



Figure 16. An early picture of the workers compound

Negative influences:

1899-1902 Anglo-Boer War: Both Jagersfontein town and mine were seriously affected by the Anglo-Boer War. For 19 months until July 1902 the town was deserted. The mine was severely damaged and water had accumulated in the mine. By 1903 the mine was dry and restoration completed.

1908 Depression in America: This led to retrenchment and the restricted output of diamonds.

1914-1916 World War I: On the outbreak of the First World War washing was suspended until the beginning of 1916 and mining operations resumed two years later.

1920 Post-war Depression: In consequence of the post-war depression of 1920 and the wholesale selling of diamonds by Russia after the Bolshevik revolution, mining operations were suspended in 1921 until November 1922.

1926 Alluvial discoveries at Alexander Bay

1928 Alluvial discoveries at Lichtenberg

1929 Wall Street crash

The beginning of De Beers Consolidated Mines Ltd involvement:

In 1931 De Beers Consolidated Mines Ltd was appointed the secretaries and consulting engineers of Jagersfontein mine to affect economies. However, in 1932 (during the Depression) underground work was stopped except for pumping and maintenance. The mine was closed and remained so until 1949. De Beers took a 10-year lease on the company's property at a specified rental in 1940. (The lease was renewed in December 1959 and 1969.) Six years later De Beers instructed their consulting engineers (AAC) to proceed with development for the re-equipping and re-opening of the mine. Production was restarted in July 1949 and the mine was officially re-opened 12 December 1949. At the same time a new hospital was built to

serve the needs of the natives. It had the most modern equipment. A new township, Charlesville, was also built to house the company's employees. The mine remained in production until 28 May 1971 when it was finally closed down.

History of mining techniques employed at Jagersfontein Mine 1871-1931

Mining operations started with open pit mining and was carried out for more than 40 years. The transition to the underground system was brought about gradually, open cast mining being finally abandoned in March 1913.



Figure 17. Early open-pit mining

Sinking of the main shaft started in 1904 but the first skip was only hoisted in February, 1911. The main hosting level was at a depth of 900 ft and blue ground above this level was removed by inclined chambering from working levels approximately 60 ft apart. During this period Jagersfontein shaft recorded the highest hoisted tons rate in the world – 12,800 tons in 24 hours. Open pit mining still continued and eventually ceased in 1913.

Until closedown in 1932 ground was treated in several small washing plants spread out over the property. The later ones had crushers but the earlier ones were for washing only – the breaking down of the ground being done on the old “floors” system. Ground from the mine was laid out on prepared surfaces in the veld for several months, where the natural weathering processes, assisted by watering and ploughing, caused it to pulverize. The early washing plants were, therefore, placed close to areas of flat veld suitable for floors, and close to koppies, up which skip haulages could be laid for tailings disposal. The dumps created during this period are referred to as the washing machine dumps and are still visible today.

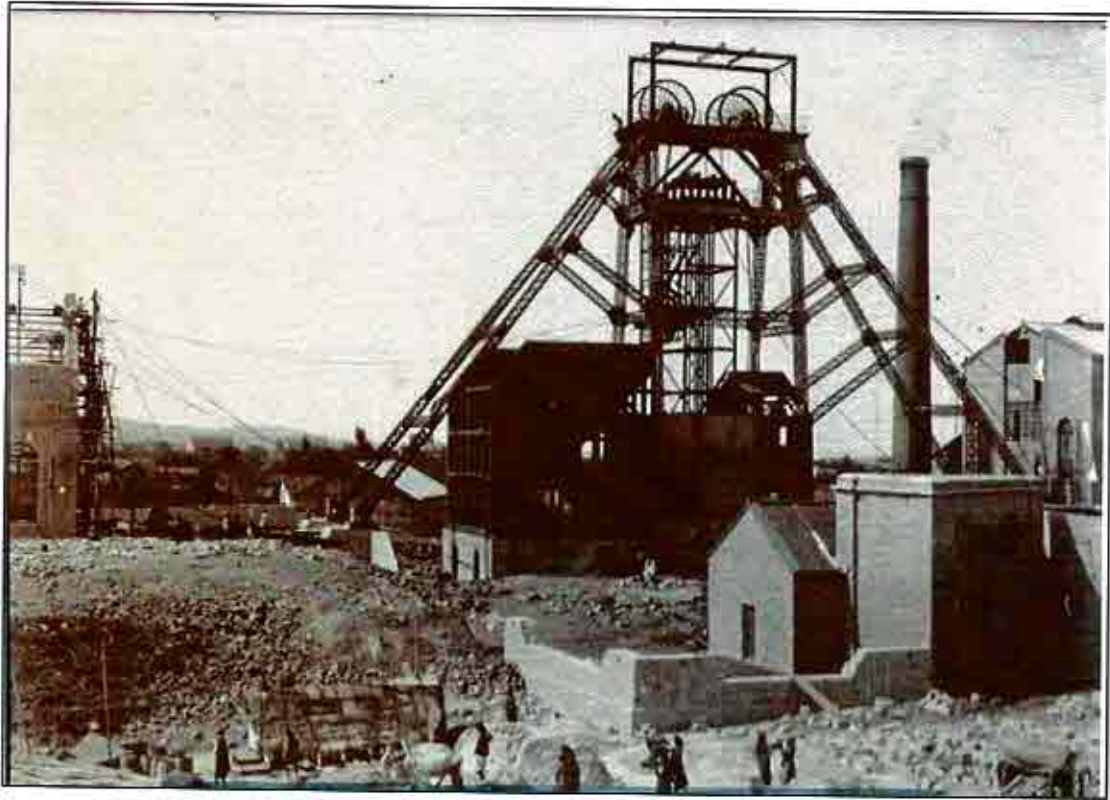


Figure 18. The first shaft hoist at Jagersfontein



Figure 19. "Floors" at the early mine

The crushed blueground hoisted to the surface by the small air hoists was loaded from the haulage boxes into coco pans for removal to the floors, where the ground was laid out to weather (about 16" deep) for about 8 months. A small crushing plant was erected at Jagersfontein in 1909 but that was used only for cylinder-lumps of the various washing gears and "hardebank" found in the mine. From the floors the ground was taken to the various washing plants.

There were at Jagersfontein, until the building of a large central washing plant, a number of small two-pan washing plants. These washing plants were very often at the summit of high kopjes thus necessitating the incline haulages from the floors to the washing plants. The ground to be treated and the water to wash have therefore to be elevated but the disposal of the tailings was very easy as it could just be thrown down the side of the kopje.

1949-1971

More modern mining techniques were employed after the re-opening of the mines on 12 December 1949. The first "block cave" installation was on the 1840 ft level and operated successfully up until May 1968. The second installation was on the 2460 ft level with the loading station on the 2430 ft level. The Modern Tailings Dump was created during this period (i.e. 1949-1971) and represents a second period of dump creation. A new plant³ was constructed involving primary and secondary crushing with concentration using rotary pans. Diamonds were recovered using grease tables and side shaking vanners.

Brief description of the various sections of the new plant:

The Crushing Plant is adjacent the mine headgear and handled all the ground hoisted from stockpiled ground and ground for re-treatment from old dumps. Waste rock was removed by hand sorting and the remaining blue ground reduced from 6 inches to 1-1/4 inches by means of Primary and Secondary crushing screening.

The Washing Plant:

From the crushing plant the ground is conveyed to the storage bins of the washing plant where it is distributed to the various chambers. Extraction of the Concentration: Concentrates of kimberlite of specific gravity approaching and exceeding that of the diamond only constitute 0.25 per cent of the ore. However, with a valuable product, such as the diamond, a high factor of safety is allowed and therefore a primary concentrate of 2 per cent of the original feed is obtained, heavy media separation and grease tables being used for the final concentration.

Primary concentration is done in three stages. Ore fed to the primary or course pan is un-sized below 1 1/4 inches. Prior to entering the pans the ground is mixed with puddle (a viscous mixture of water and kimberlite at a S.G. of 1.430). The lighter constituents of the feed overflowing the weir of the inner periphery, pass over 3/8 and 1 1/8 inch long slot screens. The oversize from these screens passes through rolls set at 3/8 inch and rejoins the screen undersize which in turn constitutes the feed to the secondary pans. At this stage "make-up" water is added for pan control. The overflow from secondary pans passes over seven mesh screens. The seven mesh screens constitute the tailings while the minus seven mesh is pumped through hydrocyclone classifiers. The cyclone underflows are fed to the tertiary pans for the final stage of primary concentration. The overflow of the cyclones returns as puddle and re-circulates through the plant.

