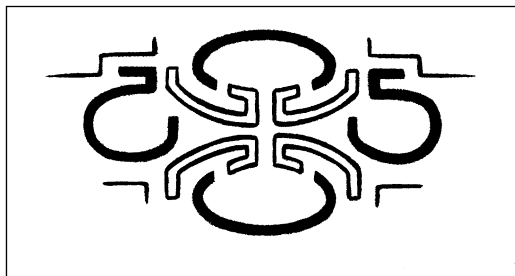


**Cultural Heritage Impact Assessment:
Phase 1 Investigation for a Prospecting Right Application of Diamond Alluvial,
Diamond General and Diamond Kimberlite near Kimberley on a Portion of the Farm
Rooifontein 1722 (Previously known as a Portion of the Farm Dutoitspan 119),
Tokologo Local Municipality, Lejweleputswa District Municipality, Free State Province**



For

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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) (NHRA) and focuses on the survey results from a cultural heritage survey as requested by Milnex 189 CC. The Scoping and EIA process for a Prospecting Right Application of Diamond Alluvial, Diamond General and Diamond Kimberlite near Kimberley on a Portion of the Farm Rooifontein 1722 (Previously known as a Portion of the Farm Dutoitspan 119), Tokologo Local Municipality, Lejweleputswa District Municipality, Free State Province. The properties are located approximately 9 km southeast of Kimberley. The Scoping and EIA process for Environmental Authorisation for the proposed diamond prospecting is conducted in terms of the National Environmental Management Act (Act No. 107 of 1998)(NEMA).

Site No	Site Type	Field Rating of Significance	Direct Impacts	Significance of Impact before Mitigation	Significance of Impact after Mitigation	Proposed Mitigation
1	Historical mine and refuse dump	Provincial Level (Grade 2)	Peripheral	64 (High)	20 (Low)	<ul style="list-style-type: none"> Maintain a buffer zone of 100 metres during prospecting phase
2	Historical water furrow	Generally protected A: High significance	High	64 (High)	20 (Low)	<ul style="list-style-type: none"> Fenced off and gate installed Maintain a buffer zone of 50 metres during prospecting phase
3	Rock art (engravings) & Historical structures	Provincial Level (Grade 2)	None			<ul style="list-style-type: none"> Maintain a buffer zone of 100 metres during prospecting phase

A total of three sites were recorded during the survey of which one is a historic mine and refuse dump (Site 1), one is a historic water furrow (Site 2) and a rock art site (Site 3). The historical sites are associated with the late 19th century and early 20th century mining activities that took place in the region.

No Stone Age or Iron Age settlements, structures, features or assemblages were recorded during the survey.

It is well known that Late Iron Age stone-walled settlements do not usually occur in open low-lying grasslands. The well-known Korana settlements of Chief Mossweu are located near Mamusa Hill (further east near Schweizer-Reneke) and other Tswana settlement (Rolong and Tlhaping) occur further north and east of the survey area.

It is therefore recommended, from a cultural heritage perspective, that the proposed prospecting activities may proceed.

Also, 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&APs:	Interested and Affected Parties

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.



Francois P Coetzee
Cultural Heritage Consultant
Accredited Archaeologist for the SADC Region
Professional Member of ASAPA (CRM Section) Reg no: 28

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1. Introduction and Terms of Reference

Milnex 189 CC an independent environmental consultant was contracted by Matolo Trade and Investment (Pty) Ltd to undertake the Scoping and EIA process for a Prospecting Right Application of Diamond Alluvial, Diamond General and Diamond Kimberlite near Kimberley on a Portion of the Farm Rooifontein 1722 (Previously known as a Portion of the Farm Dutoitspan 119), Tokologo Local Municipality, Lejweleputswa District Municipality, Free State Province. The properties are located approximately 9 km southeast of Kimberley. The Scoping and EIA process for Environmental Authorisation for the proposed diamond prospecting is conducted in terms of the National Environmental Management Act (Act 107 of 1998)(NEMA). A Cultural Heritage Impact Assessment (HIA) was requested by Milnex 189 CC on behalf of the client to evaluate the potential impact of the proposed diamond prospecting activities. File reference number SAMRAD: FS30/5/1/1/2/10462PR.

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 9 km south east of Kimberley, Free State Province. The proposed prospecting area is situated south east of De Beers Kimberley Mines not so far from their Slimes Dam.

Farm Name(s) and Portions	The following portions and farms: Rooifontein 1722 (previously known as the farm Dutoitspan 119): • A certain portion of the farm
Size of Survey Area	324.7035 hectares (Application Area) 24 hectares (Prospecting Area)
Magisterial District	Tokologo Local Municipality Lejweleputswa District Municipality
1:50 000 Map Sheet	2824DD
1:250 000 Map Sheet	2824
Central Coordinates of the Development	27.667010°E 33.500820°S

Table 1: Physical Environment

The survey area falls within the Savanna Biome, particularly the Eastern Kalahari Bushveld Bioregion and more specifically the Kimberley Thornveld (SVk 4) (Mucina & Rutherford 2006). The region is characterised by plains, slightly undulating plains and some hills, supporting open woodland with a fairly dense shrub layer, with *Acacia erioloba*, *A. karroo*, *A. tortilis*, *Rhus lancea* trees and *A. hebeclada*, *Diospyros lycioides*, *Grewia flava*, *Tarchonanthus camphoratus* shrubs. Infrastructure consists of the N8 (just south of the survey footprint) and several dirt roads that provide access to the area, as well as power lines, fences, and extensive agricultural fields (both used and fallow).

A historical furrow (canal) also transects the survey footprint almost in the middle and is aligned along the north-south axis. The furrow is part of an extensive irrigation system which links up with the Dutoits Pan and is probably linked to the diamond mining activities and dates to the late 19th and early 20th centuries.

Kimberley normally receives about 283mm of rain per year, with most rainfall occurring mainly during summer. The chart below (lower left) shows the average rainfall values for Kimberley per month. It receives the lowest rainfall (0mm) in July and the highest (59mm) in March. The monthly distribution of average daily maximum temperatures (centre chart below) shows that the average midday temperatures for Kimberley range from 18°C in June to 32°C in January. The region is the coldest during July when the mercury drops to 0.3°C on average during the night. Consult the chart below (lower right) for an indication of the monthly variation of average minimum daily temperatures (SAexplorer 2014).

Current Zoning	Agricultural (Cultivation) Cattle grazing (pastoralism)
Economic activities	Farming and mining
Soil and basic geology	The basement rocks consist of Andesitic Ventersdorp lavas and related pyroclastics overlying the Witwatersrand Strata. These lavas are covered by younger shale of the Eccca group of the Karoo Supergroup. These lavas are covered by younger shale of the Eccca group of the Karoo Supergroup. A thin layer of less than 5 m of red soils and calcrete is present on the immediate surface. The proposed prospecting area is underlain by rocks of the Karoo Supergroup, with a sequence comprising of a sedimentary succession of mainly Karoo shales and dolerite. These successions vary between 10 – 125 m. The sedimentary succession overlies a sequence of Ventersdorp lavas and quartzites, which vary in thickness from ± 900 m below surface at Wesselton Mine to ± 500 m below surface at Joint Shaft and De Beers Mine. The Ventersdorp rock overlies the basement granite gneisses with amphibolites and schists in varying amounts. The shale overlies the late Archaean Ventersdorp Lavas. This unit is dominantly hard grey-green amygdaloidal lava. The historical mining of the kimberlite dykes around this area passed downwards from shale to lava country rock, and it is estimated that the shale may be around 200 – 300 m thick
Prior activities	Livestock farming and agriculture Mining
Socio Economic Environment	According to the 2016/2017 Tokologo Local Municipality's IDP second draft (2016/2017:12) the Tokologo Local Municipality area covers 9326km ² . Tokologo Local Municipality area covers 9326 km ² and consists of three former Transitional Local Councils namely, Boshof, Dealesville and Hertzogville, as well as a portion of a former Transitional Rural Council (Modderval) which contained approximately 1480 farms.

	Unemployment in this municipality for age 15-64 years, range from 22.8% in 1996, 26.9% in 2001 and 27.4% in 2011. The school attendance percentage in 2011 shows that 66.5% were attending school whereas 33.5% were not. Males were found to be attending school more than females with 67.7% and 65.3% respectively. Since 1996 to 2011 people attaining matric certification increased from 5.4% in 1996 to 12.6% in 2011
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

