Cultural Heritage Impact Assessment:

Phase 1 Investigation of the Proposed Mining of Sand General (QY) on a Certain 5 Hectare Area on a Certain Portion of the Remaining Extent of the Farm Caledonsdraai 21 and a Certain Portion of the Remaining Extent of the Farm Groot Skuur 367, near Clocolan, Setsoto Local Municipality, Thabo Mofutsanyana District Municipality, Free State Province

For

Project Applicant	**Environmental Consultant**
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By

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Date:	**July 2023**
Version:	**1 (Final Report)**

Executive Summary

This report contains a comprehensive heritage impact assessment investigation in accordance with the provisions of Sections 38(1) and 38(3) of the *National Heritage Resources Act* (Act No. 25 of 1999) and focuses on the survey results from a cultural heritage survey as requested by Milnex Environmental Consultants. Milnex Environmental Consultants was contracted by Ladybrand Crushers CC as the independent environmental consultant to undertake the EIA process. This survey forms part of an Environmental Impact Assessment (EIA) to obtain Environmental Authorisation in terms of the EIA Regulations, 2014 (as amended) of the National Environmental Management Act (Act No. 107 of 1998) (NEMA) and the Mineral and Petroleum Resources Development Act (Act 28 of 2002 as amended). The proposed mining of Sand General (QY) on a certain 5 hectare area on a certain portion of the Remaining Extent of the Farm Caledonsdraai 21 and a certain portion of the Remaining Extent of the Farm Groot Skuur 367, near Clocolan, Setsoto Local Municipality, Thabo Mofutsanyana District Municipality, Free State Province.

No historical or archaeological (both Stone Age and Iron Age) artefacts, assemblages, features, structures or settlements were recorded during the survey of the project footprint along the banks of the Caledon (Mohokare) River.

It is therefore recommended, from a cultural heritage perspective that the proposed prospecting activities may proceed, taking into account the mitigation measures.

However, please note:

Archaeological deposits usually occur below ground level. Should archaeological artefacts or skeletal material be revealed in the area during development activities, such activities should be halted, and a university or museum notified in order for an investigation and evaluation of the find(s) to take place **(*cf*. NHRA (Act No. 25 of 1999)**, Section 36 (6)).

Definitions and abbreviations

Midden:	Refuse that accumulates in a concentrated heap.
Stone Age:	An archaeological term used to define a period of stone tool use and manufacture
Iron Age:	An archaeological term used to define a period associated with domesticated livestock and grains, metal working and ceramic manufacture
LIA:	Late Iron Age sites are usually demarcated by stone-walled enclosures
NHRA:	National Heritage Resources Act (Act No. 25 of 1999)
SAHRA:	South African Heritage Resources Agency
SAHRIS:	South African Heritage Resources Information System
PHRA-G:	Provincial Heritage Resources Authority - Gauteng
GDARD:	Gauteng Department of Agriculture and Rural Development

HIA: Heritage Impact Assessment
DMR: Department of Mineral Resources

I, Francois Coetzee, hereby confirm my independence as a cultural heritage specialist and declare that I do not have any interest, be it business, financial, personal or other, in any proposed activity, application or appeal in respect of the listed environmental processes, other than fair remuneration for work performed on this project.

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1. Introduction and Terms of Reference

Milnex Environmental Cosultants was contracted by Ladybrand Crushers CC as the independent environmental consultant to undertake the EIA process. This survey forms part of an Environmental Impact Assessment (EIA) to obtain Environmental Authorisation in terms of the EIA Regulations, 2014 (as amended) of the National Environmental Management Act (Act No. 107 of 1998) (NEMA) and the Mineral and Petroleum Resources Development Act (Act 28 of 2002 as amended). The proposed mining of Sand General (QY) on a certain 5 hectare area on a certain portion of the Remaining Extent of the Farm Caledonsdraai 21 and a certain portion of the Remaining Extent of the Farm Groot Skuur 367, near Clocolan, Setsoto Local Municipality, Thabo Mofutsanyana District Municipality, Free State Province. A Cultural Heritage Impact Assessment (HIA) was requested by Milnex CC on behalf of the client to evaluate the potential impact of the proposed mining activities.

2. Objectives

The general objective of the cultural heritage survey is to record and document cultural heritage remains consisting of both tangible and intangible archaeological and historical artefacts, structures (including graves), settlements and oral traditions of cultural significance.

As such the terms of reference of this survey are as follows:

- Identify and provide a detailed description of all artefacts, assemblages, settlements and structures of an archaeological or historical nature (cultural heritage sites) located on the study area,
- Estimate the level of significance/importance of these remains in terms of their archaeological, historical, scientific, social, religious, aesthetic and tourism value,
- Assess any impact on the archaeological and historical remains within the area emanating from the development activities, and
- Propose recommendations to mitigate heritage resources where complete or partial conservation may not be possible and thereby limit or prevent any further impact.

3. Description of Physical Environment of Study Area

The heritage survey focussed on an area situated approximately 15.5 km south east of Clocolan on the banks of the Caledon (Mohokare) River in the Free State Province.

Farm Name(s) and Portions	• Caledonsdraai 21
	  ○ a certain portion of the remaining extent
	• Groot Skuur 367
	  ○ a certain portion of the remaining extent

Size of Survey Area	Approximately 10 (5 +5) hectares
Magisterial Districts	Thabo Mofutsanyana District Municipality Setsoto Local Municipality
1:50 000 Map Sheet	2927BA
1:250 0000 Map Sheet	2926
Central Coordinates of the Development	27.644351°E 29.044531°S

Table 1: Physical Environment

The survey area falls within the Grassland Biome, particularly the Mesic Highveld Grassland Bioregion and more specifically the Eastern Free State Clay Grassland (Gm 3). This veld type occurs in the Free State Province and marginally in Lesotho as well as low-lying areas of the eastern regions of the province, covering the vicinities of Wepener (south), Petrus Steyn (north), Excelsior and east of Winburg (west) and Warden (east) and a thin extension between Maseru and Fouriesburg (Mucina & Rutherford 2010).

The survey area is characterised by a large rocky outcrop and large sand banks along the Caledon River. Southern and eastern extent of the survey area is demarcated by the Caledon River. Infrastructure consists of several dirt roads that provide access to the area and fences for grazing livestock.

The regional climate is characterised as a continental mid-altitude climate with a cold and dry winter and a warm and rainy summer. Summer (mid-October to mid-February) is characterised by hot, sunny weather often with afternoon thunderstorms of short duration. January is the warmest month of the year. The temperature in January averages 20.0 °C. In winter (May to July) day time temperatures range in the band from 19°C to early twenties dropping the mercury at night on average to 0°C in July, which is the coldest month. July has the lowest average temperature of the year. It is 7.1 °C. During the year, the average temperatures vary by 12.9 °C. The growing season is interrupted by frosts during winter (Mucina & Rutherford 2010).

Current Zoning	Farming
Economic activities	Farming (both cultivation and livestock (pastoralism))
Soil and basic geology	The Soil class at the proposed site is classified as Lithosols (shallow soils on hard or weathering rock). The favourable properties of this soil type are that it may receive water runoff from associated rock. The limit of this soil is restricted soil depth; associated with rockiness. The soil on the farm belongs to the association of Classes 17 and 19: Structure-less and textural contrast soils. The favourable properties of this soil type is it may have favourable physical properties, somewhat high natural fertility; relative wetness favourable in dry areas. The limit of this soil type is restricted depth, imperfect drainage, high erodibility; slow water infiltration and seasonal wetness. The high-lying areas are dominated by gravel and dolomite (Mucina & Rutherford 2010).
Prior activities	Farming activities
Socio Economic Environment	It is expected that the municipality will grow at an average annual rate of 1.17% from 2016 to 2021. The more diverse an economy is, the more likely it is to create employment opportunities across all skills levels (and not only - for instance – employment opportunities that cater for highly skilled labourers) and maintain a healthy balance between labour-intensive and capital-intensive industries. If both economic growth and the alleviation of unemployment are of concern, clearly there need to be industries that are growing fast and creating jobs in particular the lower skilled categories. Unfortunately, in practice many industries that

	are growing fast are not those that create many employment opportunities for unskilled labourers to the extent that this has little or no meaningful impact towards alleviating unemployment, which currently stand at 37.8%.
Evaluation of Impact	An evaluation of the impact of the development on heritage resources relative to the sustainable social and economic benefits NHRA (Act No. 25 of 1999, Section 38(3d)): Positive

Table 2: Socio-economic environment

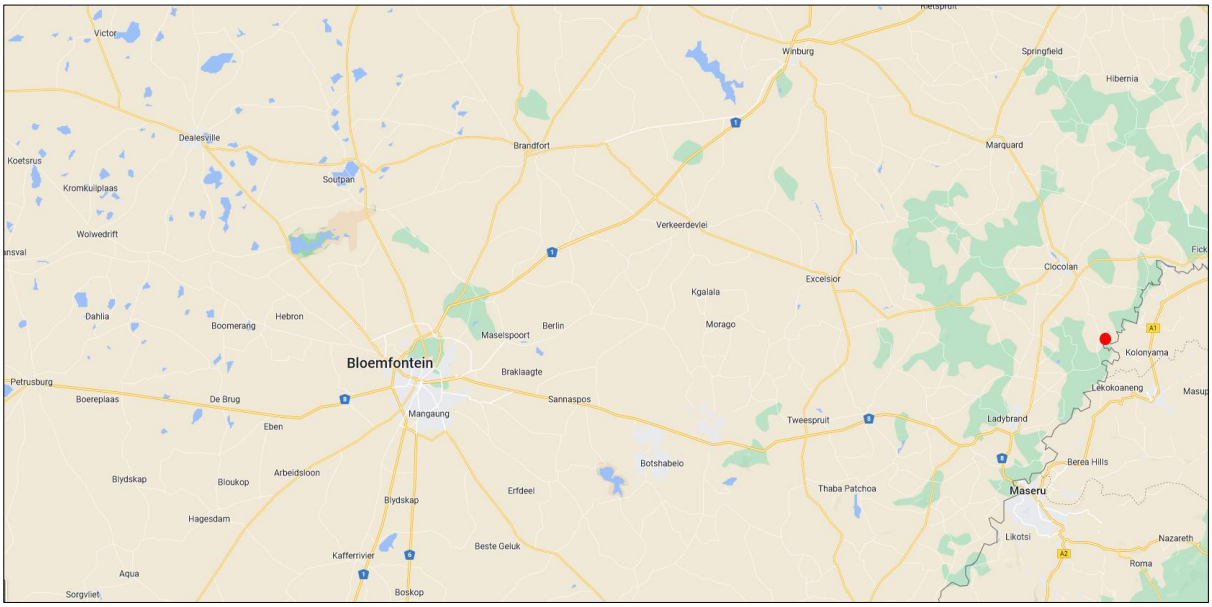

Figure 1: Regional context of the survey footprint north east of Ladybrand, Free State (indicated by the red area)

