impact summary | Without mitigation<br>S = Status; E = Spatial extent; D = Duration; M = Magnitude P = Probability | | | | | Significance rating (pre-mitigation) | Proposed mitigation and management measures | With mitigation<br>S = Status; E = Spatial extent; D = Duration; M = Magnitude P = Probability | | | | | Significance rating (post-mitigation) |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | S* | E | D | M | P | | | S | E | D | M | P | |
| | of the environment through any leaks. | | | | | | | be included into the EMPR to further reduce the significance of the impact:<br>• All plant and equipment that make use of petrochemical substances must be checked leakages on a daily basis before operations commence.<br>• All plants and equipment that are found to be leaking must be removed from the property and only returned once the leakages have been addressed.<br>• If any petrochemical substances<br>• All refuelling of plant and equipment must be conducted over a drip-tray.<br>• If any plant or equipment is to be parked on the site, these must be parked within the demarcated construction footprint that has been cleared.<br>• If any spillages from plant or equipment occur, the spill must be immediately contained, the contaminated soils must be collected and bagged in impermeable bags and stored on site to be removed and disposed of by a registered service provider. | | | | | | |

| Nature of impact | Impact summary | Without mitigation<br>S = Status; E = Spatial extent; D = Duration; M = Magnitude P = Probability | | | | | Significance rating (pre-mitigation) | Proposed mitigation and management measures | With mitigation<br>S = Status; E = Spatial extent; D = Duration; M = Magnitude P = Probability | | | | | Significance rating (post-mitigation) |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | S* | E | D | M | P | | | S | E | D | M | P | |
| Contamination of the area by domestic waste. | The employees associated with the mining activities will generate an amount of domestic waste on the site which could spread from the site and contaminate the areas surrounding the site. | - | 1 | 2 | 4 | 3 | **Score: 21<br>Medium<br>Negative** | Even though the impact pre-mitigation is considered to be low, the following mitigation measures must be included into the EMPR to further reduce the significance of the impact:<br>• A designated eating area must be established within the mining area.<br>• Covered domestic waste bins must be present at the eating area to receive all the domestic waste generated by the labour.<br>• The capacity of these domestic waste bins must be monitored on a daily basis to ensure that they are emptied timeously.<br>• The domestic waste from these waste bins must be removed off site and disposed of at a municipal landfill site on a weekly basis or more regularly if the bins fill up quicker. | - | 1 | 1 | 2 | 2 | **Score: 8<br>Low<br>Negative** |

**Table 9-3: Decommissioning impacts associated with the mining activities**

| Nature of impact | Impact summary | Without mitigation<br>S = Status; E = Spatial extent; D = Duration; P = Probability; M = Magnitude | | | | | Significance rating (pre-mitigation) | Proposed mitigation and management measures | With mitigation<br>S = Status; E = Spatial extent; D = Duration; P = Probability; M = Magnitude | | | | | Significance rating (post-mitigation) |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | S* | E | D | M | P | | | S | E | D | M | P | |
| Spreading of alien invasive vegetation | Alien invasive plant species might settle within the mining area from where these species could spread into the surrounding areas. | - | 2 | 3 | 6 | 4 | **Score: 44 Medium Negative** | A seedbed of alien plants will be present within the cleared soils. This seedbed and the plants that originate from the seedbed must be managed as follows:<br>• The rehabilitation footprint must be clearly survey and demarcated before any rehabilitation activities can commence.<br>• This demarcation must be done to ensure that the management of aliens is limited to this area.<br>• The rehabilitation areas must be regularly monitored during the decommissioning phase for the establishment of alien plant species. These must be cleared when they appear.<br>• If alien invasive plant species become a problem on the mining area, a formal Alien Invasive Management Plan must be set up and implemented. This plant must make provision for the identification and eradication of these species. | - | 1 | 2 | 3 | 3 | **Score: 9 Low Negative** |

**Table 9-4: Cumulative impacts associated with the mining activities**

| Nature of impact | Impact description | Impact rating post mitigation |
|---|---|---|
| Loss of indigenous vegetation. | The mining operations will be conducted as an open cast surface mining operation which will result in the removal of the vegetation from the active mining areas. As a result of this clearance, it is likely that some indigenous vegetation will be cleared from the site. However, vegetation that will be cleared primarily consists of Elionurus muticus (Wire Grass) that has a wide distribution and is highly unpalatable to animals. The value of this species as a habitat forming component is therefore very low.<br><br>Furthermore, the rehabilitation of the site will make provision for the reestablishment of the same pioneering grasses that would have been removed during the mining activities.<br><br>This cumulative impact can therefore be successfully managed and mitigated. | **Low Negative** |
| Spread of alien invasive plant species. | Due to the existing presence of alien invasive species on the old agricultural areas as well as the existing mining operations, the risk of these species spreading from the site is present. However, since these species will be removed and managed during the mining activities, the impact is considered to be limited.<br><br>Furthermore, the management of alien invasive plant species must be included in the EMPR for the operations. The measures included in this plan must have as a goal to reduce the spread of the alien invasive species and to eradicate them from area within the property in which they occur. Similarly, the rehabilitation of the site during the decommissioning phase must make provision for the planting of indigenous pioneering grasses on the site. As such implementation of these plans will result in the improvement of the vegetative biodiversity on the property and result in an improvement of the current biodiversity baseline on the site.<br><br>This cumulative impact can therefore be successfully managed and mitigated. | **Low Negative** |
| Disruption of an open space corridor. | The site that is designated for the quarry pit expansion is currently vacant land. The operations on the site will therefore change this "vacant land" status for the duration of the operations. As the project makes provision for the extension of the existing mining operations, the impact on the open space corridor already exists.<br><br>The rehabilitation of the site will make provision for the shaping of the mining area to blend in with the surrounding topography and associated drainage as well as for the planting of pioneering grasses that are endemic to the area.<br><br>This cumulative impact can therefore be successfully managed and mitigated. | **Low Negative** |

## 10 MANAGEMENT AND MITIGATION MEASURES

The management and mitigation measure to be included in the Environmental Management Programme Report (EMPR) for the mining activities are provided in Tables 9-1 to 9-3, above.

## 11 MONITORING REQUIREMENTS

It is recommended that an Environmental Control Officer, who meets the requirements of the NEMA: EIA Regulations (2014) as amended, be appointed to conduct audits in line with the current auditing programme that is in place for the mining operations. An audit report must be completed for each audit and be submitted to the Department of Mineral Resources and Energy.

Furthermore, a specialist ecologist should conduct a site visit at the commencement of the rehabilitation phase of the project to ensure that the contractor is adequately informed of the rehabilitation requirements associated with the works.

## 12 REASONED OPINION BY THE SPECIALIST

Appendix 6 of the National Environmental Management Act (Act No. 107 of 1998): Environmental Impact Assessment Regulations (2014), as amended requires that the specialist conducting a specialist study for submission with an Application for Environmental Authorisation provide a reasoned opinion on whether an authorisation should be granted. The following is the specialist's reasoned opinion in this regard.

Based on the findings of the assessment it is the opinion of the Specialist that there are no reasons that the development should not be authorised in accordance with the specifications as presented in this assessment. The authorisation must make provision for the various management and mitigation measures detailed in this report.

