



mineral resources

Department:

Mineral Resources

REPUBLIC OF SOUTH AFRICA

ENVIRONMENTAL IMPACT ASSESSMENT REPORT And ENVIRONMENTAL MANAGEMENT PROGRAMME REPORT

SUBMITTED FOR ENVIRONMENTAL AUTHORIZATIONS IN TERMS OF THE NATIONAL ENVIRONMENTAL MANAGEMENT ACT, 1998 AND THE NATIONAL ENVIRONMENTAL MANAGEMENT WASTE ACT, 2008 IN RESPECT OF LISTED ACTIVITIES THAT HAVE BEEN TRIGGERED BY APPLICATIONS IN TERMS OF THE MINERAL AND PETROLEUM RESOURCES DEVELOPMENT ACT, 2002 (MPRDA) (AS AMENDED)

NAME OF APPLICANT: Kimsa Mining (Pty) Ltd
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FILE REFERENCE NUMBER SAMRAD: (NC) 30/5/1/1/2/13217 PR

1. IMPORTANT NOTICE

In terms of the Mineral and Petroleum Resources Development Act, 2002 (Act 28 of 2002 as amended), the Minister must grant a prospecting or mining right if among others the mining “will not result in unacceptable pollution, ecological degradation or damage to the environment”.

Unless an Environmental Authorisation can be granted following the evaluation of an Environmental Impact Assessment and an Environmental Management Programme report in terms of the National Environmental Management Act, 1998 (Act 107 of 1998) (NEMA), it cannot be concluded that the said activities will not result in unacceptable pollution, ecological degradation or damage to the environment.

In terms of section 16(3)(b) of the EIA Regulations, 2014, any report submitted as part of an application must be prepared in a format that may be determined by the Competent Authority and in terms of section 17 (1)(c) the competent Authority must check whether the application has taken into account any minimum requirements applicable or instructions or guidance provided by the competent authority to the submission of applications.

It is therefore an instruction that the prescribed reports required in respect of applications for an environmental authorisation for listed activities triggered by an application for a right or a permit are submitted in the exact format of, and provide all the information required in terms of, this template. Furthermore, please be advised that failure to submit the information required in the format provided in this template will be regarded as a failure to meet the requirements of the Regulation and will lead to the Environmental Authorisation being refused.

It is therefore an instruction that the Environmental Assessment Practitioner must process and interpret his/her research and analysis and use the findings thereof to compile the information required herein. (Unprocessed supporting information may be attached as appendices). The EAP must ensure that the information required is placed correctly in the relevant sections of the Report, in the order, and under the provided headings as set out below, and ensure that the report is not cluttered with un-interpreted information and that it unambiguously represents the interpretation of the applicant.

2. OBJECTIVE OF THE ENVIRONMENTAL IMPACT ASSESSMENT PROCESS

The objective of the environmental impact assessment process is to, through a consultative process—

- (a) determine the policy and legislative context within which the activity is located and document how the proposed activity complies with and responds to the policy and legislative context;
- (b) describe the need and desirability of the proposed activity, including the need and desirability of the activity in the context of the preferred location;
- (c) identify the location of the development footprint within the preferred site based on an impact and risk assessment process inclusive of cumulative impacts and a ranking process of all the identified development footprint alternatives focusing on the geographical, physical, biological, social, economic, heritage and cultural aspects of the environment;
- (d) determine the—
 - (i) nature, significance, consequence, extent, duration, and probability of the impacts occurring to inform identified preferred alternatives; and
 - (ii) degree to which these impacts—
 - (aa) can be reserved;
 - (bb) may cause irreplaceable loss of resources; and
 - (cc) can be avoided, managed or mitigated.
- (e) identify the most ideal location for the activity within the preferred site based on the lowest level of environmental sensitivity identified during the assessment;
- (f) identify, assess, and rank the impacts the activity will impose on the preferred location through the life of the activity;
- (g) identify suitable measures to manage, avoid or mitigate identified impacts; and
- (h) identify residual risks that need to be managed and monitored.

PART A**SCOPE OF ASSESSMENT AND ENVIRONMENTAL IMPACT ASSESSMENT REPORT****3. Contact Person and Correspondence Address****a) Details of:-****i) Details of the EAP who prepared the report:**

Name of the Practitioner:	ROELIEN OOSTHUIZEN
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Physical Address:	Farm Oberon; Kimberley, 8301
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ii) Appointed by:

Kimswa Mining (Pty) Ltd

iii) Expertise of the EAP**(1) The qualifications of the EAP**

Registered as an Environmental Assessment Practitioner: Number 2019/1467 (EAPASA)
Masters in Environmental Management (UFS)
B-Comm in Human and Industrial- Psychology (NWU)
(with evidence attached as **Appendix 1**)

(2) Summary of the EAP's past experience

(In carrying out the Environmental Impact Assessment Procedure)

Relevant past experiences in carrying out the Environmental Impact Assessment Procedures include Environmental Impact Assessments, Environmental Management Plans/Programmes/ Reports, Performance assessments, Rehabilitation progress assessments, Environmental Liability assessments, Environmental compliance monitoring, Scoping Reports, etc. See attached CV.
(with evidence attached as **Appendix 2**)

b) Description of the property

Farm Name:	Portion 3 (Beatrys) of the Farm Lanyon Vale no. 376, Hay, Northern Cape
Application area (Ha)	2 841.1985 ha (Two thousand eight hundred and forty-one comma one nine eight five hectares).
Magisterial district:	Hay, Northern Cape Province
Distance and direction from nearest town	The Beatrys project is located along the northern bank of the middle Orange River between Douglas and Prieska in the Northern Cape Province of South Africa, some 100 km southwest of Douglas and some 200 km from Kimberley.
21-digit Surveyor General Code for each farm portion	C03100000000037600003

c) Locality map (show nearest town, scale not smaller than 1:250000)

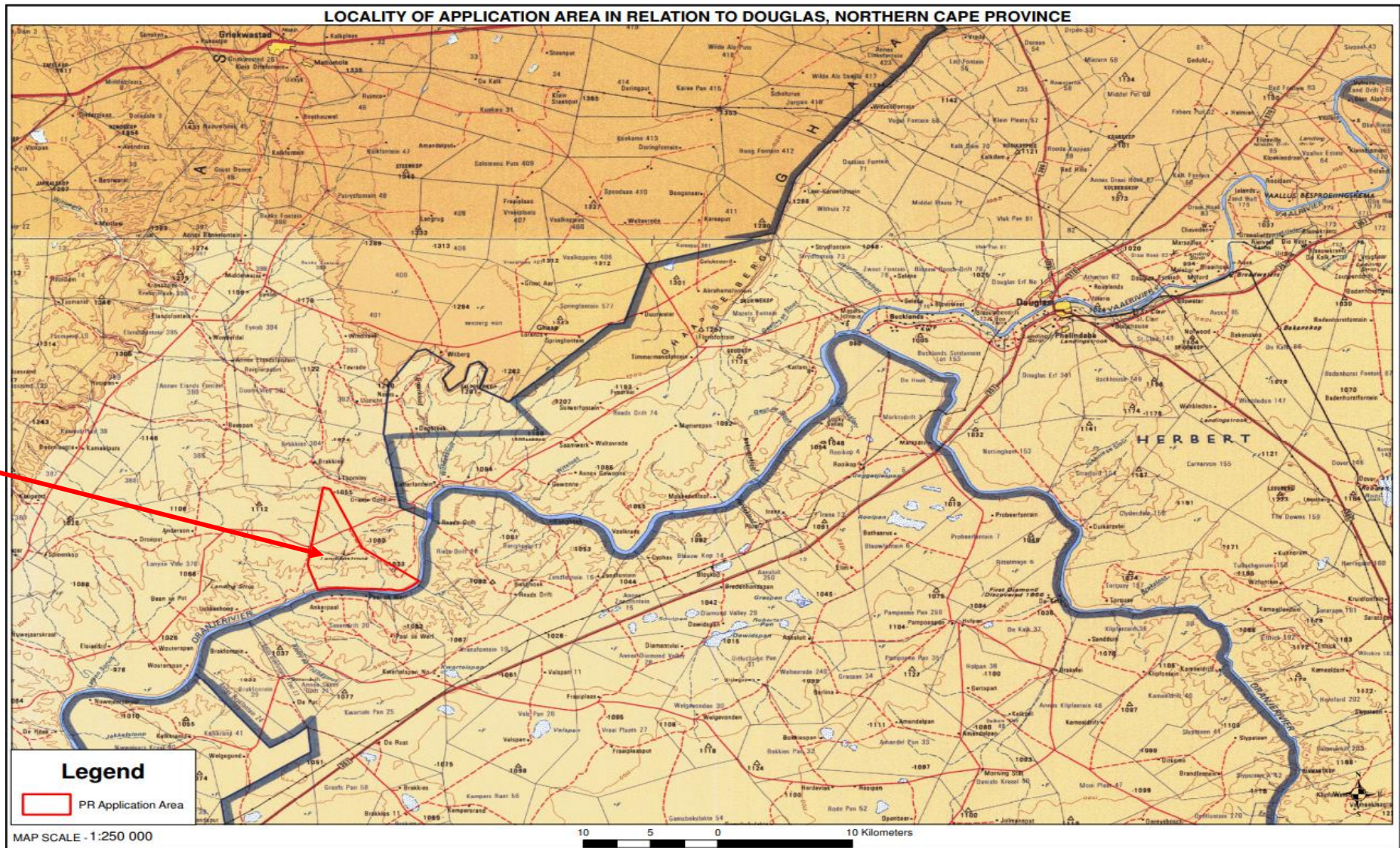


Figure 1. 1: 250 000 topocadastral map KIMBERLEY 2922 indicating the application area with RED BLOCK.