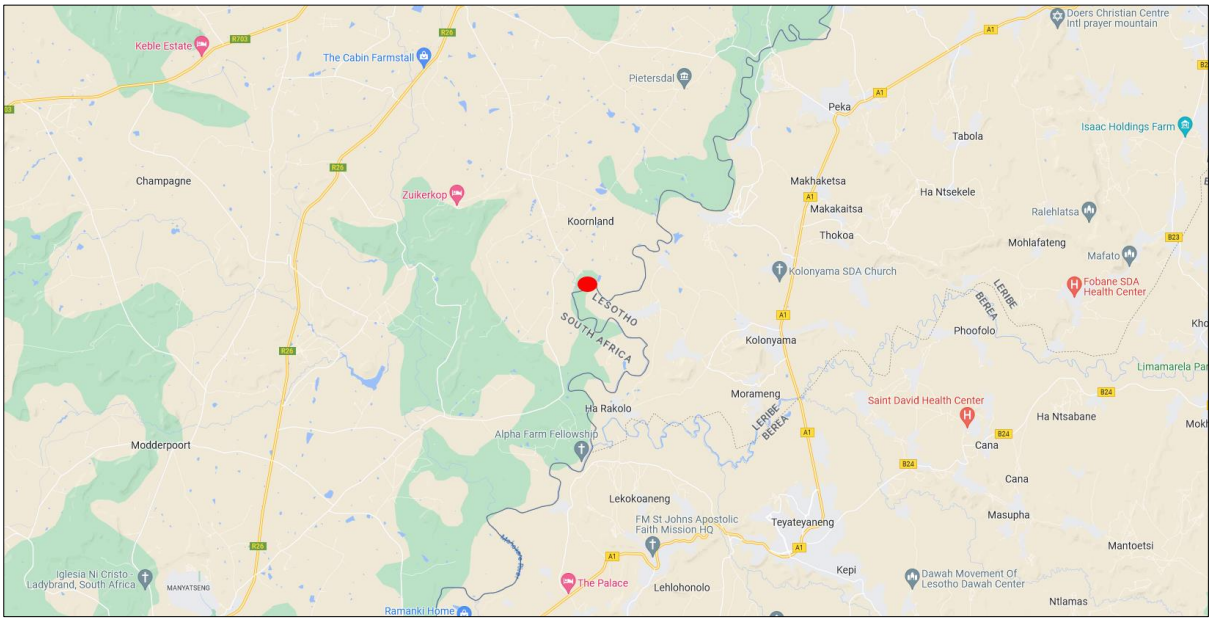

Figure 2: Local context of the survey footprint along the Caledon River, Free State (indicated by the red area)

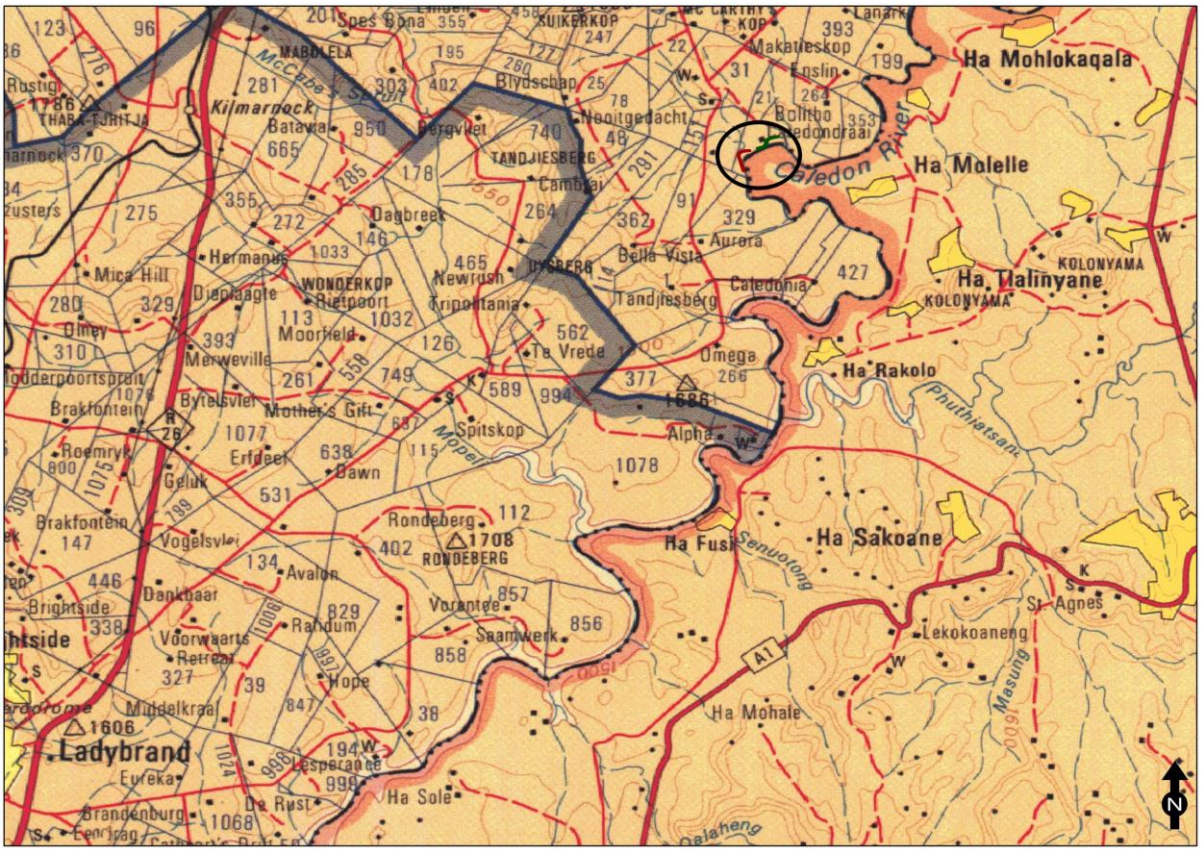

Figure 3: Local context of the survey area (1:250 000 Map 2926)

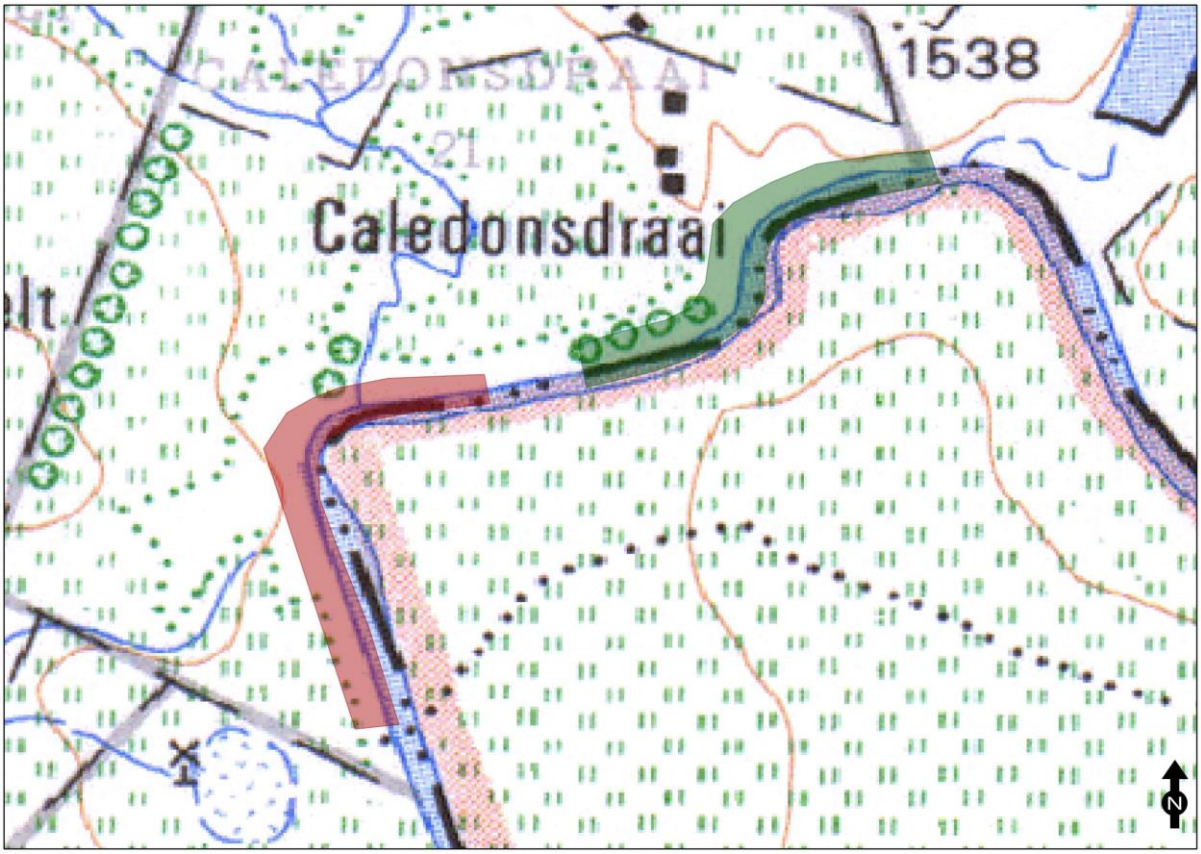

Figure 4: Location of the survey footprint as indicated on the 1:50 000 topographic map 2926BA (1978)