The following considerations were taken for the generation of the reasoned opinion regarding the potential terrestrial biodiversity impacts of the proposed mining operations associated with the mining area:

- The nature and extent of the proposed activities to be undertaken on the site;
- The location of any terrestrial biodiversity areas within the study area.
- The location of these activities to any sensitive terrestrial biodiversity areas on the site.
- The assessment of the potential impacts and risks on these terrestrial biodiversity features posed by the mining operations.

Based on the above considerations as well as the information contained in this assessment, no sensitive terrestrial biodiversity features were encountered on the study site footprint. As such, the impacts that are associated with the mining activities on the terrestrial biodiversity with applying mitigation measures are low.

It is therefore the specialist's opinion that the authorisation for the project should be granted.

## 13 CONCLUSION

The DFFE Online Screening Tool has indicated that the Plant and Animal Theme of the site is of MEDIUM sensitivity while the Terrestrial Biodiversity Theme has a LOW sensitivity.

However, the findings of this assessment do not agree with this rating. As such the impacts on the current Plant and Animal Themes is considered to be of LOW sensitivity while the LOW sensitivity of terrestrial biodiversity mining area is affirmed.

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**APPENDIX A**

**SPECIALIST CURRICULUM VITAE**

**Summary CV**

## Name Surname

Magnus van Rooyen

## Personal summary

**Year of birth:**

4 September 1976

**Nationality:**

South African

**Languages**:

- Afrikaans
- English
- German

**Qualifications:**

- MPhil (Environmental Management)
- Post Graduate Certificate in Education (Biology and Science)
- BSc Hons (Botany)
- BSc (Botany and Zoology)

**Key skills:**

- Aquatic Ecologist
- Terrestrial Ecologist

Magnus van Rooyen is a professionally registered Environmental Scientist with the South African Council for Natural Scientific Professions (SACNASP) (Reg. No. 400335/11). Mr van Rooyen has more than 15 years' experience in the environmental sector, both as an terrestrial and aquatic specialist as well as an environmental assessment practitioner. He holds a post-graduate qualification in Botany as well as Environmental Management and an undergraduate degree in Botany and Zoology.

- **GCS Water and Environment (Pty) Ltd (2021 – present)**
- **JG Afrika (Pty) Ltd (2005 – 2020)**
- **University of Stellenbosch (2002 – 2005)**

## Selected projects

| | |
|---|---|
| **Project Name:** | **Durban Dig-out Port Biodiversity Baseline Assessment** |
| **Client:** | Transnet Capital Project |
| **Location:** | Durban, South Africa |
| **Date:** | 2012 – 2014 |

**Activities Performed:** Conducted the biodiversity baseline assessment of the site identified for the new Durban Dig-out Port. The biodiversity assessment made provision for the assessment of the terrestrial ecology (mammals, birds, reptiles and vegetation) and the aquatic ecology (wetlands and watercourses occurring on the site to determine the baseline status of these aspects. Specific duties included the assessment of the aquatic features (wetlands and watercourses) as well as the amphibians.

| | |
|---|---|
| **Project Name:** | **Riversdale Anthracite Mine Biodiversity and Wetland Assessment** |
| **Client:** | Canyon Shared Services |
| **Location:** | Vryheid, South Africa |
| **Date:** | 2019 |

**Activities Performed:** Undertaking the wetland and biodiversity specialist study in support of the Application for Environmental Authorisation and the Water Use Licence Application for the Riversdale Anthracite Mine near Vryheid.

| | |
|---|---|
| **Project Name:** | **Southport Development Estuarine and Vegetation Assessment** |
| **Client:** | Royston Chapman |
| **Location:** | Southport, South Africa |
| **Date:** | 2020 |

**Activities Performed:** Undertaking of the estuarine and vegetation specialist study in support of the Application for Environmental Authorisation and the Water Use Licence Application for the development of a housing complex in Southport, KwaZulu-Natal.

| | |
|---|---|
| **Project Name:** | **KwaHlokohloko Bulk Water Supply Scheme Wetland and Vegetation Assessment** |
| **Client:** | Terratest (Pty) Ltd |
| **Location:** | KwaHlokohloko Community, South Africa |
| **Date:** | 2020 |

**Activities Performed:** Undertaking the wetland and vegetation specialist study in support of the Application for Environmental Authorisation for the implementation of the KwaHlokohloko Bulk Water Supply Scheme near Eshowe in the KwaZulu-Natal.

| | |
|---|---|
| **Project Name:** | **Kilimon Bulk Water Supply Wetland and Vegetation Assessment** |
| **Client:** | Terratest (Pty) Ltd |
| **Location:** | Kilimon Community, South Africa |
| **Date:** | 2020 |

**Activities Performed:** Undertaking the wetland and biodiversity specialist study in support of the Application for Environmental Authorisation for the Kilimon Bulk Water Supply Scheme near Ixopo in KwaZulu-Natal.

## APPENDIX B

## IMPACT ASSESSMENT METHODOLOGY

**IMPACT ASSESSMENT METHODOLOGY**

Likely impacts associated with the proposed development on the identified aquatic and terrestrial biodiversity baseline have been identified through the undertaking of site visits, consultation of published information, comments from Interested and Affected Parties, comments from the relevant authority and independent assessment by the Environmental Project Team. Impacts have also been identified by the specialist assessments undertaken.

The impact assessment will make provision for the assessment of the following impacts:

- No-go impacts;
- Planning and design phase impacts;
- Construction phase impacts;
- Operational phase impacts;
- Decommissioning phase impacts; and
- Cumulative impacts.

Impacts identified were assessed according to the criteria outlined below. Each impact was ranked according to extent, duration, magnitude and probability. These criteria are based on the Department of Environmental Affairs and Tourism (DEAT) (now the Department of Environmental Affairs, Forestry and Fisheries) Guideline Document to the EIA Regulations(1998). A significance rating was calculated as per the methodology outlined below. Where possible, mitigatory measures were recommended for the impacts identified.

***Status of the Impact***

The impacts were assessed as having either of the following:

**Table 1: Impact status classification**

| Classification | Definition |
|---|---|
| Negative effect | at a cost to the environment |
| Positive effect | a benefit to the environment |
| Neutral | Neutral effect on the environment |

***Extent of the Impact***

The extent of each impact was rated as being one of the following:

**Table 2: Impact extent classification**

| Classification | Definition |
|---|---|
| 1 | Site - within the boundaries of the development site |
| 2 | Local - the area within 5 km of the site |
| 3 | Municipal - the Local Municipality |
| 4 | Regional - The Province |
| 5 | National – South Africa |
| 6 | International – Southern Africa |

***Duration of the Impact***

The duration of each impact was rated as being one of the following:

**Table 3: Impact duration classification**

| Classification | Definition |
|---|---|
| 1 | Immediate - > 1 year |
| 2 | Short term – 1 to 5 years |
| 3 | Medium term – 6 to 15 years |
| 4 | Long Term – the impact will cease when the operation stops |
| 5 | Permanent – no mitigation measure will reduce the impact after construction |

***Magnitude of the Impact***

The intensity or severity of each impact was rated as being one of the following:

**Table 4: Impact severity classification**

| Classification | Definition |
|---|---|
| 0 | None – where the aspect will have no impact on the environment |
| 2 | Minor – where the impact affects the environment in such a way that natural, cultural and social functions / processes are not affected |
| 4 | Low – where the impact affects the environment in such a way that the natural, cultural and social functions / processes are slightly affected |
| 6 | Moderate – where the affected environment is altered but natural, cultural and social functions / processes continue, albeit in a modified way |
| 8 | High – natural, cultural or social functions / processes are altered to the extent that they will temporarily cease |
| 10 | Very high / unknown – natural, cultural or social functions / processes are altered to the extent that they will permanently cease |

***Probability of Occurrence***

The likelihood of the impact actually occurring is indicated as either:

**Table 5: Impact probability classification**

| Classification | Definition |
|---|---|
| 0 | None – the impact will not occur |
| 1 | Improbable – the possibility of the impact materialising is very low as a result of design, historic experience or implementation of adequate corrective actions |
| 2 | Low – there is a probability that the impact will occur |
| 3 | Medium – the impact may occur |
| 4 | High – it is most likely that the impact will occur |
| 5 | Definite / unknown – the impact will occur regardless of the implementation of any prevention or corrective actions, or it is not known what the probability will be, based on a lack of published information |

***Significance of the Impact***

Based on the information contained in the points above, the potential impacts have been assigned a significance weighting (S). This weighting is formulated by adding the sum of the numbers assigned to extent (E), duration (D) and magnitude (M) and multiplying this sum by the probability (P) of the impact.

**S = (E+D+M)*P**

The significance weightings are ranked as:

**Table 6: Impact significance rating**

| Impact rating | Definition |
|---|---|
| < 30 | Low – the impact would not have a direct influence on the decision to develop in the area; |
| 30 – 60 | Medium – the impact could influence the decision to develop in the area unless it is effectively managed / mitigated; |
| > 60 | High - the impact must have an influence on the decision-making process for development in the area. |

# HERITAGE DESKTOP FOR THE STONEWALL QUARRY, KOKSTRAD, KZN

## FOR GCS WATER AND ENVIRONMENT (PTY) LTD

**DATE: 13 OCTOBER 2022**

**By Gavin Anderson**

**Umlando: Archaeological Surveys and Heritage Management**

**PO Box 10153, Meerensee, 3901**

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## Abbreviations

| | |
|---|---|
| HP | Historical Period |
| IIA | Indeterminate Iron Age |
| LIA | Late Iron Age |
| EIA | Early Iron Age |
| ISA | Indeterminate Stone Age |
| ESA | Early Stone Age |
| MSA | Middle Stone Age |
| LSA | Late Stone Age |
| HIA | Heritage Impact Assessment |
| PIA | Palaeontological Impact Assessment |

## INTRODUCTION

Stonewell Quarry CC (Stonewell) is a dolerite quarry located approximately 5.6km southeast of Kokstad, KwaZulu-Natal on Portion 21 of Farm Waaifontein No 301. The site has been in operation since 2001. Due to a depletion of resources in the current pit, Stonewell wishes to extend the footprint of the current pit by approximately 4.58 ha, and increase the total area of their Mining Right. This activity triggers the need to amend its current approved Environmental Authorisation (EA) to make provision for the increase in mining area, within its existing approved MR area.

Stonewell has proposed the extension of the current pit by 4.58ha. Topsoil stripped during the clearance of the site will be added to the existing topsoil stockpile. No new infrastructure will be required on site. Access to area will be gained through the current pit, and the current storage facilities will be sufficient to handle the material mined from the extension, as resources in the current pit have been depleted.

As with mining from the current pit, material will be mined through an opencast excavation, in benches. The material will be transported by tipper truck to the primary and secondary crusher located to the north of the pit for processing, before being sold.

The Mining Right area consists of approximately 15.5 ha of the total 300.9 ha of Portion 21 of the Farm Waaifontein No. 301. The current mining area is located in the north-western corner of the property.

Umlando was requested to undertake an HIA of the proposed extension. After an initial assessment, we suggested a desktop study would suffice. Figures 1 – 4 show the location of the development.