3.5 THE SOUTH AFRICAN WAR AND JAGERSFONTEIN

The Anglo-Boer War and its effect on Jagersfontein Special mention needs to be made of this event because it directly affected the operation of the mine and could have some connection to a certain portion of the unmarked burial grounds found within the mining area.

Colonel Sir David Harris wrote in his memoirs as follows:

5 Sir David Harris was not only the Chairman of Jagersfontein Diamond Company but also the leading Director of De Beers.

"I can give many instances of this feeling of regard for the Dutch. I will give one notable example. I have been Chairman of the Jagersfontein Diamond Mining Company for many years. I occupied the position during the Boer War. Just before the War that company employed 90 per cent, of Free Staters, and a few

Transvaalers, and the balance were tradesmen from overseas. When the war broke out these white employees joined their different Commandoes. The mine was closed for three years at a loss of three-quarters of a million of money to the shareholders. When the war was over the General Manager wrote and asked me what policy to adopt with regard to the old employees. I said that every employee who was there when war broke out, and who joined his Commando, could re-join the Company, and those who did not do so should never be re-employed. I fought against the Republic in those days, and I respected the men who fought so bravely for it. Some of those men are still in the employ of this Company."

Of the Jagersfontein Town Guard 77 members were issued medals for their support in the Anglo-Boer War.

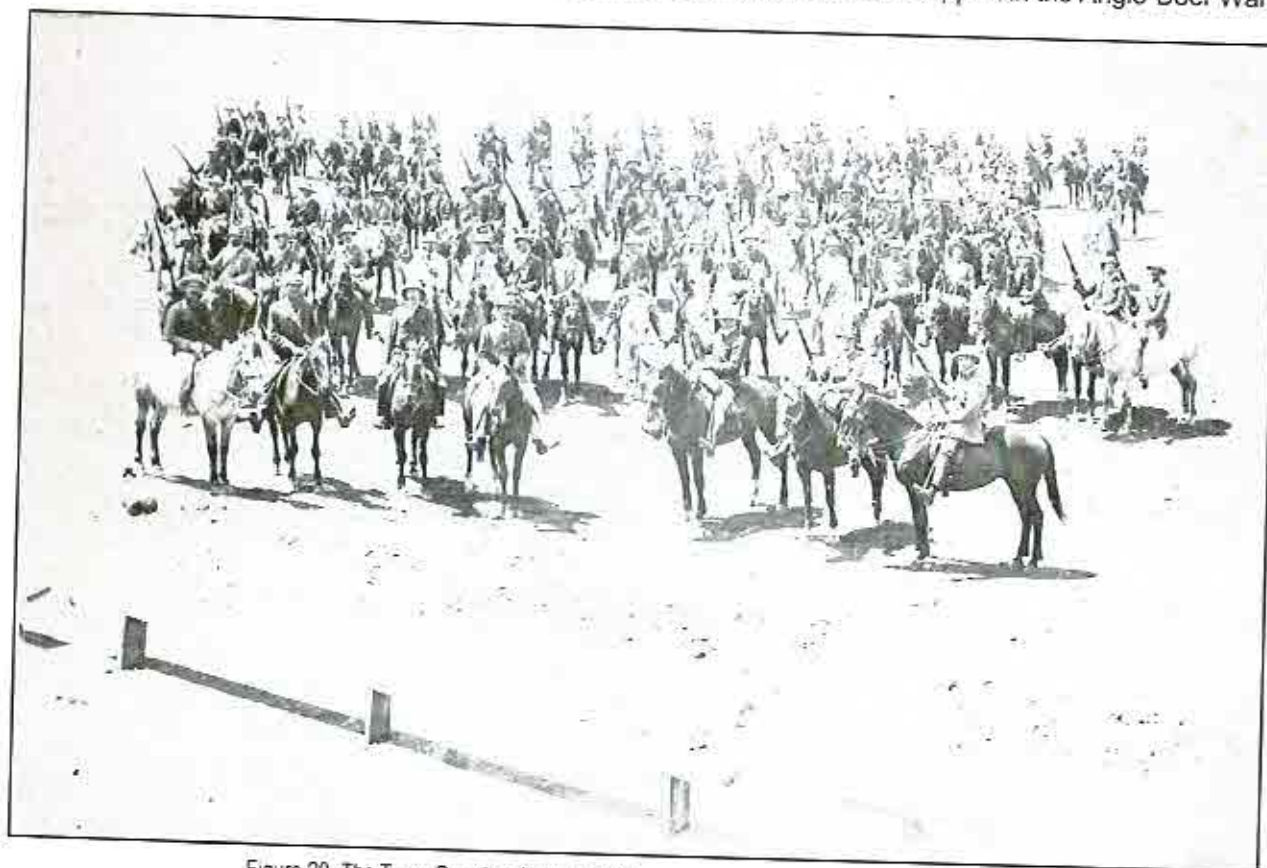


Figure 20. The Town Guard at Jagersfontein

3.6 PREVIOUS STUDIES

An extensive research into the SAHRIS database resulted in the identification of the following heritage related studies that have been performed over the last decade in the study area. Only studies within a radius of 50km from the study area were considered.

The most useful studies were two HIA,s and a PIA done for the decommissioning of the Jagersfontein Mine and the construction of a proposed canal.

L. Philip, 2013

PHASE I IMPACT ASSESSMENT OF THE DORMANT JAGERSFONTEIN MINE (FREE STATE) IN TERMS OF ARCHAEOLOGICAL AND OTHER HERITAGE SITES

This study formed the basis of the desktop study and much of it is reproduced here with the permission of the author.

The following areas were investigated during a fieldwork survey at Jagersfontein Mine during 2013.

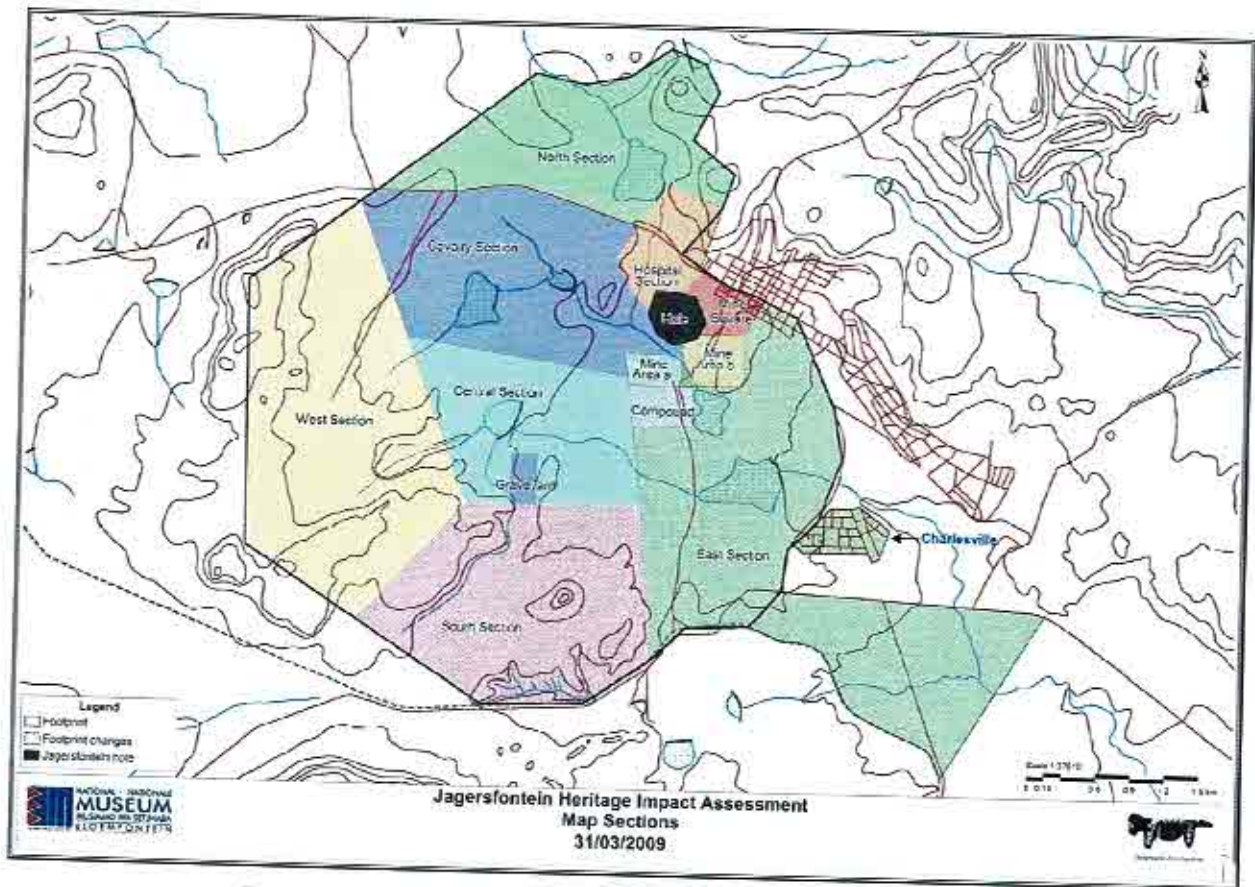


Figure 21. Area covered by Philip in 2013

Another useful study for the southern areas of the site were;

L. Philip & T. Uys, 2013. Heritage Impact Assessment of the Proposed Pipeline on subdivision 16 & Remain Extent of the farm Jagersfontein no. 14 in the Magisterial District of Xhariep, Free State Province.