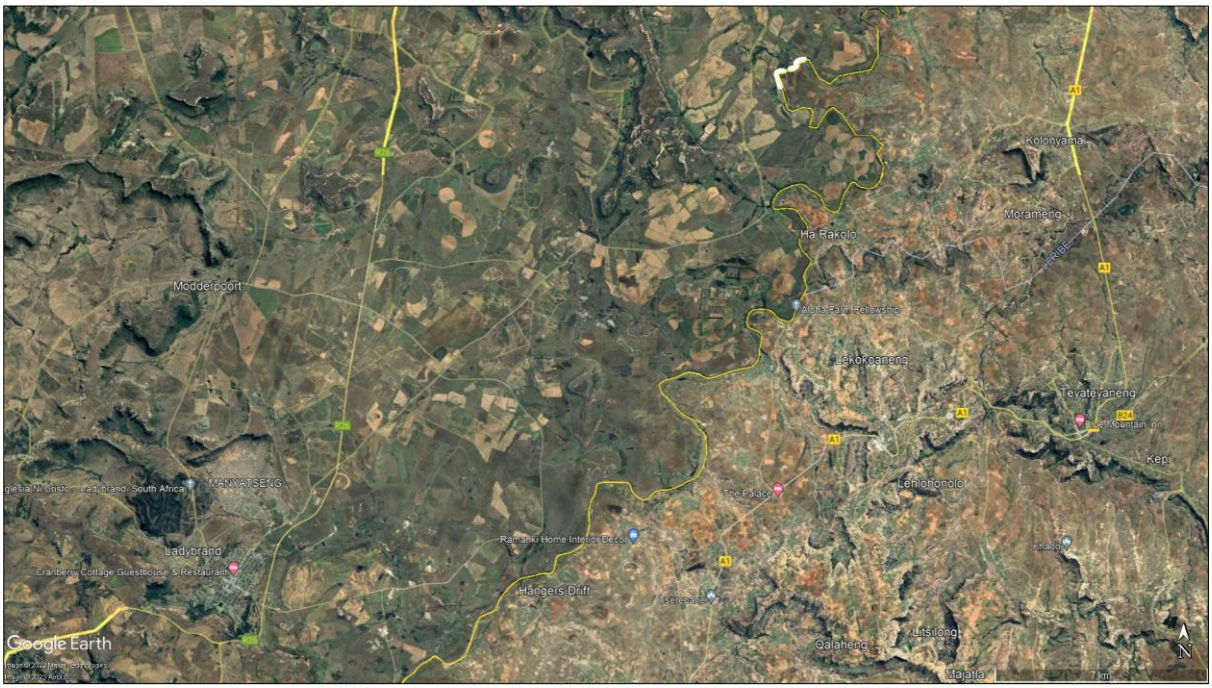

Figure 5: General location of survey region as indicated on Google Earth (2023)

Figure 6: Detail of survey footprint as indicated on Google Earth (2023)

Figure 7: General view of a rocky outcrop on the southern section of the survey footprint

Figure 8: General view of the southern section of the survey footprint

Figure 9: General view of the southern section of the survey footprint

Figure 10: General view of the small stone deposits on the rocky outcrop (no Stone Age stone tools)

Figure 11: General view of the southern section of the survey footprint (along the river)

Figure 12: General view of the southern section of the survey footprint

Figure 13: General view of the southern section of the survey footprint

Figure 14: General view of the eastern section of the survey footprint

Figure 15: General view of the eastern section of the survey footprint

Figure 16: General view of the eastern section of the survey footprint

Figure 17: General view of the eastern section of the survey footprint

Figure 18: General view of the eastern section of the survey footprint

4. Proposed Project Description

The proposed activity is the mining of sand and all associated infrastructure.

5. Legal Framework

APPLICABLE LEGISLATION AND GUIDELINES USED TO COMPILE THE REPORT	REFERENCE APPLIED
The Constitution of the Republic of South Africa (Act No. 108 of 1996)	
The National Environmental Management Act (Act No. 107 of 1998)	Section 24(1) Section 28(1)
The National Water Act (Act No. 36 of 1998)	
Air Quality Act (Act No. 39 of 2004)	
National Forests Act, Act of 84 of 1998	-
The National Heritage Resources Act (Act No. 25 of 1999)	Section 38, 34, 35, 36
Conservation of Agricultural Resources Act (Act No. 85 of 1983)	
Mineral and Petroleum Resources Development Act (Act No. 28 of 2002)	Section 22, 27
The National Water Act (Act No. 36 of 1998);	
Mine Health and Safety Act (Act No. 29 of 1996) (MHSA)	
Biodiversity Act (Act 10 of 2004)	
Setsoto Local Municipality (Draft Integrated Development Plan 2022-2023)	

Table 3: Legal framework

Description of the overall activity. **(Indicate Mining Right, Mining Permit, Prospecting right, Bulk Sampling, Production Right, Exploration Right, Reconnaissance permit, Technical co-operation permit, Additional listed activity)**	**1) Listing Notice 1: GNR 327, Activity 19:** *The infilling or depositing of any material of more than 10 cubic metres into, or the dredging, excavation, removal or moving of soil, sand, shells, shell grit, pebbles or rock of more than 10 cubic metres from a watercourse;* **2) Listing Notice 1, GNR 327, Activity 20 (As amended GNR 517: 2021):** *"Any activity including the operation of that activity which requires a prospecting right in terms of section 16 of the Mineral and Petroleum Resources Development Act, as well as any other applicable activity as contained in this Listing Notice or in Listing Notice 3 of 2014, required to exercise the prospecting right"* **3) Listing Notice 1, GNR 327, Activity 27:***" The clearance of an area of 1 hectares or more, but less than 20 hectares of indigenous vegetation."* **4) Listing Notice 2, GNR 325, Activity 19 (As amended GNR 517: 2021):** *"The removal and disposal of minerals which requires permission contemplated in terms of section 20 of the Mineral and Petroleum Resources Development Act, as well as any other applicable activity as contained in this Listing Notice, Listing Notice 1 of 2014 or in Listing Notice 3 of 2014, required to exercise the permission.* ***5)*** **Listing Notice 3, GNR 324, Activity 4:** *The development of a road wider than 4 metres with a reserve less than 13,5 metres.* ***(h) North West iv****. Critical Biodiversity Areas as identified in systematic biodiversity plans adopted by the Competent Authority,* ***vi****. Areas within 5 kilometres from protected areas identified in terms of NEMPAA or from a biosphere reserve;* **6) Listing Notice 3, GNR 324, Activity 10**: *The development and related operation of facilities or infrastructure for the storage, or storage and handling of a dangerous good, where such storage occurs in containers with a combined capacity of 30 but not exceeding 80 cubic metres* ***(h) North West (iv)*** *Critical Biodiversity areas as identified in systematic biodiversity plans adopted by the competent authority* ***(vi)*** *Areas within a watercourse or wetland, or within 100 metres from the edge of a watercourse or wetland.* **7) Listing Notice 3, GNR 324, Activity 12:** *The clearance of 300 square*

	metres or more of indigenous vegetation except where such clearance of indigenous vegetation is required for maintenance purposes undertaken in accordance with a maintenance management plan ***(h) North West (iv)*** *Critical Biodiversity Areas as identified in systematic biodiversity plans adopted by the competent authority* ***(vi)*** *Areas within a watercourse or wetland, or within 100 metres from the edge of a watercourse or wetland.* Prospecting right with bulk samples for the prospecting of **Diamonds Alluvial (DA), Diamonds General (D) & Diamonds (DIA)** including associated infrastructure, structure and earthworks.

Table 4: Listed activities

NAME OF ACTIVITY **(E.g. For prospecting - drill site, site camp, ablution facility, accommodation, equipment storage, sample storage, site office, access route etc…etc…etc** **E.g. for mining,- excavations, blasting, stockpiles, discard dumps or dams, Loading, hauling and transport, Water supply dams and boreholes, accommodation, offices, ablution, stores, workshops, processing plant, storm water control, berms, roads, pipelines, power lines, conveyors, etc…etc…etc.)**	**Aerial extent of the Activity Ha or m²**	**LISTED ACTIVITY Mark with an X where applicable or affected.**	**APPLICABLE LISTING NOTICE (GNR 324, GNR 325 or GNR 326)**
Mining permit: **Listing Notice 1 (GNR 327) as amended (GNR 517), Activity 21:** *"Any activity including the operation of that activity which requires a mining permit in terms of section 27 of the Mineral and Petroleum Resources Development Act, as well as any other applicable activity as contained in this Listing Notice on in Listing Notice 3 of 2014, required to exercise the mining permit";*	The application area is 5ha	X	Listing Notice 1 (GNR 327) as amended (GNR 517), Activity 21
Mining permit: **Listing Notice 1, (GNR 327), Activity 19:** *The infilling or depositing of any material of more than 10 cubic metres into, or the dredging, excavation, removal or moving of soil, sand, shells, shell grit, pebbles or rock of more than 10 cubic metres from:* *(i) a watercourse;*	The application area is 5 ha	X	Listing Notice 1 (GNR 327) as amended (GNR 517), Activity 19
Clearance of Vegetation **Listing Notice 1, GNR 327, Activity 27:** *"The clearance of an area of 1 hectares or more, but less than 20 hectares of indigenous vegetation."*	The application area is 5 ha	X	Listing Notice 1, GNR 327, Activity 27

