ANNEXURE K
DESKTOP FAUNA AND FLORA STUDY

DESKTOP STUDY

Fauna and Flora

FOR PROSPECTING RIGHTS

ON

VARIOUS PORTIONS OF THE FARM KLIPFONTEIN 268JR

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1 Introduction and Terms of Reference

1.1 Introduction

Prism Environmental Management Services cc (Prism EMS) was appointed by Quanto Environmental Solutions cc (QES) to conduct a Desktop level investigation in respect of the faunal and floral bio-diversity for prospecting rights on various portions of the Farm Klipfontein 268 JR.

The proposed mining site is located east of Pretoria in close proximity of Rosslyn (Refer to Figure 1).

This document presents the desktop assessment conducted in October 2012.

1.2 Terms of Reference

Platinum Group Metals (RSA) (Pty) Ltd. approached QES to compile an Environmental Management Programme (EMPr) for prospecting permits on various portions of the Farm Klipfontein 268 JR., approximately 18 km north west of Pretoria.

In turn, QES requested Prism EMS to assist with a Specialist Environmental Desktop Level Assessment in respect of:

- Fauna
- Flora

1.3 Site Description

The proposed mining site is located east of Pretoria in close proximity of Rosslyn. The study site is located on:

- Portion 16, 34, 35, 37, 38, 40, 68, 69, 70, 71, 72, 73, 75, 76, 109,122, 129, 145, 146, 147, 148, 149, 170, 179, 188, 189, 192, 194,195, 196, 198, 199, 200, 203, 204, 205, 206, 207, 208, 209, 210, 211, 212, 221, 223, 232, 233, 234, 235, 236, 237, 238, 239, 240, 241, 245, 279 and 281 of the Farm Klipfontein 268 JR
- Remainder of Portion 28, 31, 32, 33, 36, 41, 42, 43, 44, 74, 79, 111,112, 113, 163, 164, 193, 162, 216, and 242 of the Farm Klipfontein 268 JR

Refer to Figure 2.

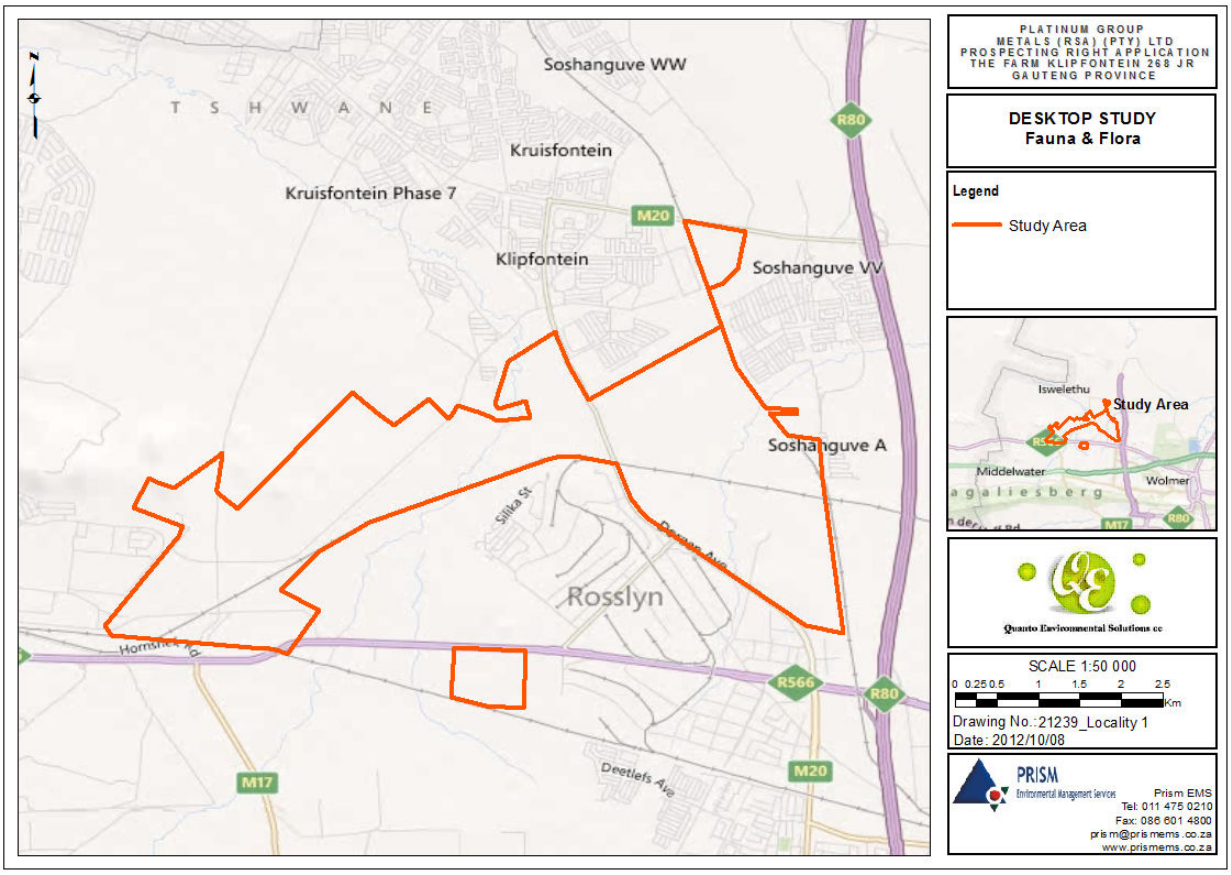

Figure 1: Locality Plan

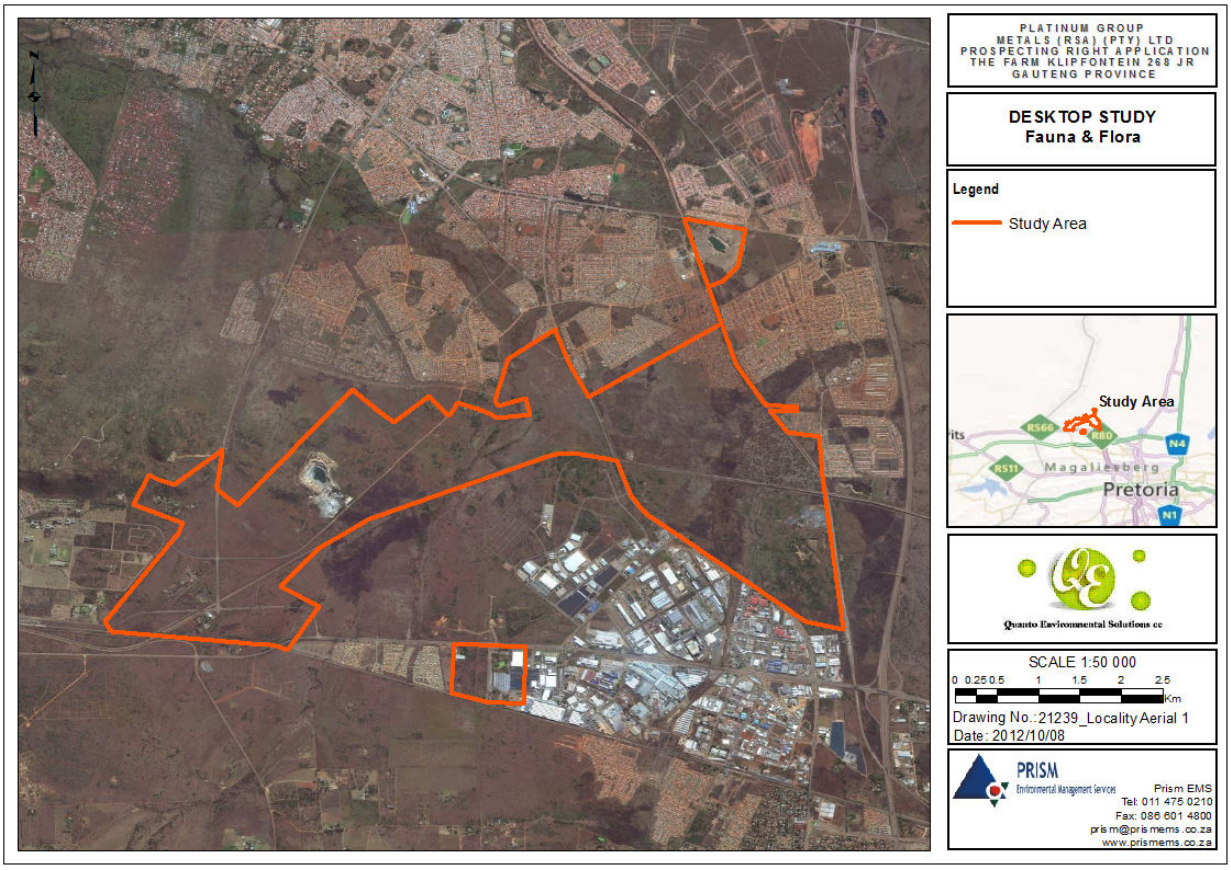

Figure 2: Study Area

2 Scope of work

The Scope of Work as requested by Quanto Environmental Solutions includes the following:

- Faunal Desktop Assessment
  - A desktop assessment of the faunal presence of the study area with emphasis on Red Data and other endangered species identification.
- Floral Desktop Assessment
  - A desktop assessment of the floral presence of the study area with emphasis on Red Data and other endangered species identification.

3 Methodology

A variety of sources was consulted to gain the information necessary to conduct the desktop assessment for the proposed mining site.
The following sources were used:

- Library;
- Reference books and articles;
- Provincial and National Departments;
- Geographic Information System (GIS) database;
- Websites; and
- Personal communication.

4 Results

4.1 Faunal

The Gauteng Conservation Plan (C-plan) version 3.3 was consulted by means of GIS layer investigation. The C-plan did not indicate any sensitivity in respect of Red data faunal species on the subject site. However, ecological support areas were identified on the study site (Refer to Figure 4). Irreplaceable areas in respect of Avi-faunal species were indicated to the east of the study site. The specific requirements in respect of Avi-faunal studies must be checked and verified with the Gauteng Department of Agricultural and Rural Development (GDARD), Directorate Conservation.

In addition to the C-plan, the "River Sensitivities" GIS layer was consulted due the presence of aquatic systems on site. The possible presence of:

- Aonyx capensis (African clawless otter),
- *Atilax paludinosus* (African marsh mongoose),
- *Chrysospalax villosus* (Rough-haired golden mole),
- *Dasymys incomtus* (African marsh rat),
- *Lutra maculicollis* (Spotted necked otter),
- *Otomys angoniensis* (Angoni vlei rat) and
- *Otomys irroratus* (Vlei rat)

must be verified as part of an ecological study informing the Environmental Impact Assessment (EIA) for mining activities. This will be required during the mining rights application but is not required for the prospecting right phase as extensive habitat unit destruction is not envisaged.

4.1.1 Avi-Faunal

The Bird species potentially occurring in the area of the proposed study site were obtained from the South African Bird Atlas Project 2. The data is for the quarter-degree squares (QDS) that the study site is located in (2528CA) and pentad 2535_2805 (SABAP2;2011) (Refer to Table 1).

Table 1: Avi-faunal recordings for area around the study site (pentad 2535_2805) (SABAP2; 2011).

	Ref No	English Name	*Scientific Name*	Rarity regions	Full protocol		Ad hoc Protocol		Incidental
					Sightings	Reporting rate	Sightings	Reporting rate	Reports
1	317	Laughing Dove (Rooiborsduifie)	*Streptopelia senegalensis*		17	100.00%	2	50.00%	
2	545	Dark-capped Bulbul (Swartoogtiptol)	*Pycnonotus tricolor*		17	100.00%	3	75.00%	
3	734	Common Myna (Indiese Spreeu)	*Acridotheres tristis*		17	100.00%	4	100.00%	
4	803	Southern Masked-Weaver (Swartkeelgeelvink)	*Ploceus velatus*		16	94.10%	4	100.00%	
5	192	Helmeted Guineafowl (Gewone Tarentaal)	*Numida meleagris*		16	94.10%	1	25.00%	
6	84	Hadeda Ibis (Hadeda)	*Bostrychia hagedash*		16	94.10%	2	50.00%	
7	242	Crowned Lapwing (Kroonkiewiet)	*Vanellus coronatus*		16	94.10%	1	25.00%	
8	649	Tawny-flanked Prinia (Bruinsylangstertjie)	*Prinia subflava*		15	88.20%	1	25.00%	
9	808	Southern Red Bishop (Rooivink)	*Euplectes orix*		15	88.20%	2	50.00%	
10	784	House Sparrow (Huismossie)	*Passer domesticus*		15	88.20%	1	25.00%	
11	339	Grey Go-away-bird (Kwêvoel)	*Corythaixoides concolor*	NC	15	88.20%	2	50.00%	
12	316	Cape Turtle-Dove (Gewone Tortelduif)	*Streptopelia capicola*		15	88.20%	1	25.00%	
13	786	Cape Sparrow (Gewone Mossie)	*Passer melanurus*		15	88.20%	3	75.00%	
14	81	African Sacred Ibis (Skoorsteenveer)	*Threskiornis aethiopicus*		15	88.20%			
15	763	White-bellied Sunbird	*Cinnyris talatala*		14	82.40%	2	50.00%	

		(Witpenssuikerbekkie)							
16	212	Red-knobbed Coot (Bleshoender)	*Fulica cristata*		14	82.40%			1
17	314	Red-eyed Dove (Grootringduif)	*Streptopelia semitorquata*		14	82.40%	2	50.00%	
18	707	Common Fiscal (Fiskaallaksman)	*Lanius collaris*		14	82.40%	1	25.00%	
19	1172	Cape White-eye (Kaapse Glasogie)	*Zosterops virens*		14	82.40%	2	50.00%	
20	245	Blacksmith Lapwing (Bontkiewiet)	*Vanellus armatus*		14	82.40%	1	25.00%	
21	387	African Palm-Swift (Palmwindswael)	*Cypsiurus parvus*	WC	14	82.40%	3	75.00%	
22	4142	Southern Grey-headed Sparrow (Gryskopmossie)	*Passer diffusus*		13	76.50%	4	100.00%	
23	439	Crested Barbet (Kuifkophoutkapper)	*Trachyphonus vaillantii*	WC	12	70.60%	1	25.00%	
24	210	Common Moorhen (Grootwaterhoender)	*Gallinula chloropus*		12	70.60%			1
25	823	Bronze Mannikin (Gewone Fret)	*Spermestes cucullatus*		12	70.60%	3	75.00%	
26	860	Black-throated Canary (Bergkanarie)	*Crithagra atrogularis*	WC	12	70.60%	3	75.00%	
27	96	Yellow-billed Duck (Geelbekeend)	*Anas undulata*		11	64.70%			1
28	940	Rock Dove (Tuinduif)	*Columba livia*		11	64.70%	1	25.00%	
29	502	Greater Striped Swallow (Grootstreepswael)	*Hirundo cucullata*		11	64.70%	2	50.00%	
30	61	Cattle Egret (Veereier)	*Bubulcus ibis*		11	64.70%			
31	867	Streaky-headed Seedeater (Streepkopkanarie)	*Crithagra gularis*		10	58.80%	2	50.00%	
32	390	Speckled Mousebird (Gevlekte Muisvoel)	*Colius striatus*		10	58.80%	1	25.00%	