d) Description of the scope of the proposed overall activity (provide a plan drawn to a scale acceptable to the competent authority but not less than 1: 10 000 that shows the location, and area (hectares) of all the aforesaid main and listed activities, and infrastructure to be placed on site)
LOCATION OF LISTED ACTIVITIES ON PROPERTY WILL BE DETERMINED AFTER FIRST PHASE OF PROSPECTING HAVE BEEN FINALIZED

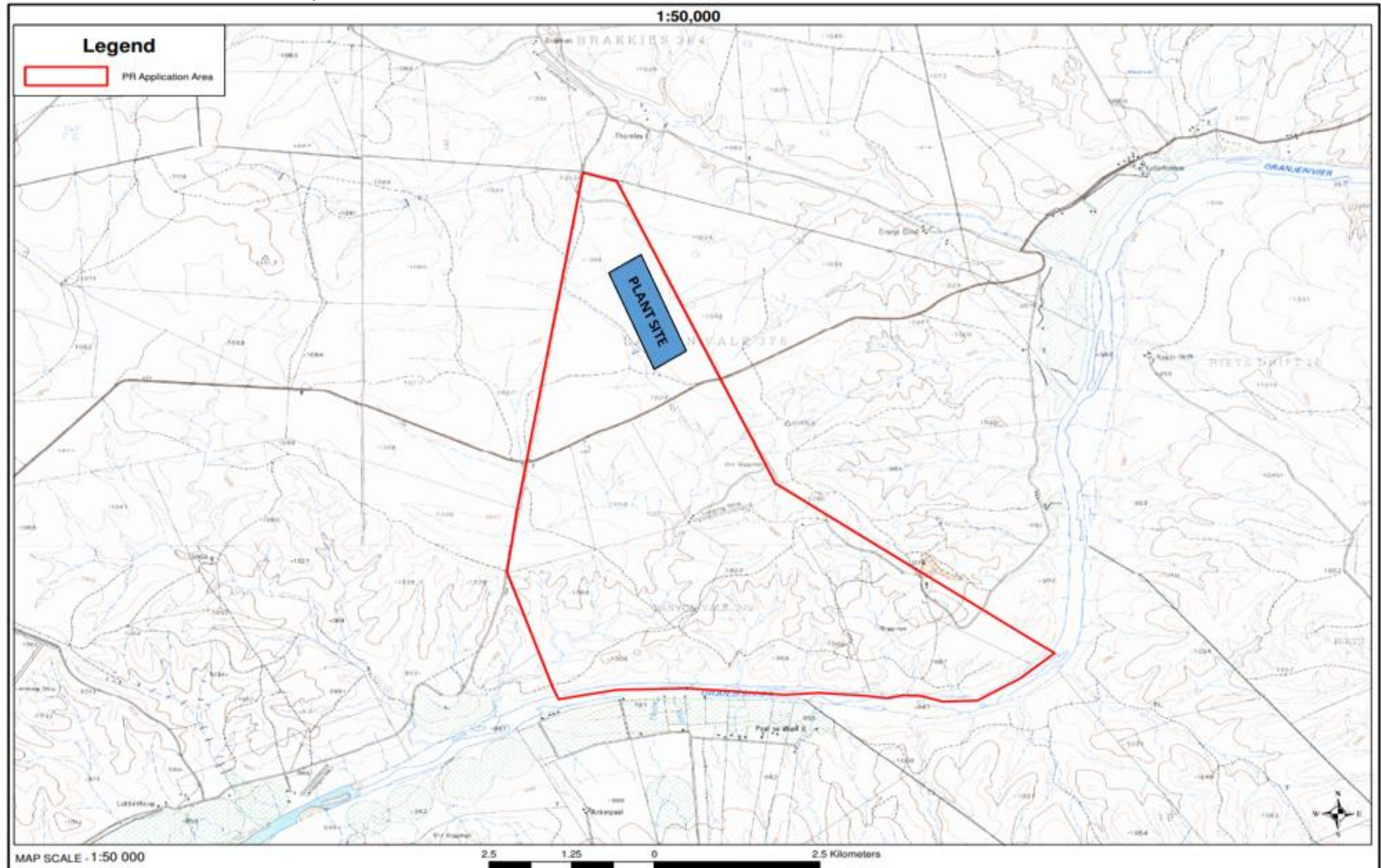


Figure 2. 1:50 000 Map of application area and provisional plant site drill holes as well as pits and trenches locations will only be determined after the first phase and desktop studies.

PHASE 1**Review of Past Exploration Results**

In order to direct the exploration programme in an efficient manner, there will be a review of all information and data gathered during previous exploration. A site investigation of the target areas will be undertaken to identify infrastructure and determine any potential problems that may need to be addressed.

Imagery Analysis & Geological Mapping

High-resolution satellite images will be studied and used to geologically map the application area. Contacts between various lithologies will be mapped and specific attention will be given to delineate and define areas underlain by alluvial gravels.

Location of drilling pitting and trenching will only be determined after the Imagery Analysis & Geological Mapping.

PHASE 2

RC-drilling – Drilling is done in phases, over anomalous target areas, using reconnaissance lines or a grid of 200m X 200m or 100m X 50m depending on the level of confidence in the targets and the level of information required. The holes will be approximately 5 metres deep depending on local depth to bedrock (It is envisaged that at least 100 holes will be drilled). If initial drilling proves that only Rooikoppie gravels exist on the property and gravels only go 1m or less deep, drilling will cease and pitting will continue.

PHASE 3**Invasive Prospecting Pits**

100 pits 2m X 3m X 0.5 - 5m

Invasive Prospecting Pits will be positioned also on a grid of 200m X 200m or 100m X 50 m.

PHASE 4**Bulk Sampling**

30 trenches 100m X 50m X 0.5 – 5m

i) Listed and specified activities

Table 1: Listed and Specified Activities

NAME OF ACTIVITY e.g. for prospecting – drill site, site camp, ablution facility, accommodation, equipment storage, sample storage, site office, access route, etc...etc...etc. e.g. for mining – excavations, blasting, stockpiles, discard dumps or dams, Loading, hauling and transport, Water supply dams and boreholes, accommodation, offices ablution, stores, workshops, processing plant, storm water control, berms, roads, pipelines, power lines, conveyors, etc...etc...etc.	Aerial extent of the Activity Ha or m²	LISTED ACTIVITY Mark with an X where applicable or affected	APPLICABLE LISTING NOTICE (GNR 544, GNR 545 or GNR 546)/NOT LISTED
Activity 9 of Listing Notice 1 "The development of infrastructure exceeding 1000 metres in length for the bulk transportation of water or storm water- (i) with an internal diameter of 0.36 metres or more; or (ii) with a peak throughput of 120 litres per second or more;	Pumping of water or storm water on the prospecting site.	X	GNR 327 Listing Notice 1
Activity 12 of Listing Notice 1 The development of – (i) dams or weirs, where the dam or weir, including infrastructure and water surface area, exceeds 100 square metres; or (ii) infrastructure or structures with a physical footprint of 100 square metres or more; where such development occurs – (a) within a watercourse; (b) in front of a development setback; or (c) if no development setback exists, within 32 metres of a watercourse, measured from the edge of a watercourse" Regulation GN R704, published on 4 June 1999 in terms of the National Water Act (Use of water for mining and related activities)	Clean and dirty water systems on the site. It is anticipated that the operations will establish storm water control berms and trenches to separate clean and dirty water on the prospecting site.	X	GNR 327 Listing Notice 1
Activity 20 of Listing Notice 1			