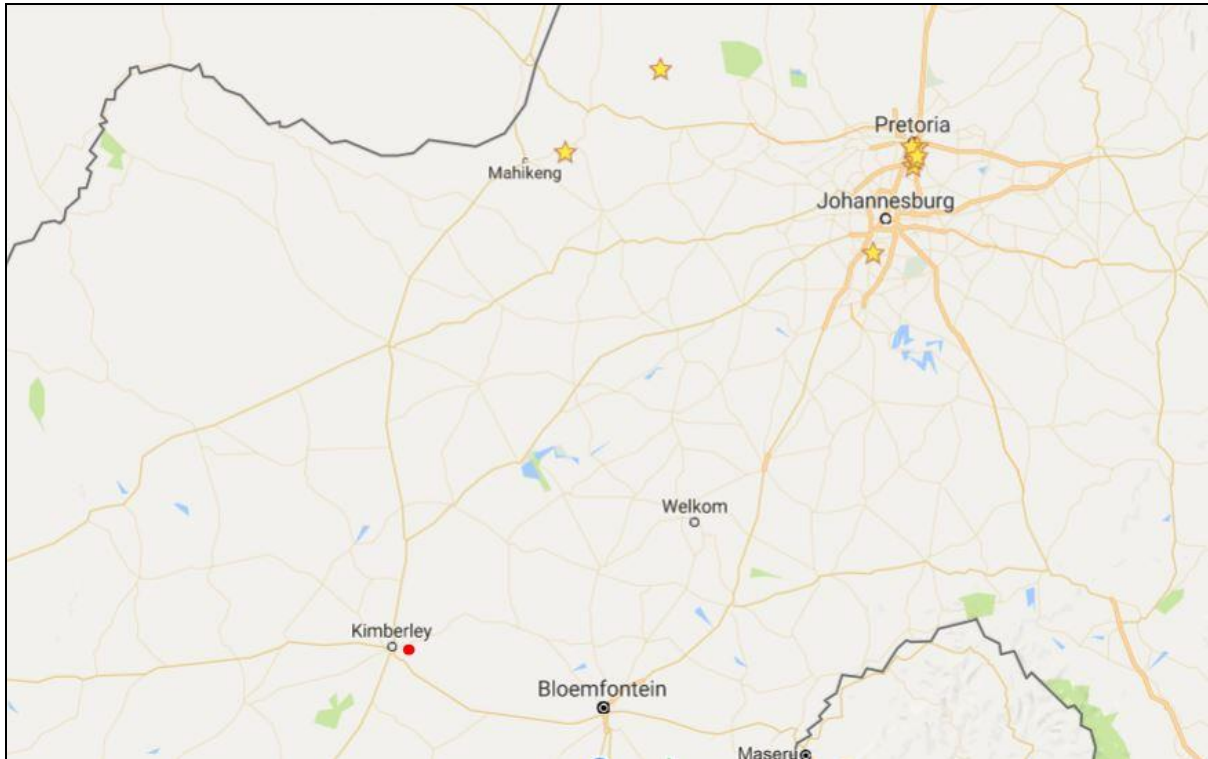


Figure 1: Regional context of the survey footprint located south east of Kimberley (indicated by the red area)

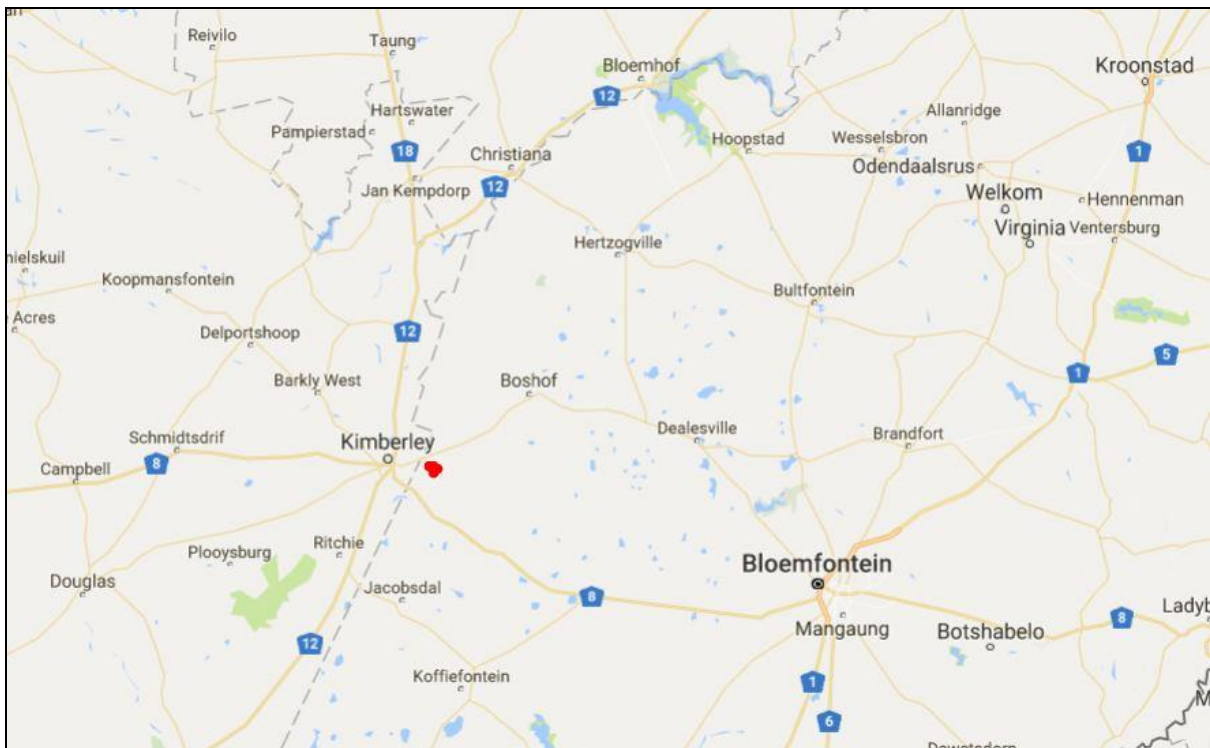


Figure 2: Local context of the survey area located south east of Kimberley (indicated by the red area)

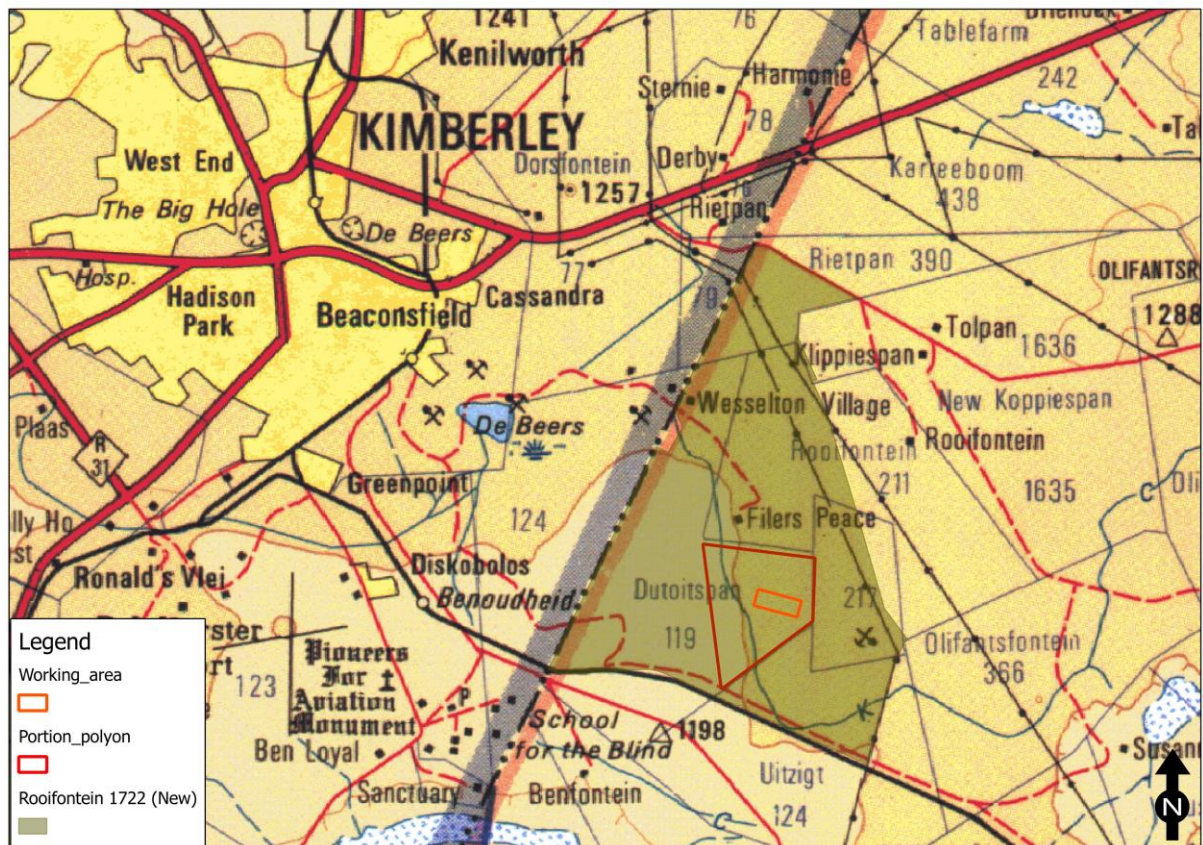


Figure 3: Local context of the survey footprint (1:250 000 Map 2824)

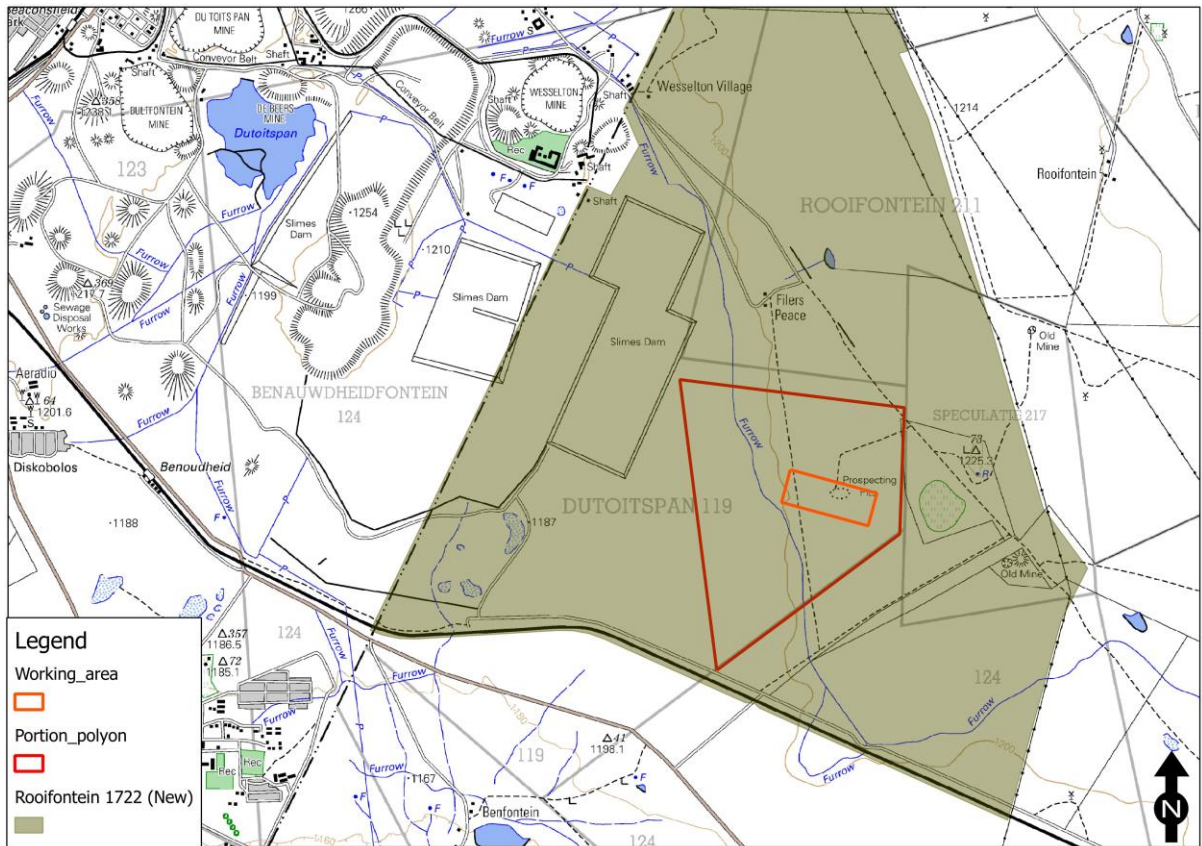


Figure 4: The survey area as indicated on the 1:50 000 topographic map 2824DD



Figure 5: Survey area within local context (Google Earth 2017)