33	709	Southern Boubou (Suidelike Waterfiskaal)	*Laniarius ferrugineus*		10	58.80%	2	50.00%	
34	1104	Karoo Thrush (Geelbeklyster)	*Turdus smithi*		10	58.80%	2	50.00%	
35	392	Red-faced Mousebird (Rooiwangmuisvoel)	*Urocolius indicus*		9	52.90%	2	50.00%	
36	183	Natal Spurfowl (Natalse Fisant)	*Pternistis natalensis*	NC	9	52.90%			
37	385	Little Swift (Kleinwindswael)	*Apus affinis*		9	52.90%	2	50.00%	
38	174	Crested Francolin (Bospatrys)	*Dendroperdix sephaena*	NC	9	52.90%			
39	581	Cape Robin-Chat (Gewone Janfrederik)	*Cossypha caffra*		9	52.90%	2	50.00%	
40	839	Blue Waxbill (Gewone Blousysie)	*Uraeginthus angolensis*	NC	9	52.90%	2	50.00%	
41	130	Black-shouldered Kite (Blouvalk)	*Elanus caeruleus*		9	52.90%	1	25.00%	
42	650	Black-chested Prinia (Swartbandlangstert jie)	*Prinia flavicans*		9	52.90%	2	50.00%	
43	247	African Wattled Lapwing (Lelkiewiet)	*Vanellus senegallus*		9	52.90%			
44	629	Zitting Cisticola (Landeryklopkloppie)	*Cisticola juncidis*		8	47.10%	2	50.00%	
45	50	Reed Cormorant (Rietduiker)	*Phalacrocorax africanus*		8	47.10%			1
46	503	Lesser Striped Swallow (Kleinstreepswael)	*Hirundo abyssinica*	WC	8	47.10%			
47	517	Fork-tailed Drongo (Mikstertbyvanger)	*Dicrurus adsimilis*		8	47.10%			
48	658	Chestnut-vented Tit-Babbler (Bosveldtjeriktik)	*Parisoma subcaeruleum*		8	47.10%	1	25.00%	
49	686	Cape Wagtail (Gewone Kwikkie)	*Motacilla capensis*		8	47.10%	2	50.00%	

50	737	Cape Glossy Starling (Kleinglansspreeu)	*Lamprotornis nitens*	WC	8	47.10%	1	25.00%	
51	431	Black-collared Barbet (Rooikophoutkapper)	*Lybius torquatus*	NC	8	47.10%	1	25.00%	
52	576	African Stonechat (Gewone Bontrokkie)	*Saxicola torquatus*		8	47.10%			
53	814	White-winged Widowbird (Witvlerkflap)	*Euplectes albonotatus*	FS	7	41.20%	2	50.00%	
54	383	White-rumped Swift (Witkruiswindswael)	*Apus caffer*		7	41.20%	2	50.00%	
55	185	Swainson's Spurfowl (Bosveldfisant)	*Pternistis swainsonii*		7	41.20%	1	25.00%	
56	522	Pied Crow (Witborskraai)	*Corvus albus*		7	41.20%	1	25.00%	
57	6	Little Grebe (Kleindobbertjie)	*Tachybaptus ruficollis*		7	41.20%			1
58	673	Chinspot Batis (Witliesbosbontrokkie)	*Batis molitor*		7	41.20%	1	25.00%	
59	275	Spotted Thick-knee (Gewone Dikkop)	*Burhinus capensis*		6	35.30%			
60	846	Pin-tailed Whydah (Koningrooibekkie)	*Vidua macroura*		6	35.30%			
61	637	Neddicky Neddicky (Neddikkie)	*Cisticola fulvicapilla*		6	35.30%	3	75.00%	
62	573	Mocking Cliff-Chat (Dassievoel)	*Thamnolaea cinnamomeiventris*		6	35.30%			
63	609	Little Rush-Warbler (Kaapse Vleisanger)	*Bradypterus baboecala*		6	35.30%			
64	646	Levaillant's Cisticola (Vleitinktinkie)	*Cisticola tinniens*		6	35.30%			
65	604	Lesser Swamp-Warbler (Kaapse Rietsanger)	*Acrocephalus gracilirostris*		6	35.30%			
66	288	Grey-headed Gull (Gryskopmeeu)	*Larus cirrocephalus*		6	35.30%			
67	404	European Bee-eater	*Merops apiaster*		6	35.30%			

		(Europese Byvreter)							
68	352	Diderick Cuckoo (Diederikkie)	*Chrysococcyx caprius*		6	35.30%	3	75.00%	
69	821	Cut-throat Finch (Bandkeelvink)	*Amadina fasciata*	KZ	6	35.30%			
70	55	Black-headed Heron (Swartkopreier)	*Ardea melanocephala*		6	35.30%			
71	622	Bar-throated Apalis (Bandkeelkleinjantjie)	*Apalis thoracica*		6	35.30%			
72	533	Arrow-marked Babbler (Pylvlekkatlagter)	*Turdoides jardineii*	NC	6	35.30%			
73	495	White-throated Swallow (Witkeelswael)	*Hirundo albigularis*		5	29.40%			
74	100	White-faced Duck (Nonnetjie-eend)	*Dendrocygna viduata*		5	29.40%	1	25.00%	
75	588	White-browed Scrub-Robin (Gestreepte Wipstert)	*Cercotrichas leucophrys*		5	29.40%	1	25.00%	
76	805	Red-billed Quelea (Rooibekkwelea)	*Quelea quelea*		5	29.40%			
77	394	Pied Kingfisher (Bontvisvanger)	*Ceryle rudis*		5	29.40%	1	25.00%	
78	621	Long-billed Crombec (Bosveldstompstert)	*Sylvietta rufescens*		5	29.40%	1	25.00%	
79	402	Brown-hooded Kingfisher (Bruinkopvisvanger)	*Halcyon albiventris*		5	29.40%			
80	712	Black-backed Puffback (Sneeubal)	*Dryoscopus cubla*		5	29.40%			
81	208	African Purple Swamphen (Grootkoningriethaan)	*Porphyrio madagascariensis*		5	29.40%			
82	582	White-throated Robin-Chat (Witkeeljanfrederik)	*Cossypha humeralis*		4	23.50%			
83	311	Speckled Pigeon (Kransduif)	*Columba guinea*		4	23.50%			
84	552	Kurrichane Thrush	*Turdus libonyanus*		4	23.50%			

		(Rooibeklyster)							
85	665	Fiscal Flycatcher (Fiskaalvlieivanger)	*Sigelus silens*		4	23.50%			
86	630	Desert Cisticola (Woestynklopkloppie)	*Cisticola aridulus*	WC,MP	4	23.50%	1	25.00%	
87	714	Brown-crowned Tchagra (Rooivlerktjagra)	*Tchagra australis*		4	23.50%			
88	521	Black-headed Oriole (Swartkopwielewaal)	*Oriolus larvatus*		4	23.50%			
89	418	African Hoopoe (Hoephoep)	*Upupa africana*		4	23.50%			
90	437	Yellow-fronted Tinkerbird (Geelblestinker)	*Pogoniulus chrysoconus*		3	17.60%			
91	859	Yellow-fronted Canary (Geeloogkanarie)	*Crithagra mozambicus*		3	17.60%			
92	238	Three-banded Plover (Driebandstrandkiewiet)	*Charadrius tricollaris*		3	17.60%			
93	102	Southern Pochard (Bruineend)	*Netta erythrophthalma*		3	17.60%			
94	745	Red-winged Starling (Rooivlerkspreeu)	*Onychognathus morio*		3	17.60%	1	25.00%	
95	442	Lesser Honeyguide (Kleinheuningwyser)	*Indicator minor*		3	17.60%			
96	72	Hamerkop Hamerkop (Hamerkop)	*Scopus umbretta*		3	17.60%			
97	54	Grey Heron (Bloureier)	*Ardea cinerea*		3	17.60%			
98	440	Greater Honeyguide (Grootheuningwyser)	*Indicator indicator*		3	17.60%			
99	89	Egyptian Goose (Kolgans)	*Alopochen aegyptiacus*		3	17.60%			
100	711	Crimson-breasted Shrike (Rooiborslaksman)	*Laniarius atrococcineus*		3	17.60%			
101	843	Common Waxbill	*Estrilda astrild*		3	17.60%			

		(Rooibeksysie)							
102	450	Cardinal Woodpecker (Kardinaalspeg)	*Dendropicos fuscescens*		3	17.60%			
103	509	Brown-throated Martin (Afrikaanse Oewerswael)	*Riparia paludicola*		3	17.60%			
104	493	Barn Swallow (Europese Swael)	*Hirundo rustica*		3	17.60%	1	25.00%	
105	359	Barn Owl (Nonnetjie-uil)	*Tyto alba*		3	17.60%			
106	424	African Grey Hornbill (Grysneushoringvoel)	*Tockus nasutus*	FS	3	17.60%			
107	52	African Darter (Slanghalsvoel)	*Anhinga rufa*		3	17.60%			
108	600	Yellow-bellied Eremomela (Geelpensbossanger)	*Eremomela icteropygialis*		2	11.80%	1	25.00%	
109	264	Wood Sandpiper (Bosruiter)	*Tringa glareola*		2	11.80%			
110	599	Willow Warbler (Hofsanger)	*Phylloscopus trochilus*	WC	2	11.80%			
111	47	White-breasted Cormorant (Witborsduiker)	*Phalacrocorax carbo*		2	11.80%			
112	654	Spotted Flycatcher (Europese Vlieievanger)	*Muscicapa striata*	WC	2	11.80%			
113	847	Shaft-tailed Whydah (Pylstertrooibekkie)	*Vidua regia*	MP	2	11.80%			
114	820	Red-headed Finch (Rooikopvink)	*Amadina erythrocephala*	WC	2	11.80%			
115	343	Red-chested Cuckoo (Piet-my-vrou)	*Cuculus solitarius*	NC	2	11.80%			
116	642	Rattling Cisticola (Bosveldtinktinkie)	*Cisticola chiniana*	NC	2	11.80%			
117	57	Purple Heron (Rooireier)	*Ardea purpurea*		2	11.80%			
118	498	Pearl-breasted Swallow	*Hirundo dimidiata*	KZ,MP	2	11.80%			

		(PiAÂ¿AÂ½relborsswael)							
119	157	Ovambo Sparrowhawk (Ovambosperwer)	*Accipiter ovampensis*	KZ,NC	2	11.80%	1	25.00%	
120	852	Long-tailed Paradise-Whydah (Gewone Paradysvink)	*Vidua paradisaea*		2	11.80%			
121	59	Little Egret (Kleinwitreier)	*Egretta garzetta*		2	11.80%	1	25.00%	
122	792	Lesser Masked-Weaver (Kleingeelvink)	*Ploceus intermedius*		2	11.80%			
123	557	Groundscraper Thrush (Gevlekte Lyster)	*Psophocichla litsipsirupa*		2	11.80%			
124	419	Green Wood-Hoopoe (Rooibekkakelaar)	*Phoeniculus purpureus*	NC	2	11.80%			
125	173	Coqui Francolin (Swempie)	*Peliperdix coqui*	NC	2	11.80%			
126	1	Common Ostrich (Volstruis)	*Struthio camelus*		2	11.80%	1	25.00%	
127	799	Cape Weaver (Kaapse Wewer)	*Ploceus capensis*		2	11.80%			
128	703	Cape Longclaw (Oranjekeelkalkoentjie)	*Macronyx capensis*		2	11.80%			
129	601	Burnt-necked Eremomela (Bruinkeelbossanger)	*Eremomela usticollis*		2	11.80%			
130	69	Black-crowned Night-Heron (Gewone Nagreier)	*Nycticorax nycticorax*		2	11.80%			
131	344	Black Cuckoo (Swartkoekoek)	*Cuculus clamosus*	FS,WC	2	11.80%			
132	772	Amethyst Sunbird (Swartsuikerbekkie)	*Chalcomitra amethystina*	FS	2	11.80%	1	25.00%	1
133	606	African Reed-Warbler (Kleinrietsanger)	*Acrocephalus baeticatus*		2	11.80%			
134	692	African Pipit (Gewone Koester)	*Anthus cinnamomeus*		2	11.80%			
135	812	Yellow-crowned Bishop	*Euplectes afer*		1	5.90%			

		(Goudgeelvink)							
136	129	Yellow-billed Kite (Geelbekwou)	*Milvus aegyptius*		1	5.90%			
137	409	White-fronted Bee-eater (Rooikeelbyvreter)	*Merops bullockoides*	WC	1	5.90%			
138	80	White Stork (Witooievaar)	*Ciconia ciconia*		1	5.90%			
139	735	Wattled Starling (Lelspreeu)	*Creatophora cinerea*		1	5.90%			
140	797	Village Weaver (Bontrugwewer)	*Ploceus cucullatus*		1	5.90%	1	25.00%	
141	804	Thick-billed Weaver (Dikbekwewer)	*Amblyospiza albifrons*	WC	1	5.90%			
142	527	Southern Black Tit (Gewone Swartmees)	*Parus niger*		1	5.90%			
143	504	South African Cliff-Swallow (Familieswael)	*Hirundo spilodera*	WC	1	5.90%			
144	506	Rock Martin (Kransswael)	*Hirundo fuligula*		1	5.90%			
145	97	Red-billed Teal (Rooibekeend)	*Anas erythrorhyncha*		1	5.90%			
146	365	Pearl-spotted Owlet (Witkoluil)	*Glaucidium perlatum*	KZ	1	5.90%			
147	838	Orange-breasted Waxbill (Rooiassie)	*Amandava subflava*	NC	1	5.90%			
148	755	Marico Sunbird (Maricosuikerbekkie)	*Cinnyris mariquensis*		1	5.90%			
149	1016	Mallard Duck (Groenkopeend)	*Anas platyrhynchos*		1	5.90%			
150	67	Little Bittern (Kleinrietreier (Woudapie))	*Ixobrychus minutus*		1	5.90%			
151	347	Levaillant's Cuckoo (Gestreepte Nuwejaarsvoel)	*Clamator levaillantii*	KZ,NC	1	5.90%			
152	648	Lazy Cisticola (Luitinktinkie)	*Cisticola aberrans*	WC	1	5.90%			