**FIG. 1 GENERAL LOCATION OF THE PROPOSED DEVELOPMENT**

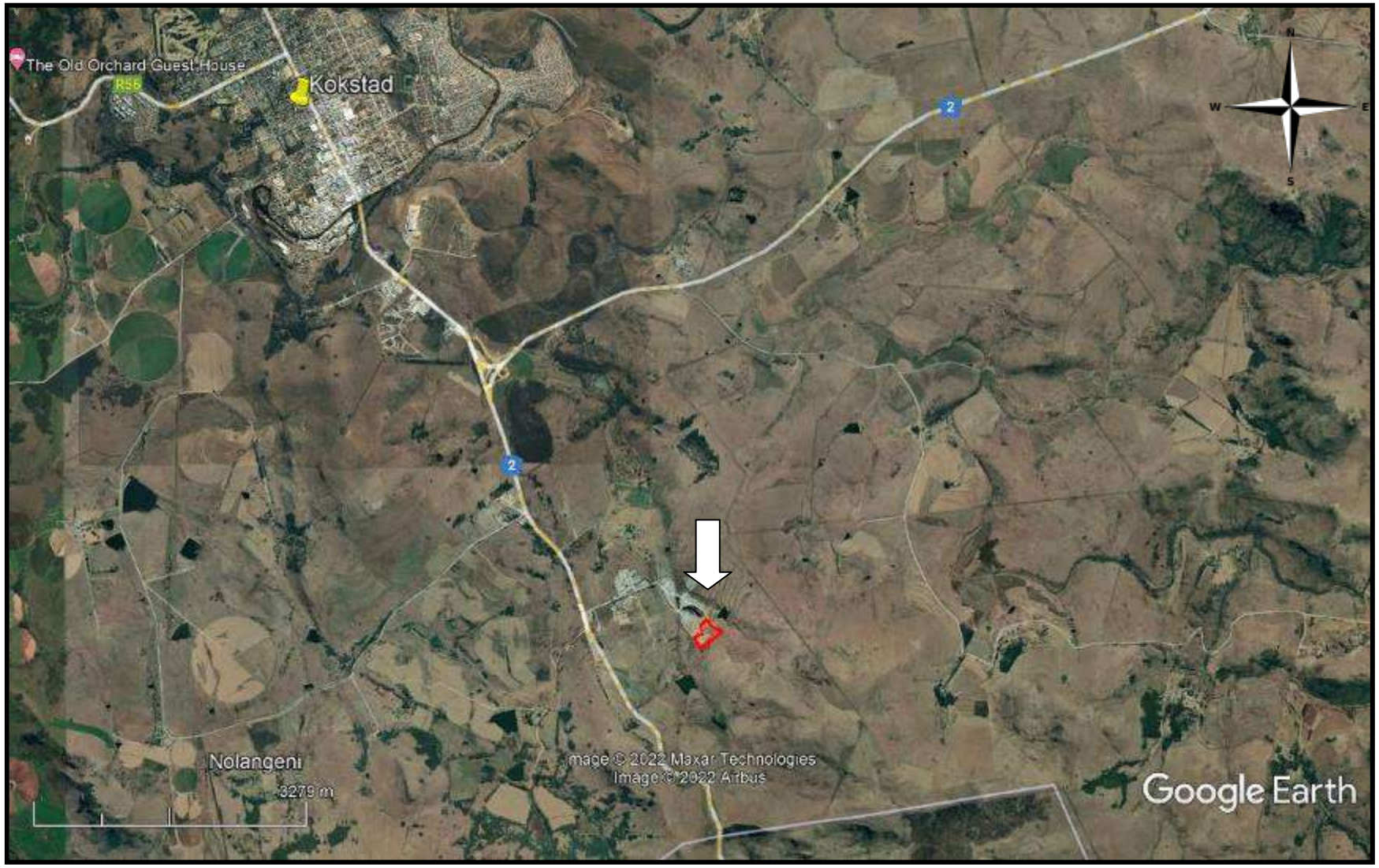


**FIG. 2: AERIAL OVERVIEW OF THE PROPOSED DEVELOPMENT**

**FIG. 3: TOPOGRAPHICAL MAP OF THE PROPOSED DEVELOPMENT (2000)**

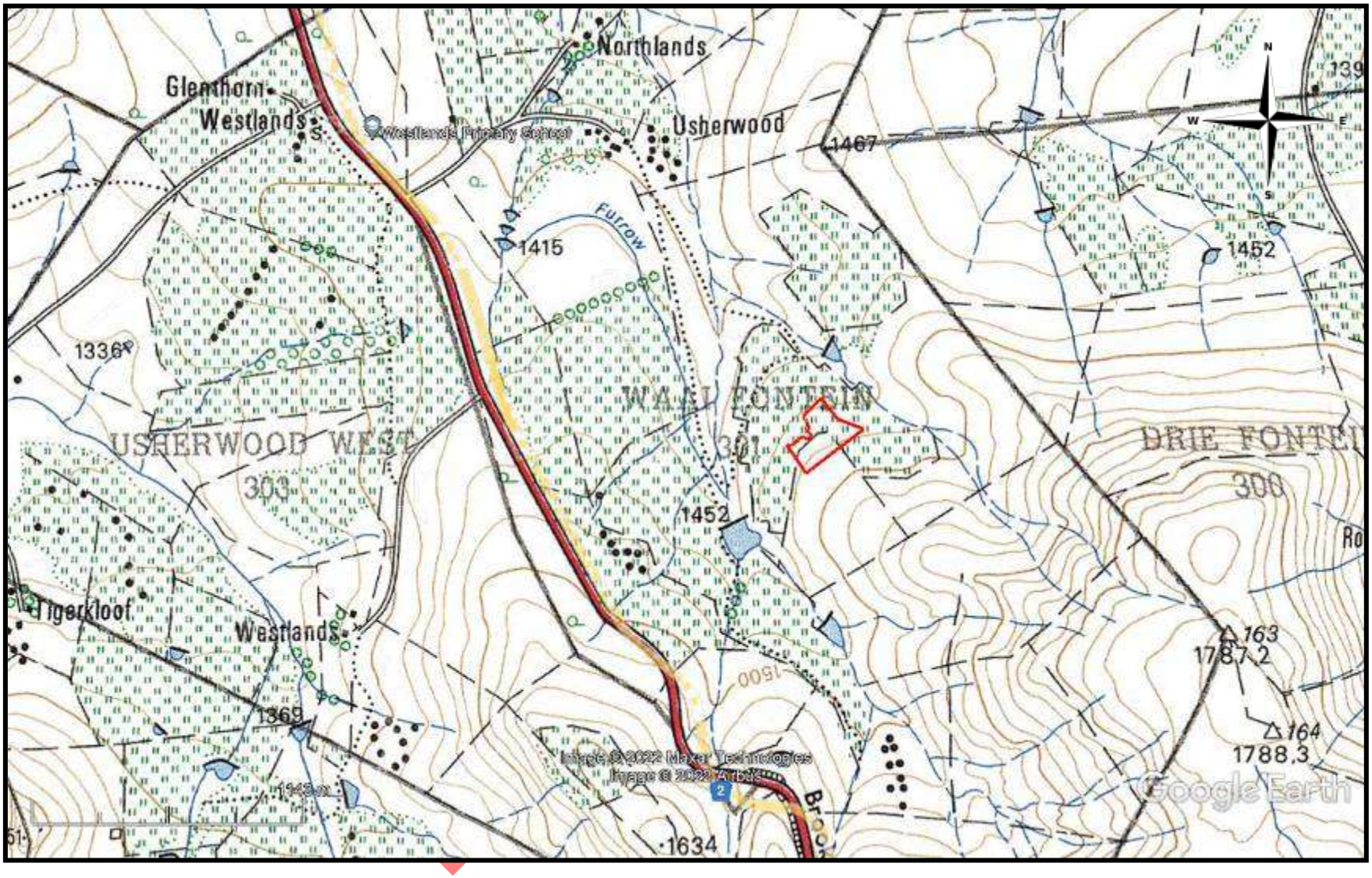


**FIG. 4: SCENIC VIEWS OF THE STUDY AREA**

***KWAZULU NATAL AMAFA AND RESEARCH INSTITUTE, ACT 05, 2018,***

The KwaZulu-Natal Amafa And Research Institute, Act 05, 2018, Chapter 8 (pp 29 – 32) defines heritage resources.

**"General protection: Structures.**

37.(1)(a)No structure which is, or which may reasonably be expected to be older than 60 years, may be demolished, altered or added to without the prior written approval of the Institute having been obtained on written application to the Council.

(b)Where the Institute does not grant approval, the Institute must consider special protection in terms of sections 38, 39, 40, 41 and 43 of Chapter 9.

The Institute may, by notice in the *Gazette*, exempt—

(a) A defined geographical area; or

(b) defined categories of sites within a defined geographical area, from the provisions of subsection where the Institute is satisfied that heritage resources falling in the defined geographical area or category have been identified and are adequately protected in terms of sections 38, 39, 40, 41 and 43 of Chapter 9.

(3) A notice referred to in subsection (2) may, by notice in the *Gazette*, be amended or withdrawn by the Council.

**General protection: Graves of victims of conflict.**

38. No person may damage, alter, exhume, or remove from its original position

(a) the grave of a victim of conflict;

(b) a cemetery made up of such graves; or

(c) any part of a cemetery containing such graves, without the prior written approval of the Institute having been obtained on written application to the Council.

**General protection: Informal and private burial grounds**

39.(1) 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, removed from its original position, or otherwise disturbed without the prior written approval of the Institute having been obtained on written application to the Council.

The Institute may only issue written approval once the Institute is satisfied that—

(a) the applicant has made a concerted effort to consult with communities and individuals who by tradition may have an interest in the grave; and

(b) the applicant and the relevant communities or individuals have reached agreement regarding the grave.

**General protection: Battlefield sites, archaeological sites, rock art sites, palaeontological sites, historic fortifications, meteorite or meteorite impact sites.—**

40 (1) No person may destroy, damage, excavate, alter, write or draw upon, or otherwise disturb any battlefield site, archaeological site, rock art site, palaeontological site, historic fortification, meteorite or meteorite impact site without the prior written approval of the Institute having been obtained on written application to the Council.