Figure 6: Detail of survey area as indicated on Google Earth Pro (2017)

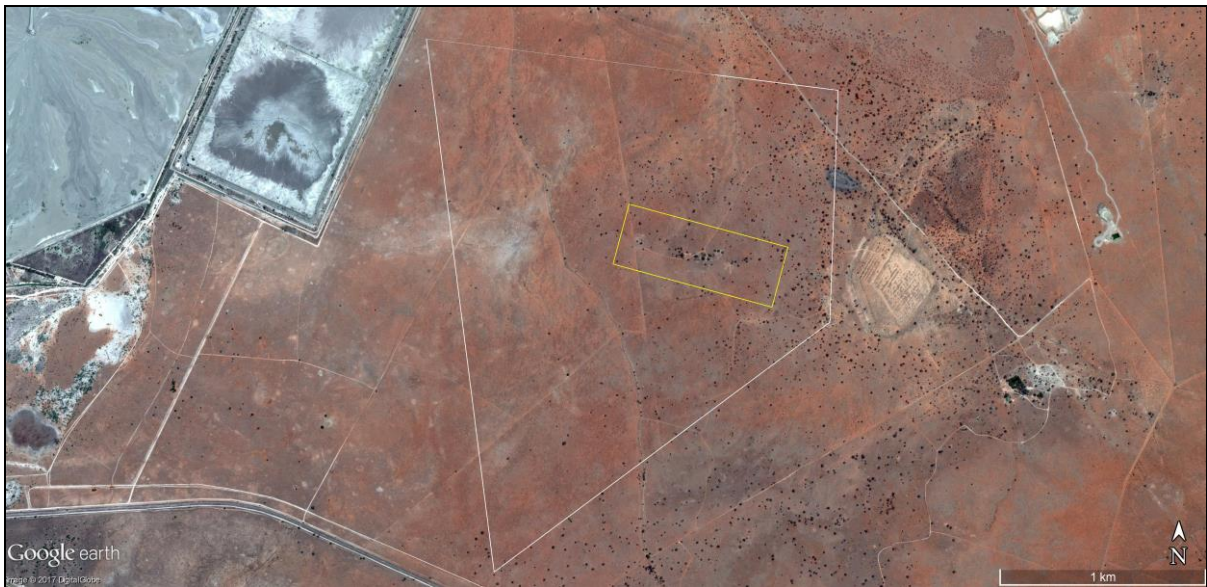


Figure 7: Detail of survey area (southern section) as indicated on Google Earth Pro (2014)



Figure 8: General view of the northern sections of the survey footprint



Figure 9: General view of the northern sections of the survey footprint



Figure 10: General view of the southern sections of the survey footprint



Figure 11: General view of the southern sections of the survey footprint



Figure 12: General view of the old mining and rubbish dump (middens) (Site 1)

4. Proposed Project Description

The proposed prospecting activities will entail the following:

- **Prospecting Drilling and excavations (Month 8 - 17)**

Prospecting boreholes are estimated to be positioned within the 20 ha footprint as marked on the prospecting area on the image below. Reverse or Percussion circulation drill holes (usually up to 165mm in diameter) will be positioned at targets identified during geological mapping and geophysical surveys. The exact location of the boreholes to be drilled is unknown since this stage is controlled by information from phase 1. The first phase of drilling will require the drilling of approximately 6 boreholes to be drilled within the prospecting area. Drilling program will be put into practice where the grid spacing will be set to 50 M x 50 M with an average depth of 100 m, followed by a second round of infill drilling as to whether to continue with the prospecting programme or not. The collar position of all boreholes will be surveyed. Each drill borehole and sample site will be rehabilitated as prospecting proceeds.

- **Bulk sampling (Month 12 - 31)**

Should delineation and initial evaluation of the deposit indicate a sufficient size and grade to warrant further evaluation, an appropriate bulk sampling program will be undertaken in order to establish grade and confirm its viability for mining.

Only two pit/trenches will be excavated (100 m x 50 m x ± 50m). No more than 2 trenches will be excavated. The total area to be disturbed for the duration of the activity will be: 2 trenches x (100 m x 50 m) = 1 ha.

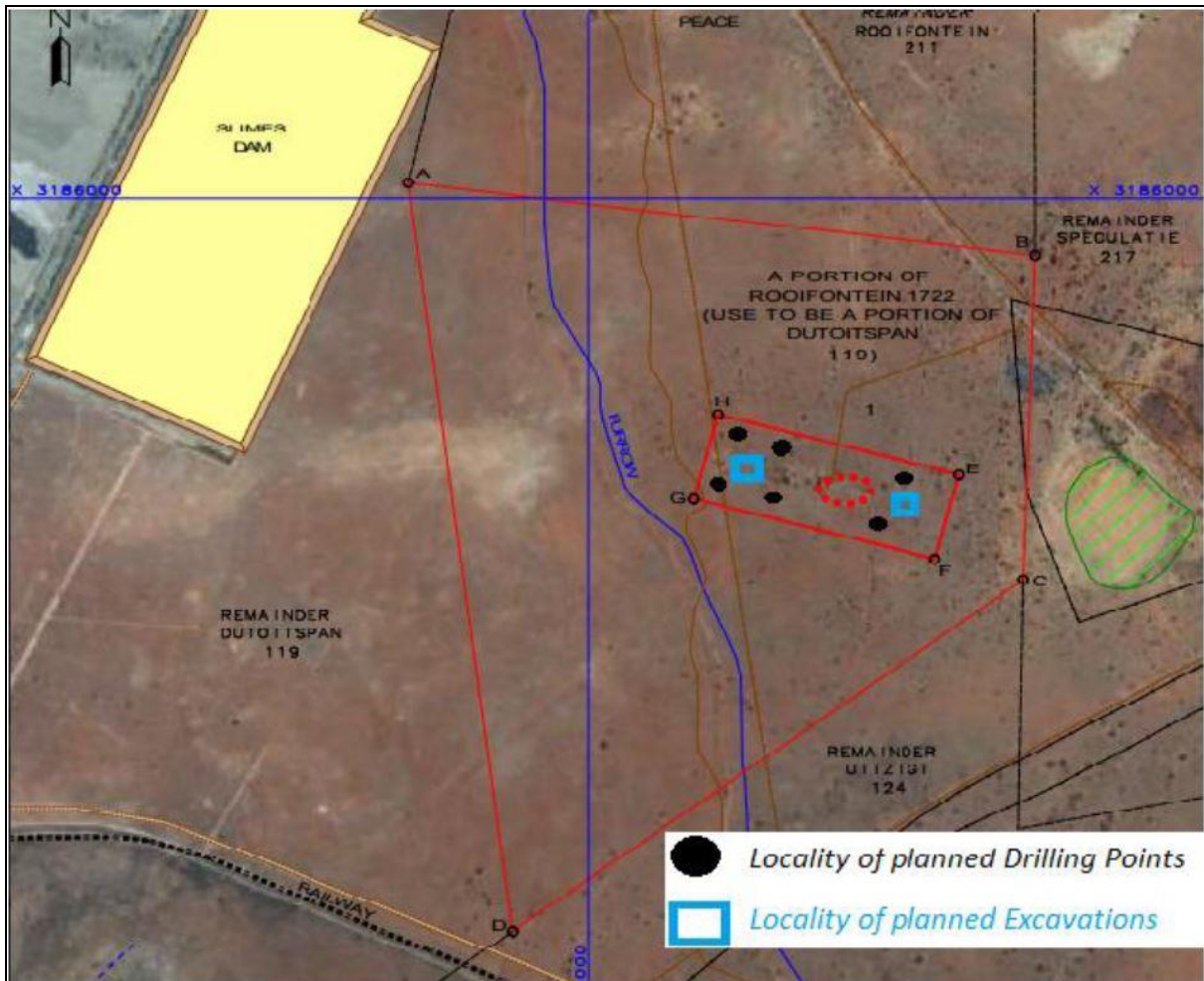


Figure 13: General layout of prospecting footprint

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 Section 28
The National Water Act (Act No. 36 of 1998)	Section 21 (a)(b)
Regulation 2, Appendix 2 of Governmental Notice Regulation (GNR) 982	Appendix 2 (a-l)
Air Quality Act (Act No. 39 of 2004)	Section 21
National Forests Act, Act of 84 of 1998	Chap 3 (Part 1), Section 12(1), Section 15(1), Section 58(1)
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)	
The National Water Act (Act No. 36 of 1998);	Section 2
Mine Health and Safety Act (Act No. 29 of 1996) (MHSA)	
Biodiversity Act (Act 10 of 2004)	
National Infrastructure Plan	
Tokologo Local Municipality’s IDP	
Lejweleputswa District Municipality Integrated Development Plan (IDP)	