153	351	Klaas's Cuckoo (Meitjie)	*Chrysococcyx klaas*	NC	1	5.90%			
154	835	Jameson's Firefinch (Jamesonse Vuurvinkie)	*Lagonosticta rhodopareia*	FS	1	5.90%	1	25.00%	
155	723	Grey-headed Bush-Shrike (Spookvoel)	*Malaconotus blanchoti*		1	5.90%			
156	628	Grey-backed Camaroptera (Grysrugkwekwevoel)	*Camaroptera brevicaudata*	MP;KZ; FS	1	5.90%			
157	63	Green-backed Heron (Groenrugreier)	*Butorides striata*	NC,WC	1	5.90%			
158	785	Great Sparrow (Grootmossie)	*Passer motitensis*	MP	1	5.90%			
159	570	Familiar Chat (Gewone Spekvreter)	*Cercomela familiaris*		1	5.90%			
160	872	Cinnamon-breasted Bunting (Klipstreepkoppie)	*Emberiza tahapisi*		1	5.90%			
161	443	Brown-backed Honeybird (Skerpbekheuningvoel)	*Prodotiscus regulus*	WC	1	5.90%			
162	722	Bokmakierie Bokmakierie (Bokmakierie)	*Telophorus zeylonus*		1	5.90%			
163	715	Black-crowned Tchagra (Swartkroontjagra)	*Tchagra senegalus*		1	5.90%			
164	203	Black Crake (Swartriethaan)	*Amaurornis flavirostris*		1	5.90%			
165	614	Barred Wren-Warbler (Gebande Sanger)	*Calamonastes fasciolatus*	NC	1	5.90%			
166	510	Banded Martin (Gebande Oewerswael)	*Riparia cincta*		1	5.90%			
167	250	African Snipe (Afrikaanse Snip)	*Gallinago nigripennis*		1	5.90%			
168	197	African Rail (Grootriethaan)	*Rallus caerulescens*		1	5.90%			
169	844	African Quailfinch (Gewone Kwartelvinkie)	*Ortygospiza atricollis*		1	5.90%			

170	228	African Jacana (Grootlangtoon)	*Actophilornis africanus*	WC	1	5.90%			
171	171	African Harrier-Hawk (Kaalwangvalk)	*Polyboroides typus*	NC	1	5.90%			
172	323	African Green-Pigeon (Papegaaiduif)	*Treron calvus*		1	5.90%			
173	149	African Fish-Eagle (Visarend)	*Haliaeetus vocifer*		1	5.90%			
174	380	African Black Swift (Swartwindswael)	*Apus barbatus*		1	5.90%			
175	458	Rufous-naped Lark (Rooineklewerik)	*Mirafra africana*				1	25.00%	
176	607	Marsh Warbler (Europese Rietsanger)	*Acrocephalus palustris*	NC,WC			1	25.00%	
177	731	Brubru Brubru (Bontroklaksman)	*Nilaus afer*				2	50.00%	
178	119	Amur Falcon (Oostelike Rooipootvalk)	*Falco amurensis*	WC			1	25.00%	
179	682	African Paradise-Flycatcher (Paradysvlieevanger)	*Terpsiphone viridis*	NC			1	25.00%	

4.2 Flora

According to Mucina and Rutherford (2006) the study site falls within the Central Bushveld Bioregion and the Savanna Biome. The vegetation types identified for the study site are:

- Marikana Thornveld
- Norite Koppies Bushveld
- Central Sandy Bushveld
    - Only a very small area of this type falls within the study area. This area is already affected by historical activities and does not represent the natural state of the grass type any more. No details are provided for this vegetation unit for this reason.

Refer to Figure 3.

4.2.1 Marikana Thornveld

4.2.1.1 Distribution

North-West and Gauteng Provinces: Occurs on plains from the Rustenburg area in the west, through Marikana and Brits to the Pretoria area in the east. Altitude about 1 050–1 450 m.

4.2.1.2 Vegetation

Open *Acacia Karoo* woodland, occurring in valleys and slightly undulation plains, and some lowland hills. Shrubs and more dense along drainage lines, on termitaria and rocky outcrops or in other habitat protected from fire.

4.2.1.3 Geology and Soils

Most of the area is underlain by the mafic intrusive rock. Intrusive rocks of the Rustenburg Layered Suite of the Bushveld Igneous Complex. Rocks include gabbro, norite, pyroxenite and anorthosite. The shales and quartzites of the Pretoria Group (Transvaal Supergroup) also contribute. Mainly vertic melanic clays with some dystrophic or mesotrophic plinthic catenas and some freely drained, deep soils. Land types mainly Ea, Ba and Ae.

4.2.1.4 Climate

Summer rainfall with very dry winters. MAP between about 600 and 700 mm. Frost fairly frequent in winter. Mean monthly maximum and minimum temperatures for Brits- Agr 35.3°C and -3.3°C for January and June, respectively. Corresponding values are 35.3°C and -1.4°C for Rustenberg (November and July) and 32.8°C and -1.0°C for Pretoria University Experimental Farm (January and July). This unit has a relatively more temperate climate than the SVcb 1 Dwaalboom Thornveld.

4.2.1.5 Important Taxa

Tall Tree: *Acacia burkei.*

Small Trees: *Acacia caffra* (d), *A. gerrardii* (d), *A. karroo* (d), *Combretum molle* (d), *Rhus lancea* (d), *Ziziphus mucronata* (d), *Acacia nilotica, A. tor- tilis* subsp. *heteracantha, Celtis africana, Dombeya rotundifo- lia, Pappea capensis, Peltophorum africanum, Terminalia seri- cea.*

Tall Shrubs: *Euclea crispa* subsp. *crispa* (d), *Olea europaea* subsp. *africana* (d), *Rhus pyroides* var. *pyroides* (d), *Diospyros lycioides* subsp. *guerkei, Ehretia rigida* subsp. *rigida, Euc/ea undulata, Grewia flava, Pavetta gardeniifolia.*

Low Shrubs: *Asparagus cooperi* (d), *Rhynchosia nitens* (d), *Indigofera zeyheri, Justicia flava.* Woody Climbers: *Clematis brachiata* (d), *Helinus integrifolius.*

Herbaceous Climbers: *Pentarrhinum insipidum* (d), *Cyphostemma cirrhosum.* Graminoids: *Elionurus muticus* (d), *Eragrostis lehmanniana* (d), *Setaria sphacelata* (d), *Themeda tri- andra* (d), *Aristida*

scabrivalvis subsp. *scabrivalvis, Fingerhuthia africana, Heteropogon contortus, Hyperthelia dissolute, Melinis nerviglumis, Pogonarthria squarrosa.*

Herbs: *Hermannia depressa* (d), *Ipomoea obscura* (d), *Barleria macrostegia, Dianthus mooi- ensis* subsp. *mooiensis, Ipomoea oblongata, Vernonia oligo- cephala.*

Geophytic Herbs: *Ledebouria revolute, Ornithogalum tenuifolium, Sansevieria aethiopica.*

4.2.1.6 Conservation

Endangered. Target 19%. Less than 1% statutorily conserved in, for example, Magaliesberg Nature Area. More conserved in addition in other reserves, mainly in De Onderstepoort Nature Reserve. Considerably impacted, with 48% transformed, mainly cultivated and urban or built-up areas. Most agricultural development of this unit is in the western regions towards Rustenburg, while in the east (near Pretoria) industrial development is a greater threat of land transformation. Erosion is very low to moderate. Alien invasive plants occur localised in high densities, especially along the drainage lines.

4.2.2 Norite Koppies Bushveld

4.2.2.1 Distribution

North-West and Gauteng Provinces: Occurs on plains from the Rustenburg area in the west, through Marikana and Brits to the Pretoria area in the east. Altitude about 1 050–1 450 m.

4.2.2.2 Vegetation & landscape Features

A low, semi-open to closed woodland upto 5 m tall, consisting of dense deciduous shrubs and trees with very sparse undergrowth on shallow soils, with large areas not covered by vegetation. Tree and shrub layers are continuous. The stands of this unit are found on noritic outcrops and koppies, many appearing as inselbergs above the surrounding plains.

4.2.2.3 Geology & Soils

Mostly gabbro and norite with interlayered anorthosite of the Pyramid Gabbro-Norite, Rustenburg Layered Suite, with a small area of the Rashoop Granophyre Suite (felsic igneous rocks), both of the Bushveld Complex (Vaalian). Large rock boulders and very shallow lithosols occur. Soils are well drained, Glenrosa and Mispah forms; in some areas vertic, melanic clays are found as well. Land types mainly Ib. with some Ea also occurring.

4.2.2.4 Climate

Summer rainfall with dry winters. MAP from 600-700mm. Frost fairly frequent around the base of hills in winter but less so on the hills.

4.2.2.5 Important Taxa

Tall Tree: *Sclerocarya birrea* subsp. *cafra.*

Small Trees: *Combretum molle* (d), *Croton gratissimus*(d), *Ficus abutilifolia* (d), *Pappea capensis* (d), *Acacia caffra, Bridelia mollis, Combretum apiculatum, Cussonia paniculata, Dombeya rotundifolia, Faurea saligna, Ficus glumosa, Lannea discolot, Obetia tenax, Peltophorum africanum, Rhus leptodictya, Vangueria infausta, Ziziphus mucronata.*

Succulent Tree: *Euphorbia cooperi.*

Tall Shrubs: *Triaspis glaucophylla (d), Canthium gilfillanii, Clerodendrum glabrum, Diplorhynchus condylocarpon, Euclea natalensis, Grewia flavescens, G. monticola, Gymnosporia nemorosa, G. polyacantha, Pavetta eylesii, Pouzolzia mixta, Psydrax livida, Vitex zeyheri.*

Low Shrubs: *Jatropha latifolia var. latifolia (d), Abutilon austro-africanum, Hermannia floribunda, Hibiscus subreniformis, Rhus zeyheri.*

Succulent Shrub: *Tetradenia brevispicata.*

Semi parasitic Shrub: *Osyris lanceolata.*

Woody Climbers: *Helinus integrifolius, Rhoicissus tridentata, Turraea obtusifolia.*

Woody Succulent Climber: *Sarcostemma viminale.*

Herbaceous Climber: *Cyphostemma lanigerum.*

Graminoids: *Chrysopogon serrulatus (d), Setaria lindenbergiana (d), Aristida congesta, Bulbostylis humilis, Eustachys paspaloides, Heteropogon contortus, Loudetia simplex, Melinis nerviglumis, Panicum maximum, Themeda triandra.*

Herb: *Hibiscus sidiformis.*

Geophytic Herbs: *Pellaea calomelanos, P viridis, Scadoxus puniceus.*

4.2.2.6 Conservation

Endangered. Target 19%. Less than 1% statutorily conserved in, for example, Magaliesberg Nature Area. More conserved in addition in other reserves, mainly in De Onderstepoort Nature Reserve. Considerably impacted, with 48% transformed, mainly cultivated and urban or built-up areas. Most agricultural development of this unit is in the western regions towards Rustenburg, while in the east (near Pretoria) industrial development is a greater threat of land transformation. Erosion is very low to moderate. Alien invasive plants occur localised in high densities, especially along the drainage lines.

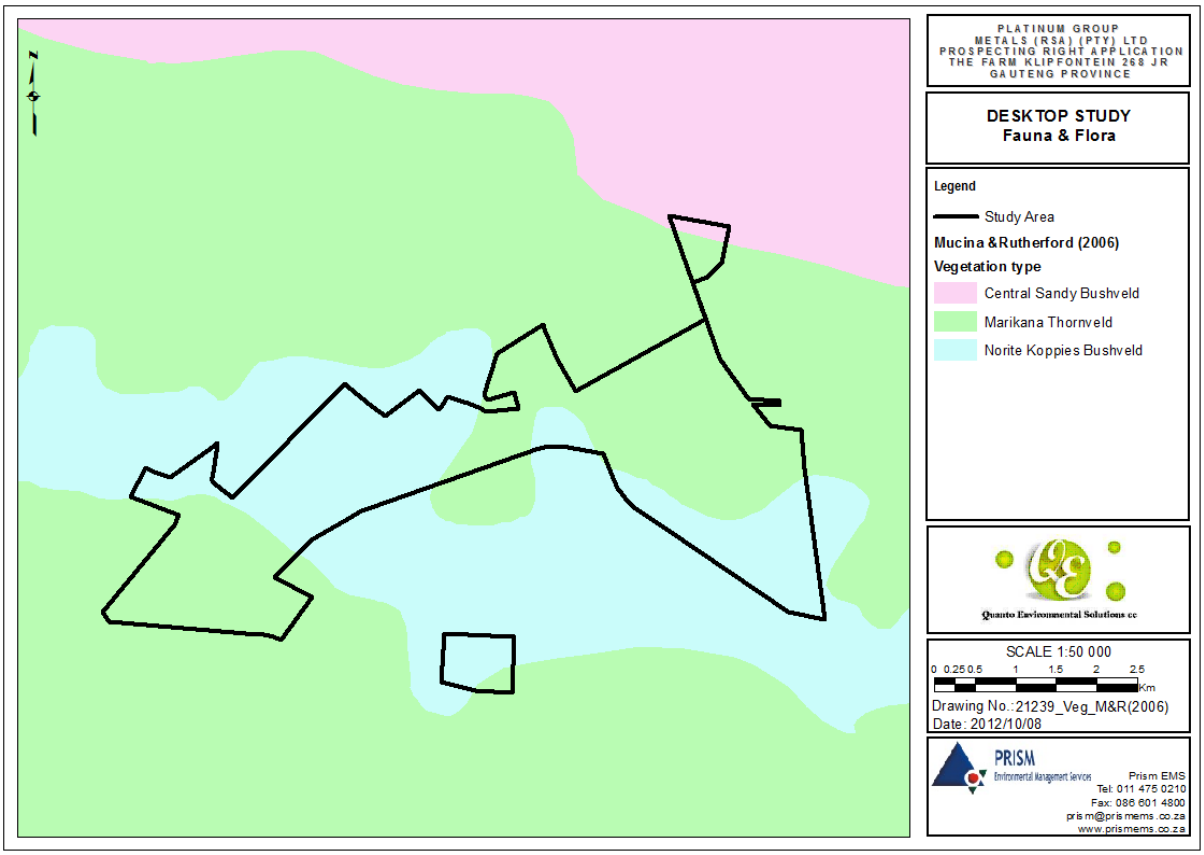

Figure 3: Vegetation types (Mucina & Rutherford; 2006)