Between the two studies and the fieldwork performed on the core areas during this study most of the prospecting rights application area was covered.

No studies could however be found for the area indicated in the map below;

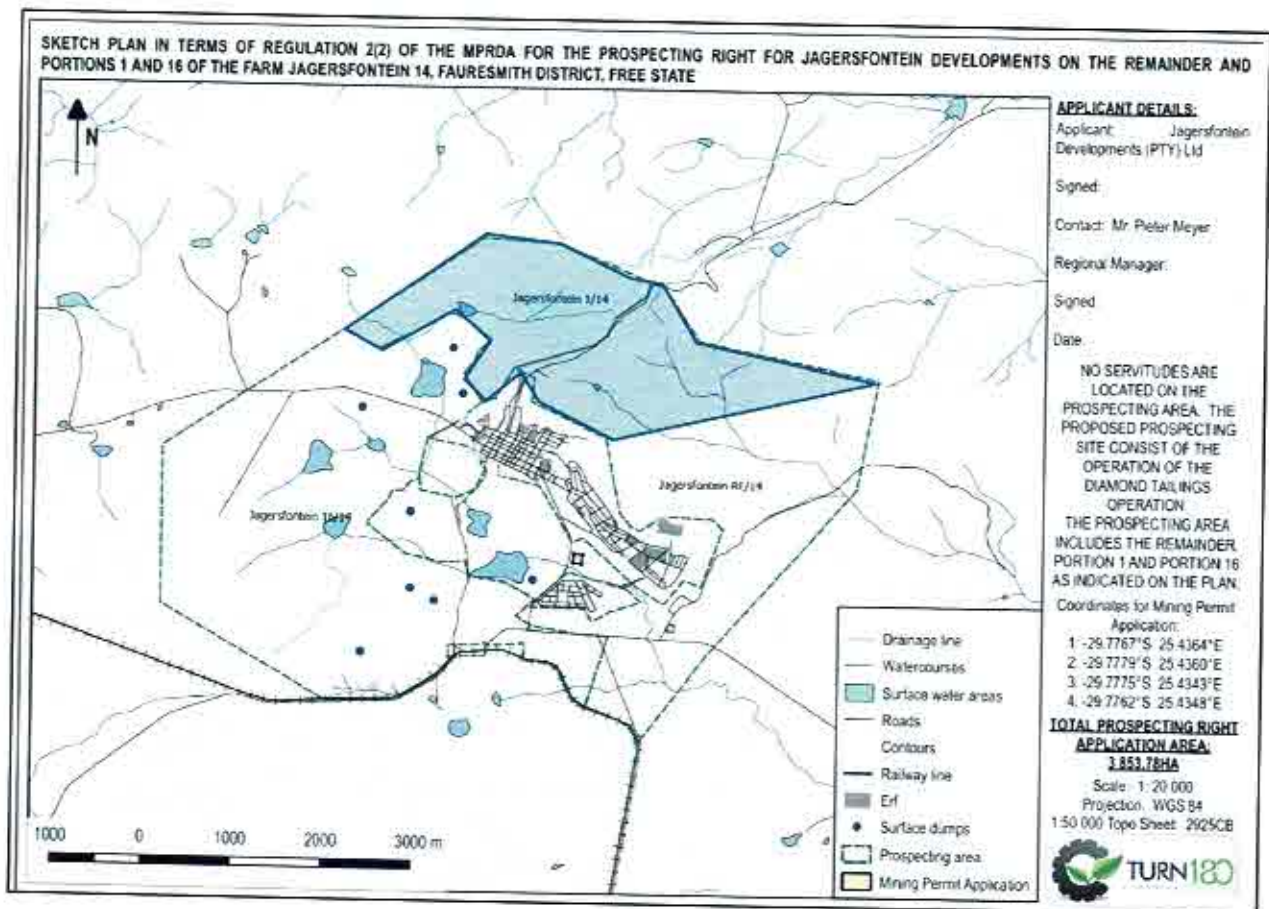


Figure 22. Blue area indicate part of study which had no desktop references

3.7 HISTORICAL MAPS AND RESULTS OF ARCHIVAL STUDY

Historic Cadastral 1 : 50 000 maps 2925 CB from 1968, 1988 and 2005, as well as 2925 CD from 1948, 1988 and 2005 could be located at the Surveyor General's Office.