Any activity including the operations of that activity which requires a prospecting right in terms of Section 16 of the Mineral and Petroleum Resources Development Act, 2002 (Act No. 28 of 2002), including-	2841.2985ha application lodged for the farm	X	GNR 327 Listing Notice 1
(a) associated infrastructure, structures and earthworks, directly related to prospecting of a mineral resource, (b) the primary processing of a mineral resource including winning, extraction, classifying, concentrating, crushing, screening or washing; but excluding the secondary processing of a mineral resource, including the smelting, beneficiation, reductio, refining, calcining or gasification of a mineral resource in which case activity 6 in listing notice 2 applies.			
Activity 24(ii) of NEMA Listing Notice 1			
The development of a road- (ii) with a reserve wider than 13,5 meters, or where no reserve exists where the road is wider than 8 metres;	±2 500 m ² on the Area.	X	GNR327 Listing Notice 1
Activity 25 of Listing Notice 1			
"The development and related operation of facilities or infrastructure for the treatment of effluent, wastewater or sewage with a daily throughput capacity of more than 2000 cubic metres but less than 15000 cubic metres."	Chemical toilets for the site Wash bays for the site		GNR 327 Listing Notice 1
Activity 30 of NEMA Listing Notice 1			
"Any process or activity identified in terms of section 53(1) of the National Environmental Management: Biodiversity Act, 2004 (Act No. 10 of 2004)."	The Orange River and its riparian- and buffer zones are classified as Critical Biodiversity Area One, while the remainder of the pristine sections on site, which encompass the drainage catchment and all terrestrial habitats, are classified as Critical Biodiversity Area Two. No Protected Areas occur in	X	GNR327 Listing Notice 1

	or near the study area according to the ecological study.		
Activity 56(ii) of NEMA Listing Notice 1 The widening of a road by more than 6 metres, or the lengthening of a road by more than 1 kilometre- (i) where the existing reserve is wider than 13,5 meters; or (ii) where no reserve exists, where the existing road is wider than 8 metres; excluding where widening or lengthening occur inside urban areas.	±2 500m ² on the Area.	X	GNR327 Listing Notice 1
Activity 15 of NEMA Listing Notice 2 The clearance of an area of 20 hectares or more of indigenous vegetation, excluding where such clearance of vegetation is required for – (i) The undertaking of a linear activity; or (ii) Maintenance purposes undertaken in accordance with a maintenance management plan.	Pits+Trenches COMBINED is ±20 ha	X	GNR 325 Listing Notice 2
Activity 19 of Listing Notice 2 The removal and disposal of minerals contemplated in terms of Section 20 of the Minerals and Petroleum Resources Development Act, 2002 (Act No. 28 of 2002), including (a) associated infrastructure, structures and earthworks, directly related to prospecting of a mineral resource or (b) the primary processing of a mineral resource including winning, extraction, classifying, concentrating, crushing, screening or washing; but excluding the secondary processing of a mineral resource, including the smelting, beneficiation, reduction, refining, calcining or gasification of a mineral resource in which case activity 6 in listing notice 2 applies.	2841.2985ha application lodged for the farm	X	GNR 325 Listing Notice 2

Activity 10 of NEMA Listing Notice 3 The development of infrastructure for the storage and handling of dangerous goods (fuel), in containers with a combined capacity of between 30 and 80 m3.	$\pm 80 \text{ m}^3$	X	GNR 324 Listing Notice 3
Activity 12(g) i & ii of NEMA Listing Notice 3 The clearance of an area of 300 square metres or more of indigenous vegetation except where such clearance of indigenous vegetation is required for maintenance purposes undertaken in accordance with a maintenance management plan. i. Within any critically endangered or endangered ecosystem listed in terms of section 52 of the NEMBA or prior to the publication of such a list, within an area that has been identified as critically endangered in the National Spatial Biodiversity Assessment 2004; ii. Within critically biodiversity areas identified in bioregional plans;	The Orange River and its riparian- and buffer zones are classified as Critical Biodiversity Area One, while the remainder of the pristine sections on site, which encompass the drainage catchment and all terrestrial habitats, are classified as Critical Biodiversity Area Two. No Protected Areas occur in or near the study area according to the ecological study.	X	GNR 324 LISTING NOTICE 3
Activity 15 of Category A under the National Environmental Management: Waste Act 59 of 2008 The continuous establishment and reclamation of temporary stockpiles resulting from activities which require a Prospecting Right.	The continuous establishment and reclamation of temporary stockpiles resulting from activities which require a prospecting right. Product stockpiles Tailing Stockpiles Topsoil Stockpiles		GNR 633 NEMWA
OTHER ACTIVITIES (Associated infrastructure not considered to be listed activities) Temporary Workshop Facilities	$\pm 0.04 \text{ ha}$		Not Listed

ii) Description of the activities to be undertaken

(Describe methodology or technology to be employed, including the type of commodity to be mined and for a linear activity, a description of the route of the activity)

The entire proposed prospecting project will be conducted in five phases as described below over a period of 60 months. This prospecting will consist of non-invasive (Bulk sampling) activities. The review of available information that exists over the area of interest will be undertaken by means of conducting a literature review from satellite images and other available information.

PHASE 1:**Review of Past Exploration Results**

In order to direct the exploration programme in an efficient manner, there will be a review of all the information and data gathered during the previous exploration. A site investigation of the target areas will be undertaken to identify infrastructure and determine any potential problems that may need to be addressed.

Imagery Analysis & Geological Mapping

High-resolution satellite images will be studied and used to geological map the application area. Contacts between various lithologies will be mapped and specific attention will be given to delineate and define areas underlain by alluvial gravels.

PHASE 2:**Drilling**

RC-drilling – Drilling is done in phases, over anomalous target areas, using reconnaissance lines or a grid of 200m x 200m or 100m x 50m depending on the level of confidence in the target and the level of information required. The holes will be approximately 5 meters deep depending on local depth to bedrock (It is envisaged that at least 100 holes will be drilled). If initial drilling proves that only Rooikoppie gravels exist on the property and gravels only go 1m deep or less, drilling will be ceased and pitting will continue.

PHASE 3:**Invasive Prospecting Pits**

Invasive Prospecting Pits will be positioned also on a grid of 200m X 200m or 100m X 50m.

PHASE 4:**Bulk Sampling**

Table 2: Bulk Sampling Activities

ACTIVITY		DETAILS		
Number of pits/trenches planned		100 pits/ 30 trenches		
	Number of pits/trenches	Length	Breadth	Depth
	100 pits	2m	3m	0.5 - 5m
	30 trenches	100m	50m	0.5 – 5m
Locality		The location of the trenches will be verified during a site reconnaissance visit and after the pre-feasibility studies has been compiled.		
Volume Overburden (Waste)		Pits 1200m ³ Trenches 300 000m ³		
Volume Ore		Pits 1200m ³ Trenches 300 000m ³		
Density Overburden		2.2		
Density Ore		2.2		
Phase(s) when bulk sampling will be required		Month 13 – 49 Phase 3, 4 and 5		
Timeframe(s)		From time to time during Month 13 to 49		

PHASE 5:**Analytical Desktop Study**

The project geologist monitors the programme, consolidates and processes the data and amends the programme depending on the results. This is a continuous process throughout the programme and continues even when no prospecting is done on the ground.

Each physical phase of prospecting is followed by desktop studies involving interpretation and modelling of all data gathered. These studies will determine the manner in which the work programme is to proceed in terms of activity, quantity, resources, expenditure and duration.

A GIS based database will be constructed capturing all exploration data.

e) Policy and Legislative Context

Applicable Legislation and Guidelines used to compile the report (a description of the policy and legislative context within which the development is proposed including an identification of all legislation, policies, plans, guidelines, spatial tools, municipal development planning frameworks and instruments that are applicable to this activity and are to be considered in the assessment process.)	Reference where applied	HOW DOES THIS DEVELOPMENT COMPLY WITH AND RESPOND TO THE POLICY AND LEGISLATIVE CONTEXT (E.g In terms of the National Water Act:-Water Use License has/has not been applied for).
Conservation of Agricultural Resources Act (Act 43 of 1983) and Regulations (CARA)	<ul style="list-style-type: none"> - Section 5: Implementation of control measures for alien and invasive plant species; - Section 6: Control measures. - Regulation GN R1048, published on 25 May 1984, in terms of CARA 	<ul style="list-style-type: none"> - Control measures are to be implemented upon the approval of the EMPR.
Constitution of South Africa (Act 108 of 1996)	<ul style="list-style-type: none"> - Section 24: Environmental right - Section 25: Rights in Property - Section 27: Water and sanitation right 	<ul style="list-style-type: none"> - To be implemented upon the approval of the EMPR.
Environment Conservation Act (Act 73 of 1989) and Regulations (ECA)	<ul style="list-style-type: none"> - Sections 21, 22, 25, 26 and 28: EIA Regulations, including listed activities that still relate to the existing section of ECA. - Section 28A: Exemptions. 	<ul style="list-style-type: none"> - To be implemented upon the approval of the EMPR.
Fencing Act (Act 31 of 1963)	<ul style="list-style-type: none"> - Section 17: States that any person erecting a boundary fence may clean any bush along the line of the fence up to 1.5m on each side thereof and remove any tree standing in the immediate line of the fence. However, this provision must be read in conjunction with the environmental legal provisions relevant to protection of flora. 	<ul style="list-style-type: none"> - Control measures are to be implemented upon the approval of the EMPR.
Hazardous Substances Act (Act 15 of 1973) and Regulations read together with NEMA and NEMWA	<ul style="list-style-type: none"> - Definition, classification, use, operation, modification, disposal or dumping of hazardous substances. 	<ul style="list-style-type: none"> - Noted and Considered measures are to be implemented upon the approval of the EMPR.
Intergovernmental Relations Act (Act 13 of 2005)	<ul style="list-style-type: none"> - This Act establishes a framework for the National, Provincial and Local Governments to promote and facilitate intergovernmental relations. 	