Table 3: Legal framework

NAME OF ACTIVITY (All activities including activities not listed) (E.g. 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.)	Aerial extent of the Activity Ha or m²	LISTED ACTIVITY Mark with an X where applicable or affected.	APPLICABLE LISTING NOTICE (GNR 983, GNR 984 or GNR 985)/NOT LISTED
Clearance of indigenous vegetation	324.7035 ha - only 24ha of indigenous vegetation will be cleared.	X	GNR. 984
Office and Workshop	50m ²	-	-
Roads	± 4 Km	-	-
Stockpiling op topsoil	24 ha – 100m x 50m x 5m x 2 = 50 000 m ³	-	-
Prospecting of Diamond Alluvial - Excavations	24 ha – 100m x 50m x 50m (2 pit/trenches)	X	GNR. 984
Processing Plant	2 x 10 Ft Pan and 1 x 12 Ft Pan – 450 000m ³ to be washed	X	-

Table 4: Listing notices

- 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	Yes
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 5: 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 6: 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 (ESRI shapefiles) on the proposed prospecting areas was supplied by Milnex 189 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 survey all the farms that form part of the application. A representative of the local mining company accompanied me during the field survey. As a result of a detailed knowledge of the farms certain features and sites were recorded first. Certain areas were surveyed by conducting intuitive pedestrian (foot) surveys. Extensive mining, prospecting and human habitation have resulted in a landscape with a complex palimpsest of historical layers.

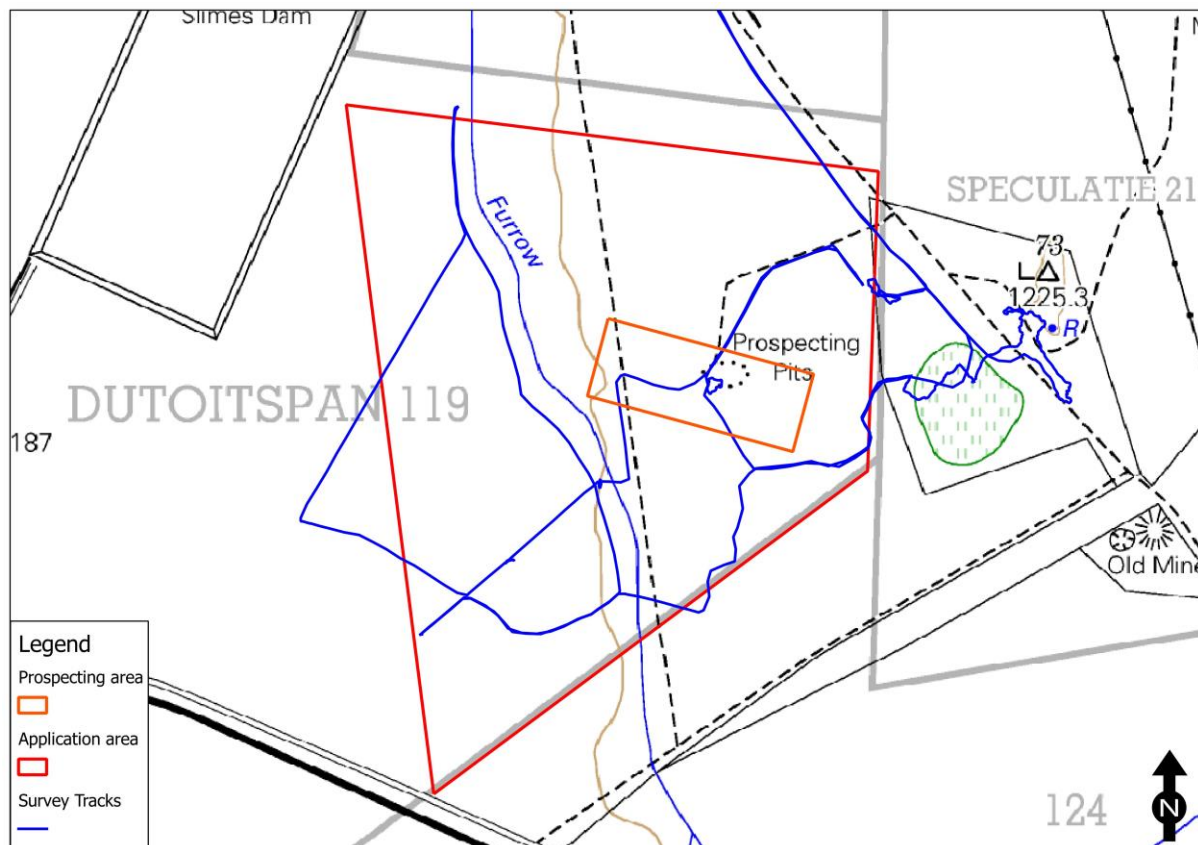


Figure 14: Recorded survey tracks for the project

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 on the area) (Hollman & Fourie 2017 & 2016, Morris 1988, 2014a & 2014b, Rossouw n.d. and Van Vollenhoven 2014).

Although several heritage impact assessments have been completed in the general vicinity of the survey footprint, no heritage sites were recorded inside the current survey area.

In addition it should be noted that a proposal has been submitted to SAHRA for the declaration of the Rooifontein Farm 1722 on the eastern outskirts of Kimberley as a suite of significant heritage resources worthy of formal protection. The application includes the following (Date submitted on SAHRIS: 21 November 2016; Case ID: 10477):

- early diamond mining sites and remains of associated infrastructure
- traces of the South African War Siege of Kimberley Boers positions and HQ sites
- pre-colonial rock engravings and Stone Age sites

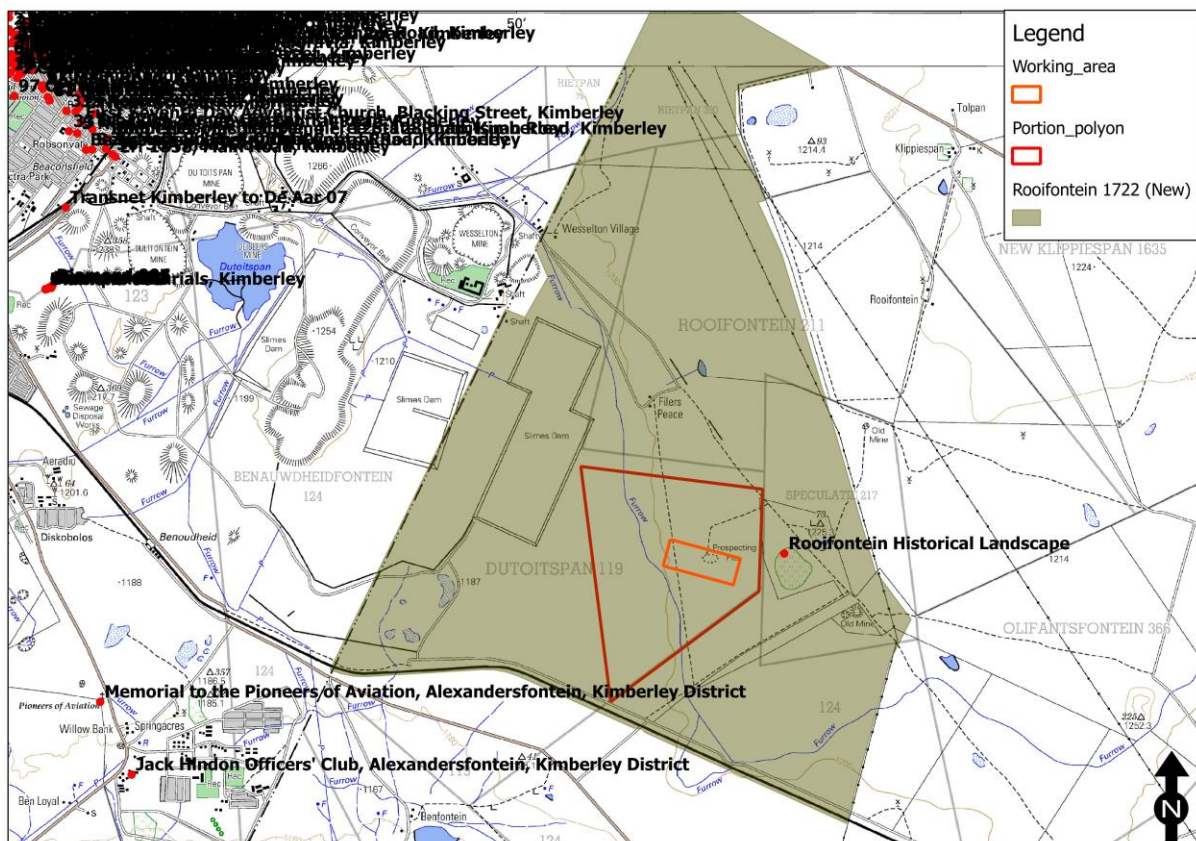


Figure 15: Recorded sites near the survey footprint, note the Rooifontein Historical Landscape proposed declaration due to its suite of cultural heritage aspects