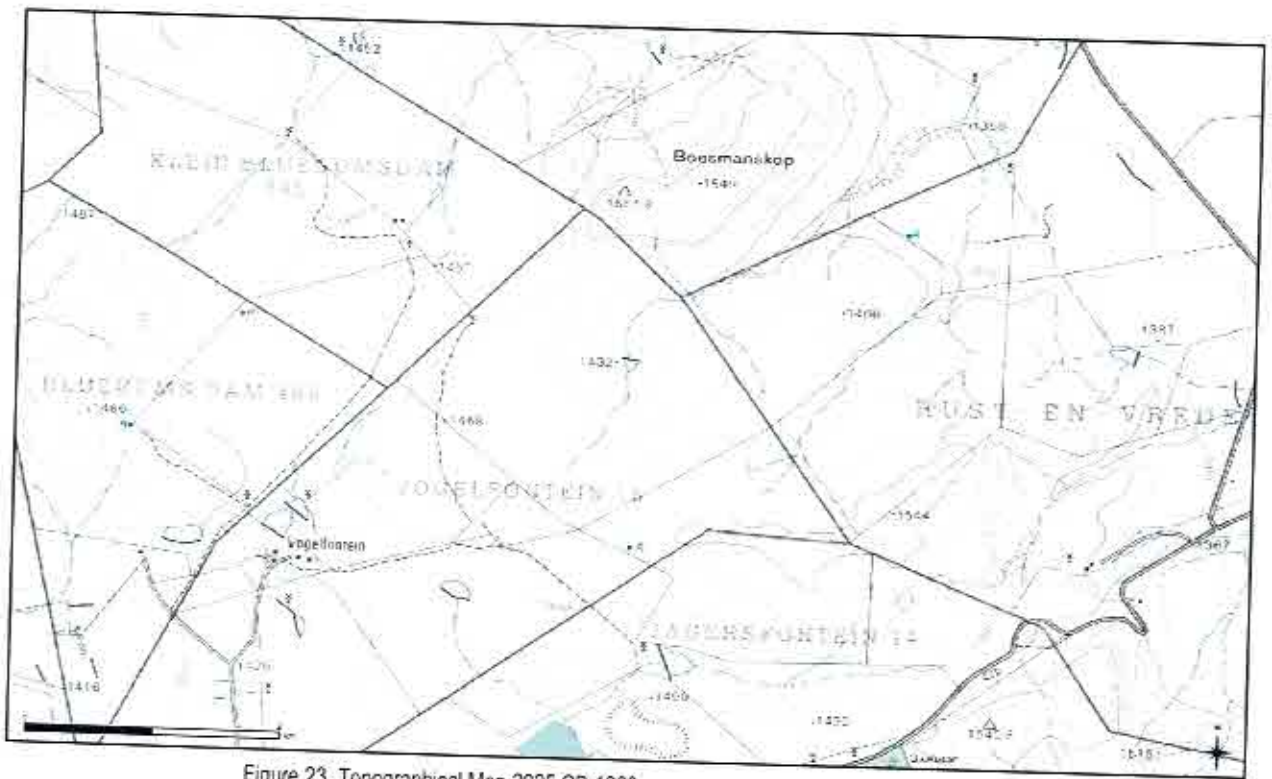


Figure 23. Topographical Map 2925 CB 1968

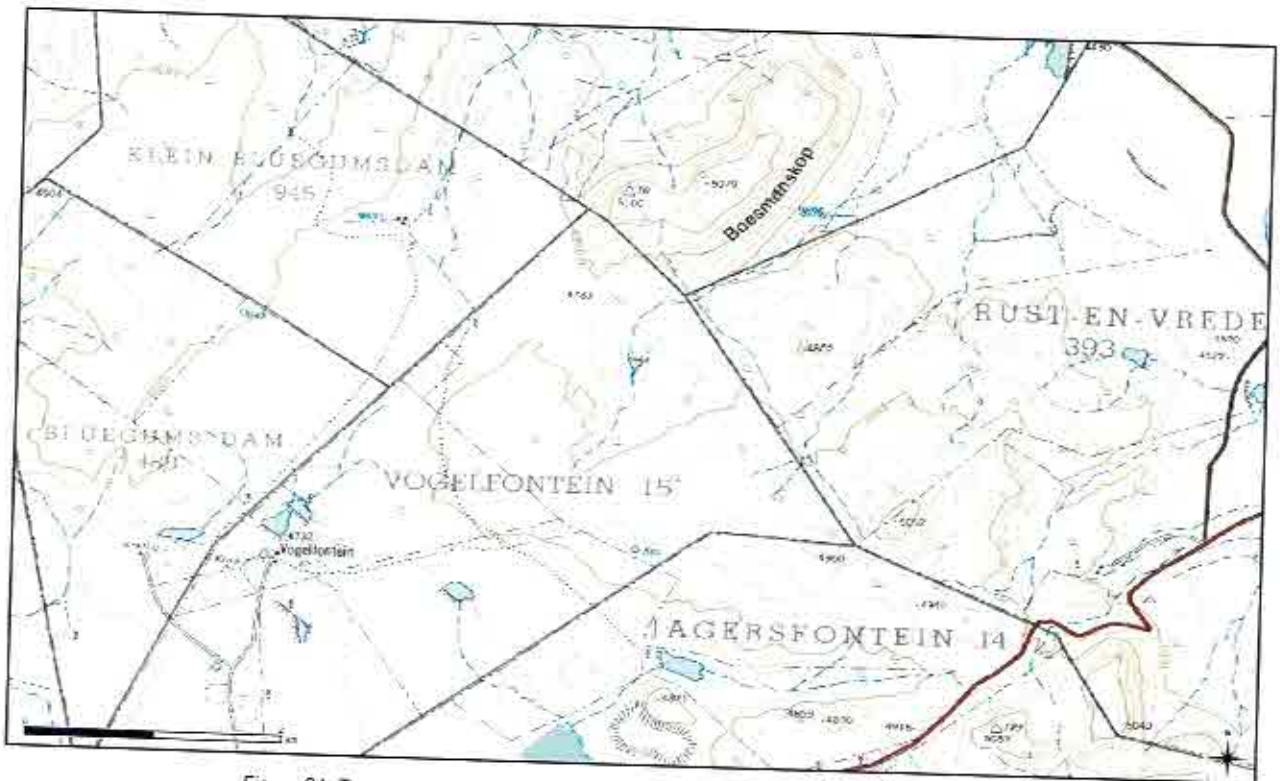


Figure 24. Topographical Map 2925 CB 1988

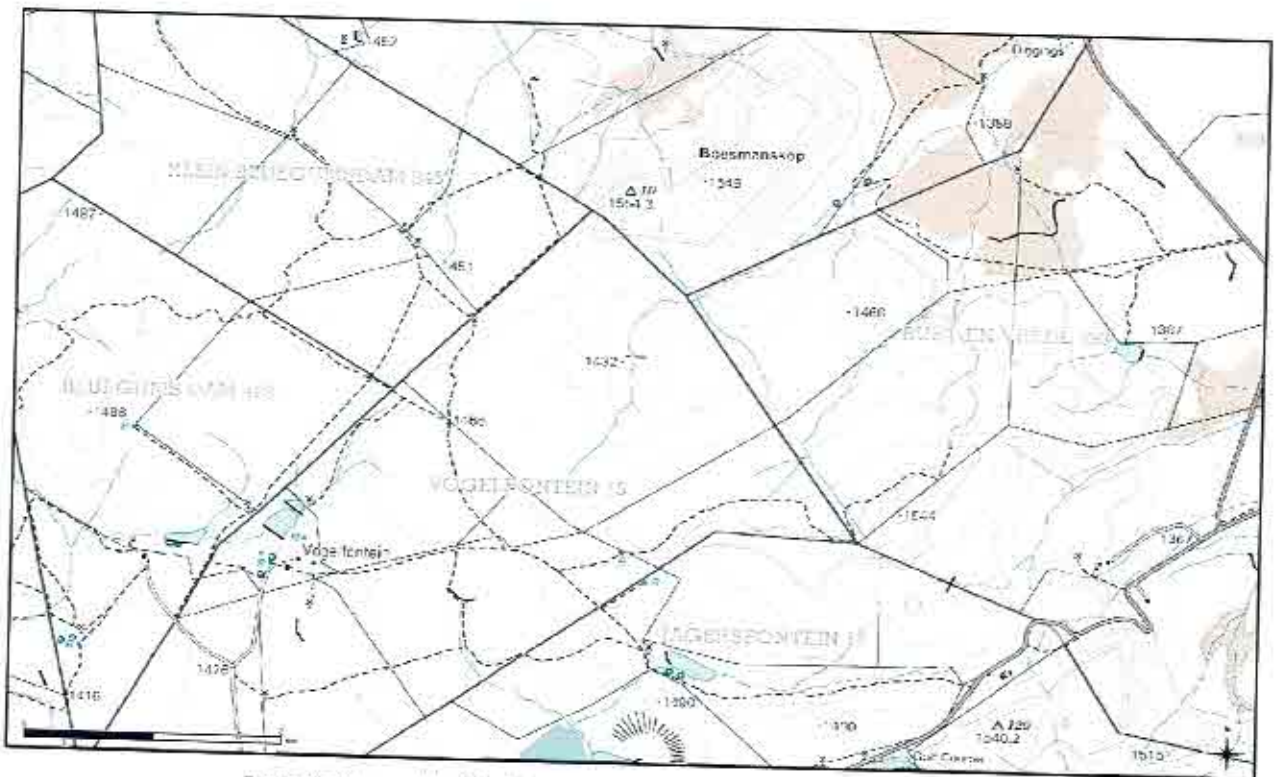


Figure 25. Topographical Map 2925 CB 2005

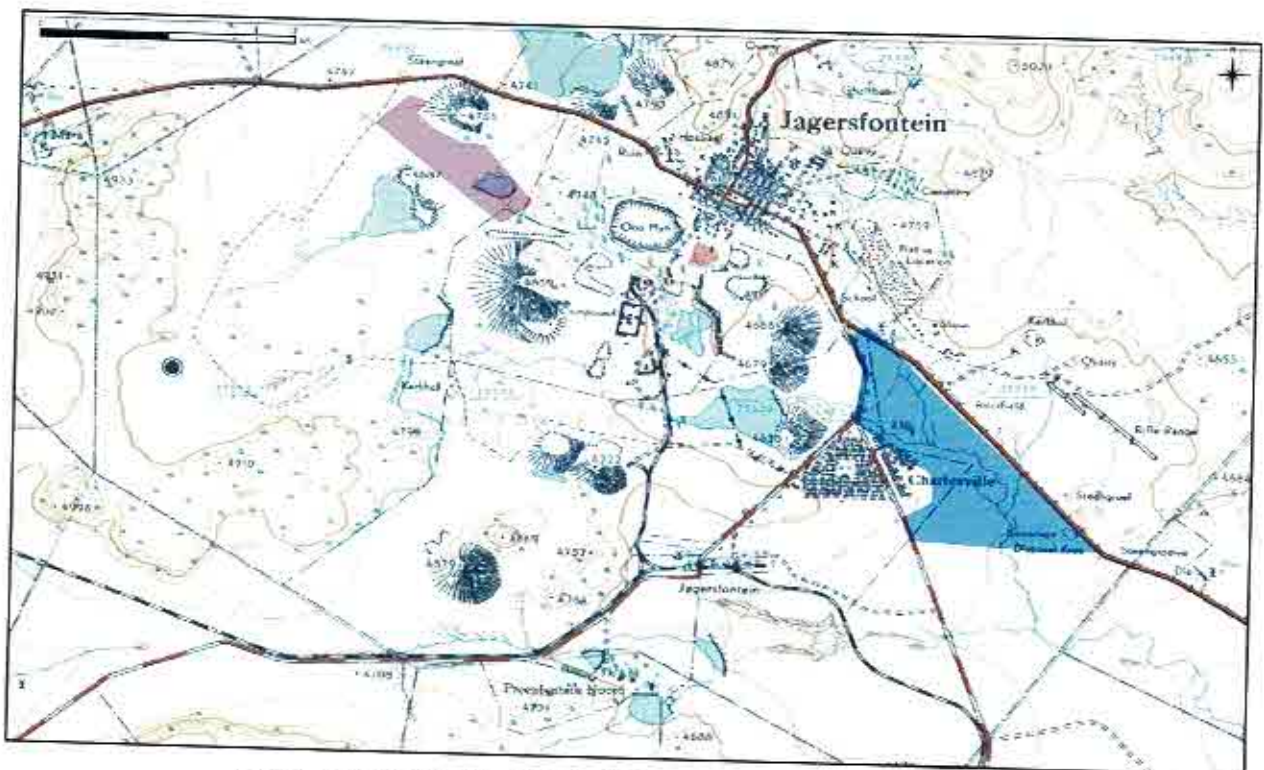


Figure 26. Topographical Map 2925 CD 1948

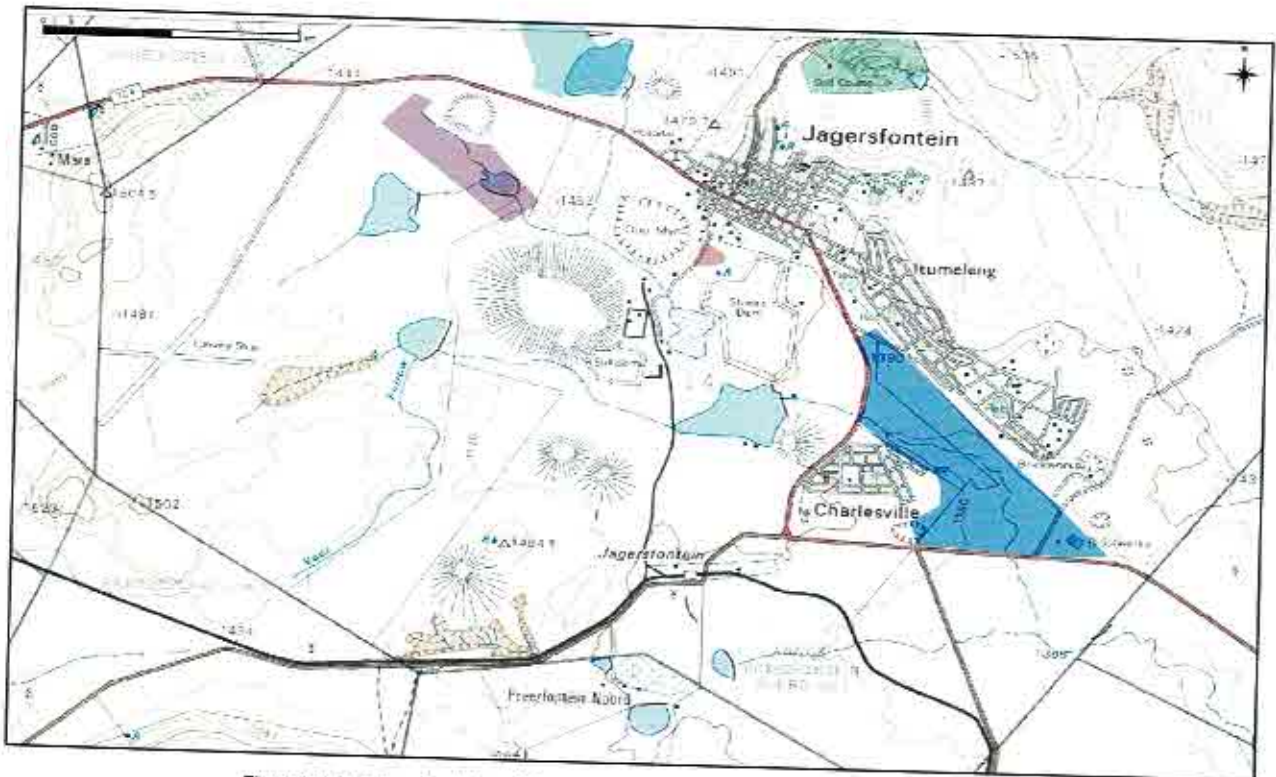


Figure 27. Topographical Map 2925 CD 1988

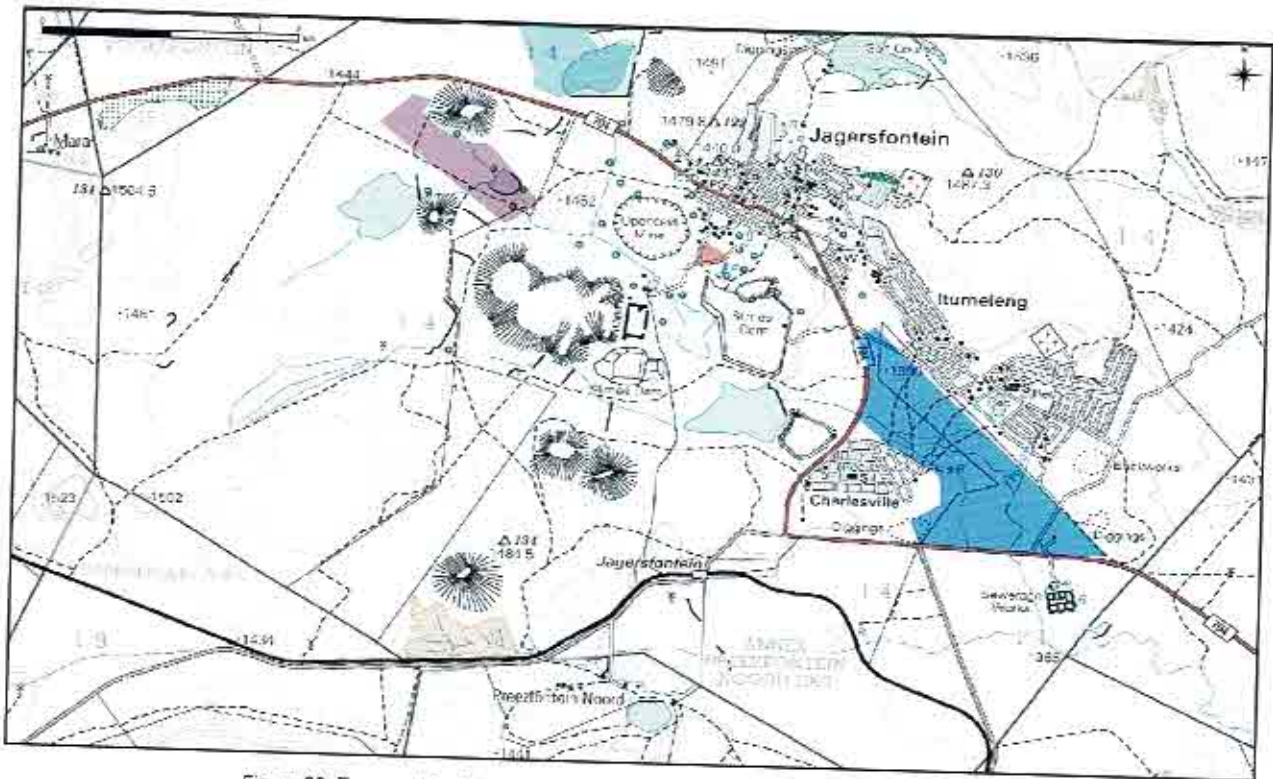


Figure 28. Topographical Map 2925 CD 2005

4. GPS TRACK PATHS

4.1 AREA A



Figure 29. Area A Track Paths

4.2 AREA B



Figure 30. Area B Track Paths

4.3 AREA C



Figure 31. Area C Track Paths

4.4 AREA D



Figure 32. Area D Track Paths

5. FINDINGS

The findings will be discussed in two separate sections. The first will discuss the findings of the fieldwork survey of the four core areas indicated. This was done during February 2019. The second section will discuss the findings of the desktop study and will focus mainly on the results achieved by Philip in 2009 and 2013.

5.1 FIELD BASED INVESTIGATION OF FOUR CORE AREAS

The mining client indicated that although they would be applying for prospecting rights within the larger Jagersfontein 14 farm, actual ground works would be limited to four core areas. These areas were surveyed during the fieldwork session of February 2019 and the results of this survey is reproduced here.



Figure 33. Four core areas indicated in white (A,B,C & D)

5.1.1 AREA A

This area is located to the north of Meteor street. Currently mining is occurring on the western section of this study block. The 2013 study by Philip indicate a stone tool concentration to the southwest of the indicated area, however this was found to be well outside of the proposed prospecting site. The site has been subjected to severe alterations due to mining activities in the past and it is not anticipated that any sites of heritage significance will be found intact here.