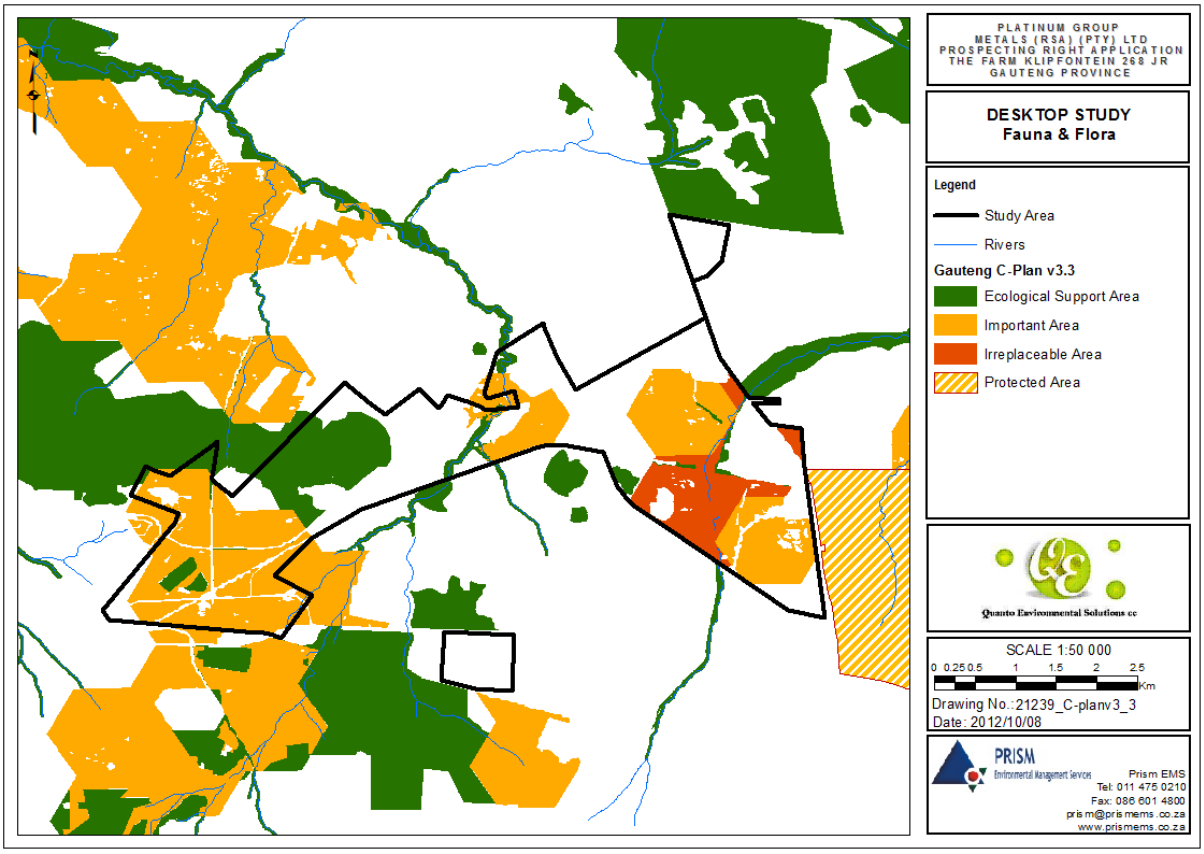

Figure 4: Gauteng Conservation Plan (C-Plan) version 3.3 for the study site (GDACE, 2011)

4.2.2.7 Gauteng Conservation Plan (C-plan)

The Gauteng Conservation Plan (C-plan) version 3.3 was consulted by means of GIS layer investigation. The C-plan version 3.3 indicated sensitivity in respect of Red Data Flora species as well as Orange Listed Plant species on the subject site (Refer to Figure 4). C-plan indicated irreplaceable and important areas with respect to Red Data Floral species were indicated to the south and east sections of the study site and fall within the quarter degree grid. The specific species and requirements in respect of floral studies must be confirmed with the Gauteng Department of Agricultural and Rural Development (GDARD), Directorate Conservation.

5 Conclusion and recommendations for further studies

After the desktop study was concluded, the following recommendation was made with regards to the specialist studies to form part of the Environmental Impact Assessment (EIA).

5.1 Faunal

The specific requirements in respect of Avi-faunal studies must be confirmed with the Gauteng Department of Agricultural and Rural Development (GDARD), Directorate Conservation.

The Avi-faunal study must be conducted to satisfy the minimum requirements for Bio-diversity studies in Gauteng as prescribed by Gauteng Department of Agricultural and Rural Development (GDARD), Directorate Conservation.

The possible presence of:

- Aonyx capensis (African clawless otter),
- *Atilax paludinosus* (African marsh mongoose),
- *Chrysospalax villosus* (Rough-haired golden mole),
- *Dasymys incomtus* (African marsh rat),
- *Lutra maculicollis* (Spotted necked otter),
- *Otomys angoniensis* (Angoni vlei rat) and
- *Otomys irroratus* (Vlei rat)

must be verified as part of an ecological study informing the Environmental Impact Assessment (EIA) for mining activities. This will be required during the mining rights application and is not required for the prospecting right phase as extensive habitat unit destruction is not envisaged.

The Faunal study must be conducted to satisfy the minimum requirements for Bio-diversity studies in Gauteng as prescribed by Gauteng Department of Agricultural and Rural Development (GDARD), Directorate Conservation.

5.2 Floral

The specific species and requirements in respect of floral studies must be confirmed with the Gauteng Department of Agricultural and Rural Development (GDARD), Directorate Conservation.

The Floral study must be conducted to satisfy the minimum requirements for Bio-diversity studies in Gauteng as prescribed by Gauteng Department of Agricultural and Rural Development (GDARD), directorate conservation.

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Appendix A – Specialist Qualifications

Table A1: Specialists consulted for this wetland delineation and their qualifications

ASPECT INVESTIGATED	SPECIALIST	QUALIFICATION	REPORT DATE
Fauna, Flora, Desktop Study. Mapping	D. Botha (Principle assessor)	M.A. Environmental Management B.A. Hons. Geography & Environmental Management, B.A. Humanities Post Higher Education Diploma Wetland and Riparian Delineation *(DWAF Accredited Short Course)* Soil Classification and Wetland Delineation - Short Course – *Terrasoil Science* Tools for Wetland Assessment – *Rhodes University*	October 2012
Fauna, Flora, Desktop Study.	A Koning (Senior assessor)	B-Tech. Nature Conservation M-Tech. Nature Conservation (In progress) M.Sc. Aquatic Health (In progress) SASS5 Accredited	October 2012
Fauna, Flora, Desktop Study.	M. Milaras (Senior assessor)	B.Sc Hons. Geography & Environmental Management B.Sc Geology & Geography	October 2012

ANNEXURE L

HERITAGE AND ARCHAEOLOGICAL ASSESSMENT

Heritage Scoping Report For The Prospecting Right Application On The Farm Klipfontein 268 JR Platinum Group Metals (RSA) (Pty) Ltd in The Gauteng Province

Prepared For

Quanto Environmental Solutions CC

By

HERITAGE
Contracts and Archaeological Consulting

CLC@UJ

PO Box 524

Auckland Park

2006

VERSION 1.1

22 OTOBER 2012

ACKNOWLEDGEMENT OF RECEIPT

CLIENT: Quanto Environmental Solutions CC

CONTACT PERSON: Leon Ellis

Cell: +27(0)82 316 4389,

Fax: 086520 0666

E – mail: leon@qesolutions.co.za

SIGNATURE: _____

LEADING CONSULTANT: Heritage Contracts and Archaeological Consulting CC

CONTACT PERSON: Jaco van der Walt

Heritage Contracts and Archaeological Consulting

Professional Member of the Association of Southern African Professional Archaeologist (#159)

I, Jaco van der Walt as duly authorised representative of Heritage Contracts and Archaeological Consulting CC, hereby confirm my independence as a specialist and declare that neither I nor the Heritage Contracts and Archaeological Consulting CC have any interest, be it business, financial, personal or other, in any proposed activity, application or appeal in respect of which the client was appointed as Environmental Assessment practitioner, other than fair remuneration for work performed on this project.

SIGNATURE: _____

EXECUTIVE SUMMARY

Site name and location: Platinum Group Metals (RSA) (Pty) Ltd applied for an extension of a prospecting right in terms of Section 102 of the Mineral and Petroleum Resource Development Act, No. 28 of 2002 ("MPRDA") on the Farm Klipfontein 268 JR in the Gauteng Province. The prospecting area applied for is in extent of 1 399 hectares and is situated in the immediate surroundings of the Rosslyn and Soshanguve area. The prospecting area is located approximately 15 km north west of Pretoria and falls within the City of Tshwane Metropolitan Municipality

1: 50 000 Topographic Map: 2528 CA.

EIA Consultant: Quanto Environmental Solutions CC.

Developer: Platinum Group Metals

Heritage Consultant: Heritage Contracts and Archaeological Consulting CC (HCAC).

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Findings of the Assessment: This report attempted to give a brief account of the history of the Farm Klipfontein 268 JR and general surrounds. By consulting various databases, maps, archival and a field visit, it was possible to compile a brief history regarding human settlement in the area. Every site is relevant to the Heritage Landscape, but it is anticipated that few if any has conservation value, therefore no fatal flaws are expected. A short field visit revealed that a range of Late Iron Age Sites occur within the study area and mitigation measures as recommended in section 10 and 11 of this report needs to be implemented to protect these sites during exploration.

Disclaimer: *Although all possible care is taken to identify sites of cultural importance during the investigation of study areas, it is always possible that hidden or sub-surface sites could be overlooked during the study. Heritage Contracts and Archaeological Consulting CC and its personnel will not be held liable for such oversights or for costs incurred as a result of such oversights.*

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ABBREVIATIONS

AIA: Archaeological Impact Assessment
ASAPA: Association of South African Professional Archaeologists
BIA: Basic Impact Assessment
CRM: Cultural Resource Management
ECO: Environmental Control Officer
EIA: Environmental Impact Assessment*
EIA: Early Iron Age*
EIA Practitioner: Environmental Impact Assessment Practitioner
EMP: Environmental Management Plan
ESA: Early Stone Age
GPS: Global Positioning System
HIA: Heritage Impact Assessment
LIA: Late Iron Age
LSA: Late Stone Age
MEC: Member of the Executive Council
MIA: Middle Iron Age
MPRDA: Mineral and Petroleum Resources Development Act
MSA: Middle Stone Age
NEMA: National Environmental Management Act
PRHA: Provincial Heritage Resource Agency
SADC: Southern African Development Community
SAHRA: South African Heritage Resources Agency

GLOSSARY

Archaeological site (remains of human activity over 100 years old)

Early Stone Age (2 million to 300 000 years ago)

Middle Stone Age (300 000 to 30 000 years ago)

Late Stone Age (30 000 years ago until recent)

Historic (approximately AD 1840 to 1950)

Historic building (over 60 years old)

Lithics: Stone Age artefacts

1. INTRODUCTION

Heritage Contracts and Archaeological Consulting CC was contracted by QES to conduct a Heritage Scoping Report as part of the Environmental Management Plan (EMP) for the prospecting application on the farm Klipfontein 268 JR. The prospecting area applied for is in extent of 1399.7453 hectares and is situated in the immediate surroundings of the Rosslyn and Soshanguve area (Figure 1). The prospecting area is located approximately 15 km north west of Pretoria and falls within the City of Tshwane Metropolitan Municipality.

The aim of the scoping report is to conduct a desktop study followed by field visit to identify possible heritage resources within the project area and to assess their importance within a Local, Provincial and National context. The study furthermore aims to assess the impact of the proposed project on non - renewable heritage resources and to submit appropriate recommendations with regards to the responsible cultural resources management measures that might be required to assist the developer in managing the discovered heritage resources in a responsible manner, in order to protect, preserve and develop them within the framework provided by Heritage legislation.

The report outlines the approach and methodology utilized for the Scoping phase of the project. The report includes information collected from various sources and consultations. Possible impacts are identified and mitigation measures are proposed in the following report. It is important to note that the study area was not subjected to a thorough field survey as part of this study, however it should be conducted as part of the Impact Assessment phase should an Environmental Impact Assessment (EIA) be required in future.

Figure 1: Locality map showing the study area in red

1.1 Terms of Reference

The main aim of this scoping report is to determine if any known heritage resources occur within the study area and to predict the occurrence of any possible heritage significant sites that might present further management action during the drilling phase of the project. The objectives of the scoping report were to:

Conduct a desktop study:

Review available literature, previous heritage studies and other relevant information sources to obtain a thorough understanding of the archaeological and cultural heritage conditions of the area;

Gather data and compile a background history of the area;

Identify known and recorded archaeological and cultural sites;

Determine whether the area is renowned for any cultural and heritage resources, such as Stone Age sites, Iron Age sites, informal graveyards or historical homesteads.

Report

The reporting of the scoping component is based on the results and findings of the desk-top study and a short site visit, wherein potential issues associated with the proposed project will be identified, and those issues requiring further investigation highlighted. Reporting will aim to identify the anticipated impacts, as well as cumulative impacts, of the operational units of the proposed drilling on the identified heritage resources. This is done to assist the developer in managing the discovered heritage resources in a responsible manner, in order to protect, preserve and develop them within the framework provided by Heritage Legislation.

1.2 Nature of the development

The Prospecting Work Programme (PWP) will consist of both Non-Invasive and Invasive Prospecting Methods.

Non-Invasive Activities will include:

- a desktop study on data availability on generic/conceptual geological model. Use of datasets supplied by the Government (Council of Geoscience) could include regional geological and geophysical plans that could be used.
- Geological Mapping to be conducted with the use of ortho-photos and aerial photography and satellite imagery of the area.
- Geophysical Survey methods on the target area.