Mine, Health and Safety Act (Act 29 of 1996) and Regulations	<ul style="list-style-type: none"> - Entire Act. 	<ul style="list-style-type: none"> - Control measures are to be implemented upon the approval of the EMPR.
Mineral and Petroleum Resources Development Act (Act 28 of 2002) and Regulations as amended	<ul style="list-style-type: none"> - Entire Act. - Regulations GN R527 	<ul style="list-style-type: none"> - A Prospecting Right has been applied for (NC) 30/5/1/1/2/13217 PR. - Rights and obligations to be adhered to.
National Environmental Management Act (Act 107 of 1998) and Regulations as amended	<ul style="list-style-type: none"> - Section 2: Strategic environmental management principles, goals and objectives. - Section 24: Foundation for Environmental Management frameworks. - Section 24N: - Section 24O: - Section 28: The developer has a general duty to care for the environment and to institute such measures to demonstrate such care. - Regulations GN R547, more specifically Chapters 5 and 7, where applicable (the remainder was repealed) published on 18 June 2010 in terms of NEMA (Environmental Management Framework Regulations) - Regulations GN R982 to R985, published on 4 December 2014 in terms of NEMA (Listed Activities) - Regulations GN R993, published on 8 December 2014 in terms of NEMA (Appeal) - Regulations GN R994, published on 8 December 2014 in terms of NEMA (exemption) - Regulations GN R205, published on 12 March 2015 in terms of NEMA (National appeal Amendment Regulations) - Regulations GN R1147, published on 20 November 2015 in terms of NEMA (Financial Provision) 	<ul style="list-style-type: none"> - Control measures are to be implemented upon the approval of the EMPR.

National Environmental Management: Air Quality Act (Act 39 of 2004)	<ul style="list-style-type: none"> - Section 32: Control of dust - Section 34: Control of noise - Section 35: Control of offensive odours - Regulation GN R551, published on 12 June 2015 (amended Categories 1 to 5 of GN 983) in terms of NEM:AQA (Atmospheric emission which have a significant detrimental effect on the environment) - Regulation GN R283, published on 2 April 2015 in terms of NEM:AQA (National Atmospheric Emissions Reporting Regulations) (Group C-Mines) 	<ul style="list-style-type: none"> - Control measures are to be implemented upon the approval of the EMPR. - This is also legislated by Mine Health and Safety from DMR and is to be adhered to.
National Environmental Management: Biodiversity Act (Act 10 of 2004)	<ul style="list-style-type: none"> - Section 52 of The National Environmental Management Act: Biodiversity Act (NEMBA) (Act 10 of 2004) states that the MEC/Minister is to list ecosystems that are threatened and in need of protection. - Section 53 states that the Minister may identify any process or activity in such a listed ecosystem as a threatening process. - A list of threatened and protected species has been published in terms of Section 56(1) GG 29657 GNR 151 and GNR 152, Threatened or Protected Species Regulations. <p>Commencement of Threatened or Protected Species Regulations 2007 : 1 June 2007 GNR 150/GG 29657/23-02-2007</p> <p>Publication of lists of critically endangered, vulnerable and protected species GNR 151/GG 29657/23-02-2007 *</p> <p>Threatened or Protected Species Regulations GNR 152/GG 296547/23-02-2007 *</p> <ul style="list-style-type: none"> - Sections 65 – 69: These sections deal with restricted activities involving alien species; restricted activities 	<ul style="list-style-type: none"> - A permit application regarding protected plant species needs to be lodged with DENC if any protected species is encountered. Control measures are to be implemented upon the approval of the EMPR.

	<p>involving certain alien species totally prohibited; and duty of care relating to alien species.</p> <ul style="list-style-type: none"> - Sections 71 and 73: These sections deal with restricted activities involving listed invasive species and duty of care relating to listed invasive species. - Regulation GN R151, published on 23 February 2007 (List of Critically Endangered, Vulnerable and Protected Species, 2007) in terms of NEM: BA - Regulation GN R152, published on 23 February 2007 (TOPS) in terms of NEM:BA - Regulations GN R507 to 509 of 2013 and GN 599 of 2014 in terms of NEM:BA (Alien Species) 	
The National Environmental Management Act: Protected Areas Act (NEMPAA) (Act 57 of 2003) provides for the protection of ecologically viable areas that are representative of South Africa's natural biodiversity and its landscapes and seascapes.	<ul style="list-style-type: none"> - Chapter 2 lists all protected areas. 	The Orange River and its riparian- and buffer zones are classified as Critical Biodiversity Area One, while the remainder of the pristine sections on site, which encompass the drainage catchment and all terrestrial habitats, are classified as Critical Biodiversity Area Two. No Protected Areas occur in or near the study area according to the ecological study.
National Environmental Management: Waste Management Act (Act 59 of 2008)	<ul style="list-style-type: none"> - Chapter 4: Waste management activities - Regulations GN R634 published on 23 August 2013 in terms of NEM:WA (Waste Classification and Management Regulations) - Regulations GN R921 published on 29 November 2013 in terms of NEM:WA (Categories A to C – Listed activities) - National Norms and Standards for the Remediation of contaminated Land and Soil Quality published on 2 May 2014 in terms of NEM:WA (Contaminated land regulations) 	<ul style="list-style-type: none"> - To be implemented upon the approval of the EMPR.

	<ul style="list-style-type: none"> - Regulations GN R634 published on 23 August 2013 in terms of NEM: WA (Waste Classification and Management Regulations) - Regulations GN R632 published on 24 July 2015 in terms of NEM: WA (Planning and Management of Mineral Residue Deposits and Mineral Residue Stockpiles) - Regulations GN R633 published on 24 July 2015 in terms of NEM: WA (Amendments to the waste management activities list published under GN921) 	
National Forest Act (Act 84 of 1998) and Regulations	<ul style="list-style-type: none"> - Section 15: No person may cut, disturb, damage, destroy or remove any protected tree; or collect, remove, transport, export, purchase, sell, donate or in any other manner acquire or dispose of any protected tree, except under a licence granted by the Minister. 	<ul style="list-style-type: none"> - A permit application regarding protected tree species needs to be lodged with DAFF if necessary and determined by a specialist study. - Control measures are to be implemented upon the approval of the EMPR.
National Heritage Resources Act (Act 25 of 1999) and Regulations	<ul style="list-style-type: none"> - Section 34: No person may alter or demolish any structure or part of a structure which is older than 60 years without a permit issued by the relevant provincial heritage resources authority. - Section 35: No person may, without a permit issued by the responsible heritage resources authority destroy, damage, excavate, alter, deface or otherwise disturb any archaeological or paleontological site. - Section 36: No person may, without a permit issued by SAHRA or a provincial heritage resources authority destroy, damage, alter, exhume, remove from its original position or otherwise disturb any grave or burial ground older than 60 years which is situated outside a forma cemetery administered by a local authority. - Section 38: This section provides for HIA which are not already covered under the ECA. Where they are covered under the ECA the provincial heritage resources 	<ul style="list-style-type: none"> - Control measures are to be implemented upon the approval of the EMPR. Fossil finds procedure are attached to the PIA.

	<p>authorities must be notified of a proposed project and must be consulted during HIA process.</p> <ul style="list-style-type: none"> - Regulation GN R548 published on 2 June 2000 in terms of NHRA 	
National Water Act (Act 36 of 1998) and regulations as amended, <i>inter alia</i> Government Notice No. 704 of 1999	<ul style="list-style-type: none"> - Section 4: Use of water and licensing. - Section 19: Prevention and remedying the effects of pollution. - Section 20: Control of emergency incidents. - Section 21: Water uses In terms of Section 21 a licence is required for: <ul style="list-style-type: none"> (a) taking water from a water resource; (b) storing water; (c) impeding or diverting the flow of water in a watercourse; (f) Waste discharge related water use; (g) disposing of waste in a manner which may detrimentally impact on a water resource; (i) altering the bed, banks, course or characteristics of a watercourse; (j) removing, discharging or disposing of water found underground if it is necessary for the efficient continuation of an activity or for the safety of people; and; - Regulation GN R704, published on 4 June 1999 in terms of the National Water Act (Use of water for prospecting and related activities) - Regulation GN R1352, published on 12 November 1999 in terms of the National Water Act (Water use to be registered) - Regulation GN R139, published on 24 February 2012 in terms of the National Water Act (Safety of Dams) - Regulation GN R398, published on 26 March 2004 in terms of the National Water Act (Section 21 (j)) 	<ul style="list-style-type: none"> - A water use application (WULA) must be submitted and will be submitted to run concurrently with the Prospecting Right application. - Control measures are to be implemented upon the approval of the EMPR.