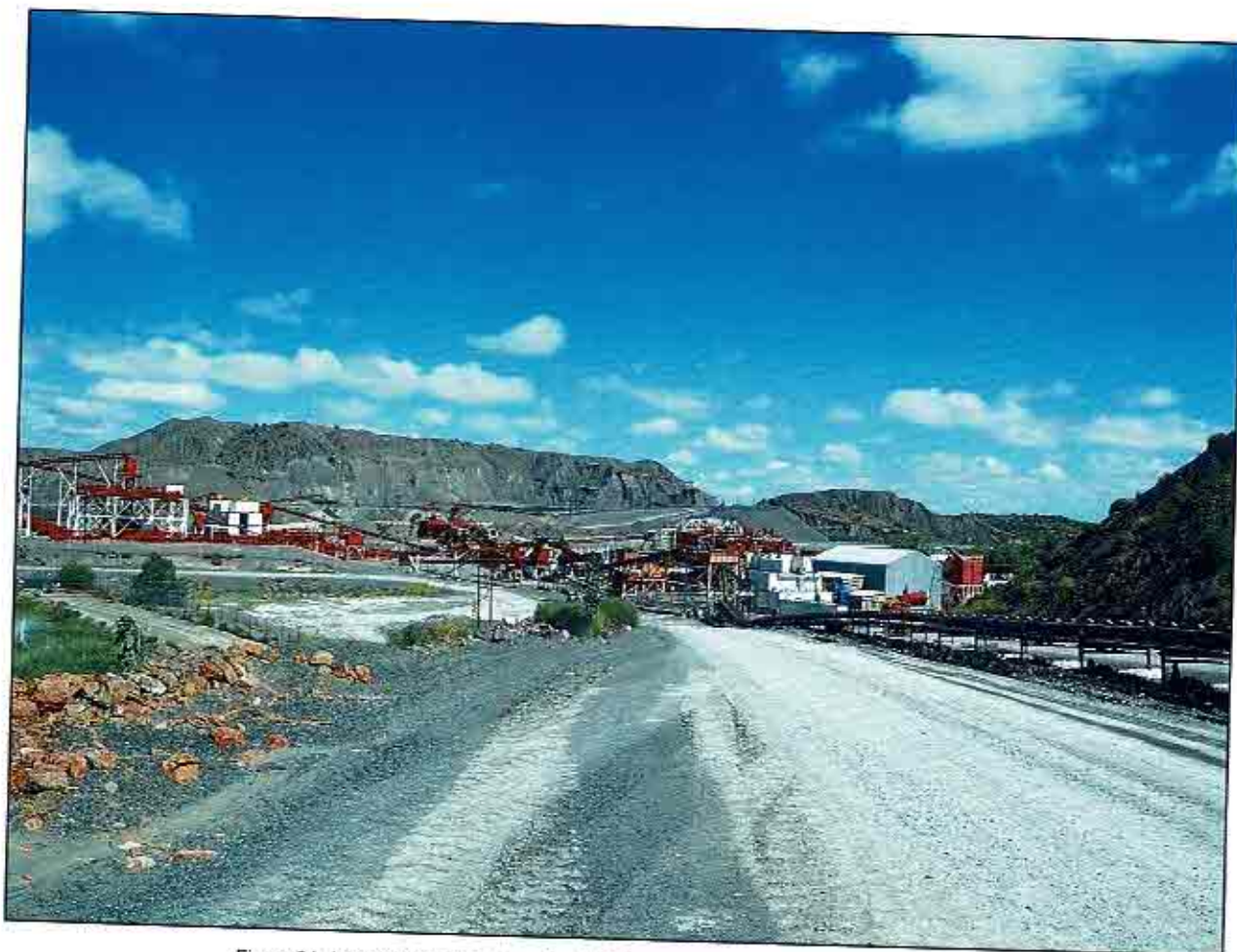


Figure 34. Approach towards Jagersfontein Mine

5.1.2 AREA B

Area B is located to the North and West of the main mining area towards the rear of the mining dumps. A new haulage road has been constructed through this area and it has undergone severe alteration in many of its parts. This site does however contain a site of high significance in terms of heritage. This is the location for the historic Cavalry Quarters.

Site 1

GPS 29° 45' 38" S
25° 24' 24" E

Much of the intricate stone walling is still in place and well preserved. Due to its historic importance and intact nature it is of paramount importance that this site be preserved. This is a large neatly constructed stone-walled enclosed area with a wide opening (approximately 6m wide) to the east. Only three of the four sides are still standing and consists of a double row of stone-packed walls with a + 3m wide space between the two walls to form an enclosed channel that presumably ran right around to form a courtyard space in the middle. The eastern and southern sides have only one opening to these areas facing the courtyard area of the enclosed area. The foundations on the northern side are too low to determine whether it had a similar opening. The western corner of the southern wall still has a portion of the original wall constructed of sun-dried mudstone brick on top and it is assumed the stone walls served as foundation for these walls. These foundation walls were constructed with large stones filled with smaller stones and blue gravel (similar to that found on the mine dumps) in-between. No associated midden (rubbish dump) could be found in the vicinity. Apparently a large amount of old horse shoes were collected from this area over the years. Feeding troughs constructed of wood and long strips of metal sheets fashioned into a hollow shape suggests an

area where animals were kept. It is, however, possible that the latter could have been a later edition and therefore might be a secondary use.

According to the war records the British occupied Jagersfontein during the Anglo-Boer War and used the old mine dumps as entrenchments. If this area was not constructed by the miners then it might have been constructed during this time to stable the cavalry soldiers' horses. The mine itself also made extensive use of horses for a variety of reasons ranging from pulling the rollers that compacted and ploughed the floors areas to patrolling the mining area. On the outside of the western wall are a long thin cement foundation and a scatter of more modern bricks.

Even if no further activities are planned within this area the impact of past developments close to the structure should be mitigated.



Figure 35. Stone walling at Cavalry Enclosure

The enclosure is rectangular with interior divisions and measure approximately 110m x 70m.



Figure 36. Interior of the Cavalry Enclosure



Figure 37. Stone walling at the Cavalry Enclosure



Figure 38. Area where the Cavalry Enclosure lies indicated in red

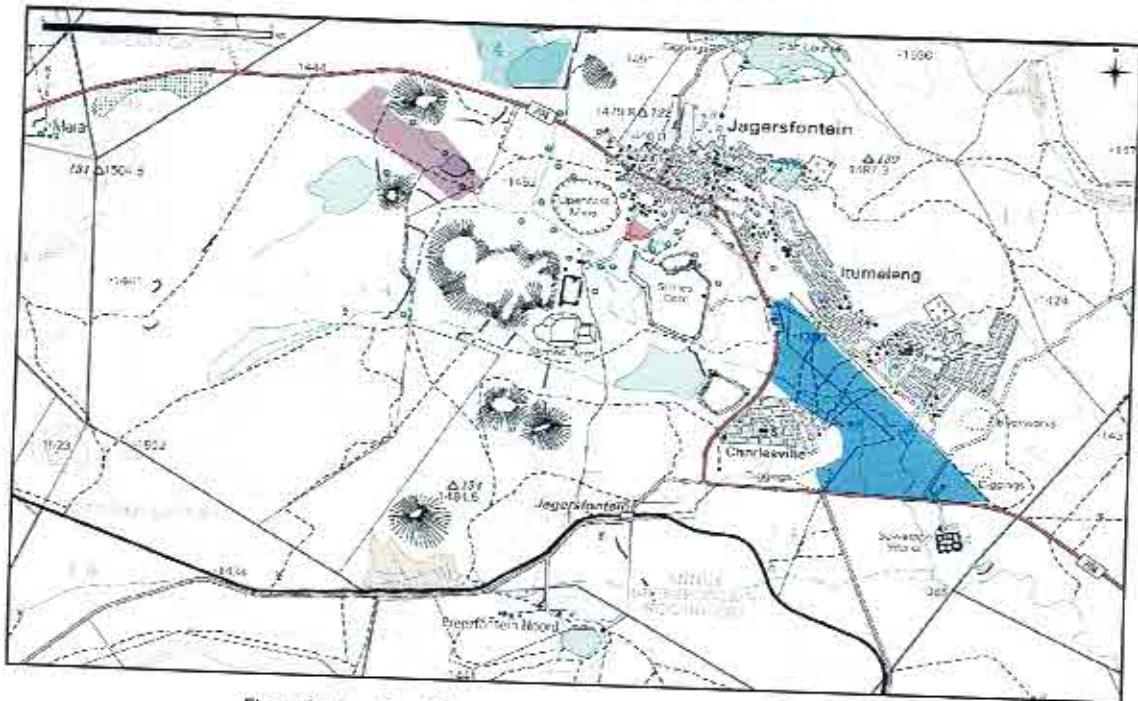


Figure 39. Location of Cavalry Enclosure

5.1.3 AREA C

Area C lies right alongside the existing mining administration buildings. Although the site might have contained mining structures of historic nature these have long since been obliterated by newer mining activities. No sites of any heritage importance was noted here.