(2) Upon discovery of archaeological or palaeontological material or a meteorite by any person, all activity or operations in the general vicinity of such material or meteorite must cease forthwith and a person who made the discovery must submit a written report to the Institute without delay.

(3) The Institute may, after consultation with an owner or controlling authority, by way of written notice served on the owner or controlling authority, prohibit

any activity considered by the Institute to be inappropriate within 50 metres of a rock art site.

(4) No person may exhume, remove from its original position or otherwise disturb, damage, destroy, own or collect any object or material associated with any battlefield site, archaeological site, rock art site, palaeontological site, historic fortification, meteorite or meteorite impact site without the prior written approval of the Institute having been obtained on written application to the Council.

(5) No person may bring any equipment which assists in the detection of metals and archaeological and palaeontological objects and material, or excavation equipment onto any battlefield site, archaeological site, rock art site, palaeontological site, historic fortification, or meteorite impact site, or use similar detection or excavation equipment for the recovery of meteorites, without the prior written approval of the Institute having been obtained on written application to the Council.

(6)(a) The ownership of any object or material associated with any battlefield site, archaeological site, rock art site, palaeontological site, historic fortification, meteorite or meteorite impact site, on discovery, vests in the Provincial Government and the Institute is regarded as the custodian on behalf of the Provincial Government.

(b) The Institute may establish and maintain a provincial repository or repositories for the

safekeeping or display of —

(i) archaeological objects;

(ii} palaeontological material;

(iii) ecofacts;

(iv) objects related to battlefield sites;

(v) material cultural artefacts; or

(vi) meteorites,

(7) The Institute may, subject to such conditions as the Institute may determine, loan any object or material referred to in subsection (6) to a national or provincial museurn or institution.

(8) No person may, without the prior written approval of the Institute having been obtained on written application to the Institute, trade in, export or attempt to export from the Province ~

(a} any category of archaeological object;

{b) any palaeontological material;

(c) any ecofact;

{d) any object which may reasonably be regarded as having been recovered from a battlefield site;

(e) any material cultural artefact; or

{f) any meteorite.

(9){a) A person or institution in possession of an object or material, referred to in paragraphs (a) ~(f) of subsection (8), must submit full particulars of such object or material, including such information as may be prescribed, to the Institute.

(b} An object or material referred to in paragraph (a) must, subject to paragraph (c) and the directives of the Institute, remain under the control of the person or institution submitting the particulars thereof.

(c) The ownership of any object or material referred to in paragraph (a) vests in the Provincial Government and the Institute is regarded as the custodian on behalf of the Provincial Government."



## METHOD

The method for Heritage assessment consists of several steps.

The first step forms part of the desktop assessment. Here we would consult the database that has been collated by Umlando. This databases contains

archaeological site locations and basic information from several provinces (information from Umlando surveys and some colleagues), most of the national and provincial monuments and battlefields in Southern Africa (http://www.vuvuzela.com/googleearth/monuments.html) and cemeteries in southern Africa (information supplied by the Genealogical Society of Southern Africa). We use 1st and 2nd edition 1:50 000 topographical and 1937 aerial photographs where available, to assist in general location and dating of buildings and/or graves. The database is in Google Earth format and thus used as a quick reference when undertaking desktop studies. Where required we would consult with a local data recording centre, however these tend to be fragmented between different institutions and areas and thus difficult to access at times. We also consult with an historical architect, palaeontologist, and an historian where necessary.

The survey results will define the significance of each recorded site, as well as a management plan.

All sites are grouped according to low, medium, and high significance for the purpose of this report. Sites of low significance have no diagnostic artefacts or features. Sites of medium significance have diagnostic artefacts or features and these sites tend to be sampled. Sampling includes the collection of artefacts for future analysis. All diagnostic pottery, such as rims, lips, and decorated sherds are sampled, while bone, stone, and shell are mostly noted. Sampling usually occurs on most sites. Sites of high significance are excavated and/or extensively sampled. Those sites that are extensively sampled have high research potential, yet poor preservation of features.

**Defining significance**

Heritage sites vary according to significance and several different criteria relate to each type of site. However, there are several criteria that allow for a general significance rating of archaeological sites.

These criteria are:

**1. State of preservation of:**

1.1. Organic remains:

1.1.1. Faunal

1.1.2. Botanical

1.2. Rock art

1.3. Walling

1.4. Presence of a cultural deposit

1.5. Features:

1.5.1. Ash Features

1.5.2. Graves

1.5.3. Middens

1.5.4. Cattle byres

1.5.5. Bedding and ash complexes

**2. Spatial arrangements:**

2.1. Internal housing arrangements

2.2. Intra-site settlement patterns

2.3. Inter-site settlement patterns

**3. Features of the site:**

3.1. Are there any unusual, unique or rare artefacts or images at the site?

3.2. Is it a type site?

3.3. Does the site have a very good example of a specific time period, feature, or artefact?

**4. Research:**

4.1. Providing information on current research projects

4.2. Salvaging information for potential future research projects

**5. Inter- and intra-site variability**

5.1. Can this particular site yield information regarding intra-site variability, i.e. spatial relationships between various features and artefacts?

5.2. Can this particular site yield information about a community's social relationships within itself, or between other communities?

**6. Archaeological Experience:**

6.1. The personal experience and expertise of the CRM practitioner should not be ignored. Experience can indicate sites that have potentially significant aspects, but need to be tested prior to any conclusions.

**7. Educational:**

7.1. Does the site have the potential to be used as an educational instrument?

7.2. Does the site have the potential to become a tourist attraction?

7.3. The educational value of a site can only be fully determined after initial test-pit excavations and/or full excavations.

**8. Other Heritage Significance:**

8.1. Palaeontological sites

8.2. Historical buildings

8.3. Battlefields and general Anglo-Zulu and Anglo-Boer sites

8.4. Graves and/or community cemeteries

8.5. Living Heritage Sites

8.6. Cultural Landscapes, that includes old trees, hills, mountains, rivers, etc related to cultural or historical experiences.

The more a site can fulfill the above criteria, the more significant it becomes. Test-pit excavations are used to test the full potential of an archaeological deposit. This occurs in Phase 2. These test-pit excavations may require further excavations if the site is of significance (Phase 3). Sites may also be mapped

and/or have artefacts sampled as a form of mitigation. Sampling normally occurs when the artefacts may be good examples of their type, but are not in a primary archaeological context. Mapping records the spatial relationship between features and artefacts. Table 1 lists the grading system.

**TABLE 1: SAHRA GRADINGS FOR HERITAGE SITES**

| SITE SIGNIFICANCE | FIELD RATING | GRADE | RECOMMENDED MITIGATION |
|---|---|---|---|
| **High Significance** | National Significance | Grade 1 | Site conservation / Site development |
| **High Significance** | Provincial Significance | Grade 2 | Site conservation / Site development |
| **High Significance** | Local Significance | Grade 3A / 3B | |
| **High / Medium Significance** | Generally Protected A | | Site conservation or mitigation prior to development / destruction |
| **Medium Significance** | Generally Protected B | | Site conservation or mitigation / test excavation / systematic sampling / monitoring prior to or during development / destruction |
| **Low Significance** | Generally Protected C | | On-site sampling monitoring or no archaeological mitigation required prior to or during development / destruction |



# RESULTS

## DESKTOP STUDY

The desktop study consisted of analysing various maps for evidence of prior habitation in the study area, as well as for previous archaeological surveys. No surveys have occurred near the study area; however the general area is known to be archaeologically sensitive (fig. 5). These sites are mostly open scatters of stone tools. A few Rock Art, Late Iron Age and Historical Period sites occur as well.