Invasive activities will include:

- Drilling – the presence of concealed mineralization / ore body can only be confirmed and outlined by drilling. Diamond boreholes will be drilled to ascertain the sequence stratigraphy and potential prospective reef horizons. A follow up exploration drilling program will be conducted as the source for gaining ground truth information of the potential ore body and to prove continuity in the third dimension. This drilling will be conducted in a basic one phase approach. Primary Exploration drilling on a widely spaced grid which is intended to simply delineate the mineralization.

  Diamond drilling of BQ (outside diameter core of 36.4mm) size will be the preferred drilling method but as the nature of the mineralization are established other forms of drilling could be used such as percussion, reverse circulation and rotary blast be used.

  With the above being said, non-invasive prospecting methods will not have an impact on the receiving environment. Invasive activities (drilling) will have an impact, although limited, on the receiving environment.

Activities associated with drilling will include the establishment of temporary access roads where existing access roads cannot be used. These access roads will be tracks and will be utilised for the duration of the prospecting phase. A number of small drilling sample sites will be cleared from vegetation in order to allow for the drilling operation to continue. Water will be sourced off site in the event where no water is available on site. Water will be circulated throughout the drilling operation and is needed to cool the drill rig. Circulated water will be stored in temporary plastic lined sumps and cleaned with oil water separators for reuse. The area to be cleared will generally not exceed 20m X 20m.

1.3 The receiving environment

The prospecting area is located on the western limb of the Bushveld Igneous complex ("BIC"). The proposed property area falls within the jurisdiction of the City of Tshwane Metropolitan Municipality within Region 1. The affected wards are 4 and 37.

The total area applied for prospecting measures approximately 1399.7453 hectares.

Specifically the prospecting area is north of the R566 extending over the agricultural holdings of Rosslyn. Onderstepoort is situated to the east and the farm Medunsa 237 JR to the west of the prospecting area (Figure 2). Neighbouring towns of Soshanguve-south borders the prospecting area to the north. The Rosslyn Industrial area is situated to the south of the prospecting area. Neighbouring towns of Ga-Rankuwa borders the prospecting area to the west. The area is characterised as agricultural land with mining activities.

The Sandspruit flows through the north-western corner of the prospecting area in a north-westerly direction.

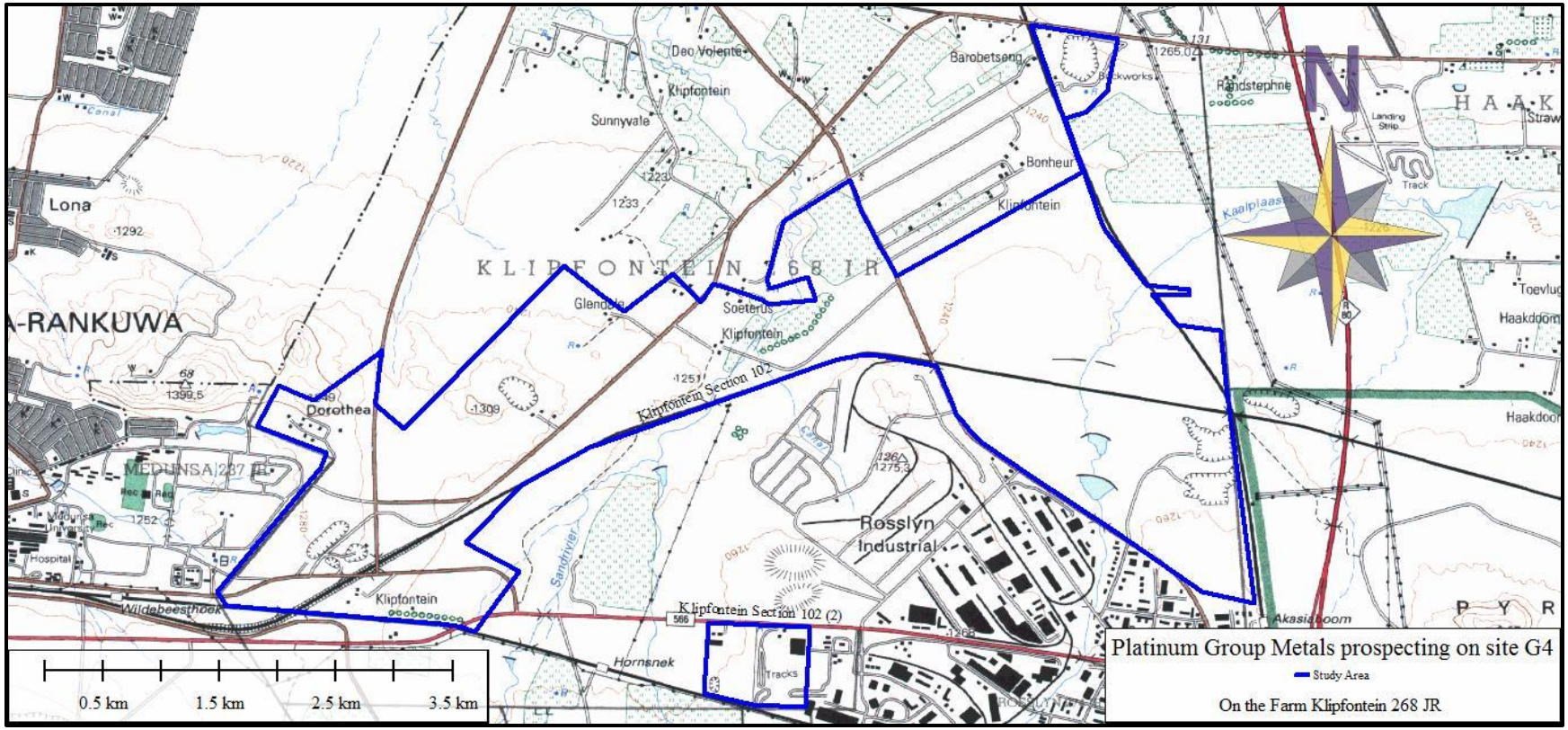

Figure 2: Study area marked in blue

2. APPROACH AND METHODOLOGY

The aim of the scoping phase is to extensively cover all archaeological and cultural heritage data available to compile a background history of the study area. In order to identify possible heritage issues that will require further mitigation or management actions before prospecting can start.

This was accomplished by means of the following phases of which the results are discussed in section 4 of this report:

2.1 Literature search

Utilising data for information gathering stored in the archaeological database at Wits, published articles on the archaeology and history of the area and a search in the National archives. The aim of this is to extract data and information on the area in question, looking at archaeological sites, historical sites, graves, architecture, oral history and ethnographical information on the inhabitants of the area.

2.2 Information collection

The SAHRA report mapping project (Version 1.0) was consulted to further collect data from CRM practitioners who undertook work in the area to provide the most comprehensive account of the history of the area where possible.

2.3 Public consultation

No public consultation was conducted during this phase.

2.4 Google Earth and mapping survey

Google Earth and 1:50 000 maps of the area were utilised to identify possible places where archaeological sites might be located.

2.5 Genealogical Society of South Africa

The database of the genealogical society was consulted to collect data on any known graves in the area.

3. LEGISLATION

For this project the National Heritage Resources Act, 1999 (Act No. 25 of 1999) is of importance and the following sites and features are protected:

a. Archaeological artefacts, structures and sites older than 100 years
b. Ethnographic art objects (e.g. prehistoric rock art) and ethnography
c. Objects of decorative and visual arts
d. Military objects, structures and sites older than 75 years
e. Historical objects, structures and sites older than 60 years
f. Proclaimed heritage sites
g. Grave yards and graves older than 60 years
h. Meteorites and fossils
i. Objects, structures and sites or scientific or technological value.

The national estate that includes the following:

a. Places, buildings, structures and equipment of cultural significance
b. Places to which oral traditions are attached or which are associated with living heritage
c. Historical settlements and townscapes
d. Landscapes and features of cultural significance
e. Geological sites of scientific or cultural importance
f. Archaeological and palaeontological importance
g. Graves and burial grounds
h. Sites of significance relating to the history of slavery
i. Movable objects (e.g. archaeological, palaeontological, meteorites, geological specimens, military, ethnographic, books etc.)

Section 34 (1) of the act deals with structures which is older than 60 years. Section 35(4) of this act deals with archaeology, palaeontology and meteorites. Section 36(3) of the National Heritage Resources Act, deals with human remains older than 60 years. Unidentified/unknown graves are also handled as older than 60 until proven otherwise.

3.1 Heritage Site Significance and Mitigation Measures

The presence and distribution of heritage resources define a Heritage Landscape. In this landscape, every site is relevant. In addition, because heritage resources are non-renewable, heritage surveys need to investigate an entire project area. In all initial investigations, however, the specialists are responsible only for the identification of resources visible on the surface.

This section describes the evaluation criteria used for determining the significance of archaeological and heritage sites. National and Provincial Monuments are recognised for conservation purposes. The following interrelated criteria were used to establish site significance:

- The unique nature of a site;
- The integrity of the archaeological/cultural heritage deposit;
- The wider historic, archaeological and geographic context of the site;
- The location of the site in relation to other similar sites or features;
- The depth of the archaeological deposit (when it can be determined or is known);
- The preservation condition of the site;
- Potential to answer present research questions.

Furthermore, The National Heritage Resources Act (Act No 25 of 1999, Sec 3) distinguishes nine criteria for places and objects to qualify as 'part of the national estate' if they have cultural significance or other special value. These criteria are:

- Its importance in/to the community, or pattern of South Africa's history;
- Its possession of uncommon, rare or endangered aspects of South Africa's natural or cultural heritage;
- Its potential to yield information that will contribute to an understanding of South Africa's natural or cultural heritage;
- Its importance in demonstrating the principal characteristics of a particular class of South Africa's natural or cultural places or objects;
- Its importance in exhibiting particular aesthetic characteristics valued by a community or cultural group;
- Its importance in demonstrating a high degree of creative or technical achievement at a particular period;
- Its strong or special association with a particular community or cultural group for social, cultural or spiritual reasons;
- Its strong or special association with the life or work of a person, group or organisation of importance in the history of South Africa;
- Sites of significance relating to the history of slavery in South Africa.

The criteria above will be used to place identified sites with in SAHRA's system of grading of places and objects which form part of the national estate, and which distinguishes between at least three categories—

(a) Grade I: Heritage resources with qualities so exceptional that they are of special national significance;

(b) Grade II: Heritage resources which, although forming part of the national estate, can be considered to have special qualities which make them significant within the context of a province or a region; and

(c) Grade III: Other heritage resources worthy of conservation.

Sites with no significance do not require mitigation; low to medium sites may require limited mitigation; while high significance requires extensive mitigation. Outstanding sites should not be disturbed at all. Recognizable graves and living heritage sites have high social value regardless of their archaeological significance.

4. REGIONAL OVERVIEW

4.1 General Information

4.1.1. Literature search

13 previously recorded sites exist with the Archaeological databases at Wits University on the 2528 CA map. These sites mostly consist of Late Iron Age Stone walling, two of these sites (CA9 and CA10) are located on the farm Klipfontein 268 JR.

4.1.2. Information collection

Several unpublished CRM projects were conducted in the general study area (van der Walt 2008 & 2012, Pelser 2010, Kusel 2003, Van Schalkwyk. & Moifatswane 2003 and van Vollenhoven 1992. The study by van Vollenhoven might have covered the entire Klipfontein Farm but this could not be verified due to time constraints in order to make the deadlines as provided by the client.

4.1 3. Public consultation

No public consultation was conducted during the scoping phase.

4.1.4. Google Earth and mapping survey

Google Earth and 1:50 000 maps of the area was utilised to identify possible places where archaeological sites might be located.

4.1.5. Genealogical Society of South Africa

No grave sites are indicated within the study area.

5. HISTORIC PERIOD

The following section will endeavour to give an account of the history of this farm and also a brief overview of the history of the area and district in which it is located. The report has been divided into several sections that will focus on the following aspects:

- General history of human settlement in the area
- The history of black and white interaction in the farm area
- The development of the farm

5.1.Historiography And Methodology

It was necessary to use a range of sources in order to give an accurate account of the history of the area in which the farm Klipfontein 268 JR is located. Sources included secondary source material, maps and archival documents.

The report was written within a limited time-frame, and should therefore only serve as an introduction to the history of the farm. Also, not all of the sources that were found could be incorporated into the report. The following are relevant sources that can be consulted in the future, if a more thorough investigation is done on the history of the farm area:

- The City Council of Pretoria. 1955. *Pretoria (1855-1955). History of the city of Pretoria published in the centenary year 1955.* Pretoria: Wallachs' P. & P. Co. Ltd.