Creation of a road **Listing Notice 3 (GNR 324), Activity 4:** *The development of a road wider than 4 metres with a reserve less than 13,5 metres. (g) Free State (ii) Outside urban areas; (ee) Critical Biodiversity areas as identified in systematic biodiversity plans adopted by the competent authority (gg) areas within 10 kilometres from national parks or world heritage sites or 5 kilometres from any other protected area identified in terms of NEMPAA or from the core areas of a biosphere reserve, excluding disturbed areas*	The application area is 5 ha	X	Listing Notice 3 (GNR 324), Activity 4 (g)(ii)(ee)(gg)
Mining activities **Listing Notice 3 (GNR 324), Activity 10:** *The development and related operation of facilities or infrastructure for the storage, or storage and handling of a dangerous good, where such storage occurs in containers with a combined capacity of 30 but not exceeding 80 cubic metres. (g) Free State (iii) Outside urban areas (ee) CBA as identified is systematic biodiversity plans adopted by the competent authority or in bioregional plans; (gg) Areas within 10 kilometres from national parks or world heritage sites or 5 kilometres from any other protected area identified in terms of NEMPAA or from the core areas of a biosphere reserve; (ii) Areas on the watercourse side of the development setback line or within 100 metres from the edge of a watercourse where no such setback line has been determined; or*	The application area is 5 ha	X	Listing Notice 3 (GNR 324), Activity 10 (g)(iii)(ee)(gg)
Clearance of indigenous vegetation: **Listing Notice 3 (GNR 324), Activity 12:** *"The clearance of an area of 300 square metres or more of indigenous vegetation except where such clearance of indigenous vegetation is required for maintenance purposes undertaken in accordance with a maintenance management plan. (g) Free State (ii) Critical Biodiversity Areas as identified in biodiversity plans ".*	The application area is 5 ha	X	Listing Notice 3 (GNR 324), Activity 12 (g)(ii)

Table 5: Regulatory requirements

- Section 38 of the NHRA (Act No. 25 of 1999) stipulates that the following activities trigger a heritage survey:

Development criteria in terms of Section 38(1a-e) of the NHRA (Act No. 25 of 1999)	Yes/No
Construction of road, wall, powerline, pipeline, canal or other linear form of development or barrier exceeding 300m in length	No
Construction of bridge or similar structure exceeding 50m in length	No
Development exceeding 5000 m^2 in extent	Yes
Development involving three or more existing erven or subdivisions	No
Development involving three or more erven or divisions that have been consolidated within past five years	No
Rezoning of site exceeding 10 000 m^2	Yes
Any other development category, public open space, squares, parks, recreation grounds	No

Table 6: Activities that trigger Section 38 of the NHRA

- Field rating system as recommended by SAHRA:

Field Rating	Grade	Significance	Recommended Mitigation
National Significance	Grade I	High significance	Conservation by SAHRA, national site nomination, mention any relevant international ranking. No alteration
Provincial Significance	Grade II	High significance	Conservation by provincial heritage authority, provincial site nomination. No alteration whatsoever without permit
Local Significance	Grade III-A	High significance	Conservation by local authority, no alteration whatsoever without permit from provincial heritage authority. Mitigation as part of development process not
Local Significance	Grade III-B	High significance	Conservation by local authority, no external alteration without permit from provincial heritage authority. Could
Generally Protected A	Grade IV-A	High/medium significance	Conservation by local authority. Site should be mitigated before destruction. Destruction permit required from
Generally Protected B	Grade IV-B	Medium significance	Conservation by local authority. Site should be recorded before destruction. Destruction permit required from provincial heritage authority.
Generally Protected C	Grade IV-C	Low significance	Conservation by local authority. Site has been sufficiently recorded in the Phase 1 HIA. It requires no further recording before destruction. Destruction permit

Table 7: Field rating system to determine site significance

- Heritage resources have lasting value in their own right and provide evidence of the origins of South African society and they are valuable, finite, non-renewable and irreplaceable.

- All archaeological remains, features, structures and artefacts older than 100 years and historic structures older than 60 years are protected by the relevant legislation, in this case the National Heritage Resources Act (NHRA) (Act No. 25 of 1999, Section 34 & 35). The Act makes an archaeological impact assessment as part of an EIA and EMPR mandatory (see Section 38). No archaeological artefact, assemblage or settlement (site) may be moved or destroyed without the necessary approval from the South African Heritage Resources Agency (SAHRA). Full cognisance is taken of this Act in making recommendations in this report.

- Cognisance will also be taken of the Mineral and Petroleum Resources Development Act (Act No 28 of 2002) and the National Environmental Management Act (Act No 107 of 1998) when making any recommendations.

- Human remains older than 60 years are protected by the NHRA, with reference to Section 36. Human remains that are less than 60 years old are protected by the Regulations Relating to the Management of Human Remains (GNR 363 of 22 May 2013) made in terms of the National Health Act No. 61 of 2003 as well as local Ordinances and regulations.

- With reference to the evaluation of sites, the certainty of prediction is definite, unless stated otherwise.

- The guidelines as provided by the NHRA (Act No. 25 of 1999) in Section 3, with special reference to subsection 3, and the Australian ICOMOS (International Council on Monuments and Sites) Charter (also known as the Burra Charter) are used when determining the cultural significance or other special value of archaeological or historical sites.

- A copy of this report will be submitted on SAHRIS as stipulated by the National Heritage Resources Act (NHRA) (Act No. 25 of 1999), Section 38 (especially subsection 4) and the relevant Provincial Heritage Resources Authority (PHRA).

- Note that the final decision for the approval of permits, or the removal or destruction of sites, structures and artefacts identified in this report, rests with the SAHRA (or relevant PHRA).

6. Study Approach/Methodology

Geographical information (KML shapefiles) on the proposed prospecting areas was supplied by Milnex CC. The most up-to-date Google Earth images and topographic maps were used to indicate the survey area. Topographic maps were sources from the Surveyor General. Please note that all maps are orientated with north facing upwards (unless stated otherwise).

The strategy during this survey was to conduct a thorough investigation of the various sections of the farm that form part of the application. The aim was therefore to conduct a detailed pedestrian (foot) and predictive survey of the survey footprint, augmented by existing knowledge and aerial information of the region. Existing infrastructure was used to gain access to the area followed by detailed pedestrian investigations.

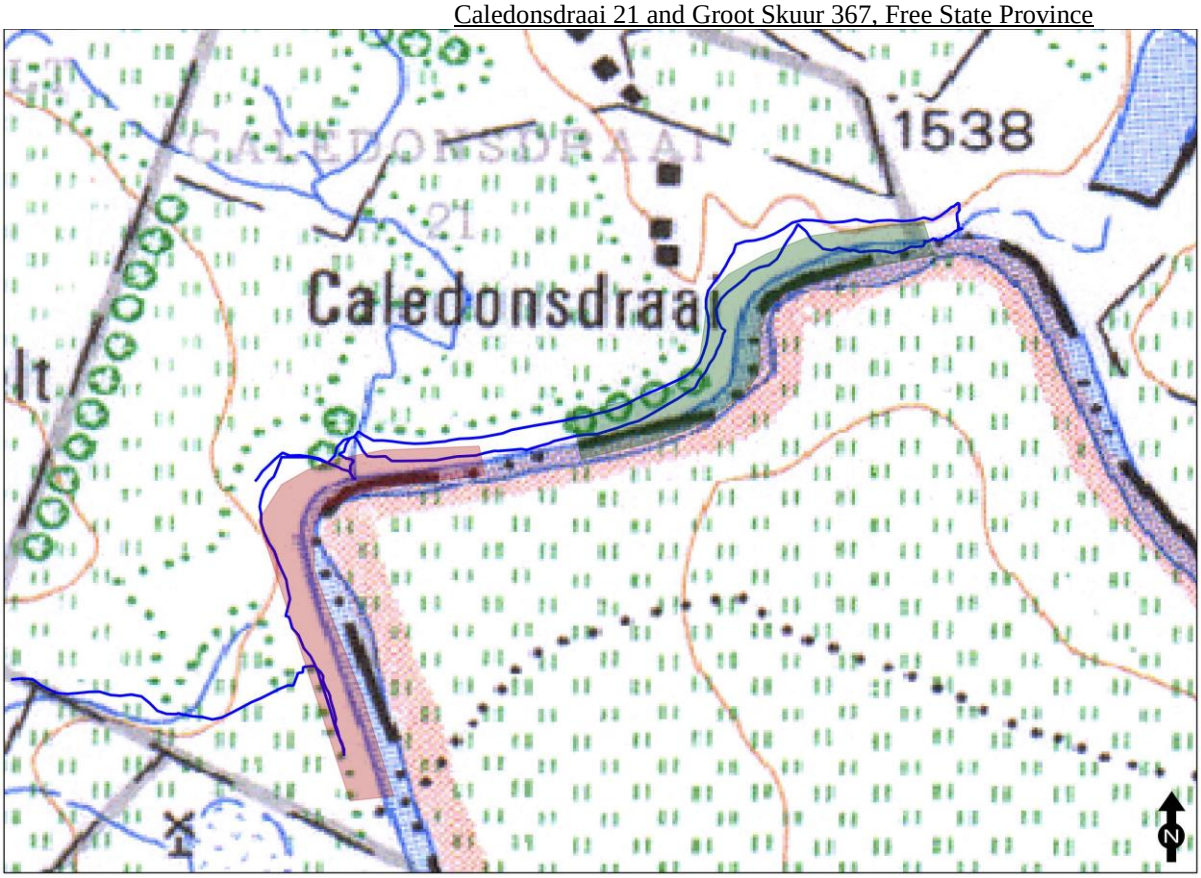

Figure 19: Recorded survey tracks for the project

6.1 Review of existing information/data

Additional information on the cultural heritage of the area was sourced from the following records:

- National Mapping Project by SAHRA (which lists heritage impact assessment reports submitted for South Africa);
- Environmental Potential Atlas (ENPAT);
- Online SAHRIS database;
- National Automated Archival Information retrieval System (NAAIRS);
- Maps and information documents supplied by the client; and
- Several heritage surveys have been conducted in the vicinity of the survey area (published and unpublished material) (Pelser 2019, Nhundu & Magoma 2022 and Van Ryneveld 2007)

No heritage surveys and research projects have been conducted near the project footprint during the last few years. Although several heritage impact assessments have been completed in the general vicinity of the survey area (especially further to the north), no heritage sites were recorded inside the footprint of the two farms.