The Surveyor General's map of the farm Waai Fontein 301 indicates that the farm was surveyed in 1878. The farm was probably rented before 1878, as the map indicates existing houses. These houses still occur there today. This indicates that any built structure on the farm could be more than 150 years ion age. No structures occur on the quarry footprint.

The 1948 aerial photograph indicates that the footprint is grassland. No built structures occur in the footprint. (fig. 7).

The 1955 and 1969 aerial photographs indicate that the hill has been transformed into agricultural fields (fig.'s 8 - 9). The footprint has been used as agricultural fields since then (fig. 2).

The aerial photographs show that there is no stone walling or other built structures before the land was converted to agricultural fields and ploughed.

No further heritage mitigation should be required for the quarry extension.

**FIG. 5: LOCATION OF KNOWN HERITAGE SITES IN THE GENERAL AREA**

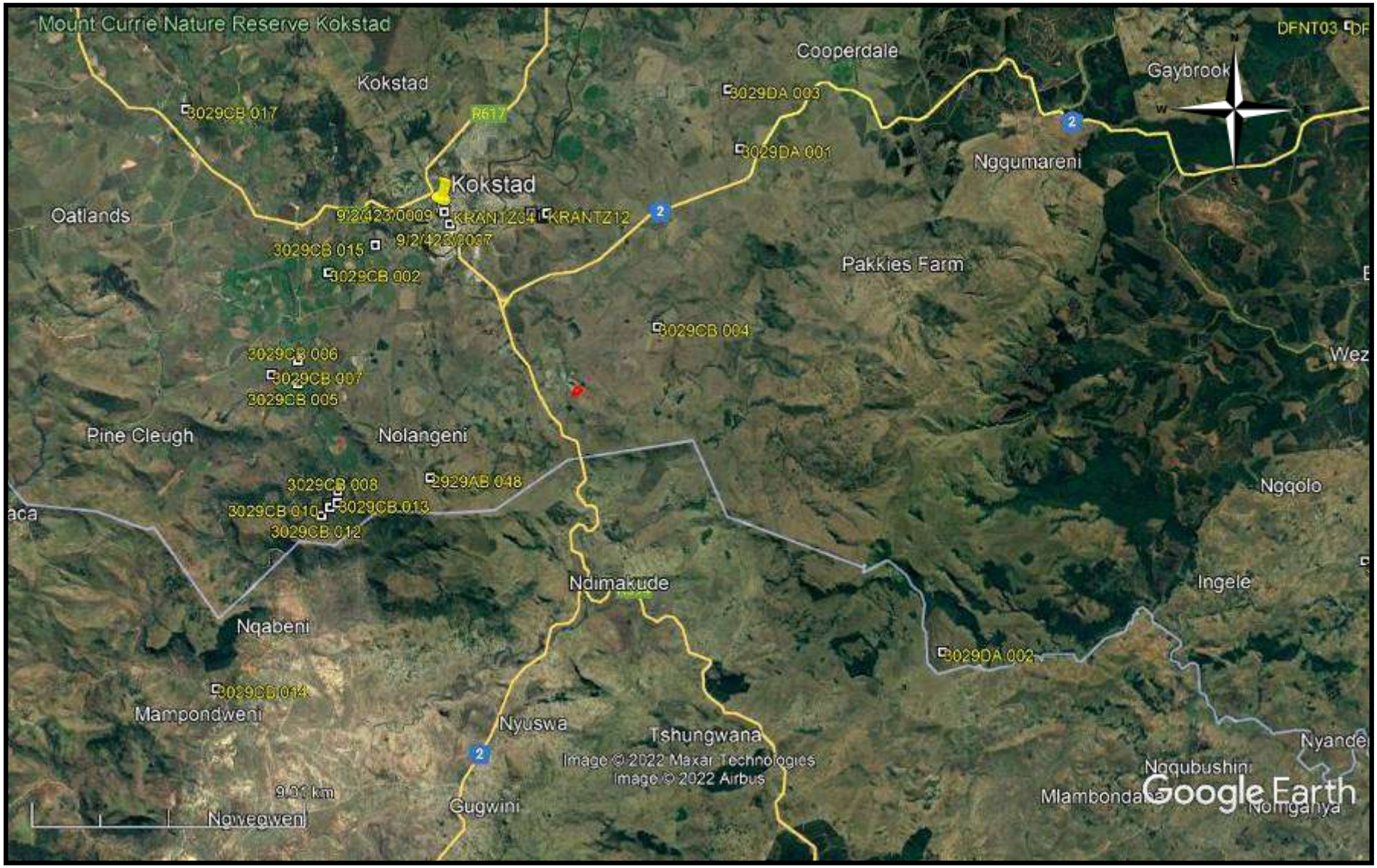
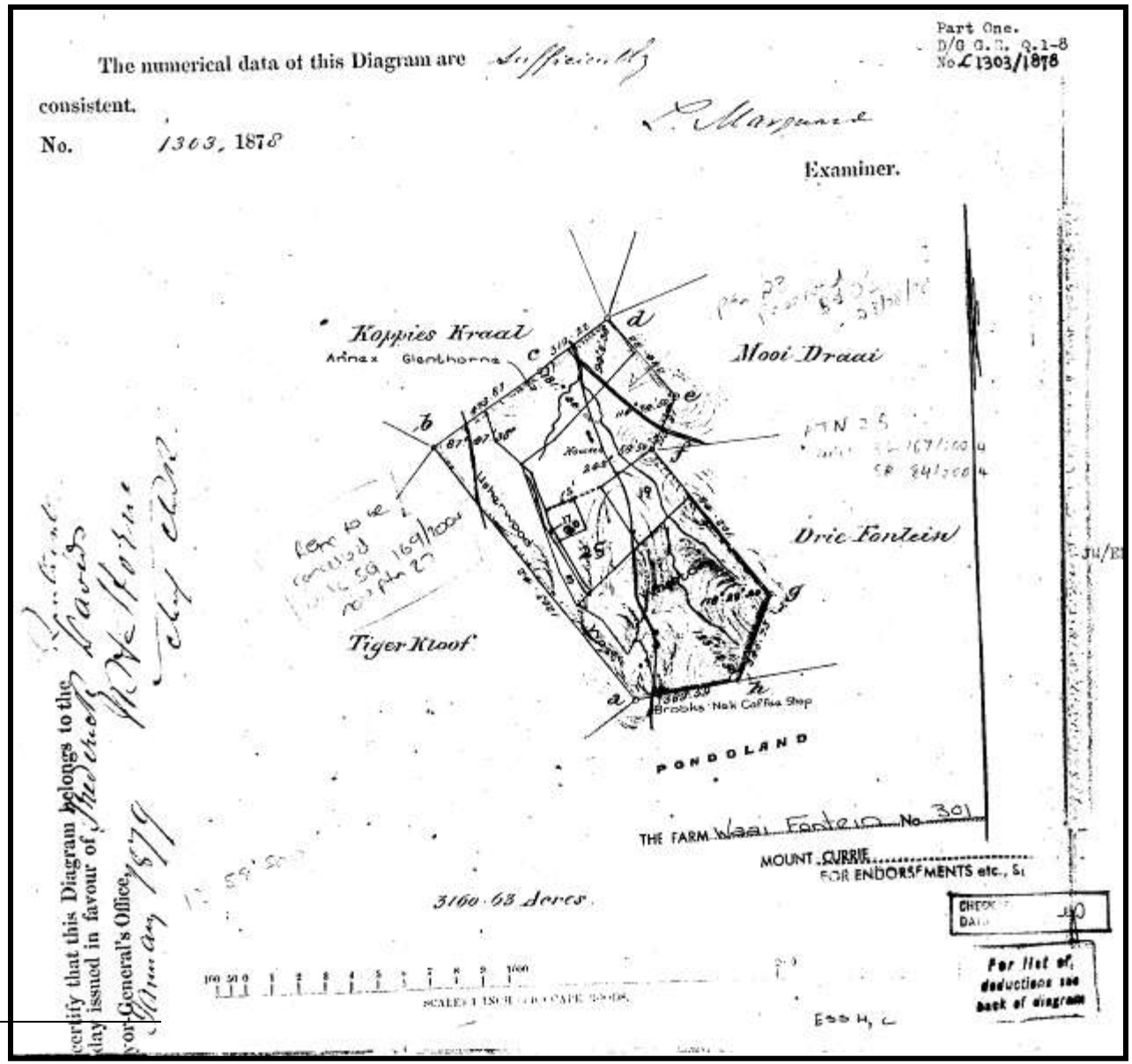
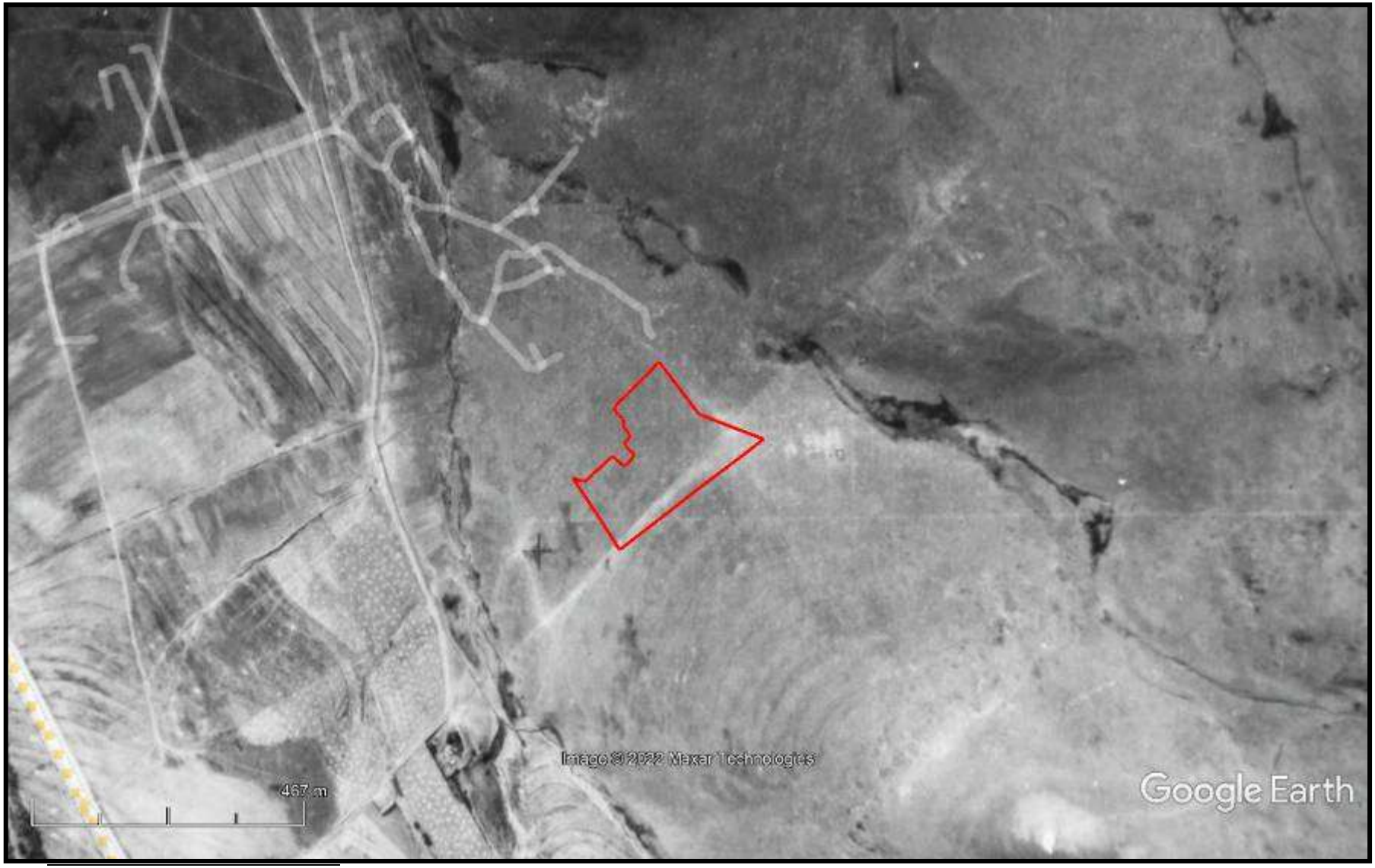