	<ul style="list-style-type: none"> - Regulation GN R399, published on 26 March 2004 in terms of the National Water Act (Section 21 (a) and (b)) - Regulation GN R1198, published on 18 December 2009 in terms of the National Water Act (Section 21 (c) and (i) – rehabilitation of wetlands) - Regulations GN R1199, published on 18 December 2009 in terms of the National Water Act (Section 21 (c) and (i)) - Regulations GN R665, published on 6 September 2013 in terms of the National Water Act (Amended GN 398 and 399 – Section 21 (e), (f), (h), (g), (j)) 	
Nature Conservation Ordinance (Ord 19 of 1974)	<ul style="list-style-type: none"> - Chapters 2, 3, 4 and 6: Nature reserves, miscellaneous conservation measures, protection of wild animals other than fish, protection of Flora. 	<ul style="list-style-type: none"> - Control measures are to be implemented upon the approval of the EMPR.
Northern Cape Nature Conservation Act (Act 9 of 2009)	<ul style="list-style-type: none"> - Addresses protected species in the Northern Cape and the permit application process related thereto. 	<ul style="list-style-type: none"> - A permit application regarding provincially protected plant species as well as for large-scale harvesting of indigenous flora need to be lodged with DENC if necessary and will be determined by the specialist study. - Control measures are to be implemented upon the approval of the EMPR.
Occupational Health and Safety Act (Act 85 of 1993) and Regulations	<ul style="list-style-type: none"> - Section 8: General duties of employers to their employees. - Section 9: General duties of employers and self-employed persons to persons other than their employees. 	<ul style="list-style-type: none"> - Control measures are to be implemented upon the approval of the EMPR.
Road Traffic Act (Act 93 of 1997) and Regulations	<ul style="list-style-type: none"> - Entire Act. 	<ul style="list-style-type: none"> - Control measures are to be implemented upon the approval of the EMPR.

Water Services Amendment Act (Act 30 of 2007)	- It serves to provide the right to basic water and sanitation to the citizens of South Africa (giving effect to section 27 of the Constitution).	- Control measures are to be implemented upon the approval of the EMPR.
National Land Transport Act, (Act 5 of 1998)		- To take note.
Northern Cape Planning and Development Act (Act 7 of 1998)	- To control planning and development	- To be implemented upon the approval of the EMPR.
Spatial Planning and Land Use Management (Act 16 of 2013 (SPLUMA) and regulations	<ul style="list-style-type: none"> - To provide a framework for spatial planning and land use management in the Republic; - To specify the relationship between the spatial planning and the land use management, amongst others - Regulations GN R239 published on 23 March 2015 in terms of SPLUMA 	- To be implemented upon the approval of the EMPR.
Subdivision of Agricultural Land Act, 70 of 1970 and regulations	- Regulations GN R373 published on 9 March 1979 in terms of Subdivision of Agricultural Land	- To take note.
Basic Conditions of Employment Act (Act 3 of 1997)) as amended	- To regulate employment aspects	- To be implemented upon the approval of the EMPR
Community Development (Act 3 of 1966)	- To promote community development	- To be implemented upon the approval of the EMPR
Development Facilitation (Act 67 of 1995) and regulations	- To provide for planning and development	- To take note.
Development Facilitation (GN24, PG329, 24/07/1998)	- Regulations re Northern Cape LDO's	- To take note.
Development Facilitation (GNR1, GG20775, 07/01/2000)	- Regulations re application rules S26, S46, S59	- To take note.
Development Facilitation (GN732, GG14765, 30/04/2004)	- Determines amount, see S7(b)(ii)	- To take note.
Land Survey Act (Act 8 of 1997)) and regulations, more specifically GN R1130	<ul style="list-style-type: none"> - To control land surveying, beacons etc. and the like; - Agriculture, land survey S10 	- To take note.
National Veld and Forest Fire Act (Act 101 of 1998)) and regulations, more specifically GN R1775	<ul style="list-style-type: none"> - To regulate law on veld and forest fires - (Draft regulations s21) 	- To be implemented upon approval of the EMPR

Municipal Ordinance, 20/1974	- To control pollution, sewers etc.	- To be implemented upon approval of the EMPR
Municipal Ordinance, PN955, 29/08/1975	- Nature conservation Regulations	- To be implemented upon approval of the EMPR
Cape Land Use Planning Ordinance, 15/85	- To control land use planning	- To take note.
Cape Land Use Planning Ordinance, PN1050, 05/12/1988	- Land use planning Regulations	- To take note.

f) Need and desirability of the proposed activities

(Motivate the need and desirability of the proposed development including the need and desirability of the activity in the context of the preferred location)

The Kimsa Mining Project is in line with the 'Beneficiation Strategy for the Minerals Industry of South Africa' (DMR, 2011) in terms of aiming to beneficiate diamonds for sale/export. The benefits of this will fall directly to the Northern Cape Province and, specifically, the Siyancuma District.

In addition, the South Africa National Development Plan aims to eliminate poverty and reduce inequality by 2030. South Africa can realise these goals by drawing on the energies of its people, growing an inclusive economy, building capabilities, enhancing the capacity of the state, and promoting leadership and partnerships throughout society. The Kimsa Mining Project will contribute to achieving this plan in terms of direct and indirect employment of people from the local and district municipalities as well as investment in the region and on a national scale.

Need

Analysis of the Diamond Industry – ALROSA (website)

The Information on the analysis of the diamond industry was obtained from the ALROSA website which is one of the biggest diamond producers in the world.

The world diamond market is represented by diamond mining and trade in rough diamonds. The bulk of the world diamond mining is concentrated in nine countries, with their share in the global production in physical terms as high as 99%.

The world's largest producers of natural diamonds are Russia, the Democratic Republic of Congo (DRC) and Botswana, all together accounting over 60% of the global diamond production.

Top Countries in the Global Diamond Production 2016: 134.1 mln. Carats

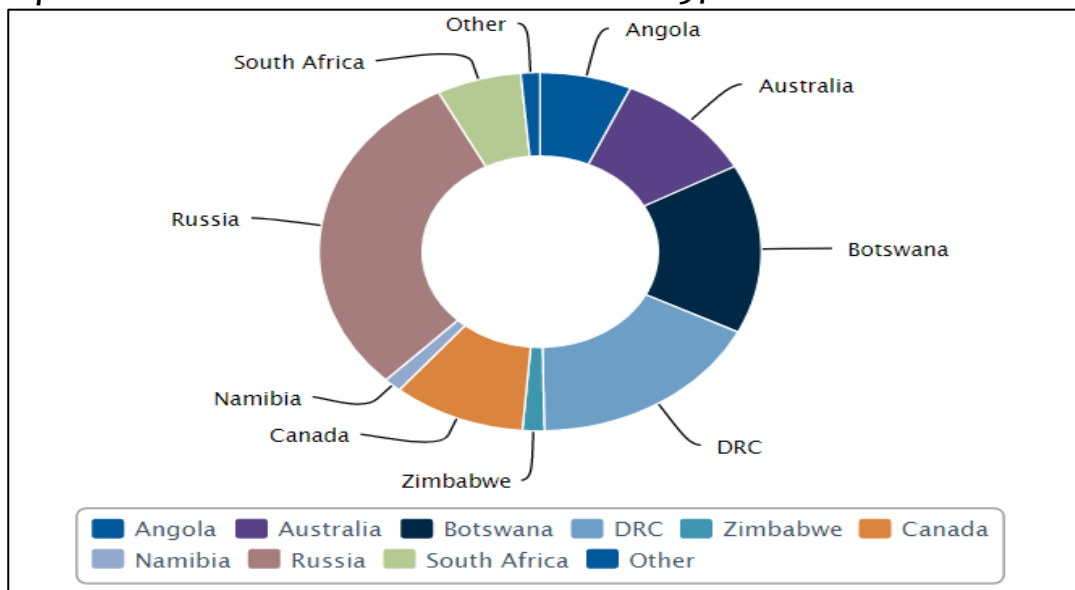


Figure 3. Kimberley Process companies' data Global Diamond Production 2011-16 (thousands carats)

World diamond production based on the costs of produced rough diamonds are dominated by Russia, Botswana and Canada with a combined production of more than 60% of the total worldwide production.

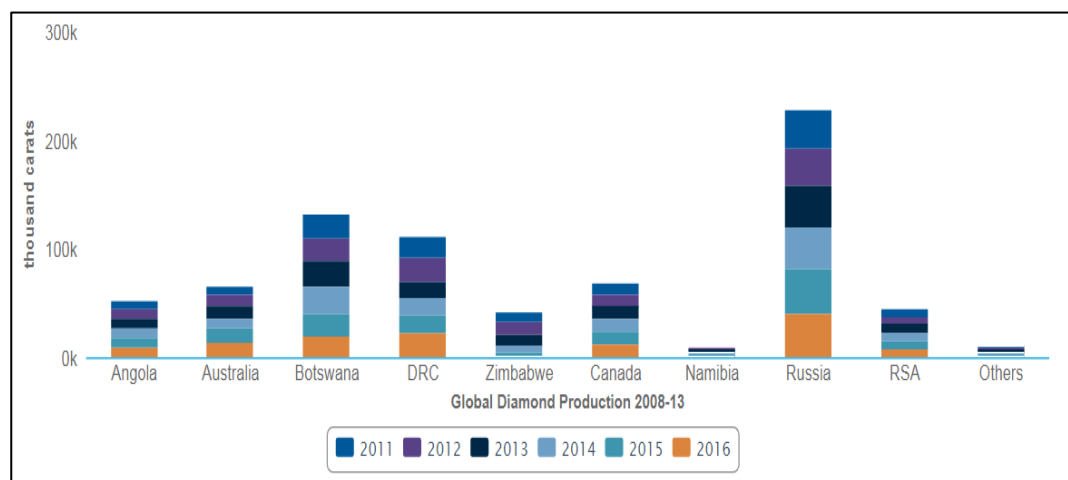


Figure 4. Global Diamond Production 2011-16 (thousands carats) Kimberley Process companies' data

Russia ranks first in the world's diamond production. ALROSA Group accounts for 93% of the total diamond production in the Russian Federation in physical terms, and it is the leader of the global diamond mining industry. Major mining companies are engaged in mining in the main diamond-producing countries, the exception being Zimbabwe and the DRC, where diamond deposits are developed by small companies and prospectors. The graph below represents the geography of the companies' activities including exploration.