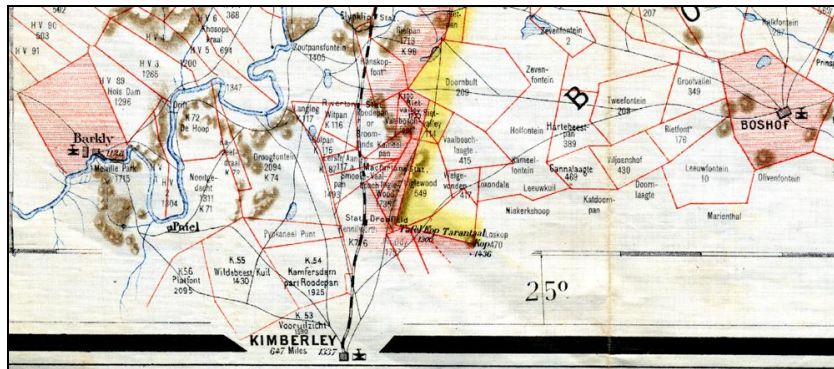


Figure 16: Jeppe's Map dating to 1899 indicates the location of Kimberley

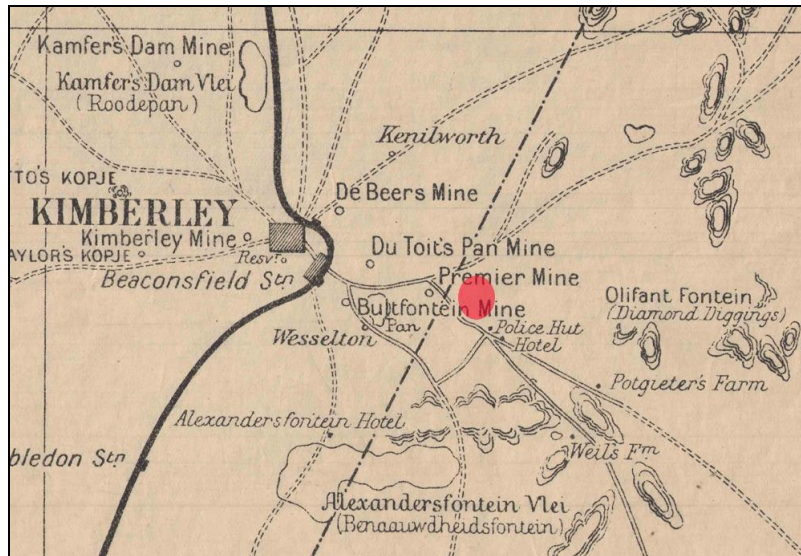


Figure 17: War Office Map indicating the location of the survey area as it was in 1899

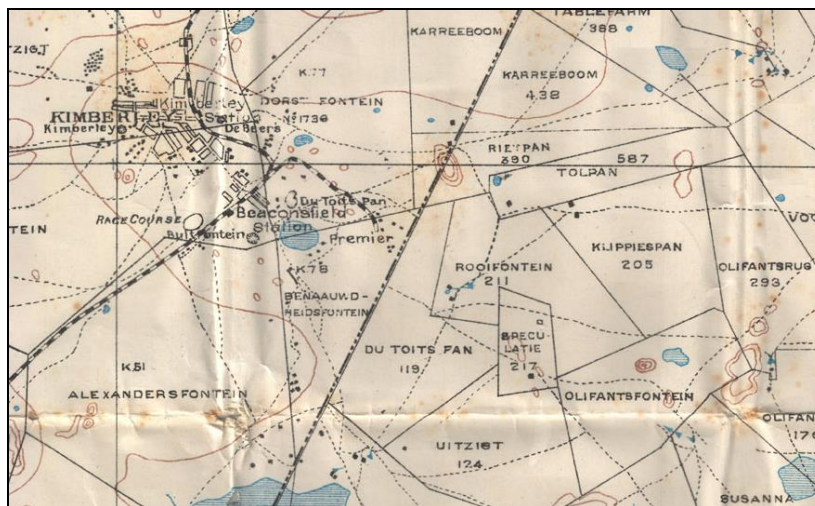


Figure 18: Surveyor General's map of the area (n.d.)

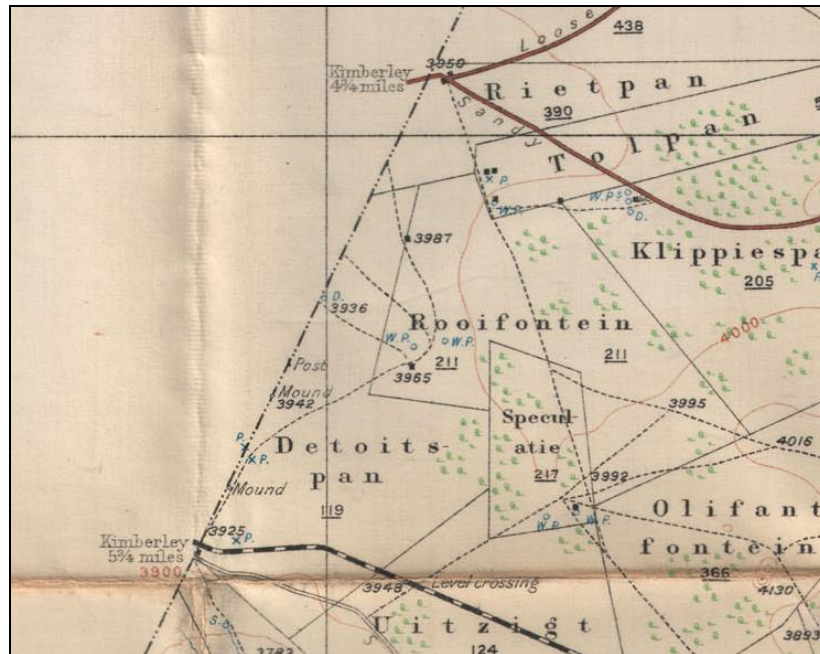


Figure 19: Surveyor General's map of the area (1:25000 dated 1915)

Archival material also confirms that diamond miners required certificates before they were allotted claims in any mine other than Kimberley, De Beers, Dutoitspan or Bultfontein by 1887 (KAB LND Vol No 1/226).

Also note that rock art especially engravings (petroglyphs) do occur in the general region and several sites are known such as Wildebeestkuil, Vaalpan, Driekopseiland and many more (Morris 1988).



Figure 20: Rock art sites in the general region near the survey area (after Morris 1988)

6.2 Palaeontological sensitivity

The shale overlies the late Archaean Ventersdorp Lavas. This unit is dominantly hard grey-green amygdaloidal lava. The historical mining of the kimberlite dykes around this area passed downwards from shale to lava country rock, and it is estimated that the shale may be around 200 – 300 m thick. As a result the following palaeontological sensitivity map was extracted from the SAHRIS database and clearly shows a medium to high sensitivity areas.

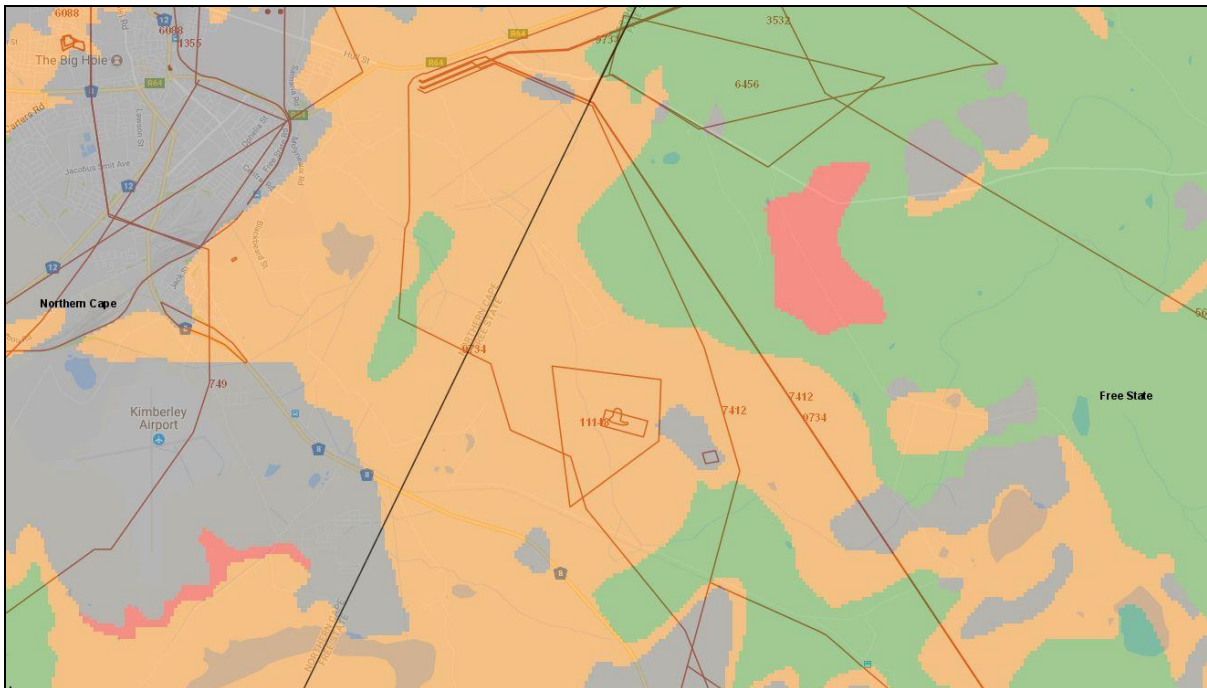


Figure 21: No high palaeontological sensitivity zones are located in the survey footprint

6.3 Site visits

The field survey was conducted on 23 August 2017.

6.4 Social interaction and current inhabitants

A representative of the local mine were consulted to locate known sites during the field survey.

6.5 Public Consultation and Stakeholder Engagement

An advertisement was placed in English in the local newspaper (Stellalander newspaper) on 30 March 2017 notifying the public of the EIA process and requesting Interested and Affected Parties (I&APs) to register with, and submit their comments to Milnex 189 CC. I&APs were given the opportunity to raise comments within 30 days of the advertisement. Site notices were also placed on 2 April 2017 to inform surrounding communities and immediately adjacent landowners of the proposed development. I&APs were given the opportunity to raise comments by 06 March 2017. Identified I&APs, including key stakeholders representing various sectors, are directly informed of the proposed development and the availability of the Scoping Report via registered post on 27 March 2017 and were requested to submit comments by 2 May 2017. A copy of the report is also available at the Milnex offices, Schweizer-Reneke and Potchefstroom, from 7:30AM – 17:00PM, Monday to Thursday and between 7:30AM and 4PM on Fridays.

6.6 Assumptions, restrictions, gaps and limitations

No severe physical restrictions were encountered as the survey area was fairly accessible. The survey area is however severely disturbed due to farming and mining activities.