A Phase 1 archaeological survey was conducted at Baken Park Extension 5, 6 and 7 on the farm Vogelsfontein 69 near Bethlehem further to the north. Although no heritage sites were recorded, two graveyards however were recorded in the survey footprint (Van Ryneveld 2007). A heritage survey of a pipeline along the main route between Lindley and Arlington

yielded no archaeological remains, however two historical Railway bridges were recorded (Pelser 2019). During a survey for the Reitz-Petsana Powerline a cemetery was recorded. No other heritage structures or remains were noted (Nhundu & Magoma 2022).

According to the Surveyor General's database the farm Caledonsdraai 21 was originally surveyed in 1909, and the farm Groot Skuur 367 was first surveyed in 1927 (see Addendum 3).

Extensive Late Iron Age stone-walled sites are known to occur in the region of the survey footprint. According to Maggs (1976) the Type V settlements have been extensively recorded in the general area (see Addendum 1 for details). These settlements are categorised according the Central Cattle Pattern (CCP) with a large cattle kraal at the centre of the homestead and houses surrounding it (See Addendum 1; also Huffman 2007).

The following declared Provincial Heritage Site has been recorded in the Ladybrand region:

- Tandjiesberg Rock Art shelter (Site Ref no: 9/2/308/0001; Notice No: 2960; Declared on 30 October 1992).

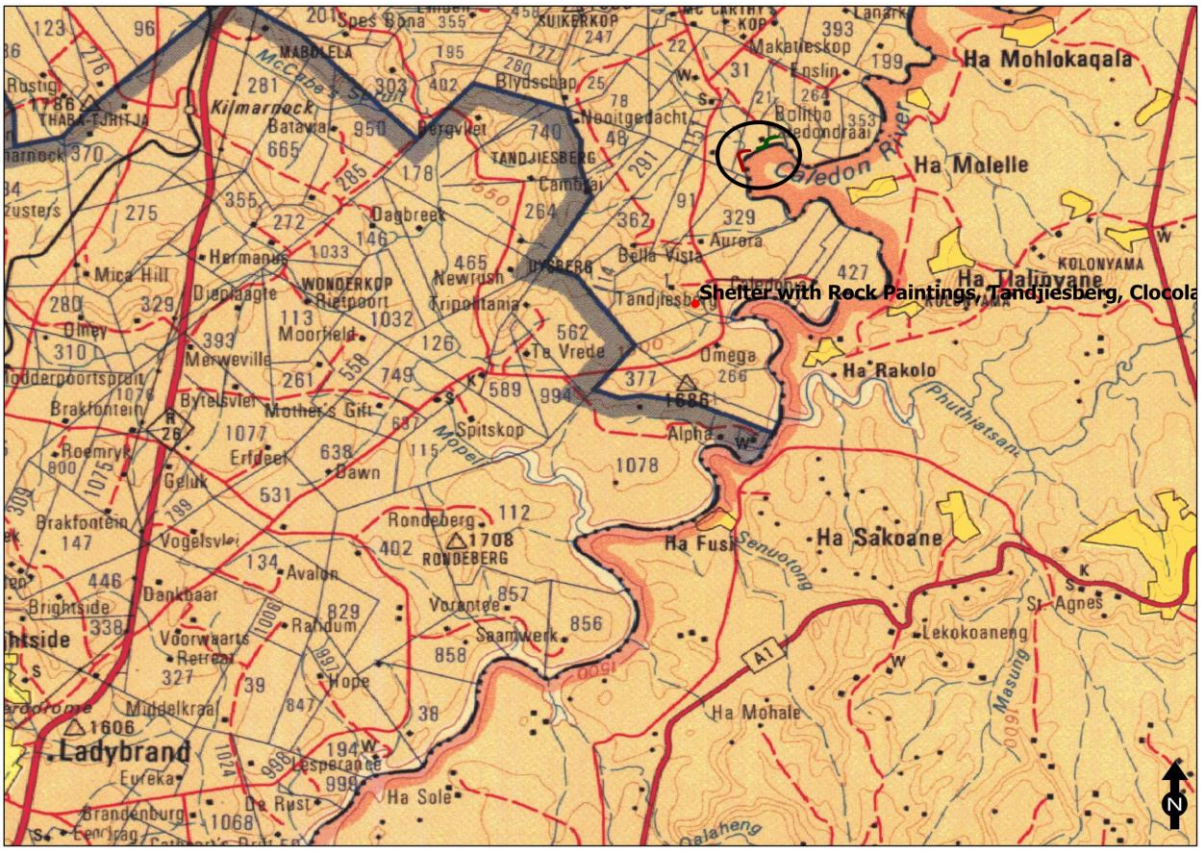

Figure 20: Recorded heritage sites near the survey footprint (SAHRIS as at February 2023)

6.2 Palaeontological sensitivity

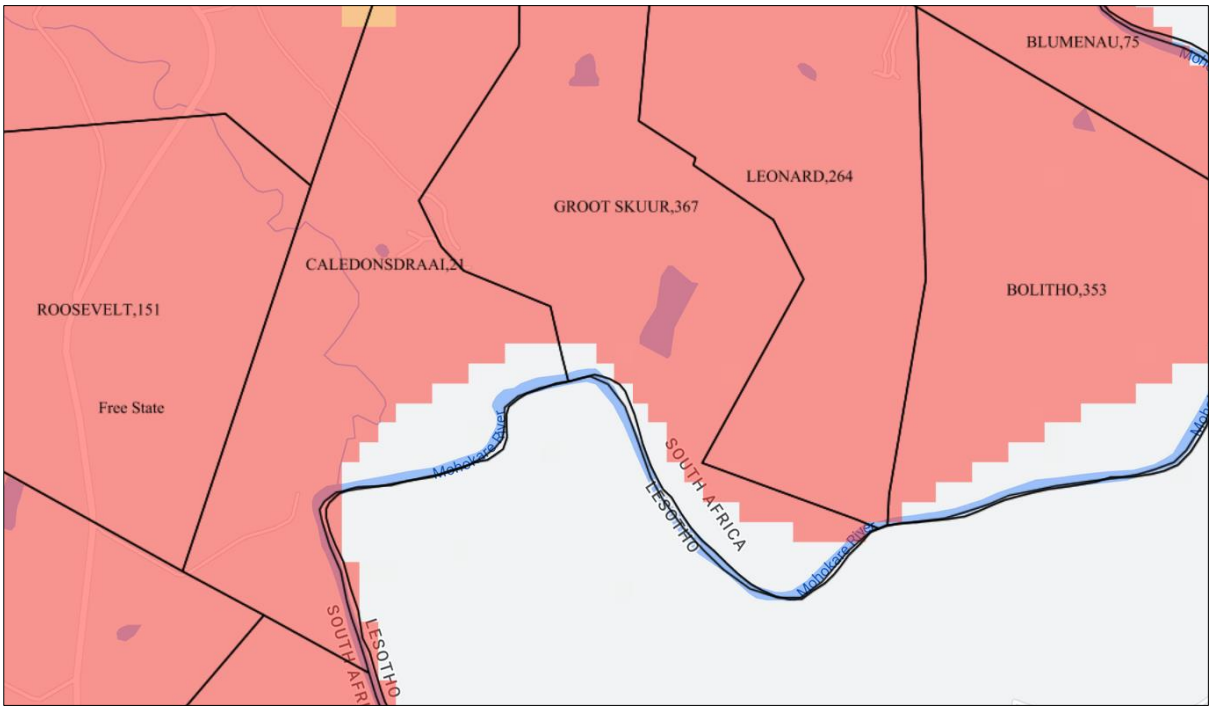

Figure 21: Palaeontological sensitivity zones as indicated (SAHRIS 2023)

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	Will require a minimum of a desktop study. As more information comes to light, SAHRA will continue to populate the map.

The palaeontological sensitivity map was extracted from the SAHRIS database and indicates red (very high) sensitivity for the farms, especially the eastern sections. As a result a field assessment will be required for the survey footprint.

6.3 Site visits

The field surveys were conducted on 28 June 2023.

6.4 Social interaction and current inhabitants

A local man looking after the cattle were consulted about the location of graves and any known heritage site is interest.

6.5 Public Consultation and Stakeholder Engagement

The public participation process will be conducted strictly in accordance with Regulations 39-44. The following three categories of variables will take into account when deciding the required level of public participation:

- The scale of anticipated impacts.
- The sensitivity of the affected environment and the degree of controversy of the project.
- The characteristics of the potentially affected parties.

The following public participation mechanisms will be used:

- Newspaper advertisement in local newspaper
- Site notices
- Direct notification of identified key stakeholders
- Direct notification of surrounding landowners and occupiers
- Circulation of draft BAR
- Public participation meeting if required and one on one consultation
- Direct notification to all stakeholders of the Environmental Authorisation given.

6.6 Assumptions, restrictions, gaps and limitations

No restrictions or limitations were encountered during the survey.

6.7 Methodology for assessment of potential impacts

All impacts identified during the EIA stage of the study will be classified in terms of their significance. Issues were assessed in terms of the following criteria:

- The **nature**, a description of what causes the effect, what will be affected and how it will be affected;
- The **physical exten**t, wherein it is indicated whether:
  - 1 - the impact will be limited to the site;
  - 2 - the impact will be limited to the local area;
  - 3 - the impact will be limited to the region;
  - 4 - the impact will be national; or
  - 5 - the impact will be international.
- The **duration**, wherein it is indicated whether the lifetime of the impact will be:
  - 1 - of a very short duration (0–1 years);
  - 2 - of a short duration (2-5 years);
  - 3 - of a medium-term (5–15 years);
  - 4 - of a long term (> 15 years); or
  - 5 - permanent.
- The **magnitude** of impact, quantified on a scale from 0-10, where a score is assigned:
  - 0 - small and will have no effect;
  - 2 - minor and will not result in an impact;
  - 4 - low and will cause a slight impact;

  - 6 - moderate and will result in processes continuing but in a modified way;
  - 8 - high, (processes are altered to the extent that they temporarily cease); or
  - 10 - very high and results in complete destruction of patterns and permanent cessation of processes;
- The **probability** of occurrence, which describes the likelihood of the impact actually occurring and is estimated on a scale where:
  - 1 - very improbable (probably will not happen);
  - 2 - improbable (some possibility, but low likelihood);
  - 3 - probable (distinct possibility);
  - 4 - highly probable (most likely); or
  - 5 - definite (impact will occur regardless of any prevention measures);
- The **significance**, which is determined through a synthesis of the characteristics described above (refer formula below) and can be assessed as low, medium or high;
- The **status**, which is described as either positive, negative or neutral;
  - The degree to which the impact can be reversed;
  - The degree to which the impact may cause irreplaceable loss of resources; and
  - The degree to which the impact can be mitigated.