Diamond Production by Leading Companies, 2016(* - including Ekati; Companies' data)

The world's diamond mining is concentrated in the major primary deposits accounting for about 60% of the global diamond production. The remaining production is concentrated in placer deposits, the principal of them located in the DRC (Mbiji-Mayii) and Zimbabwe (Marange).

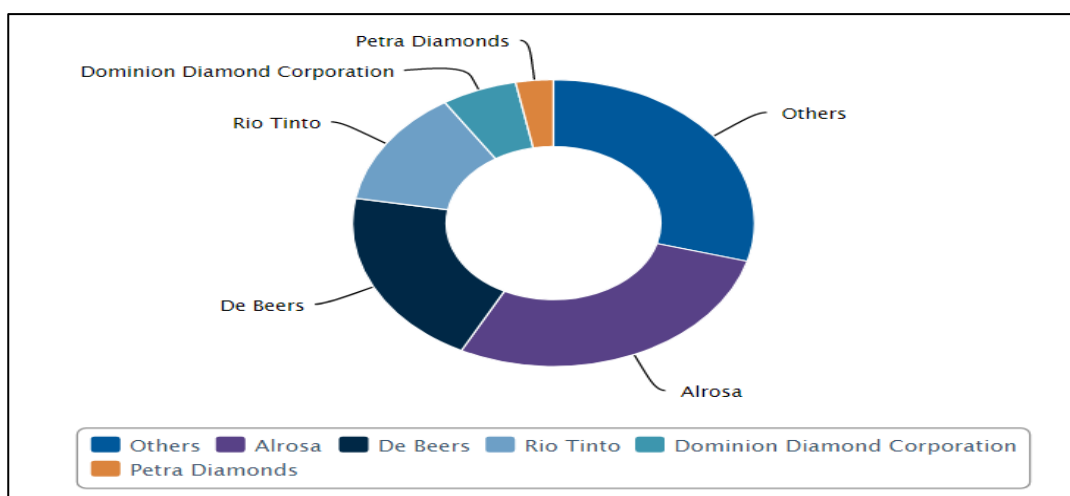


Figure 5. Diamond Production by Leading Companies, 2016(* - including Ekati; Companies' data)

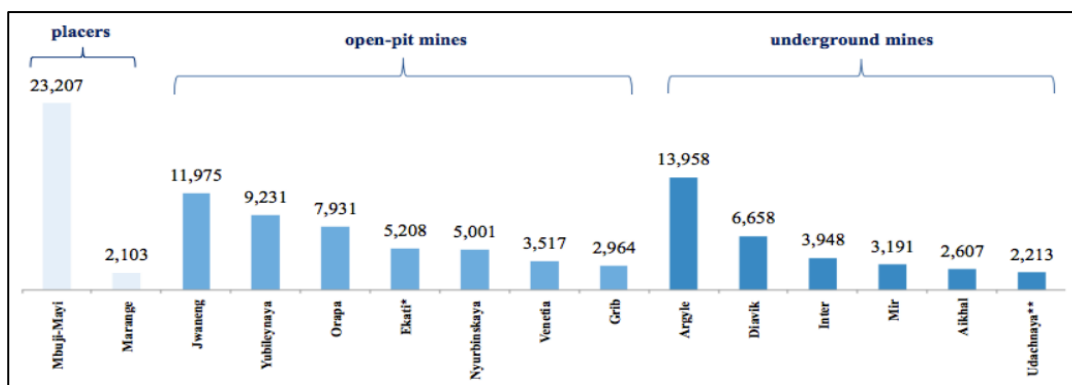


Figure 6. Production Output of the World's Major Diamond Deposits, 2016 (thousand carats) Kimberley Process and compnies' data; * - Ekati includes open-pit and underground mining; ** - output, including further developement of the open-pit

By their attributes diamonds from deposits fall into two categories: gem quality and industrial grade diamonds. The former is used in diamond jewellery production, while the latter is used for industrial purposes (manufacture of drills, saws, and abrasive powders). Gem quality rough diamonds are sorted by size, colour, quality and shape, and then are sold to buyers in conformity with the sales policy adopted in a rough diamond production company. Depending on the quality of the mined rough diamonds, the current state of the market, the adopted marketing policy, companies use different approaches to diamond sales: sights, tenders, auctions, spot transactions and long-term contracts.

The world's largest trading centres, which concentrate the bulk of trade in natural rough diamonds, are India, Belgium, the UAE, the USA, Hong Kong and Israel. Being sold from mines, natural rough diamonds arrive at cutting and polishing plants to become polished diamonds that will be used in jewellery making.

(The information above was sourced from the ALROSA website. ALROSA is a world leader in the world diamond mining industry, a Russian partially state-owned diamond mining company)

The Diamond Pipeline

The Diamond Pipeline can be defined as the route the diamond takes from mine to end consumer. The diamond pipeline, typically, comprises (Fig. 7).



Figure 7. The Diamond Pipeline

Exploration/Prospecting; involves geologists finding diamond deposits in different areas. Prospecting is vital to the future survival of any diamond business as there is a predicted supply-demand gap.

Mining and Recovery; once diamonds have been discovered and surveys shown that it is financially viable to mine them; they are now recovered from the ground. The manner in which they are mined and recovered depends on their source, thus, where they are found.

Sorting and valuing; process of sorting and valuing of diamonds, categorizing them according to size, quality, model and colour.

Cutting and polishing; refers to manufacturing of diamonds; the process of turning rough diamonds into polished.

Polished Market; this is referred to as the 'diamond exchange bourse', a place where diamonds are traded. These are located in some of the world's major diamond manufacturing centres, e.g. Belgium.

Retailing; polished diamonds find their way to Jewellers and Consumers through Wholesalers and Retailers.

International Diamond Market Trends

Although global financial stability has proven quite volatile over the past 4-5 years, the diamond industry appears to have stabilised somewhat, with moderate increases in diamond prices forecast for the immediate future.

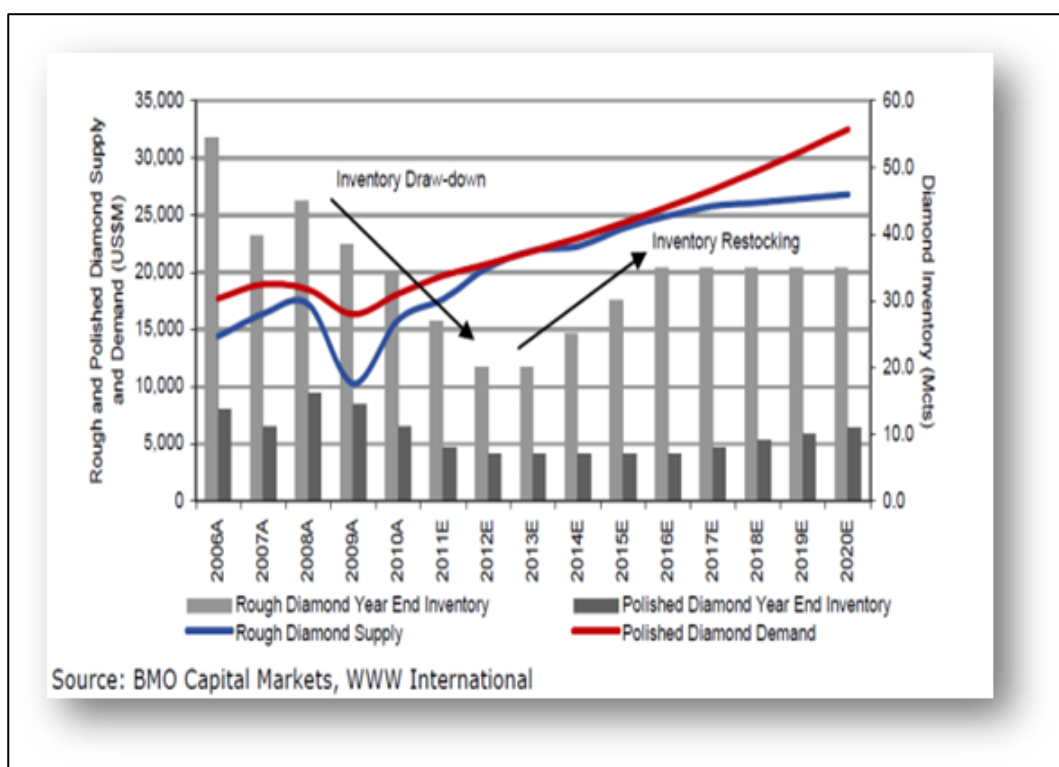


Figure 8. Inventory movements support diamond prices(USDM, Mct)

BMO Capital Markets (Sterck, 2011) estimated at the time that Chinese demand for polished diamonds accounted for 5% or USD1 billion of the market in 2010. While this represents a relatively small proportion of the market currently, growth is extremely strong.