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 extent**, 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:

$S = (E+D+M) \times P$; 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.
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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.

Throughout the survey area several isolated occurrences were recorded usually associated with the Middle Stone Age. These surface finds were recorded near open areas in the southern section of the survey area. As such a general A°/m² index for the survey footprint is 0 – 5 artefacts per m² which is low. Also note an agricultural field that was used to test bombs in the 1940s further to the east of the survey footprint.



Figure 22: Middle Stone Age (MSA) flake tools found on the surface in the survey footprint



Figure 23: A large agricultural field that was used during the 1940s to test bombs (see shrapnel)

7.2 Heritage sites

A total of three sites were recorded during the survey of which one is a historic mine and refuse dump (Site 1), one is a historic water furrow (Site 2) and a rock art site (Site 3). The historical sites are associated with the late 19th century and early 20th century mining activities that took place in the region.

No Stone Age or Iron Age settlements, structures, features or assemblages were recorded during the survey.

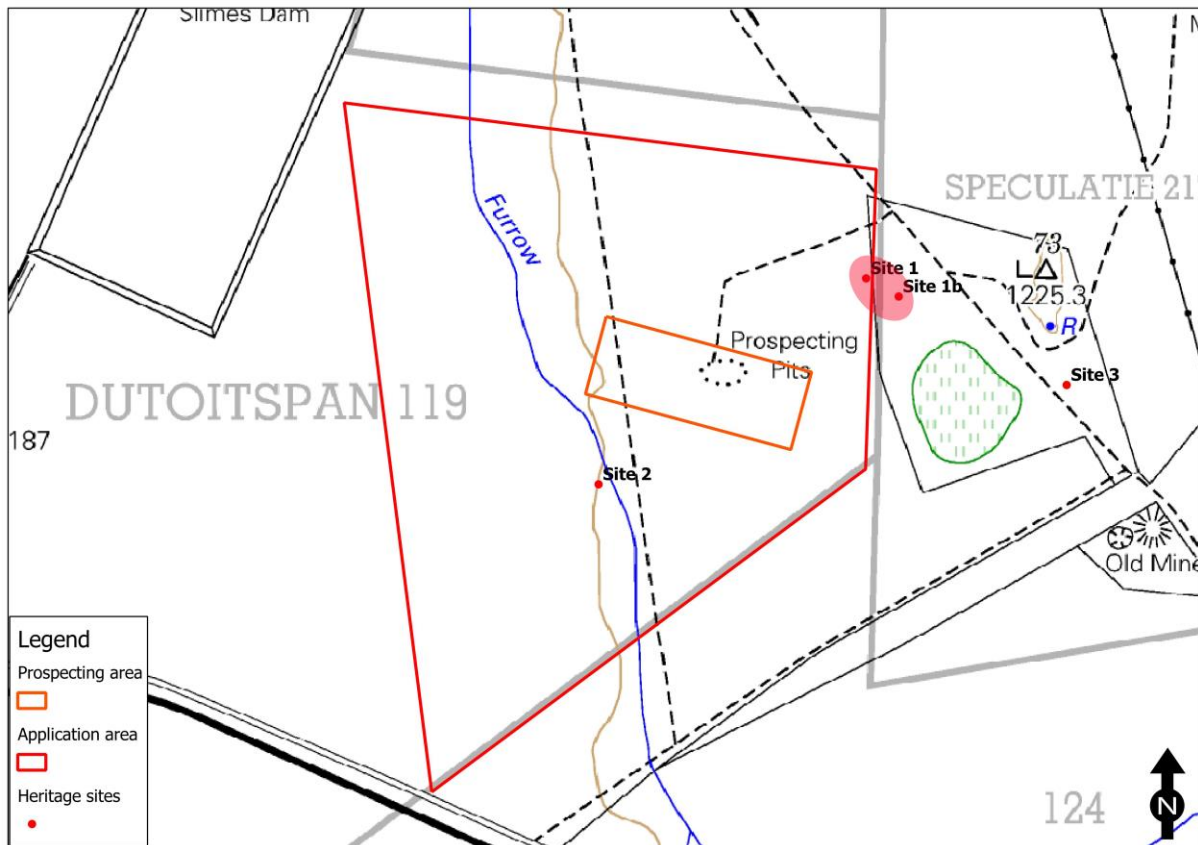


Figure 24: Location of the various recorded heritage sites

8. Locations and Evaluation of Sites

Site No	Coordinates	Site Type	Field Rating of Significance	Impact	Proposed Mitigation
1	28.795409°S 24.860596°E 28.796021°S 24.861853°E	Historical mine and refuse dump	Provincial Level (Grade 2)	Peripheral	<ul style="list-style-type: none"> Maintain a buffer zone of 100 metres during prospecting phase
2	28.802357°S 24.850289°E	Historical water furrow	Generally protected A: High significance	High	<ul style="list-style-type: none"> Maintain a buffer zone of 50 metres during prospecting phase
3	28.799006°S 24.868322°E	Rock art (engravings) & Historical structures	Provincial Level (Grade 2)	None	<ul style="list-style-type: none"> Maintain a buffer zone of 100 metres during prospecting phase

Table 7: Location and evaluation of sites

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

A total of three sites were recorded during the survey of which one is a historic mine and refuse dump (Site 1), one is a historic water furrow (Site 2) and a rock art site (Site 3). The historical sites are associated with the late 19th century and early 20th century mining activities that took place in the region..

No Stone Age or Iron Age settlements, structures, features or assemblages were recorded during the survey.

It is well known that Late Iron Age stone-walled settlements do not usually occur in open low-lying grasslands. The well-known Korana settlements of Chief Mossweu are located near

Mamusa Hill (further east near Schweizer-Reneke) and other Tswana settlement (Rolong and Tlhaping) occur further north and east of the survey area.

It is therefore recommended, from a cultural heritage perspective that the proposed prospecting activities may proceed.

Nature: A historical water furrow and late 19 th century mining and refuse dump are located within the area of the proposed prospecting of diamonds.		
	Without mitigation	With mitigation
Pre-construction & Construction Phase		
<i>Probability</i>	Highly probable (4)	Improbable (2)
<i>Duration</i>	Very short term (1)	Very short term (1)
<i>Extent</i>	Limited to the site (1)	Limited to the site (1)
<i>Magnitude</i>	High (8)	Minor (2)
Significance of Impact	40 (Medium)	8 (Low)
<i>Status (positive or negative)</i>	Negative	Neutral
Operational (Mining) Phase		
<i>Probability</i>	Highly probable (4)	Improbable (2)
<i>Duration</i>	Long term (4)	Long term (4)
<i>Extent</i>	Limited to the local area (2)	Limited to the local area (2)
<i>Magnitude</i>	Very high (10)	Low (4)
Significance of Impact	64 (High)	20 (Low)
<i>Status (positive or negative)</i>	Negative	Neutral
Decommissioning/Rehabilitation Phase		
<i>Probability</i>	Highly probable (4)	Improbable (2)
<i>Duration</i>	Very short term (1)	Very short term (1)
<i>Extent</i>	Limited to the site (1)	Limited to the site (1)
<i>Magnitude</i>	High (8)	Minor (2)
Significance of Impact	40 (Medium)	8 (Low)
<i>Status (positive or negative)</i>	Negative	Neutral
Reversibility	Low	Low
<i>Irreplaceable loss of resources?</i>	High	Low
<i>Cumulative impacts and indirect impacts</i>	Prospecting activities result in extensive heavy vehicle traffic, extraction of deposits, movements of heavy machinery which culminate in vibrations and dust which will also indirectly affect the heritage remains.	
<i>Can impacts be mitigated?</i>	Yes, buffer zones are recommended (50 metres)	

Table 8: Significance of the impact

Also, 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 DATES
Earlier Stone Age	more than 2 million years ago to >200 000 years ago
Middle Stone Age	<300 000 years ago to >20 000 years ago
Later Stone Age (Includes hunter-gatherer rock art)	<40 000 years ago up to historical 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)

< = less than; > = greater than

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 kill 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.

The following chronological sequence was recently established by prominent Stone Age archaeologists (Lombard et al 2012):

Later Stone Age

- Age Range: recent to 20-40 thousand years ago

- General characteristics: expect variability between assemblages, a wide range of formal tools, particularly scrapers (microlithic and macrolithic), backed artefacts, evidence of hafted stone and bone tools, borers, bored stones, upper and lower grindstones, grooved stones, ostrich eggshell (OES) beads and other ornaments, undecorated/decorated OES fragments, flasks/flask fragments, bone tools (sometimes with decoration), fishing equipment, rock art, and ceramics in the final phase.
 - **Ceramic or Final Later Stone Age**
 - Generally < 2 thousand years ago
 - MIS 1
 - Contemporaneous with, and broadly similar to, final Later Stone Age, but includes ceramics
 - Economy may be associated with hunter-gatherers or herders

Technological characteristics

- Stone tool assemblages are often microlithic
- In some areas they are dominated by long end scrapers and few backed microliths; in others formal tools are absent or rare
- Grindstones are common, ground stone artefacts, stone bowls and boat-shaped grinding grooves may occur
- Includes grit- or grass-tempered pottery
- Ceramics can be coarse, or well-fired and thin-walled; some times with lugs, spouts and conical bases; sometimes with decoration; sometimes shaped as bowls
- Ochre is common
- Ostrich eggshell (OES) is common
- Metal objects, glass beads and glass artefacts also occur
- **Final Later Stone Age**
 - 100 – 4000 years ago
 - MIS 1
 - Hunter-gatherer economy

Technological characteristics

- Much variability can be expected
- Variants include macrolithic (similar to Smithfield [Sampson 1974]) and/or microlithic (similar to Wilton) assemblages
- Assemblages are mostly informal (Smithfield)
- Often characterised by large untrimmed flakes (Smithfield)
- Sometimes microlithic with scrapers, blades and bladelets, backed tools and adzes (Wilton-like)
- Worked bone is common
- OES is common
- Ochre is common
- Iron objects are rare
- Ceramics are absent
- **Wilton**
 - 4000 – 8000 years ago
 - MIS 1