5.2. Maps Of The Area Under Investigation

Since the mid 1800's up until the present, South Africa had been classified into various different districts. Since 1857, the farm formed part of the Pretoria District. (Geskiedenisatlas van Suid-Afrika 1999: 17) This remained the case up until the present. (Geskiedenisatlas van Suid-Afrika 1999: 20-27)

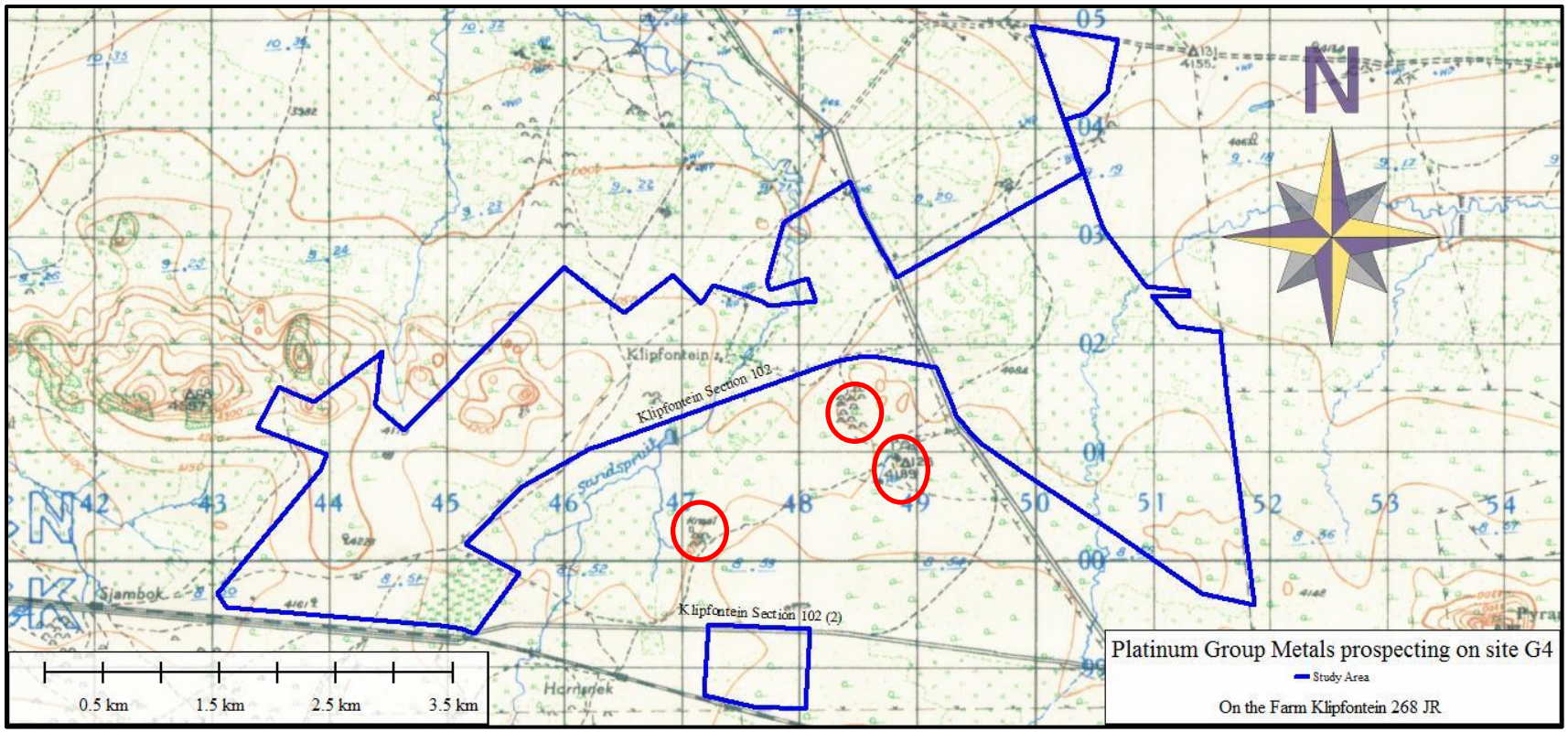

Figure 3. 1943 Map showing the study area in blue, note the presence of huts and kraals marked in red outside of the study area

5.3. A Brief History Of Human Settlement And Black And White Interaction In The Pretoria Area

J. S. Bergh's historical atlas of the four northern provinces of South Africa is a very useful source for the writing of local and regional histories. Interestingly, it seems that Klipfontein 268 JR is located in the vicinity of several Later Stone Age Terrains, collectively known as the Magaliesberg Research District. There is also one Early Stone Age Site, located slightly to the east of the farm, known as Wonderboompoort . (Geskiedenisatlas van Suid-Afrika 1999: 4) This area was also important to Iron Age communities, as one can see that Klipfontein was located within an area where many Late Iron Age terrains were found. The farm is also situated in the vicinity of an Iron Age iron smelting site. (Geskiedenisatlas van Suid-Afrika 1999: 7, 8)

The Difaqane (Sotho), or Mfekane ("the crushing" in Nguni) was a time of bloody upheavals in Natal and on the Highveld, which occurred around the early 1820's until the late 1830's. (Geskiedenisatlas van Suid-Afrika 1999: 109-115) It came about in response to heightened competition for land and trade, and caused population groups like gun-carrying Griquas and Shaka's Zulus to attack other tribes. (Geskiedenisatlas van Suid-Afrika 1999: 14; 116-119) At the beginning of the nineteenth century, the predominant black tribe in the area north of Pretoria was the Manala-Ndebele. The Kgatla were also present to the north of where Pretoria is located today. It seems that, in 1832, Shaka's Zulu tribe passed by the south of Pretoria from the southeast in a westerly direction. This was in order to attack Mzilikazi's Ndebele. This group also went on raids in various other areas in order to expand their area of influence. (Geskiedenisatlas van Suid-Afrika 1999: 11)

During the time of the Difaqane, a northwards migration of white settlers from the Cape was also taking place. Some travellers, missionaries and adventurers had gone on expeditions to the northern areas in South Africa, some already as early as the 1720's. The Scottish travellers Robert Scoon and William McLuckie passed through, or close by the area where the present-day Klipfontein 268 JR was located in 1829. In the same year, Robert Moffat and James Archbell also travelled through this area. (Geskiedenisatlas van Suid-Afrika 1999: 12) In the mid 1830's, several travellers made their way from the Pretoria area into the inland. These included the travellers Robert Scoon, Dr. Andrew Smith and Captain William Cornwallis Harris. (Geskiedenisatlas van Suid-Afrika 1999: 13)

It was however only by the late 1820's that a mass-movement of Dutch speaking people in the Cape Colony started advancing into the northern areas. This was due to feelings of mounting dissatisfaction caused by economical and other circumstances in the Cape. This movement later became known as the Great Trek. This migration resulted in a massive increase in the extent of that proportion of modern South Africa dominated by people of European descent. (Ross 2002: 39)

Pretoria was founded in 1855 and became the capital of South Africa, then known as the Zuid-Afrikaanse Republiek, in 1860. By 1900, Pretoria was a thriving Transvaal town, with shaded streets, well-kept gardens and a lively economy. In mid-1899, the Pretoria district had a white population of 21 000 men and 19 000 women, while the black, coloured and Indian population totalled 38 618. (Theron 1984: 1-3)

The Anglo-Boer War was the greatest conflict that had taken place in South Africa up to date, and also affected the Pretoria area, where the farm Klipfontein is situated. The white concentration camp located closest to this farm, was situated a small distance to the northeast of Pretoria. Another white and a black concentration camp are located to the southwest of Pretoria, in the Irene area. One battle took place at Silkaatsnek, to the northwest of Pretoria, some distance from the farm. Here, General De la Rey's Boer troops defeated the British army on 11 July 1900. (Geskiedenisatlas van Suid-Afrika 1999: 54, 250) The Boer side however generally lost ground against the British as the war continued, and in June 1900 the Boer military leaders decided that Pretoria would have to be surrendered to the British forces. This decision was inevitable if the war was to be continued. The town was very susceptible to a siege, and its defence would have gravely endangered the lives of its inhabitants. More importantly, the defence of the town would involve such a great number of Boers that the capture of these men would have surely meant the end of the war. Pretoria was therefore occupied by British forces on Tuesday 5 June 1900. (Theron 1984: 273-279)

Between 1939 and 1940, farm boundaries were drawn up in an area that includes the present-day Pretoria. (Geskiedenisatlas van Suid-Afrika 1999: 15)

5.4. Historical Overview Of The Ownership And Development Of The Farm Klipfontein 268 JR

The time frame for this report did not allow for a complete archival study, but some facets of the farms history can be deduced by studying the list of available archival documents on the property.

By 1903, the farm Klipfontein, then known as Klipfontein No. 482, was owned by one G. C. B. Brit. (National Archives of South Africa 1903) It is not certain when this farm was first proclaimed, but this is the earliest known reference to the property that could be found. In 1905, there was a suspected outbreak of a contagious disease on the farm (National Archives of South Africa 1905), and in 1907 quarantine on cattle was passed in the area (National Archives of South Africa 1907).

In the 1940s a number of farms in the Pretoria district, including Klipfontein No. 482, were subdivided. (National Archives of South Africa 1941-1949) In 1946, the farm became known as Klipfontein 268 JR. (National Archives of South Africa 1946-1959)

In the 1950s the establishment of black locations in the area of the farm Klipfontein came under discussion. (National Archives of South Africa 1950-1960) It is not certain what came of these discussions.

By 1960, the Anglo American Prospecting Company (Africa) Limited had an interest in the farm Klipfontein 268 JR. (National Archives of South Africa 1960) Together with the advent of mining activities on the property, there were a number of applications for business rights on the farm between the late 1950s and the 1990s. (National Archives of South Africa 1958-1987; National Archives of South Africa 1961-1986; National Archives of South Africa 1961-1990)

In 1965, the Peri-urban Areas Health Board purchased portions of Klipfontein, seemingly as a boundary zone for the industrial area northwest of Pretoria. (National Archives of South Africa 1965)

5.5 Conclusion – Historical

This report endeavoured to give an account of the history of the farm Klipfontein 268 JR. It was possible to ascertain that Klipfontein 268 JR had existed since at least 1903. No evidence of historical monuments or sites of great historical value on the property could be found thus far. There is however evidence that the property has captured the interest of mining companies and various businesses and government agencies since the 1960s.

6. ARCHAEOLOGICAL BACKGROUND

South Africa has one of the longest archaeological sequences in the world because humanity evolved in the area stretching from the Cape to Ethiopia. Most of this sequence covers the times when our ancestors used stone tools.

It is worthwhile, thus, to review the archaeological record for southern Africa and to place in context the known occurrences.

The archaeology of the area can be divided into the Stone Age and Iron Age time frames. Each of these will be briefly discussed

6.1 Introduction Stone Age

South Africa has a long and complex Stone Age sequence of more than 2 million years. The broad sequence includes the Later Stone Age, the Middle Stone Age and the Earlier Stone Age. Each of these phases contains sub-phases or industrial complexes, and within these we can expect regional variation regarding characteristics and time ranges. For Cultural Resources Management (CRM) purposes it is often only expected/ possible to identify the presence of the three main phases. Yet sometimes the recognition of cultural groups, affinities or trends in technology and/or subsistence practices, as represented by the sub-phases or industrial complexes, is achievable. Such finer-grained identifications may help to highlight the importance of some archaeological sites in a specific region. Table 1 provides a brief overview of the Stone Age phases and sub-phases/industrial complexes of South Africa, based on our current knowledge. The information is aimed at assisting the identification of Stone Age occurrences in the field by providing the main associated characteristics, and it provides the broadly associated age estimates. Users of this document should, however, remember that the outlines are broad, and any field interpretations can only be considered preliminary observations until further research is conducted.

Cultural sequence	**~ Associated ages**	**Associated characteristics**
Later Stone Age; associated with Khoi and San societies and their immediate predecessors		
See sub-phases below for more detailed chronology	Recently to ~30 thousand years ago	Include stone tools mostly < 25 mm, bored stones, grinding stones, grooved stones, ostrich eggshell beads, bone tools sometimes with decoration, decorated ostrich eggshell flasks and fishing equipment These are the general characteristics for the Later Stone Age. In the sub-divisions below I highlight differences or characteristics that may be used to refine interpretations depending on context.
Broad overview of Later Stone Age sub-phases/industrial complexes		
Hunters-with-livestock/herders (e.g. Mitchell 2002; Lombard & Parsons 2008; Sadr 2008)	Mostly less than 2 thousand years ago	Regular occurrence of blades and bladelets, but formal stone tools are rare, backed pieces mostly absent, grindstones are common, stone bowls and boat-shaped grinding grooves may occur Sheep, goat, cattle and dog bones along with wild species Pottery is mostly well-fired, thin-walled, sometimes with

		lugs, spouts and coned bases, sometimes with comb-stamping
Post-Wilton (includes some Smithfield phases) (e.g. Deacon & Deacon 1999; Lombard & Parsons 2008)	~1 hundred -3 thousand years ago	Mostly macrolithic (stone tools > 20 mm) and informal sometimes with blades and bladelets Characterised by large untrimmed flakes At some sites there are also small backed tools, scrapers and adzes Sometimes includes thick-walled, grass-tempered potsherds
Wilton (includes some Smithfield phases) (e.g. Deacon & Deacon 1999; Wadley 2007)	~4-8 thousand years ago	Microlithic (stone tools < 20 mm) High incidence of backed bladelets and geometric shapes such as segments Include borers, small scrapers, double scrapers, polished bone tools
Oakhurst (includes Albany and Lockshoek) (e.g. Deacon & Deacon 1999; Wadley 2007)	~8-12 thousand years ago	Characterised by round, end and D-shaped scrapers, adzes and a wide range of polished bone tools Few or no microliths
Robberg (Deacon & Deacon 1999; Wadley 2007)	~12-22 thousand years ago	Characterised by few backed tools, few scrapers, significant numbers of unretouched bladelets
Early Later Stone Age	~30-40 thousand years ago	Described at some sites, but as yet unclear whether this represents a real archaeological phase or a mixture of LSA/MSA artefacts
Middle Stone Age; associated with *Homo sapiens* and archaic modern humans		
See sub-phases below	~30-300	Mostly based on prepared core techniques, and the

for more detailed chronology	thousand years ago	production of triangular flakes with convergent dorsal scars and faceted striking platforms Most pieces are in the region of 40-100 mm Often includes the deliberate manufacture of parallel-sided blades and flake-blades Sometimes produced using the Levallois technique Occasionally includes marine shell beads, bone points, engraved ochre nodules and engraved ostrich eggshell fragments These are the general characteristics for the Middle Stone Age. In the sub-divisions below I highlight differences or characteristics that may be used to refine interpretations depending on context
Broad overview of Middle Stone Age sub-phases/industrial complexes		
Final Middle Stone Age (informal designation partly based on the Sibudu sequence) (Jacobs et al. 2008; Wadley, 2005, 2010)	~30-40 thousand years ago	Could include bifacially retouched, hollow-based points Small bifacial and unifacial points Could include backed geometric shapes such as segments, as well as side scrapers
Late Middle Stone Age (informal designation partly based on the Sibudu sequence) (Jacobs et al. 2008; Wadley 2010)	~45-50 thousand years ago	Most formal retouch aimed at producing unifacial points Sometimes includes bifacially retouched points
Post-Howieson's Poort (also referred to as MSA III at Klasies River or MSA 3 generally) (e.g. Soriano et al. 2007; Jacobs et al.	~47-58 thousand years ago	Most points are produced using Levallois technique, and many are unifacially retouched Some side scrapers are present Backed pieces are rare