The significance is determined by combining the criteria in the following formula:

S = (E+D+M) x P; where:
S = Significance weighting
E = Extent
D = Duration
M = Magnitude
P = Probability

Points	Significance Weighting	Discussion
< 30 points	Low	Where this impact would not have a direct influence on the decision to develop in the area.
31-60 point	Medium	Where the impact could influence the decision to develop in the area unless it is effectively mitigated.
> 60 points	High	Where the impact must have an influence on the decision process to develop in the area.

7. The Cultural Heritage Sites

7.1. Isolated occurrences

Isolated occurrences are artefacts or small features recorded on the surface with no contextual information. No other associated material culture (in the form of structures or deposits) was noted that might provide any further context. This can be the result of various impacts and environmental factors such as erosion and modern developments. By contrast archaeological sites are often complex sites with evidence of archaeological deposit and various interrelated features such as complex deposits, stone walls and middens. However, these isolated occurrences are seen as remains of erstwhile complex or larger sites and they therefore provide a broad indication of possible types of sites or structures that might be expected to occur or have occurred in the survey footprint.

No isolated finds were recorded during the survey.

7.2 Heritage sites

No historical or archaeological (both Stone Age and Iron Age) artefacts, assemblages, features, structures or settlements were recorded during the survey of the project footprint along the banks of the Caledon River.

8. Locations and Evaluation of Sites

None

9. Management Measures

Heritage sites are fixed features in the environment, occurring within specific spatial confines. Any impact upon them is permanent and non-reversible. Those resources that cannot be avoided and that are directly impacted by the proposed development can be excavated/recorded and a management plan can be developed for future action. Those sites that are not impacted on can be written into the management plan, whence they can be avoided or cared for in the future.

9.1 Objectives

- Protection of archaeological, historical and any other site or land considered being of cultural value within the project boundary against vandalism, destruction and theft.
- The preservation and appropriate management of new discoveries in accordance with the NHRA, should these be discovered during construction activities

The following shall apply:

- Known sites should be clearly marked in order that they can be avoided during construction activities.
- The contractors and workers should be notified that archaeological sites might be exposed during the construction activities.
- Should any heritage artefacts be exposed during excavation, work on the area where the artefacts were discovered, shall cease immediately and the Environmental Control Officer shall be notified as soon as possible;
- All discoveries shall be reported immediately to a heritage practitioner so that an investigation and evaluation of the finds can be made. Acting upon advice from these specialists, the Environmental Control Officer will advise the necessary actions to be taken;
- Under no circumstances shall any artefacts be removed, destroyed or interfered with by anyone on the site; and
- Contractors and workers shall be advised of the penalties associated with the unlawful removal of cultural, historical, archaeological or palaeontological artefacts, as set out in the NHRA (Act No. 25 of 1999), Section 51. (1).

9.2 Control

In order to achieve this, the following should be in place:

- A person or entity, e.g. the Environmental Control Officer, should be tasked to take responsibility for the heritage sites and should be held accountable for any damage.
- Known sites should be located and isolated, e.g. by fencing them off. All construction workers should be informed that these are no-go areas, unless accompanied by the individual or persons representing the Environmental Control Officer as identified above.
- In areas where the vegetation is threatening the heritage sites, e.g. growing trees pushing walls over, it should be removed, but only after permission for the methods proposed has been granted by SAHRA. A heritage official should be part of the team executing these measures.

10. Recommendations and Conclusions

No historical or archaeological (both Stone Age and Iron Age) artefacts, assemblages, features, structures or settlements were recorded during the survey of the project footprint along the banks of the Caledon River.

It is therefore recommended, from a cultural heritage perspective that the proposed prospecting activities may proceed, taking into account the mitigation measures.

However, please note:

Archaeological deposits usually occur below ground level. Should archaeological artefacts or skeletal material be revealed in the area during development activities, such activities should be halted, and a university or museum notified in order for an investigation and evaluation of the find(s) to take place **(*cf*. NHRA (Act No. 25 of 1999)**, Section 36 (6)).

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Addendum 1: Archaeological and Historical Sequence

The table provides a general overview of the chronological sequence of the archaeological periods in South Africa.

PERIOD	APPROXIMATE DATE
Earlier Stone Age	More than c. 2 million years ago - c. 250 000 years ago
Middle Stone Age	c. 250 000 years ago – c. 40 000 years ago
Later Stone Age (Includes San Rock Art)	c. 40 000 years ago - c. AD 200 (up to historic times in certain areas)
Early Iron Age	c. AD 200 - c. AD 900
Middle Iron Age	c. AD 900 – c. AD 1300
Late Iron Age (Stonewalled sites)	c. AD 1300 - c. AD 1840 (c. AD 1640 - c. AD 1840)

Archaeological Context

Stone Age Sequence

Concentrations of Early Stone Age (ESA) sites are usually present on the flood-plains of perennial rivers and may date to over 2 million years ago. These ESA open sites may contain scatters of stone tools and manufacturing debris and secondly, large concentrated deposits ranging from pebble tool choppers to core tools such as handaxes and cleavers. The earliest hominins who made these stone tools, probably not always actively hunted, instead relying on the opportunistic scavenging of meat from carnivore fill sites.

Middle Stone Age (MSA) sites also occur on flood plains, but are also associated with caves and rock shelters (overhangs). Sites usually consist of large concentrations of knapped stone flakes such as scrapers, points and blades and associated manufacturing debris. Tools may have been hafted but organic materials, such as those used in hafting, seldom preserve. Limited drive-hunting activities are also associated with this period.

Sites dating to the Later Stone Age (LSA) are better preserved in rock shelters, although open sites with scatters of mainly stone tools can occur. Well-protected deposits in shelters allow for stable conditions that result in the preservation of organic materials such as wood, bone, hearths, ostrich eggshell beads and even bedding material. By using San (Bushman) ethnographic data a better understanding of this period is possible. South African rock art is also associated with the LSA.

Iron Age Sequence

In the northern regions of South Africa at least three settlement phases have been distinguished for early prehistoric agropastoralist settlements during the **Early Iron Age** (EIA). Diagnostic pottery assemblages can be used to infer group identities and to trace movements across the landscape. The first phase of the Early Iron Age, known as **Happy Rest** (named after the site where the ceramics were first identified), is representative of the Western Stream of migrations, and dates to AD 400 - AD 600. The second phase of **Diamant** is dated to AD 600 - AD 900 and was first recognized at the eponymous site of Diamant in the western Waterberg. The third phase, characterised by herringbone-decorated pottery of the **Eiland** tradition, is regarded as the final expression of the Early Iron Age (EIA) and occurs over large parts of the North West Province, Northern Province, Gauteng and Mpumalanga. This phase has been dated to about AD 900 - AD 1200. These sites are usually located on low-lying spurs close to water.

The **Late Iron Age** (LIA) settlements are characterised by sites without stone walls (Early Moloko settlements such as Icon (AD 1350 – 1500) and stone-walled sites such as Madikwe (AD 1500 – 1700) and Buispoort (AD 1700 – 1800) situated on defensive hilltops. This occupation phase has been linked to the arrival of ancestral Tswana speakers and in the northern regions of South Africa with associated sites dating between the sixteenth and seventeenth centuries AD. The terminal LIA is represented by late 18th/early 19th century settlements with multichrome Moloko pottery commonly attributed to the Sotho-Tswana. These settlements can in many instances be correlated with oral traditions on population movements during which African farming communities sought refuge in mountainous regions during the processes of disruption in the northern interior of South Africa, resulting from the so-called *difaqane* (or m*fecane*).

Sites that were identified during the survey are archaeological sites dated to the later (stone walled) phase of the Late Iron Age (c. AD 1640 - AD 1830s) also known as the Late Moloko. These sites all conform to a general settlement layout that forms part of a certain worldview. As such, the livestock enclosures are situated in the central area of a settlement. The court (kgotla) is also located in this central area and is associated with men (men are usually also buried here). The surrounding scalloped walling is where the houses are situated and is associated with women. This type of settlement layout is generally known as the Central Cattle Pattern (CCP) (Huffman 2006).

Extensive surveying by Tim Maggs in the Free State during the 1970s culminated in an extensive framework for Late Iron Age stone-walled settlements. Maggs established the following classification of sites (Maggs 1976):

- Type N (Ntuanatsatsi): Occurring mostly in the north eastern Free State
- Type V (Makgwareng): Occurring mostly in the eastern Free State towards the Drakensberg
- Type Z (OXF1): Occurring mostly in the north western regions of the Free State
- Type R (OFD 1): Riet River area of the Free State.