- At some sites continues into the final Later Stone Age as regional variants (e.g. Wilton Large Rock Shelter and Cave James)

Technological characteristics

- Fully developed microlithic tradition with numerous formal tools
 - Highly standardised backed microliths and small convex scrapers (for definition of standardisation see Eerkens & Bettinger 2001)
 - OES is common
 - Ochre is common
 - Bone, shell and wooden artefacts occur
- **Oakhurst**
 - 7000 – 12 000 years ago
 - MIS 1
 - Includes Albany, Lockshoek and Kuruman as regional variants

Technological characteristics

- Flake based industry
 - Characterised by round, end, and D-shaped scrapers and adzes
 - Wide range of polished bone tools
 - Few or no microliths
- **Robberg**
 - 12 000 to 18 000 years ago
 - MIS 2

Technological characteristics

- Characterised by systematic bladelet (<26mm) production and the occurrence of outils ecailles or scaled pieces
 - Significant numbers of unretouched bladelets and bladelet cores
 - Few formal tools
 - Some sites have significant macrolithic elements
- **Early Late Stone Age**
 - 18 000 – 40 000 years ago
 - MIS 2-3
 - Informal designation
 - Also known as transitional MSA-LSA
 - Overlapping in time with final Middle Stone Age

Technological Characteristics

- Characterised by unstandardised, often microlithic, pieces and includes the bipolar technique
- Described at some sites, but not always clear whether assemblages represent a real archaeological phase or a mixture of LSA/MSA artefacts

Middle Stone Age

- Age Range: 20 000 – 30 000 years ago

- General characteristics: Levallois or prepared core techniques (for definitions see Van Peer 1992; Boeda 1995; Pleurdeau 2005) occur in which triangular flakes with convergent dorsal scars, often with faceted striking platforms, are produced. Discoidal systems (for definition see Inizan et al. 1999) and intentional blade production from volumetric cores (for definition see Pleurdeau 2005) also occur; formal tools may include unifacially and bifacially retouched points, backed artefacts, scrapers, and denticulates (for definition see Bisson 2000); evidence of hafted tools; occasionally includes marine shell beads, bone points, engraved ochre nodules, engraved OES fragments, engraved bone fragments, and grindstones.
- In the sequence below we highlight differences or characteristics that may be used to refine interpretations depending on context.
- **Final Middle Stone Age**
 - 20 000 – 40 000 years ago
 - MIS 3
 - Informal designation partly based on the Sibudu sequence

Technological characteristics

- Characterised by high regional variability that may include, e.g. bifacial tools, bifacially retouched points, hollow-based points
- Triangular flake and blade industries (similar to Strathalan and Melikane)
- Small bifacial and unifacial points (similar to Sibudu and Rose Cottage Cave)
- Sibudu point characteristics: short, stout, lighter in mass compared to points from the Sibudu technocomplex, but heavier than those from the Still Bay
- Can be microlithic
- Can include bipolar technology
- Could include backed geometric shapes such as segments, as well as side scrapers

Sibudu

- 45 000 – 58 000 years ago
- MIS 3
- Previously published as informal late Middle Stone Age and post-Howieson's Poort at Sibudu
- Formerly known post-Howieson's Poort, MSA 3 generally, and MSA III at Klasies River

Technological characteristics

- Most points are produced using Levallois technique
- Most formal retouch aimed at producing unifacial points
- Sibudu unifacial point (type fossil) characteristics: faceted platform; shape is somewhat elongated with a mean length of 43.9 mm), a mean breadth of 26.8 mm and mean thickness of 8.8 mm (L/B ratio 1.7); their mean mass is 11.8 g (Mohapi, 2012)
- Some plain butts
- Rare bifacially retouched points
- Some side scrapers are present
- Backed pieces are rare
- **Howieson's Poort**
 - 58 000 – 66 000 years ago
 - MIS 3-4

Technological characteristics

- Characterised by blade technology
- Includes small (<4 cm) backed tools, e.g. segments, scrapers, trapezes and backed blades
- Some denticulate blades
- Pointed forms are rare or absent
- **Still Bay**
 - 70 000 – 77 000 years ago
 - MIS 4-5a

Technological characteristics

- Characterised by thin (<10 mm), bifacially worked foliate or lanceolate points
- Semi-circular or wide-angled pointed butts
- Could include blades and finely serrated points (Lombard et al. 2010)
- **Pre-Still Bay**
 - 72 000 – 96 000 years ago
 - MIS 4-5

Technological characteristics

- Characteristics currently being determined / studied
- **Mossel Bay**
 - 77 000 to —105 000 years ago
 - MIS 5a-4
 - Also known as MSA II at Klasies River or MSA 2b generally

Technological characteristics

- Characterised by recurrent unipolar Levallois point and blade reduction
- Products have straight profiles; percussion bulbs are prominent and often splintered or ring-cracked
- Formal retouch is infrequent and restricted to sharpening the tip or shaping the butt
- **Klasies River**
 - 105 000 to —130 000 years ago
 - MIS 5d-5e
 - Also referred to as MSA I at Klasies River or MSA 2a generally

Technological characteristics

- Recurrent blade and convergent flake production
- End products are elongated and relatively thin, often with curved profiles
- Platforms are often small with diffused bulbs
- Low frequencies of retouch
- Denticulate pieces
- **Early Middle Stone Age**
 - Suggested age MIS 6 to MIS 8 (130 000 to —300 000 years ago)
 - Informal designation

Technological characteristics

- This phase needs future clarification regarding the designation of cultural material and sequencing
- Includes discoidal and Levallois flake technologies, blades from volumetric cores and a generalised toolkit
- **Earlier Stone Age**
 - Age range: >200 000 to 2 000 000 years ago
 - General characteristics: early stages include simple flakes struck from cobbles, core and pebble tools; later stages include intentionally shaped handaxes, cleavers and picks; final or transitional stages have tools that are smaller than the preceding stages and include large blades.
 - In the sequence below we highlight differences or characteristics that may be used to refine interpretations depending on context.
- **ESA-MSA transition**
- 200 to —600 thousand years ago
- MIS 7-15

Technological characteristics

- Described at some sites as Fauresmith or Sangoan
- Relationships, descriptions, issues of mixing and ages yet to be clarified
- Fauresmith assemblages have large blades, points, Levallois technology, and the remaining ESA components have small bifaces
- The Sangoan contains small bifaces (<100 mm), picks, heavy and light-duty denticulated and notched scrapers
- The Sangoan is less well described than the Fauresmith
- **Acheulean**
 - 300 thousand to —1.5 million years ago
 - MIS 8-50

Technological characteristics

- Bifacially worked handaxes and cleavers, large flakes > 10 cm
- Some flakes with deliberate retouch, sometimes classified as scrapers
- Gives impression of being deliberately shaped, but could indicate result of knapping strategy
- Sometimes shows core preparation
- Generally found in disturbed open-air locations
- **Oldowan**
 - 1.5 to >2 million years ago
 - MIS 50-75

Technological characteristics

- Cobble, core or flake tools with little retouch and no flaking to predetermined patterns
- Hammerstones, manuports, cores
- Polished bone fragments/tools

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 stone-walled enclosures situated on defensive hilltops c. AD 1640 - AD 1830). This occupation phase has been linked to the arrival of ancestral Northern Sotho, Tswana and Ndebele (Nguni-speakers) 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 mfecane).

Ethno-historical Context

Kimberley and surrounds

The diamonds originated some 60 million years ago with volcanic activity which blew up groups of pipes through the earth's crust. Many of the kimberlite pipes were entirely eroded away and the diamond content dispersed along the beds of rivers such as at Hopetown and Barkley West. The first diamond rush took place at Hopetown which was followed by a much greater discovery in 1870 in the gravels of the Vaal River at Barkley West. The Bultfontein Mine resulted, the farm first owned by Cornelius du Plooy. In December 1870 diamonds were discovered at Du Toit's Pan on the farm Dorstfontein. In May 1871 a new discovery was made on the farm Vooruitzicht which resulted in Colesberg Koppie known as the 'New Rush'. This diamond rush eventually resulted in what became known as the 'Big Hole' of Kimberley Mine, the largest man-made hole in the world.

Kimberley, named after the Secretary of State for Colonies, the Earl of Kimberley, grew quickly together with its twin, Beaconsfield (named after Benjamin Disraeli, the Earl of Beaconsfield). Beaconsfield served as the centre for Bultfontein, Wessel and Du Toit's Pan Mines. The two towns eventually amalgamated to form one city in 1912.

Kimberley became a municipality in 1877. By 1882 a tramway connected Kimberley with Beaconsfield and the streets were illuminated with the first electric lights in Southern Africa. All the smaller diggings were eventually taken up in the amalgamation that took place between Cecil Rhodes's De Beers Mine and Barney Barnato's Kimberley Central Mining Company in 1888.

Various alluvial diamond digging was going on in the region, but it seems Canteen Kopje (north west of the survey footprint) was one of the first and started in 1869 and continued until 1927. It was declared a National Monument in 1948. The site also yielded extensive Stone Age deposits that were excavated by Peter Beaumont of the McGregor Museum. The site is famous for containing Later Stone Age, Middle Stone Age and Earlier Stone Age (Acheulian) stone tools (Beaumont & Morris 1990).



Figure 25: Canteen kopje in the 1870s (Sketch by A. A. Anderson)

A study of archival information however indicates the presence of the redoubts and encampments of the Boer forces during the South African war of 1899-1902 present just outside the study area. During the South African War, also referred to as the Anglo Boer war, Kimberley was besieged by Boer forces from 14 October 1899 to 15 February 1900. For four months the Boer forces placed a total lock down on the town of Kimberley and besieged it until the town was relieved by General French on 15 February 1900. For the siege to be of any success the Boer forces needed to construct numerous redoubts and encampments around the town to control access in and out of town. The British military had to change its strategy for the war as public opinion demanded that the sieges of Kimberley, Ladysmith and Mafeking be relieved before the Boer capitals were assaulted. The first attempt at relief of Kimberley under Lord Methuen was stopped at the battles of Modder River and Magersfontein. The 124-day siege was finally relieved on 15 February 1900 by a cavalry division under Lieutenant-General John French, part of a larger force under Lord Roberts. The battle against the Boer general Piet Cronjé continued at Paardeberg immediately after the town itself was relieved.