2008:734)		
Howieson's Poort Industry (e.g. Jacobs et al. 2008:734)	~58-66 thousand years ago	Characterized by blade technology and the presence of small (< 4 cm) backed tools (made on blades), including segments, trapezes and backed blades.
Still Bay Industry (e.g. Jacobs et al. 2008; Lombard et al. 2010; Henshilwood & Dubreuil 2011)	~70-77 thousand years ago	Characterised by thin (< 10 mm), bifacially worked foliate or lanceolate points with either a semicircular or wide-angled pointed butt Could include finely serrated points
Mossel Bay Industry (also referred to as MSA II at Klasies River or MSA 2b generally) (e.g. Wurz 2010, in press)	~85-105 thousand years ago	Characterised by a unipolar Levallois-type point reduction Products have straight profiles, percussion bulbs are prominent and often splintered or ring-cracked Formal retouch is infrequent, restricted to sharpening the tip or shaping the butt
Klasies River sub-stage (also referred to as MSA I at Klasies river or MSA 2a generally) (e.g. Wurz 2010, in press)	~105-115 thousand years ago	Mostly large blades, pointed flakes are elongated and thin, often with curved profiles Platforms are often diffuse and lack clear percussion marks Low frequencies of retouch, few denticulated pieces
MSA 1 (tentative, informal designation) (Volman 1984; Thompson et al. 2010)	Suggested age OIS 6 (~130-195 thousand years ago)	Platforms are mostly plain Very little formal retouch Flakes are mostly short and broad, few have denticulate retouch Rare scraper retouch
Sangoan Sometimes observed between MSA and ESA deposits, some researcher place this	> 200 thousand years ago, but few sites in southern Africa have been	Contains small bifaces (< 100 mm), picks, heavy- and light-duty denticulated and notched scrapers

phase under the Middle Stone Age, others under the Earlier Stone Age, the designation is thus not yet clear (e.g. Kuman et al. 2005)	dated	
Earlier Stone Age; associated with early *Homo* groups such as *Homo habilis* and *Homo erectus*		
Fauresmith (e.g. Porat et al. 2010)	~400-600 thousand years ago	Generally includes small handaxes, long blades and convergent/pointed pieces
Acheulean (e.g. Kuman 2007; Mitchell 2002)	~300 thousand-1.5 million years ago	Bifacially worked handaxes and cleavers, large flakes > 10 cm Some flakes with deliberate retouch, sometimes classified as scrapers Give impression of being deliberately shaped, but could indicate result of knapping strategy Sometimes shows core preparation Mostly found in disturbed open-air locations
Oldowan (e.g. Kuman 2007; d'Errico & Backwell 2009; Mitchell 2002)	~1.5 -> 2 million years ago	Cobble, core or flake tools with little retouch and no flaking to predetermined patterns Hammerstones, manuports, cores Polished bone fragments/tools

Table 1. *Outline of the Stone Age cultural sequence of South Africa. The information presented here provides a basic, simplified interpretation for the Stone Age sequence. Details may vary from region to region and from site to site. Most of the criteria such as dating, transitional phases, technological phenomena and recursions are currently being researched, so that the information cannot be considered static or final*

6.2 Iron Age

6.2.1. Iron Age (general)

The Iron Age as a whole represents the spread of Bantu speaking people and includes both the pre-Historic and Historic periods. It can be divided into three distinct periods:

The Early Iron Age: Most of the first millennium AD.

The Middle Iron Age: 10th to 13th centuries AD

The Late Iron Age: 14th century to colonial period.

The Iron Age is characterised by the ability of these early people to manipulate and work Iron ore into implements that assisted them in creating a favourable environment to make a better living.

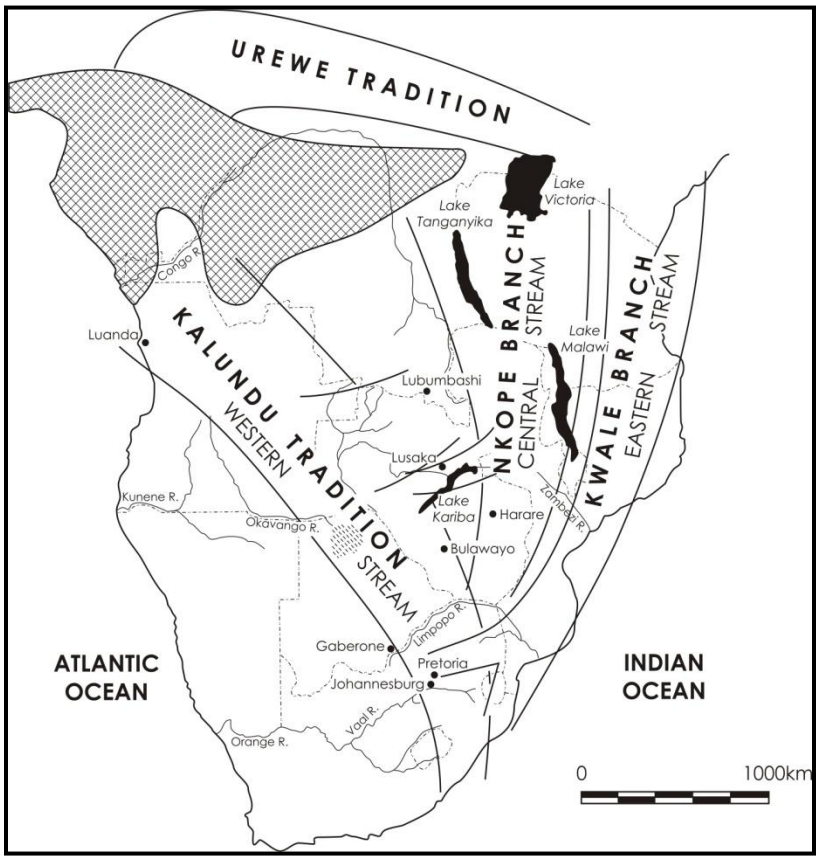

Figure 4*: Movement of Bantu speaking farmers (Huffman 2007)*

6.2.2 Early Iron Age

Early in the first millennium AD, there seem to be a significant change in the archaeological record of the greater part of eastern and southern Africa lying between the equator and Natal. This change is marked by the appearance of a characteristic ceramic style that belongs to a single stylistic tradition. These Early Iron Age people practised a mixed farming economy and had the technology to work metals like iron and copper. A meaningful interpretation of the Early Iron Age has been hampered by the uneven distribution of research conducted so far; this can be partly attributed to the poor preservation of these early sites.

Sites belonging to the EIA consisting of *Happy Rest and Mzonjani facies* have been recorded close to the project area. Happy Rest and Mzonjani pottery form part of two traditions (Kalundu and Urewe) that represent the spread of mixed farmers into southern Africa during the Early Iron Age (See Figure 1). This find is important as it provides evidence for early interaction between these groups. Later, by the 8th and 9th centuries, the two merged to form a new facies, *Doornkop*.

6.2.3 Middle Iron Age

No sites dating to this period are on record close to the study area.

6.2.4 Late Iron Age

For the area in question the history and archaeology of the Sotho Tswana are of interest. The ceramic sequence for the Sotho Tswana is referred to as Moloko and consists of different facies with origins in either the Icon facies or a different branch associated with Nguni speakers. Several sites belonging to the Madikwe and Olifantspoort facies (from Icon) have been recorded close to the project area. These sites date to between AD 1500 and 1700 and predate stone walling ascribed to Sotho-Tswana speakers.

What is of interest here is the Swartkoppies mountain range that extents into the southern part of the study area this area is renowned for its LIA stone walled settlements. A detailed survey of the mountain range on the farm Hoekfontein (located to the west of the current study area) identified 470 individual archaeological sites (Kusel 2003) covering an area of about 1000 hectares (Pelser 2007). Unfortunately almost 110 of these sites were already negatively impacted on in 2007. Another site worth mentioning is the LIA stone walled complex at Medunsa on the southern border of the prospecting area. The sites are currently being researched as part of a Master's Thesis project. Following the classification system used for Makau these sites belong to Mike Taylor's (1979) group 2, particularly group 2a. These sites date to between AD 1650 and AD 1840.

Sotho Tswana stonewalled sites with Uitkomst pottery have been found close to the study area and dates to the seventeenth to nineteenth centuries.

6.3. Concluding remarks

The brief background study above indicates that an extensive range of LIA manifestations can be expected in the area demarcated for potential prospecting, particularly in the south close to hills and mountain ranges.

7 PROBABILITY OF OCCURRENCE OF SITES

Based on the above information, it is possible to determine the probability of finding archaeological and cultural heritage sites within the study area to a certain degree. For the purposes of this section of the report the following terms are used – low, medium and high probability. Low indicates that no known occurrences of sites have been found previously in the general study area, medium probability indicates some known occurrences in the general study area are documented and can therefore be expected in the study area and a high probability indicates that occurrences have been documented close to or in the study area and that the environment of the study area has a high degree of probability having sites.

» Palaeontological landscape

Fossil remains. Such resources are typically found in specific geographical areas, e.g. the Karoo and are embedded in ancient rock and limestone/calcrete formations exposed by road cuttings and quarry excavation: *Unknown.*

» Archaeological And Cultural Heritage Landscape

NOTE: *Archaeology is the study of human material and remains (by definition) and is not restricted in any formal way as being below the ground surface*.

*Archaeologica*l remains dating to the following periods can be expected within the study area:

» Stone Age finds

ESA: *Low Probability*
MSA*: High Probability*
LSA: Medium Probability
LSA –Herder: Low Probability

» Iron Age finds

EIA: *Low - Medium Probability*
MIA*: Low Probability*
LIA: High Probability

» Historical finds

Historical period: *Low -Medium Probability*
Historical dumps: *Low -Medium Probability*
Structural remains: *Low -Medium Probability*
Cultural Landscape*: Low -Medium probability*

» Living Heritage
For example rainmaking sites: *Low Probability*

» Burial/Cemeteries

Burials over 100 years: M*edium Probability*
Burials younger than 60 years*: Higher Probability*

Subsurface excavations or drilling including ground levelling, landscaping, and foundation preparation can expose any number of these.

8. ASSUMPTIONS AND LIMITATIONS

The study area was not subjected to a thorough field survey. It is assumed that information obtained for the wider area is applicable to the study area.

9. FINDINGS

The heritage scoping study revealed that the following heritage sites, features and objects that can be expected within the study area

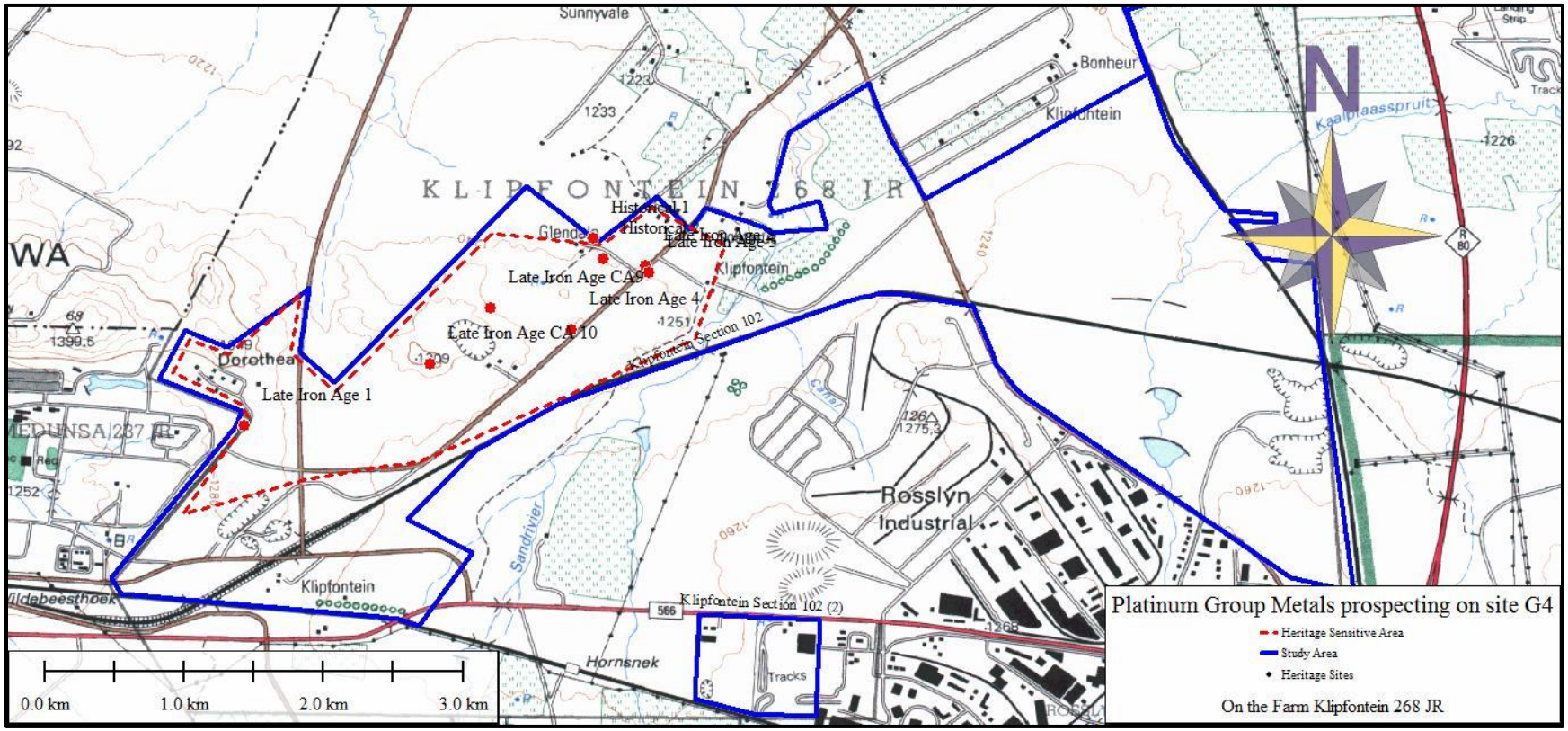

Figure 5: Distribution of documented sites

9.1. Archaeology

9.1.1 Archaeological finds

There is a high likelihood of finding Middle Stone Age artefacts scattered over the study area; these sites are mostly out of context and of low - medium archaeological significance. There is an increased likelihood of finding Stone Age material nearer to rivers, tributaries and ridges. Several stone walled settlements are known from the literature occurring in the wider region (Medunsa S25 36 27.5451 E28 01 35.8124) Makau S25 36 9.1419 E 27 54 47.2624) Zambok Zyn Kraal S25 35 42.1251 E 28 01 17.5626. Several other sites have been recorded during the short site visit.