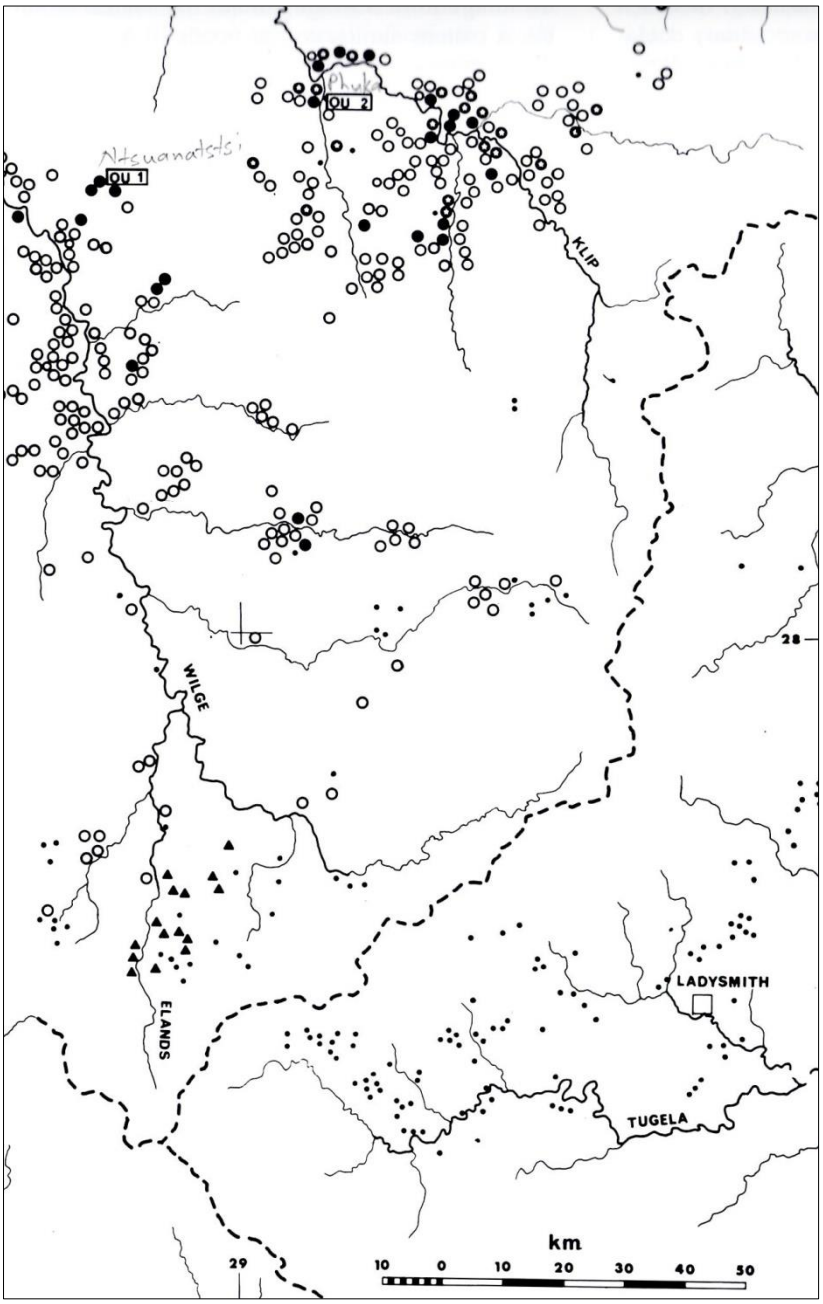

Figure 22: Distribution of Iron Age sites in the north eastern Free State (survey area to the west) (Maggs 1976)

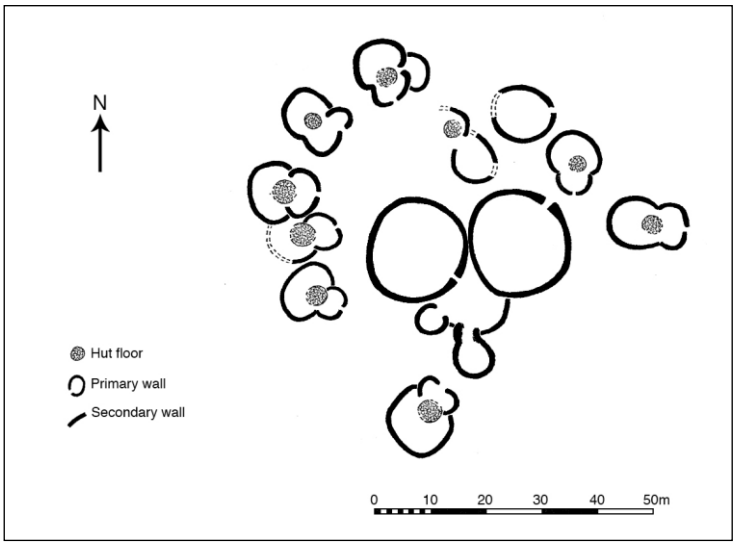

Figure 23: Type Z homestead (after Maggs 1976)

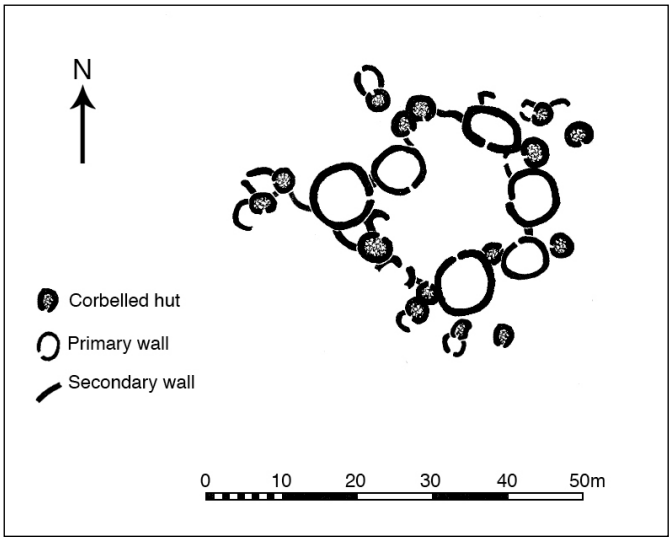

Figure 24: Type V homestead (after Maggs 1976)

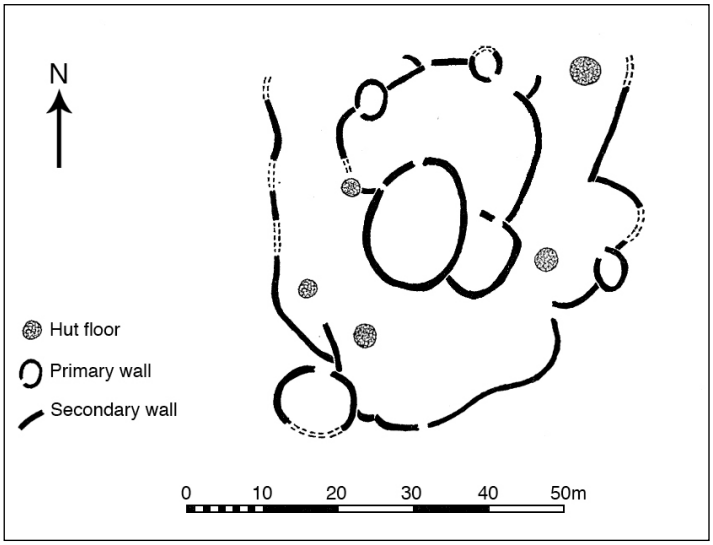

Figure 25: Type N homestead (after Maggs 1976)

Addendum 2: Description of the Recorded Sites

A system for grading the significance of heritage sites was established by the NHRA (Act No. 25 of 1999) and further developed by the South African Heritage Resources Agency (SAHRA 2007) and has been approved by ASAPA for use in southern Africa and was utilised during this assessment.

Sample of data form

A. GENERAL SITE DESCRIPTION			
Site type			
Site Period			
Physical description			
Integrity of deposits or structures			
Site extent			
B. SITE EVALUATION			
B1. HERITAGE VALUE		**Yes**	**No**
Historic Value			
It has importance to the community or pattern of South Africa's history or precolonial history.			
It has strong or special association with the life or work of a person, group or organisation of importance in the history of South Africa.			
It has significance relating to the history of slavery in South Africa.			
Aesthetic Value			
It has importance in exhibiting particular aesthetic characteristics valued by a particular community or cultural group.			
Scientific Value			
It has potential to yield information that will contribute to an understanding of South Africa's natural and cultural heritage.			
It has importance in demonstrating a high degree of creative or technical achievement at a particular period.			
It has importance to the wider understanding of the temporal change of cultural landscapes, settlement patterns and human occupation.			
Social Value			
It has strong or special association with a particular community or cultural group for social, cultural or spiritual reasons (sense of place).			
Tourism Value			
It has significance through its contribution towards the promotion of a local sociocultural identity and can be developed as tourist destination.			
Rarity Value			
It possesses unique, uncommon, rare or endangered aspects of South Africa's natural or cultural heritage.			
Representative Value			
It is importance in demonstrating the principle characteristics of a particular class of South Africa's natural or cultural places or objects.			
B2. REGIONAL CONTEXT			
Other similar sites in the regional landscape.			
C. SPHERE OF SIGNIFICANCE	**High**	**Medium**	**Low**
International			
National			
Provincial			
Local			
Specific community			

D. FIELD REGISTER RATING	
National/Grade 1 [should be registered, retained]	
Provincial/Grade 2 [should be registered, retained]	
Local/Grade 3A [should be registered, mitigation not advised]	
Local/Grade 3B [High significance; mitigation, partly retained]	
Generally Protected A [High/Medium significance, mitigation]	
Generally protected B [Medium significance, to be recorded]	
Generally Protected C [Low significance, no further action]	
E. GENERAL STATEMENT OF SITE SIGNIFICANCE	
Low	
Medium	
High	
F. RATING OF POTENTIAL IMPACT OF DEVELOPMENT	
None	
Peripheral	
Destruction	
Uncertain	