Figure 26: The siege of Kimberley (R.H. Wishart)

The extension of the line to Kimberley was as a direct result of the discovery of diamonds in that area in 1869. The line from De Aar to the Orange River was officially opened in November 1884. Due to a world-wide economic slump the Cape Colony was in a recession and it was only after the British Government advanced £400 000 the line to Kimberley could be completed. The 121km track between the Orange River and Kimberley was opened on 28 November 1885. The history of the construction of the railway line between Kimberley and Hotazel seems to have been as a direct result of the discovery of various minerals in this region. The line was built in various sections first from Kimberley to Barkly West and then from Barkly West to Koopmansfontein. The line was then extended from Koopmansfontein to Postmasburg and from Postmasburg to Lohathla. As more mining development was earmarked it necessitated the extension of the line from Lohathla to Sishen and at a later stage from Sishen to Hotazel. It seems from archival documents that a proposal was submitted for the establishment of a railway line from Kimberley to Barkly West with its terminus at Borrelskop, a railway siding between Longlands and Delportshoop in 1922. The line between Kimberley, Barkly West and Koopmansfontein thus had to be completed between 1922 and 1930 although the precise date on which the extension of the railway line was inaugurated could not be established.

For both wars, Kimberley was the main centre for mustering and training the Cape Corps which was served by a hospital and a convalescent depot. During the Second World War, Number 21 Air School of the Empire Air Training Scheme was based at Alexanderfontein just outside the city. Kimberley (Dutoitspan) Cemetery contains two Commonwealth burials



of the First World War and 14 from the Second World War. The cemetery lies on the eastern outskirts of Kimberley, to the northern side of Dutoits Pan mine.

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.

Site 1

A. GENERAL SITE DESCRIPTION				
Site type	Historical mining and refuse dump			
Site Period	Late 19 th century			
Physical description	The site comprises a large dump that is probably the result of the adjacent miner compound linked to the nearby Olifantsfontein Shaft. The accumulation of cinder and cultural material is dramatic with a large quantity of material evident on the surface. The open areas to the south were probably occupied by miners in a large mining compound. Note that the site is included in a proposal to have the area declared a Provincial heritage site.			
Integrity of deposits or structures	Unstable with animal burrowing Treasure hunters also frequent the site			
Site extent	Main dump: 150 m x 80 m; wall height 5 m			
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.				X
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.				X
It has significance relating to the history of slavery in South Africa.				X
Aesthetic Value				
It has importance in exhibiting particular aesthetic characteristics valued by a particular community or cultural group.				X
Scientific Value				
It has potential to yield information that will contribute to an understanding of South Africa's natural and cultural heritage.			X	
It has importance in demonstrating a high degree of creative or technical achievement at a particular period.				X
It has importance to the wider understanding of the temporal change of cultural landscapes, settlement patterns and human occupation.			X	
Social Value				
It has strong or special association with a particular community or cultural group for social, cultural or spiritual reasons (sense of place).				X
Tourism Value				
It has significance through its contribution towards the promotion of a local sociocultural identity and can be developed as tourist destination.			X	
Rarity Value				
It possesses unique, uncommon, rare or endangered aspects of South Africa's natural or cultural heritage.				X
Representative Value				
It is importance in demonstrating the principle characteristics of a particular class of South Africa's natural or cultural places or objects.			X	
B2. REGIONAL CONTEXT				
Other similar sites in the regional landscape.			X	
C. SPHERE OF SIGNIFICANCE		High	Medium	Low
International				X
National			X	
Provincial		X		
Local		X		

Specific community	X	
D. FIELD REGISTER RATING		
National/Grade 1 [should be registered, retained]		
Provincial/Grade 2 [should be registered, retained]		X
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		X
F. RATING OF POTENTIAL IMPACT OF DEVELOPMENT		
None		
Peripheral		X
Destruction		
Uncertain		
G. RECOMMENDED MITIGATION		
<ul style="list-style-type: none"> Maintain a buffer zone of 100 metres during prospecting phase 		
H. APPLICABLE LEGISLATION AND LEGAL REQUIREMENTS		
<ul style="list-style-type: none"> National Heritage Resources Act (Act No. 25 of 1999, Sections 34) 		
I. PHOTOGRAPHS		
		
<p>Figure 27: The slope of the one side of the mound</p>		
		
<p>Figure 28: The cinder layers are clearly visible with cultural material washing out</p>		



Africa's natural or cultural places or objects.				
B2. REGIONAL CONTEXT				
Other similar sites in the regional landscape.			X	
C. SPHERE OF SIGNIFICANCE		High	Medium	Low
International				X
National			X	
Provincial			X	
Local		X		
Specific community		X		
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]				X
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				X
F. RATING OF POTENTIAL IMPACT OF DEVELOPMENT				
None				
Peripheral				
Destruction				X
Uncertain				
G. RECOMMENDED MITIGATION				
<ul style="list-style-type: none"> • Fenced off and gate installed • Maintain a buffer zone of 50 metres during prospecting phase 				
H. APPLICABLE LEGISLATION AND LEGAL REQUIREMENTS				
<ul style="list-style-type: none"> • National Heritage Resources Act (Act No. 25 of 1999, Section 34) 				
I. PHOTOGRAPHS				
				
<p>Figure 30: Detailed view of the water canal and the embankment is clearly visible</p>				



Figure 31: Detailed view of the water canal and the embankment is clearly visible

Site 3

A. GENERAL SITE DESCRIPTION				
Site type	Rock Art (engravings) Historical features including the possible foundations of a fort (spring, trenches, pipes water reservoir)			
Site Period	Later Stone Age Historical (Second South African War 1899 – 1902)			
Physical description	The site comprises a rock art site with several Later Stone Age and historical (gravitti) engravings. The engravings were done on large boulders on top of a small hillock to the east of the survey area. The main animal that was recorded is the eland and some antelope. A large water reservoir constructed of iron plates riveted together is situated on a stone base. Some foundations were noted that could possibly be associated with a fort structure dating to the Second South African War.			
Integrity of deposits or structures	Stable			
Site extent	2 hectares			
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.			X	
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.				X
It has significance relating to the history of slavery in South Africa.				X
Aesthetic Value				
It has importance in exhibiting particular aesthetic characteristics valued by a particular community or cultural group.			X	
Scientific Value				
It has potential to yield information that will contribute to an understanding of South Africa's natural and cultural heritage.			X	
It has importance in demonstrating a high degree of creative or technical achievement at a particular period.			X	
It has importance to the wider understanding of the temporal change of cultural landscapes, settlement patterns and human occupation.			X	
Social Value				
It has strong or special association with a particular community or cultural group for social, cultural or spiritual reasons (sense of place).				X
Tourism Value				
It has significance through its contribution towards the promotion of a local sociocultural identity and can be developed as tourist destination.			X	
Rarity Value				

It possesses unique, uncommon, rare or endangered aspects of South Africa's natural or cultural heritage.			X
Representative Value			
It is importance in demonstrating the principle characteristics of a particular class of South Africa's natural or cultural places or objects.		X	
B2. REGIONAL CONTEXT			
Other similar sites in the regional landscape.			X
C. SPHERE OF SIGNIFICANCE	High	Medium	Low
International			X
National		X	
Provincial	X		
Local	X		
Specific community	X		
D. FIELD REGISTER RATING			
National/Grade 1 [should be registered, retained]			
Provincial/Grade 2 [should be registered, retained]			X
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			X
F. RATING OF POTENTIAL IMPACT OF DEVELOPMENT			
None			X
Peripheral			
Destruction			
Uncertain			
G. RECOMMENDED MITIGATION			
<ul style="list-style-type: none"> Maintain a buffer zone of 100 metres during prospecting phase 			
H. APPLICABLE LEGISLATION AND LEGAL REQUIREMENTS			
<ul style="list-style-type: none"> National Heritage Resources Act (Act No. 25 of 1999, Section 35) 			
I. PHOTOGRAPHS			
			
<p>Figure 32: An eland as depicted on the engraved rocks</p>			

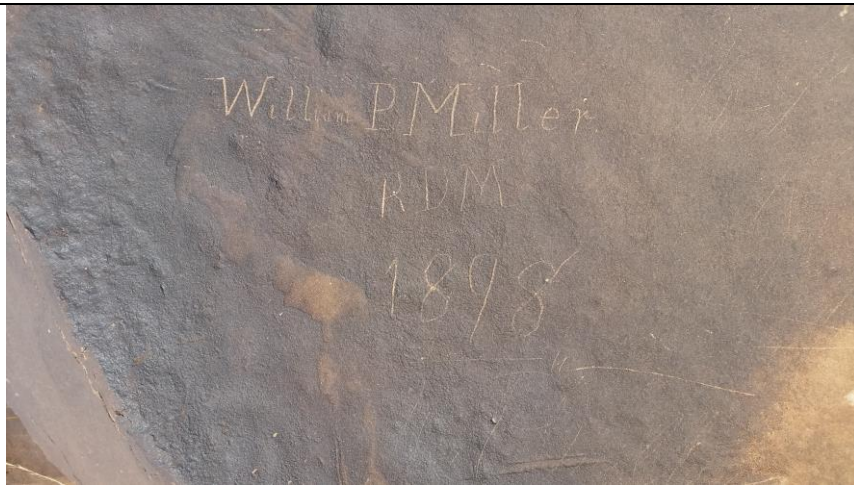


Figure 33: Historical engraving of a Wiliam P. Miller in 1898



Figure 34: Water reservoir consisting of iron plates revited together, standing on a stone platform