Site Number	Type Site	Cultural Markers	Co ordinate	Heritage Significance
Late Iron Age 1	Late Iron Age	Stone Walls and Ceramics	S25 36 42.4 E28 02 06.9	Medium
Late Iron Age 2	Late Iron Age	Stone Walls and Ceramics	S25 36 05.3 E28 03 39.8	Medium
Late Iron Age 3	Late Iron Age	Stone Walls and Ceramics	S25 36 06.8 E28 03 40.8	Medium
Late Iron Age 4	Late Iron Age	Stone Walls and Ceramics	S25 36 20.1 E28 03 22.8	Medium
Late Iron Age CA9	Late Iron Age	Stone Walls and Ceramics	S25 36 15.0 E28 03 04.0	Medium
Late Iron Age CA10	Late Iron Age	Stone Walls and Ceramics	S25 36 28.0 E28 02 50.0	Medium

Figure 6. Ill-defined stone walling

Figure 7. Late Iron age stone walling

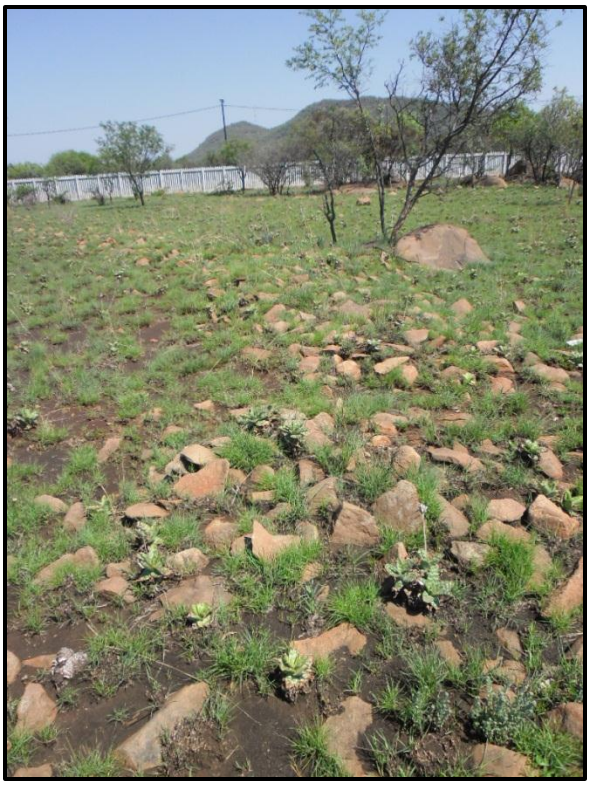

Figure 8.Stone walling in study area

9.1.2 Nature of Impact

Drilling and associated activities like roads etc could directly impact on surface and subsurface archaeological sites.

9.1.3 Extent of impact

Drilling could have a low to medium impact on a local scale.

9.2. Historical period

9.2.1 Historical finds:

Historical finds include middens, structural remains and cultural landscape. The desktop study highlighted the fact that the area was occupied at least from the 1900's and features dating to this period associated with farming can be expected.

Site Number	Type Site	Cultural Markers	Co ordinate	Heritage Significance
Historical 1	Possibly Historical	Square stone foundations	S25 35 58.9 E28 03 27.8	Low
Historical 2	Possibly Historical	Square stone foundations	S25 36 03.6 E28 03 30.2	Low

9.2.2 Nature of Impact

Drilling activities can directly impact on historic sites affecting both the visual context and sense of place of historical sites.

9.2.3 Extent of impact

Drilling activities will have a negligible impact on the historic time period and cultural landscape due to the lack of any noteworthy sites in the area.

9.3. Burials and Cemeteries

9.3.1 Burials and Cemeteries

Graves can be expected especially close to the river with more recent formal and informal cemeteries anywhere else on the landscape.

9.3.2 Nature of Impact

Drilling activities could directly impact on marked and unmarked graves.

9.3.3 Extent of impact

The activities could have a low to medium impact on a local scale.

10. POTENTIAL SIGNIFICANCE OF HERITAGE RESOURCES

Based on the current information obtained for the area at a desktop level it is anticipated that any sites that occur within the proposed development area will be graded as Generally Protected B.

11. CONCLUSIONS AND RECOMMENDATIONS

This report endeavoured to give an account of the history of the farm Klipfontein268 JR. Several sites that are protected by Heritage legislation were identified that might be impacted on by the proposed exploration activities. Although every site is relevant to the Heritage Landscape, t it is anticipated that few if any sites in the area have conservation value. However these sites are protected by legislation and some management actions will be necessary to protect the archaeological sites within the study area from drilling activities.

Here brief consideration is given to measures that would be required during drilling activities in the lease area.

OBJECTIVE: prevent unnecessary disturbance and/or destruction of historical features, graves and archaeological sites.

Project component/s	Exploration activities		
Potential impact	Damage and disturbance to the cultural heritage of the area.		
Activity risk/source	Impact of drilling sites and new access roads on cultural heritage of the area.		
Mitigation: target/objective	To retain historical features, graves and archaeological sites in undisturbed condition.		
Mitigation: Action/control		**Responsibility**	**Timeframe**
Mini heritage management plan must be implemented. Survey of drilling points and identification of no go areas.		ECO	Duration of drilling activities
Performance indicator	Historical features, graves and archaeological sites remain undamaged.		
Monitoring	No activity outside of agreed upon ‘archaeologically cleared areas”.		

» Archaeological sites

All sites could be mitigated either in the form of conservation of the sites or by a Phase 2 study where the sites will be recorded and sampled before the client can apply for a destruction permit for these sites prior to destruction.

» Historical finds and Cultural landscape

It is not anticipated that the built environment will be severely impacted upon as it is assumed that no buildings will be demolished for drilling activities. However, direct and indirect impacts on the cultural landscape and possible historical sites can only be assessed during a survey of the drilling points and suitable mitigation measures proposed.

» Burials and cemeteries

Formal and informal cemeteries as well as pre-colonial graves occur widely across Southern Africa. It is generally recommended that these sites are preserved *in-situ.* These sites can how ever be relocated if conservation is not possible, but this option must be seen as a last resort. The presence of any grave sites can only be confirmed during a thorough field survey and the public consultation process.

General

It is recommended that as part of the public consultation process the history of the area as well as the oral history pertaining to the area must be recorded.

12. PLAN OF STUDY

Compilation of a mini heritage management plan and watching brief complying with the National Heritage Resources Act (Act 25 of 1999) to ensure that drilling activities do not impact on heritage resources. This includes basic training for construction staff on possible finds, action steps for mitigation measures, surface collections, excavations and communication routes to follow in the case of a discovery. It is further recommended that an Phase 1 Archaeological Impact Assessment must be undertaken focussing on the drilling points.

13. LIST OF PREPARERS

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14. STATEMENT OF COMPETENCY

The author of the report is a member of the Association of Southern African Professional Archaeologists and is also accredited in the following fields of the Cultural Resource Management (CRM) Section, member number 159: Iron Age Archaeology, Colonial Period Archaeology, Stone Age Archaeology and Grave Relocation.

Jaco serves as a council member for the CRM Section of the Association of Southern African Association Professional Archaeologists and is also an accredited CRM Archaeologist with SAHRA and AMAFA.

Jaco has been involved in research and contract work in South Africa, Botswana, Mozambique, Zimbabwe and Tanzania and conducted well over 300 AIAs since he started his career in CRM in 2000. This involved several mining operations, Eskom transmission and distribution projects and infrastructure developments. The results of several of these projects were presented at international and local conferences.

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MAPS

Google Earth. 2011. 25°*45'56.30" S 28°20'54.78" E elev 1350m. [Online]. [Cited 10 December 2011].*

Google Earth. 2011. Map of Klipfontein 286 JR.

ANNEXURE M

IMPACT ASSESSMENT METHODOLOGY

Methodology for Environmental Impact Assessment

In order to adequately assess and evaluate the impacts and benefits associated with the project it was necessary to develop a methodology that could scientifically achieve this and to reduce the subjectivity involved in making such evaluations. For proper decision making it is necessary to assess all legal requirements and clearly defined criteria in order to accurately determine the significance of the predicted impacts or benefits on the surrounding natural and social environment.

This section will aim to discuss the methodology to be followed to determine, assess and describe possible impacts as a result of project implementation. Impacts will be discussed in terms of the construction, operational and decommissioning/closure phases of the project. The evaluation of impacts is conducted in terms of the criteria discussed below. The various environmental impacts and benefits of this project will be discussed in terms of the nature of the impact, as well as the status, certainty, duration, magnitude, extent, intensity, frequency and significance. The significance rating of each impact will determine whether or not mitigation will be required.

The EIA will also aim to achieve the following:

- Provide an overall assessment of the social and biophysical environments affected by the proposed project;
- Assess the study area in terms of environmental criteria;
- Identify and recommend appropriate mitigation measures for potentially significant environmental impacts, and
- Successfully analyse all public issues raised to date in order to recommend appropriate mitigation measures for all social and environmental related concerns.

Impacts and benefits are assessed before and after the application of mitigation measures.

Status of the Impact

The nature or status of the impact is determined by the conditions of the environment prior to construction and operation. A discussion on the nature of the impact will include a description of what causes the effect, what will be affected and how will it be affected. The nature of the impact can be described as negative or positive and can be derived from the significance rating of the impacts.

RATING	DESCRIPTION	QUANTITATIVE RATING
Positive	A benefit to the holistic environment	1
Negative	A detriment to the holistic environment	-1

Probability of the Impact

The certainty or probability of the impact describes the likelihood of the impact actually occurring.

RATING	DESCRIPTION	QUANTITATIVE RATING
Improbable	In all likelihood the impact will not occur	1
Low Probability	Possibility of the impacts to materialise is very low	2
Probable	A distinct possibility that the impact will occur	3
Highly Probable	Most likely that the impact will occur	4
Definite	The impact will occur regardless of any prevention measures.	5

Frequency of the impact

The frequency of the impact refers to the temporal scale of the impact or benefit, in terms of the period of time that the surrounding environment will be affected or altered by the proposed project. This is determined by the following scale:

RATING	DESCRIPTION	QUANTITATIVE RATING
Continuous	Daily	1
Frequent	Less than daily (hours)	0.8
Infrequent	Moderate frequency (weekly)	0.5
Occasional	Less than weekly (Once or twice per month)	0.2

Spatial Extent of the impact

The extent of the impact refers to the spatial scale of the impact or benefit of the proposed project and the area over which it extends. A description is provided of whether effects are limited in extent or affects a wide area or group of people. The extent is rated according to the following scale:

RATING	DESCRIPTION	QUANTITATIVE RATING
Site Specific	• Effects occur within the site/servitude boundary	1
Local	• Effects extend beyond the site boundary • Affects immediate surrounding areas	2
Regional	• Widespread effect • Extends far beyond the site boundary • Effects felt within a 50km radius of the surface lease area	3
National	• Effects felt beyond the 50km radius	4

Intensity of the impact

The severity or intensity of an impact is an attempt to quantify the magnitude of the impacts and benefits associated with the proposed project. The severity scale accounts for extent

and magnitude, but is subject to the value judgement of the report writer. The following scale is useful in measuring severity and benefit.

RATING	DESCRIPTION	QUANTITATIVE RATING
Very Severe	• Substantial deterioration/improvement • Irreversible or permanent • Cannot be mitigated	4
Very Beneficial	• Permanent improvement and benefit	4
Severe	• Marked deterioration • Long term duration • Serious and severe impacts • Mitigation is very expensive, difficult or time consuming	3
Beneficial	• Large improvement • Long term duration	3
Moderately Severe	• Moderate deterioration • Medium term to long term duration • Fairly easily mitigated	2
Moderately Beneficial	• Moderate improvement • Medium to long term duration	2
Slight	• Minor deterioration • Short to medium term duration • Mitigation is easy, cheap or quick	1
Beneficial	• Minor improvement • Short to medium term duration	1

Duration of the impact

The duration of the impact refers to the temporal scale of the impact or benefit, in terms of the period of time that the surrounding environment will be affected or altered by the proposed project. This is determined by the following scale:

RATING	DESCRIPTION	QUANTITATIVE RATING
Short Term	• 0 – 5 years • Less than the project lifespan	1
Medium Term	• 5 – 10 years	2
Long Term	• Life of project • 15 – 40 years	3
Permanent	• Where the impact will be irreversible and will remain	4

Significance of the impact

After assessment of an impact in accordance to the preceding six criteria, the significance of an impact can be determined through a synthesis of the aspects produced in terms of their status, probability, duration, frequency, extent and severity. The significance of an impact is an expression of the cost or value of an impact to society. The focus of EIAs must be a judgement as to whether or not impacts are significant, based upon the value system of society, or groups of people (Thompson, 1988, 1990).

This subsection presents the criteria used to define significant effects on the environment. A high ranking for natural and cultural impacts will result in a significant negative impact on the existing environment. A high ranking for social impacts will give the indication that the impact will be positive. The rankings of each of the different impacts [health, safety, environment and community (social)] relates to the maximum and minimum totals that can be achieved for each possible impact.

The totals were used to calculate the threshold "classes" to determine the significance of the impact.

RATING	DESCRIPTION	THRESHOLD OF SIGNIFICANCE (NEGATIVE)
High	• Negative long term/permanent change to the natural and social environment	**13– 18**
Medium	• Medium or long term effects to the natural and social environment • These effects are real and mitigation is possible, difficult and often costly	**7 – 12.9**
Low	• Short term effects on the natural and environment • Effects are not substantial and are often viewed as unimportant • Mitigation is cheap, easy, quick or seldom required	**0 – 6.9**

Some impacts will prove to be positive and a benefit to the social and or natural environment. Although these impacts will be rated in accordance with the methodology provided above, high significance values could be obtained. The nature or status of the impact then proves to be the key indicator. Should the nature of the activity, as assessed, be positive the significance threshold will be reversed and the impact will be a benefit to the holistic environment.

RATING	DESCRIPTION	THRESHOLD OF SIGNIFICANCE (POSITIVE)
High	• To the greater benefit of the social and/or natural environment • No mitigation or monitoring needed	**13 – 18**

Medium	• A benefit to the holistic environment • Monitoring is needed • Some mitigation is needed	**7 – 12.9**
Low	• No real benefit to the holistic environment • Mitigation and monitoring is needed	**0 – 6.9**

An example of the Impact Assessment methodology is provided below. The significance is determined by the following formula:

*(Status * Certainty/Probability + Duration + Extent + Intensity)*Frequency = Significance.*

This method for assessing the significance of impacts will be repeated for all three project phases i.e. Construction, Operation and Decommissioning. Impacts were also assessed in terms of project activities. The reason for this is that different environmental impacts can be expected for various project activities. For example, impacts on air quality associated with slag and alloy tapping will vary if compared with the impacts expected for handling of raw materials. This approach allows for a more adequate assessment of impacts and additional mitigating measures that should be identified and implemented per project related activity.