**FIG. 6: SURVEYOR GENERAL MAP OF WAAI FONTEIN (1878)[1]**




[1] N_CC38T1

**FIG. 7: LOCATION OF THE STUDY AREA IN 1948**[2]

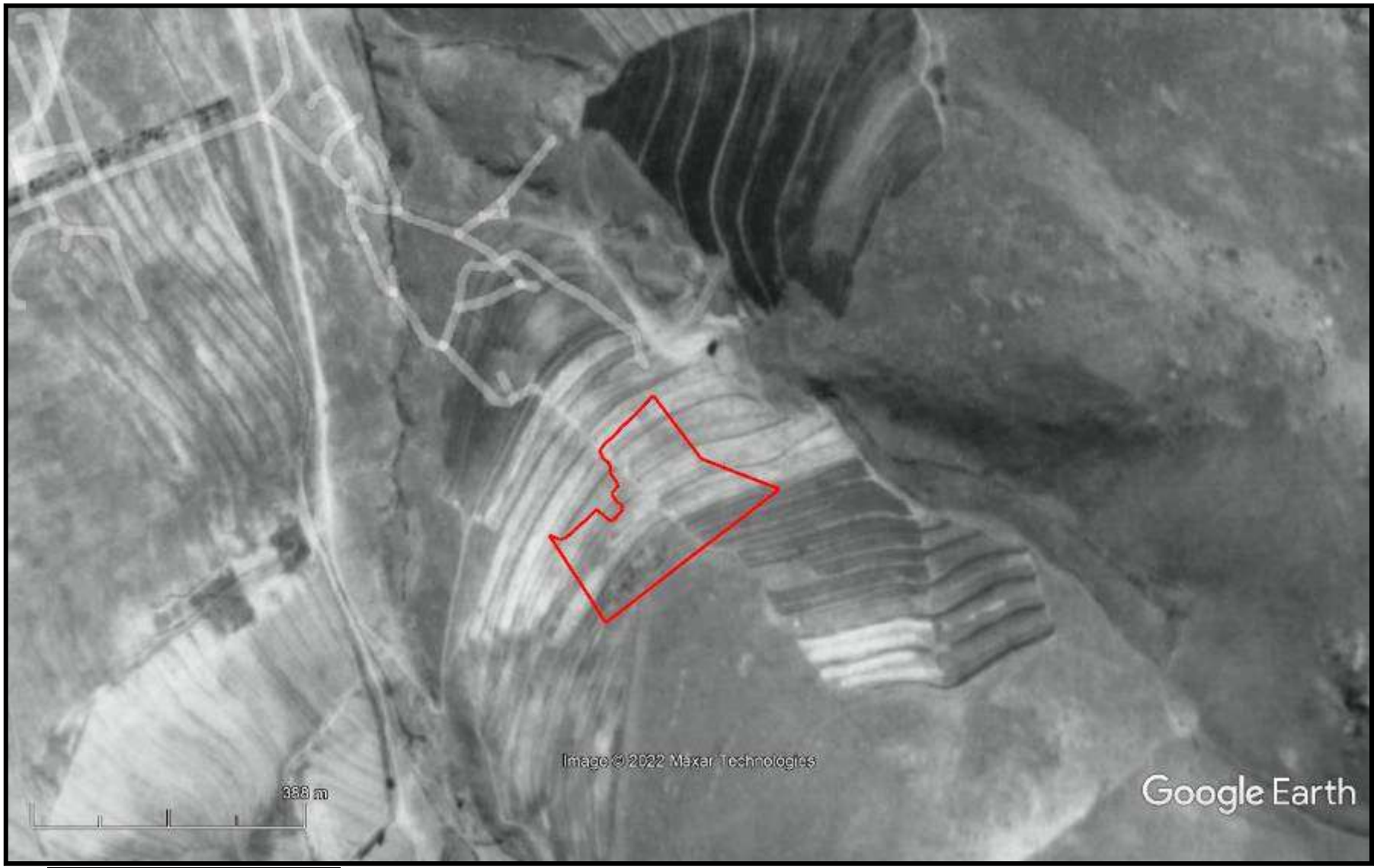



[2] 207_005_26716

**FIG. 8: LOCATION OF THE STUDY AREA IN 1955**[3]


[3] 358_010_05279

**FIG. 9: LOCATION OF THE STUDY AREA IN 1969**[4]



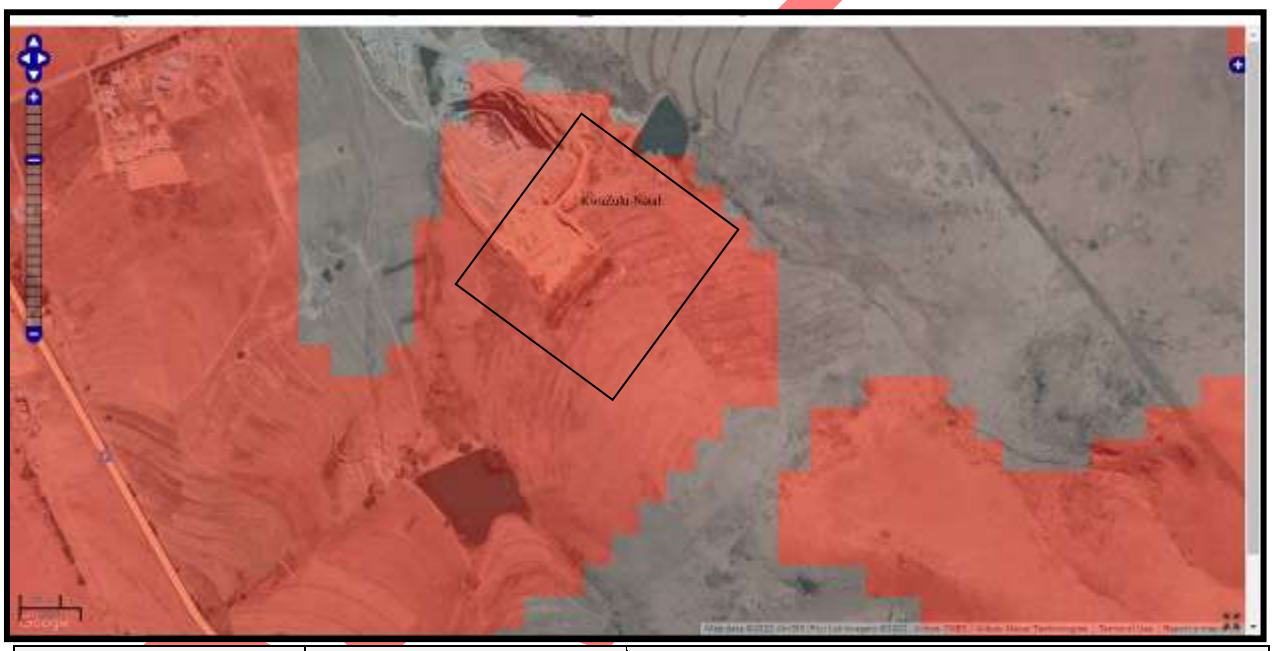

[4] 358_010_05279

## PALAEONTOLOGICAL SENSITIVITY

The area is in an area of very high palaeontological sensitivity according to the SAHRIS map (fig. 10). Figure 11 shows the profile of one side of the quarry.

Pending

**FIG. 10: PALAEONTOLOGICAL 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. |

**FIG. 11: GEOLOGICAL PROFILE OF THE QUARRY**

## CONCLUSION

A desktop heritage survey was undertaken for the proposed Stonewall quarry extension. No heritage sites are known to occur in the study area, nor were any noted from the historical maps.

The project should be exempt from further heritage mitigation.

PIA pending

## REFERENCES

**Surveyor General Map**

N_CC38T1

**1:50 000 Topographical Maps**

3029CB 1980 Kokstad

**Aerial Photographs**

207_005_26716

358_010_05279

616_003_00119

**Database**

KZN Museum

SHARIS

Umlando

## EXPERIENCE OF THE HERITAGE CONSULTANT

Gavin Anderson has a M. Phil (in archaeology and social psychology) degree from the University of Cape Town. Gavin has been working as a professional archaeologist and heritage impact assessor since 1995. He joined the Association of Professional Archaeologists of Southern Africa in 1998 when it was formed. Gavin is rated as a Principle Investigator with expertise status in Rock Art, Stone Age and Iron Age studies. In addition to this, he was worked on both West and East Coast shell middens, Anglo-Boer War sites, and Historical Period sites.

## DECLARATION OF INDEPENDENCE

I, Gavin Anderson, declare that I am an independent specialist consultant and have no financial, personal or other interest in the proposed development, nor the developers or any of their subsidiaries, apart from fair remuneration for work performed in the delivery of heritage assessment services. There are no circumstances that compromise the objectivity of my performing such work.

Gavin Anderson
Archaeologist/Heritage Impact Assessor