De Beers reported that Chinese demand for polished diamonds grew at 25% in 2010, significantly ahead of GDP growth of 13%. Looking ahead, momentum into 2011 suggests that growth of 15% may be possible. From 2012 onwards, growth in household disposable income is forecast to average 11% to 12% per annum. This translates into minimum growth in diamond demand of 13% per annum.

From 2012 onwards diamond demand is likely to grow in line with economic growth at around 10% per annum. Combining steady demand growth from the established diamond consuming nations and strong growth in demand from emerging consumer's results in a forecast of polished diamond demand almost doubling by 2020, resulting in a total market value of over USD30 billion in nominal terms.

Desirability:

No	Description	Yes/No
1	Does the proposed land use / development fit the surrounding area?	Yes
2	Does the proposed land use / development conform to the relevant structure plans, SDF and planning visions for the area?	Yes
3	Will the benefits of the proposed land use / development outweigh the negative impacts of it?	Yes
4	Will the proposed land use / development impact on the sense of place?	Yes
5	Will the proposed land use / development set a precedent?	No
6	Will any person's rights be affected by the proposed land use / development?	Yes
7	Will the proposed land use / development compromise the "urban edge"?	No

Benefits:

No	Description	Yes/No
1	Will the land use / development have any benefits for society in general?	Yes
2	Will the land use / development have any benefits for the local communities where it will be located?	Yes

g) Motivation for the preferred development footprint within the approved site including a full description of the process followed to reach the proposed development footprint within the approved site

NB!! – This section is about the determination of the specific site layout and the location of infrastructure and activities on site, having taken into consideration the issues raised by interested and affected parties, and the consideration of alternatives to the initially proposed site layout.

This section converses the determination of the specific site layout having taken into consideration the comparison of the originally proposed site plan, the comparison of that plan with the plan of environmental features and current land uses, the issues raised by interested and affected parties, and the consideration of alternatives to the initially proposed site layout as a result.

i) Details of the development footprint alternatives considered

With reference to the site plan provided as Figure 2 and the location of the individual activities on site, provide details of the alternatives considered with respect to:

- (a) the property on which or location where it is proposed to undertake the activity;
- (b) the type of activity to be undertaken;
- (c) the design or layout of the activity;
- (d) the technology to be used in the activity;
- (e) the operational aspects of the activity; and
- (f) the option of not implementing the activity.

(a) The property on which or location where it is proposed to undertake the activity:

Farm Name	Title Deed	In Extent
Portion 3 (Beatrys) of the farm Lanyon Vale no. 376.	T1638/1995	2 841.2985 ha

The property on which the Prospecting Right was applied for is determined by the possible geological location of the mineral resource. Therefore, there are no alternatives for the location of the activity, except for not proceeding with the operation. This will however cause the underutilisation of a national economic resource.

The area is accessible via tar and gravel roads from different directions.

Infrastructure in the Siyancuma Local Municipality area is well developed with good road and rail networks, electricity grid and water. Experienced labour is available in the area as is an extensive network of secondary industries geared towards small and large-scale diamond mining. Water for Processing Plant will be a crucial element that needs to be secured towards the successful operating of the operation. An application for a water use license will be lodged with the Department of Water and Sanitation which may include a Section 21 (a), (b), (g), (i) and (c) application.

Alternatives considered: -

As the area covered under the Prospecting Right had been selected based on the assumption of alluvial gravels, it will not be viable to consider an alternative site for the prospecting. Alternatives for land are thus not available, as the Prospecting Right application cannot be considered over another area.

Therefore, there are no alternatives to the area.

(b) The type of activity to be undertaken:

The consideration of alternatives is a critical component of the EIA process, where an appropriate range of alternatives require consideration whilst achieving the desired objective of the proposed project. In order to ensure that the proposed development enables sustainable development, a number of feasible options must be explored. The various alternatives were assessed in terms of logistical practicality, environmental acceptability and economic feasibility. Alternatives for the locality of the prospecting operation do not form part of the discussion as the

location of the prospecting operation is determined by the geological location of the mineral resource.

Land Use

Dr Elizabeth (Betsie) Milne from Boscia Ecological Consulting has been appointed by Wadala Mining to provide an ecological study in order to highlight the ecological characteristics of the proposed mining area, and to determine the possible impact of mining on the diversity and ecological status of the application area, land use was described and included in this report as part of the ecological study.

The major land uses in the area are mining and agriculture. According to AGIS, the land capability of the study site is moderate along the river, low on the plateau, and very low along the ridge slopes. Irrigation suitability is excellent along the river, but low on the remainder of the site. The region is demarcated for sheep farming, with the grazing capacity on site being 24 ha/LSU.

Apart from the proposed prospecting activities, the prospecting right application area is mainly utilised as natural pastures for livestock grazing. Disturbances from past mining activities and borrow pitting are evident and existing infrastructure include a farm dam, remnant mining infrastructure, a landing strip, and roads. (Information taken out of the ecological study by Boscia Ecological Consultants Dr. Betsie Milne).

It would however be feasible to determine if there are any economically viable minerals to mine as prospecting can also generate income for the property owner that can be used for further development of the property.

The prospectors will have to promote rehabilitation strategies to ensure that open pits and trenches are backfilled. There will be infield screening to ensure that all oversize material is deposited back into the pits and trenches. This material should be covered with the overburden (where available), and topsoil that has been previously put aside for this purpose. The post-prospecting land use should be determined so that the developments strategies of the farm can still continue beyond the prospecting and mining of the area should the area be viable for mining.

Project Infrastructure

Alternatives and considerations pertaining to the project infrastructure were discussed in section g.

Prospecting Method

The prospecting method of drilling and open pits and trenches with continued backfilling is the only economic viable method currently being used by the diamond fraternity. There is no alternative rehabilitation and prospecting method for the prospecting of diamonds.

Socio-Economy

The prospecting plan is to employ $\pm 7 - 15$ people. The non-approval of this prospecting operation would impact negatively on the employment rate for the Douglas area and the families who are likely to benefit from the positive employment opportunities. Substantial tax benefits to the State and Local Government will also be lost.

Biodiversity

The implementation of the prospecting will have a potential impact on the biodiversity through removal of indigenous vegetation and destruction of habitats. If no prospecting activities were to continue, the status quo would apply, and no damage would accrue to the environment.

Heritage and Cultural Resources

In the event that the prospecting operation does not proceed, the heritage resources will remain as is. The protection and preservation of these resources are therefore not guaranteed. However, if the prospecting operation is approved, the heritage resources will be protected through the demarcation of no-go zones and fencing off if any of these resources are encountered.

(c) The design or layout of the activity:

The site infrastructure will need to be strategically placed by incorporating prospecting project demands and environmental sensitivities identified during the Environmental Impact Assessment process. Thus, the site layout will primarily be based on proximity to the nearby access roads, proximity to the areas earmarked for bulk sampling as well as limited additional impact on the environmental (non-perennial drainage lines and wind direction), heritage resources and discussions with the relevant Departments.

The following infrastructure will be established and will be associated with the prospecting operation outside of the 1:100-year flood line zone with permission of the relevant competent authority and the surface owners:

- Processing Plant: 2 x 16 feet pans with conveyers and recovery per property.
- Ablution Facilities: In terms of sewage the decision was made to use chemical toilets which can be serviced regularly by the service provider.
- Clean & Dirty water system: Berms
It is anticipated that the operation will establish stormwater control berms and trenches to separate clean and dirty water on the prospecting site.
- Fuel Storage facility (Concrete Bund walls and Diesel tanks):
It is anticipated that the operation will utilize 2 x 23 000 litre diesel tank. This tank must be placed in bund walls, with a capacity of 1.5 time the volume of the diesel tank. A concrete floor must be established where the re-fuelling will take place.
- Prospecting Area: Area applied for to pit and trench for diamond (bulk sampling).
- Roads (both access and haulage road on the mine site):
Although it is recommended that the operation utilize existing roads as far as possible, it is anticipated that the prospecting operation will create an additional 1.5 km of roads, with a width of 8 meters where no reserve exists and where the reserve exists 15 meters.

- Salvage yard (Storage and laydown area).
- Residue Stockpile area.
- Product Stockpile area.
- Waste disposal site
The operation will establish a dedicated, fenced waste disposal site with a concrete floor and bund wall. The following types of waste will be disposed of in this area:
 - Small amounts of low-level hazardous waste in suitable receptacles;
 - Domestic waste;
 - Industrial waste.
- Temporary Workshop Facilities and Wash Bay.
- Water distribution Pipeline.
- Water tank: It is anticipated that the operation will establish 1 x 10 000 litre water tanks with purifiers for potable water.