G. RECOMMENDED MITIGATION

H. APPLICABLE LEGISLATION AND LEGAL REQUIREMENTS

I. PHOTOGRAPHS

Addendum 3: Surveyor General Farm Diagram

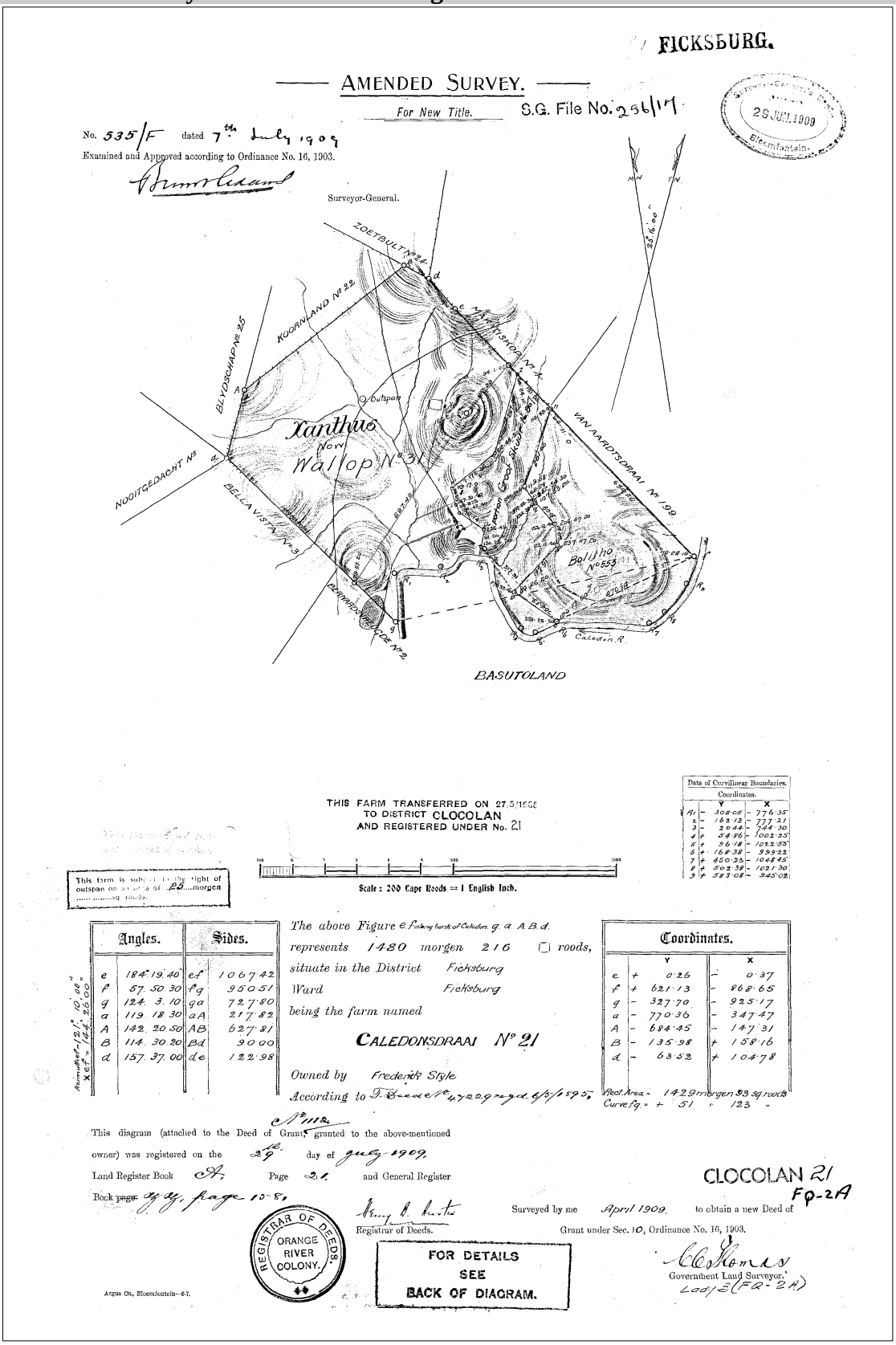

Figure 26: Surveyor General's diagram of the farm Caledonsdraai 21 was surveyed in 1909

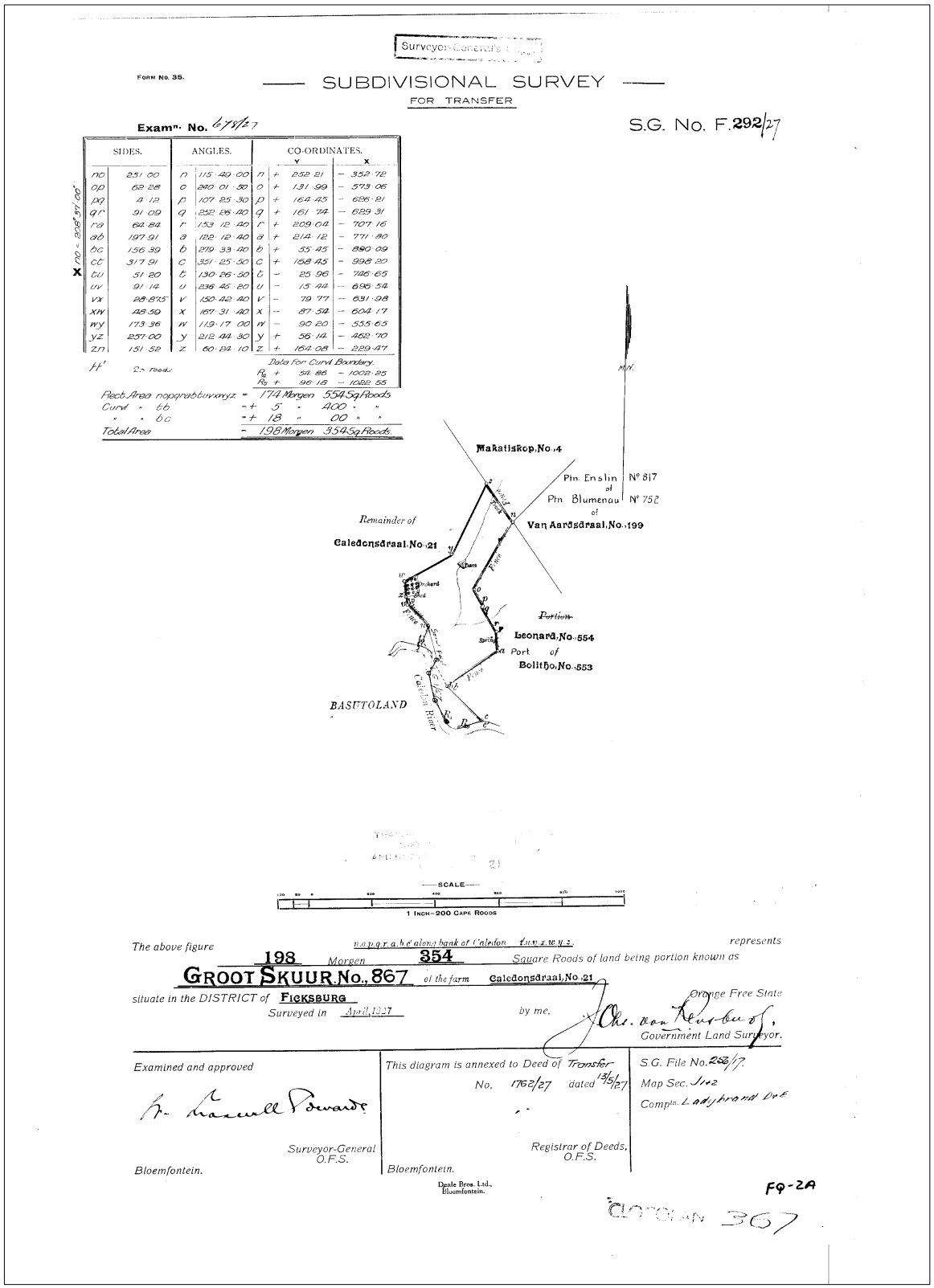

Figure 27: Surveyor General's diagram of the farm Groot Skuur 367 was surveyed in 1927

Addendum 4: Relocation of Graves

Marked graves younger than 60 years do not fall under the protection of the NHRA (Act No. 25 of 1999) with the result that exhumation, relocation and reburial can be conducted by an undertaker. This will include logistical aspects such as social consultation, purchasing of plots in cemeteries, procurement of coffins, etc. Other legislative measures which may be pertinent include the Removal of Graves and Dead Bodies Ordinance (Ordinance No. 7 of 1925), Regulations Relating to the Management of Human Remains (GNR 363 of 22 May 2013) made in terms of the National Health Act No. 61 of 2003, Ordinance on Exhumations (Ordinance No. 12 of 1980) as well as any local and regional provisions, laws and by-laws that may be in place.

Marked graves older than 60 years are protected by the NHRA (Act No. 25 of 1999) an as a result an archaeologist must be in attendance to assist with the exhumation and documentation of the graves. Note that unmarked graves are by default regarded as older than 60 years and therefore also falls under the NHRA (Act No. 25 of 1999, Section 36).

The relocation of graves entails the following procedure:

- Notices of intent to relocate the graves must be put up at the burial site for a period of 60 days. This should contain contact information where communities and family members can register as interested and affected parties. All information pertaining to the identification of the graves must be documented for the application of a SAHRA permit. All notices must be in at least 3 languages, of which English is one. This is a requirement by law.
- These notices of intention must also be placed in at least two local newspapers and have the same information as above.
- Local radio stations can also be used to try contact family members. This is not required by law, but can be helpful.
- During this time (60 days) a suitable cemetery must be identified near to the development or otherwise one specified by the family of the deceased.
- An open day for family members should be arranged after the period of 60 days so that they can gather to discuss the way forward, and to sort out any problems. The developer needs to take the families requirements into account.
- Once the 60 days have passed and all the information from the family members have been received, a permit can be requested from SAHRA. This is a requirement by law.
- Once the permit has been issued, the graves may be exhumed and relocated.
- All headstones must be relocated with the graves as well as any remains and any additional objects found in the grave.

Information needed for the SAHRA permit application

- The permit application must be done by an archaeologist.
- A map of the area where the graves have been located.
- A survey report of the area prepared by an archaeologist.
- All the information on the families that have identified graves.

- A letter of permission from the landowner granting permission to the developer to exhume and relocate the graves.
- A letter (or proof of purchase of the plots) from the new cemetery confirming that the graves will be reburied there.
- Details of the farm name and number, magisterial district and GPS coordinates of the gravesite.

Graves are generally be classified into four categories. These are:

- Graves younger than 60 years;
- Graves older than 60 years, but younger than 100 years;
- Graves older than 100 years; and
- Graves of victims of conflict or of individuals of royal descent.