Figure 40. Area C indicated in white lines

5.1.4 AREA D

This is the only focus area that has not previously formed part of a heritage study. The Canal Study bordered this area to the south and the paleontological information is derived from this study. The site is open and devoid of developments in most areas. It lies between the main access road to the town of Jagersfontein and the formal township of Ithumeleng.

A large drainage ditch runs diagonally through the study area. This has caused much erosion in the past and it was hoped that any Stone Age deposits would have been exposed, however none were found. Isolated stone chips and possible cores were noted, however non were thought to be diagnostic of either the Fauresmith or Smithfield Industries that would be expected in these areas.



Figure 41. Study Area D indicated in white



Figure 42. Landscape at Area D



Figure 43. Drainage ditch at Area D



Figure 44. Houses at Ithumeleng

Two areas of development were noted in Area D. The first seemed to be the remains of an old water treatment or supply plant. It had concrete flooring, a round concrete reservoir and several rectangular dams. These dams were filled with water due to the rain of the previous day.

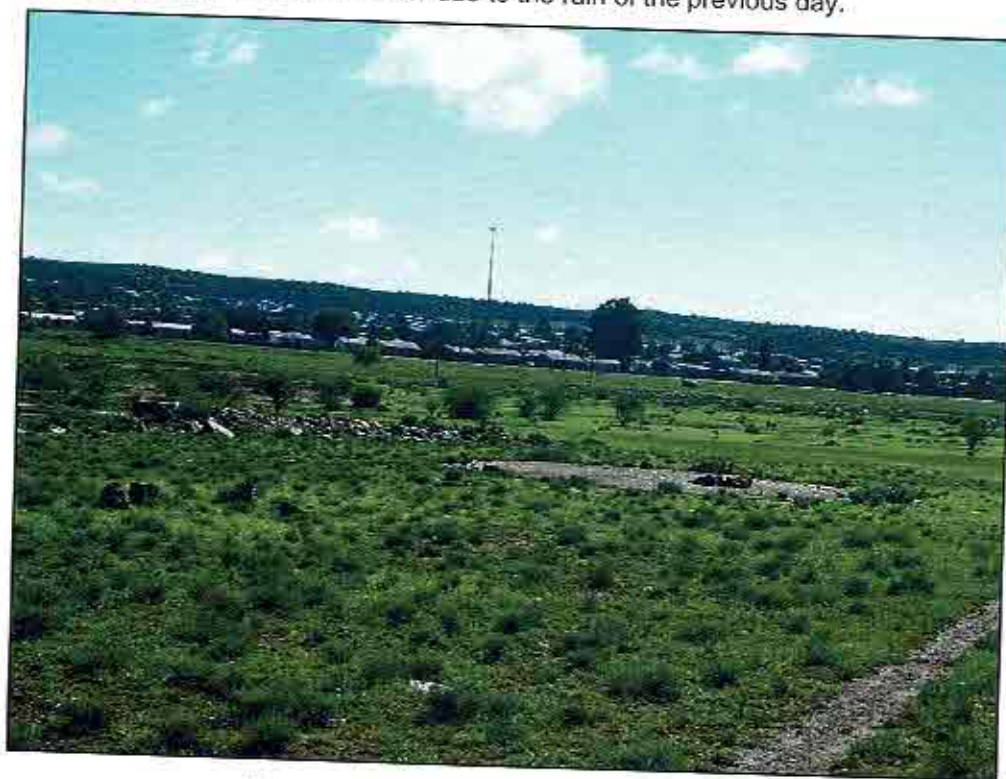


Figure 45. Concrete foundations



Figure 46. Concrete Reservoir



Figure 47. Dams filled with water

Through analysis of the historic topographic maps available it is evident that this site is only referred to as a "Reservoir" with no indications of the dams. The site is indicated on the 1988 and 2005 maps as "Res." The 1948 map does show green rectangles that could possibly be the dams. The concrete structures are however not older than 60 years and are therefore not protected under the NHRA. It is very doubtful if the dams could be older than 60 years and if they are their heritage value is negligible.

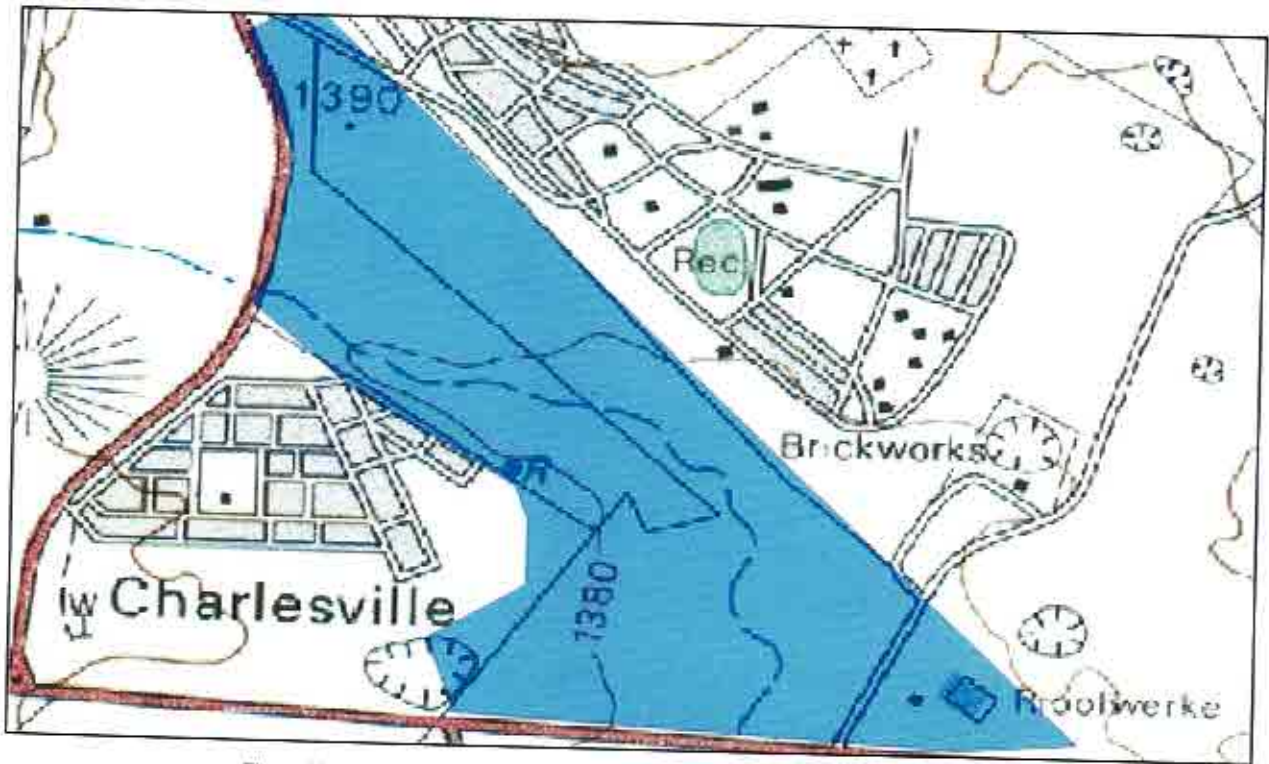


Figure 48. 2005 Map showing Reservoir

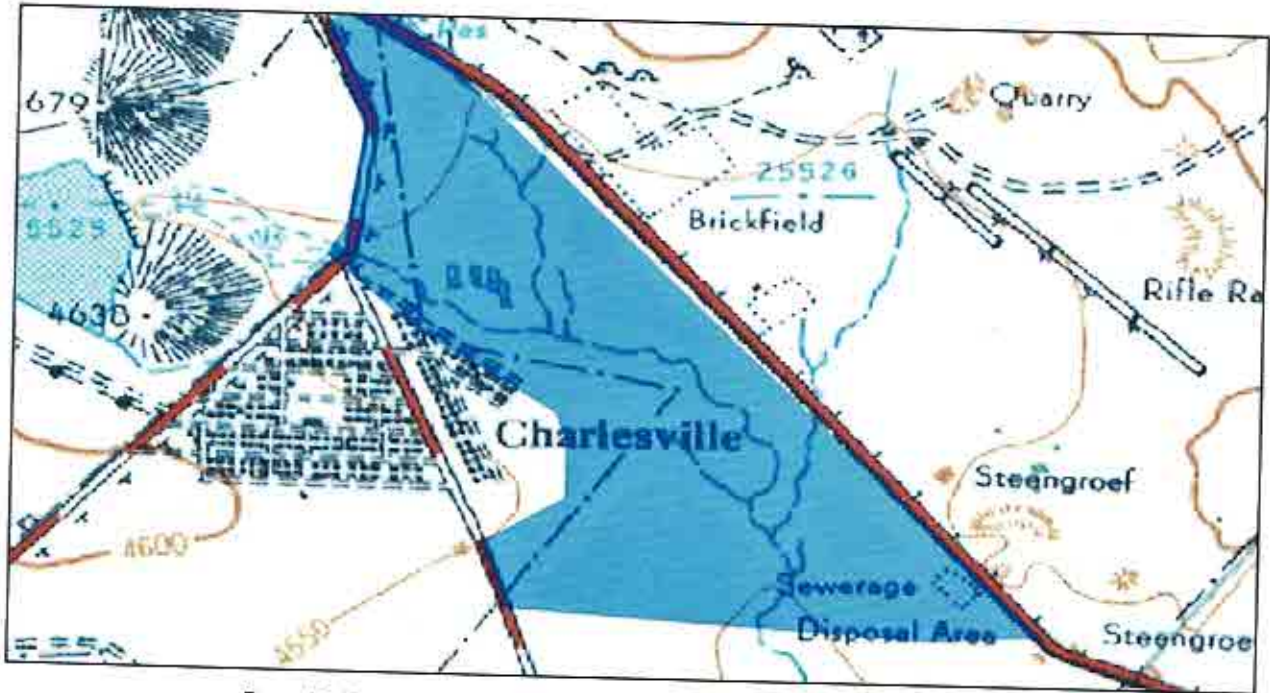


Figure 49. 1948 Map not showing the Reservoir, but possibly showing the dams

6. DESKTOP STUDY FOR THE REMAINDER OF THE PRA AREA

Figure 50. Area Covered By Philip in 2013

As indicated earlier in the document, the desktop findings rely heavily on the fieldwork performed by L. Philip and her team in 2013. These findings will largely be reproduced here with the consent of the author (pers. Comm), since it would be counterproductive to redo the study.

The sites identified by Philip in 2013 is listed and classified as per the attached tables. Google earth images will be supplied to indicated the locations, however these should be used in conjunction with the supplied KMZ files.

Sites identified are as follows;

6.1 CAVALRY SECTION

Area	Map Name	Group Name	Era	Date Recorded	Latitude	Longitude	Altitude	Site No.
Cavalry Section	Cavalry	Structure	Historic	2009/02/02	-29.7605	25.406	1427 m	1.1
Cavalry Section	Cavalry	Structure	Historic	2009/02/02	-29.76086	25.40685	1426 m	1.2
Cavalry Section	Cavalry	Structure	Historic	2009/02/02	-29.76038	25.40708	1427 m	1.3
Cavalry Section	Cavalry Structure	Structure	Historic	2009/02/02	-29.76	25.4063	1428 m	1.4

Cavalry Section	Cavalry Structure	Structure	Historic	2009/02/02	-29.76074	25.40687	1427 m	1.5
Cavalry Section	Cavalry Structure	Structure	Historic	2009/02/02	-29.7607	25.40689	1426 m	1.6
Cavalry Section	Cement Foundation	Cement Foundation	Mine	2009/03/02	-29.76225	25.41197		1.7
Cavalry Section	Cement Foundation	Cement Foundation	Mine	2009/03/02	-29.76222	25.41194		1.8
Cavalry Section	Cement Slab on hill	Cement Foundation	Mine	2009/03/02	-29.76321	25.41163	1439 m	1.9
Cavalry Section	Dam with pump and Trough	Dam	Mine	2009/03/02	-29.76281	25.40982	1421 m	1.10
Cavalry Section	Midden	Midden	Mine	2009/02/02	-29.762	25.41448	1425 m	1.11
Cavalry Section	Mudbrick building	Structure	Mine	2009/02/02	-29.76186	25.41487	1420 m	1.12
Cavalry Section	Packed stones	Structure	Mine	2009/03/02	-29.75814	25.40187	1437 m	1.13
Cavalry Section	Packed stones	Structure	Mine	2009/03/02	-29.75808	25.40194	1434 m	1.14
Cavalry Section	Pump House	Structure	Mine	2009/03/02	-29.76389	25.41106		1.15
Cavalry Section	Slimes Dam	Dam	Mine	2009/02/02	-29.7611	25.407	1430 m	1.16
Cavalry Section	Stone Foundation	Stone Foundation	Mine	2009/03/02	-29.76219	25.41194		1.17
Cavalry Section	Stone Foundation	Stone Foundation	Mine	2009/03/02	-29.76206	25.412		1.18
Cavalry Section	Stone Foundation	Stone Foundation	Mine	2009/03/02	-29.76222	25.412		1.19
Cavalry Section	Stone Foundation	Stone Foundation	Mine	2009/03/02	-29.76208	25.41206		1.20
Cavalry Section	Stone terraces and wall	Other	Historic	2009/03/02	-29.76306	25.41161	1434 m	1.21
Cavalry Section	Water shaft	Structure	Mine	2009/02/02	-29.76478	25.41282	1421 m	1.22

Site Table 1. Cavalry Section



Figure 51. Cavalry Section Site Map 1



Figure 52. Cavalry Section Site Map 2

6.2 CENTRAL SECTION

Area	Map Name	Group Name	Era	Date Recorded	Latitude	Longitude	Altitude	Site No.
Central Section	Dam Center	Dam	Mine	2009/03/02	-29.77124	25.40383	1426 m	2.1
Central Section	Dam Wall	Dam	Mine	2009/03/02	-29.77162	25.40543	1425 m	2.2
Central Section	Dam Wall	Dam	Mine	2009/03/02	-29.77334	25.40385	1428 m	2.3
Central Section	Fence Post	Fence Post	Mine	2009/03/02	-29.77628	25.40757	1423 m	2.4
Central Section	Fence Post	Fence Post	Mine	2009/03/02	-29.77397	25.40794	1417 m	2.5
Central Section	Fence Post	Fence Post	Mine	2009/03/02	-29.77721	25.40742	1401 m	2.6
Central Section	Fence Post	Fence Post	Mine	2009/03/02	-29.77641	25.40756	1422 m	2.7
Central Section	Fence Post	Fence Post	Mine	2009/03/02	-29.77655	25.40754	1422 m	2.8
Central Section	Fence Post	Fence Post	Mine	2009/03/02	-29.77383	25.40801	1417 m	2.9
Central Section	Fence Post	Fence Post	Mine	2009/03/02	-29.77369	25.40803	1415 m	2.10
Central Section	Fence Post	Fence Post	Mine	2009/03/02	-29.77359	25.40808	1416 m	2.11
Central Section	Fence Post	Fence Post	Mine	2009/03/02	-29.77272	25.40798	1419 m	2.12
Central Section	Fence Post	Fence Post	Mine	2009/03/02	-29.77232	25.4079	1418 m	2.13
Central Section	Fence Post	Fence Post	Mine	2009/03/02	-29.77471	25.4078	1419 m	2.14
Central Section	Fence Post	Fence Post	Mine	2009/03/02	-29.77442	25.40778	1418 m	2.15
Central Section	Fence Post	Fence Post	Mine	2009/03/02	-29.77409	25.40793	1418 m	2.16
Central Section	Fence Post	Fence Post	Mine	2009/03/02	-29.77483	25.40777	1416 m	2.17
Central Section	Fence Post	Fence Post	Mine	2009/03/02	-29.77536	25.40769	1420 m	2.18
Central Section	Gate Post	Gate Post	Mine	2009/03/02	-29.77185	25.40788	1422 m	2.19
Central Section	Gate Post	Gate Post	Mine	2009/03/02	-29.77156	25.40785	1423 m	2.20
Central Section	Gate Post	Gate Post	Mine	2009/03/02	-29.77148	25.4079	1423 m	2.21
Central Section	Gate Post	Gate Post	Mine	2009/03/02	-29.77189	25.40785	1420 m	2.22
Central Section	Gate Post	Gate Post	Mine	2009/03/02	-29.77138	25.40795	1423 m	2.23
Central Section	Loading Ramp	Structure	Mine	2009/03/02	-29.77447	25.41153	1423 m	2.24
Central Section	Pump House	Cement Foundation	Mine	2009/03/02	-29.77165	25.40806	1421 m	2.25
Central Section	Stone Wall	Wall	Mine	2009/03/02	-29.77165	25.40806	1422 m	2.26
Central Section	Stone Wall	Wall	Mine	2009/03/02	-29.77159	25.40818	1421 m	2.27
Central Section	Stonetool Scatter	Stonetool Scatter	Stone Age	2009/03/02	-29.77214	25.4068	1424 m	2.28

Site Table 1. Central Section Sites