Alternatives considered: -

Alternatives for fuel storage include surface storage, underground storage, and the storage of fuel in mobile tanks with a metal bund wall. Underground storage has an adverse negative pollution potential because it is not easy to monitor leakages. Remediation measures are also not as effective as compared to surface storage tanks. Mobile tanks are a viable option for infield screening activities, but the best viable long-term option is the instalment of fuel tanks within a concrete bund wall. The final location of the fuel storage tanks will be determined based on proximity to site operations.

In terms of water use alternatives, the operation is located next to the Orange River. Plastic pipelines are considered to be the best long-term option for transferring water, due to their temporary nature which causes minimum environmental disturbances. Therefore, a pipeline route will be designed based on the principle of minimum impacts on the environment.

If prospecting proves positive a diamond rotary plant will be established which uses 2 x 16 feet rotary pans. Water use for a 16 feet rotary pan is in the order of 18 000 litres per hour. The operation will only work in daytime hours which will constitute about 8 hours per day which will bring water consumption to 144 000 litres per day and 720 000 litres per week, 2 880 000 litres per month per pan. Total cubic metres tested will be 81 206.25 m³ per 16 feet pan which can work about 65 tons per hour which constitutes about 117 m³ per hour.

The locality of the mine residue dam will be selected based on the following considerations, this dam will be very small due to the limited material being processed and the limited water needed:

- The locality is already disturbed or mined out.
- It is within reach of the treatment plant (1 000m).
- It is situated near the access road to the prospecting activities.
- No underlying ore bodies or geological discontinuities.
- No geomorphological impacts.
- No structures, dwellings or other points of risk on down-stream side.
- Topsoil from the treatment process will be available for final rehabilitation.

A standard slimes dam design will be established in order to maximise the capacity of the slimes dam and to minimise the risks in terms of general safety and the DWS regulations.

In terms of power generation, the options available was for Generators or ESKOM power. All of the electricity needs for the operations will be generated by a diesel generator and there would therefore be no additional pressure on the Eskom Electricity Grid.

In terms of sewage the decision was made to use chemical toilets which can be serviced regularly by the service provider.

(d) The technology to be used in the activity:

- **Technique**
The area will be excavated (bulk sampling) with an excavator up to bedrock, stockpiled next to an open area and loaded onto the trucks by a frond end loader. The trucks will transport the gravel via a newly constructed road, which will be constructed to the required safety standards. No provincial roads will be used.

At the processing plant the run of mine tailings will be fed onto a grizzly for the screening out oversize material. The gravel will be processed through a screening process and transported for delivery to a recovery plant and associated equipment. In terms of processing, it should take place outside the 1:100-year flood line and a processing area will be negotiated with the Department. This area will be used for all processing and stockpiling operations with an agreement entered into with the relevant Department.

- **Technology**
At the processing plant the run of the mine tailings will be fed onto a grizzly for the screening of the oversize material. The gravel will be processed through a screening process and transported for delivery to a recovery plant and associated equipment. In terms of the processing, it should take place outside the 1:100-year flood line and a processing area footprint will still be decided after the first phases of the prospecting results. This area will be used for all processing and stockpiling operations with an agreement entered into with the farm owner.

Alternatives considered: -

The planned prospecting activities include bulk sampling with an excavator up to bedrock. The operation is also associated with processing techniques that make use of modern technologies. These are the most economic viable method currently being used by the diamond fraternity. There is no other feasible, alternative prospecting method for the prospecting and bulk sampling of possible alluvial diamonds.

(e) The operational aspects of the activity:

The gravel will be loaded with an excavator on to dump trucks for conveyance to the processing plant. At the processing plant the bulk sample gravels will be fed onto a grizzly for screening out oversize material. The tailings will be processed through screening section and transported for delivery to a recovery plant. Concentrate from the recovery plant will be processed through an X-Ray/Sortex plant to extract possible diamonds. An area will be used for all processing and dumping operations outside the 1:100-year flood line.

Prospecting activities will primarily make use of existing roads, but additional roads will most likely be created.

Alternatives considered: -

The conventional opencast load-haul-bulk sampling method has been proven to be the most economic viable method currently being used by the diamond fraternity for bulk sampling. There is no other feasible, alternative bulk sampling method for the prospecting and extraction of possible alluvial diamonds.

(f) The option of not implementing the activity:

The major land uses in the area are mining and agriculture. According to AGIS, the land capability of the study site is moderate along the river, low on the plateau, and very low along the ridge slopes. Irrigation suitability is excellent along the river, but low on the remainder of the site. The region is demarcated for sheep farming, with the grazing capacity on site being 24 ha/LSU.

As seen in the Screening Report (below) there are currently no agricultural pivots on the proposed prospecting area and that the agricultural sensitivity of the area is predominantly low except for some areas with a medium sensitivity.

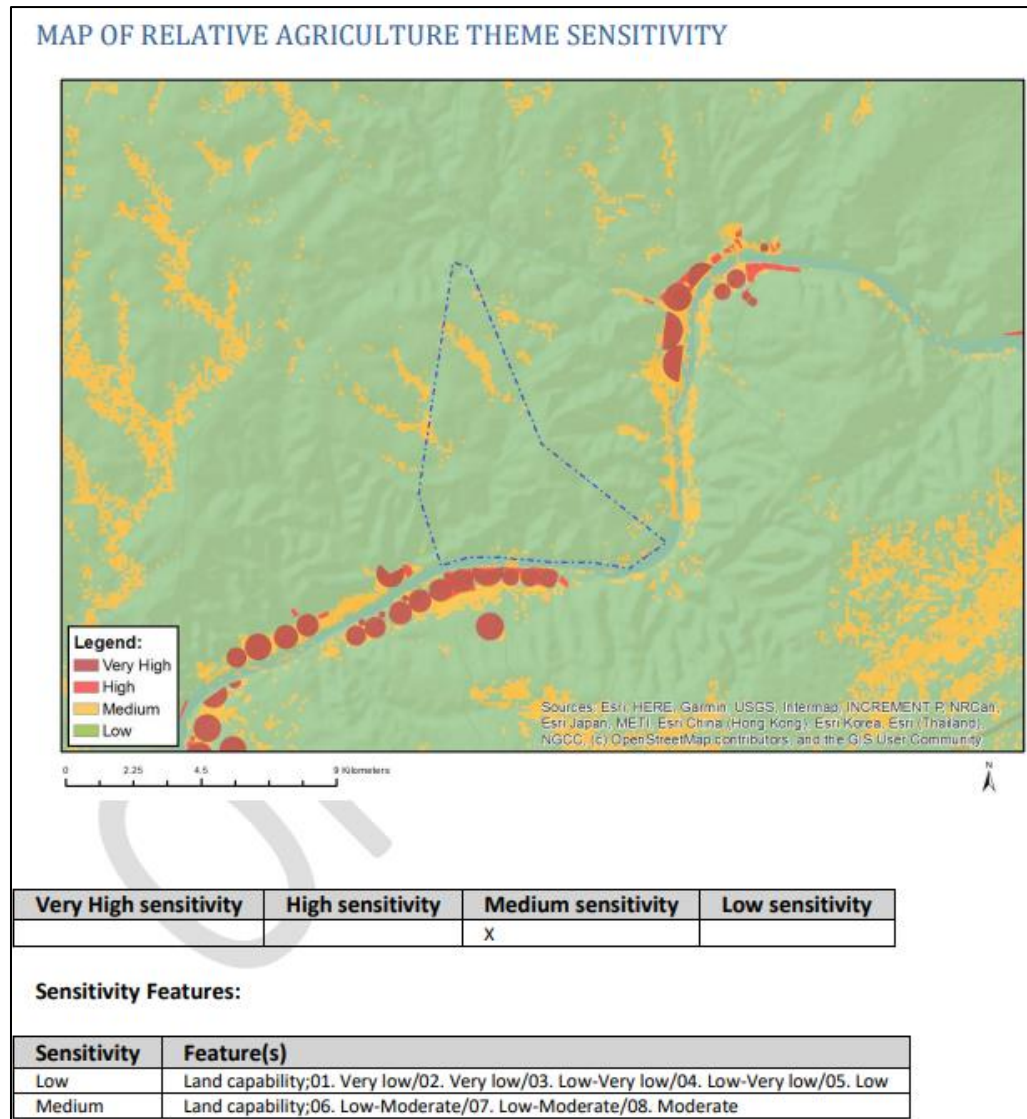


Figure 9. Relative Agricultural Theme Sensitivity for the proposed prospecting area.

Socio-Economy

The operation will make provision for $\pm 7-15$ job opportunities. This will be lost if the project does not proceed. Substantial tax benefits to the State and Local Government will also be lost.

Biodiversity

In terms of the Screening Tool that had been done for the prospecting right application the area falls into Critical Biodiversity Area 1 and 2 as well as Ecological support areas and the FEPA Sub catchment. Furthermore, a part of the application area falls within the Freshwater ecosystem priority area quinary catchment.

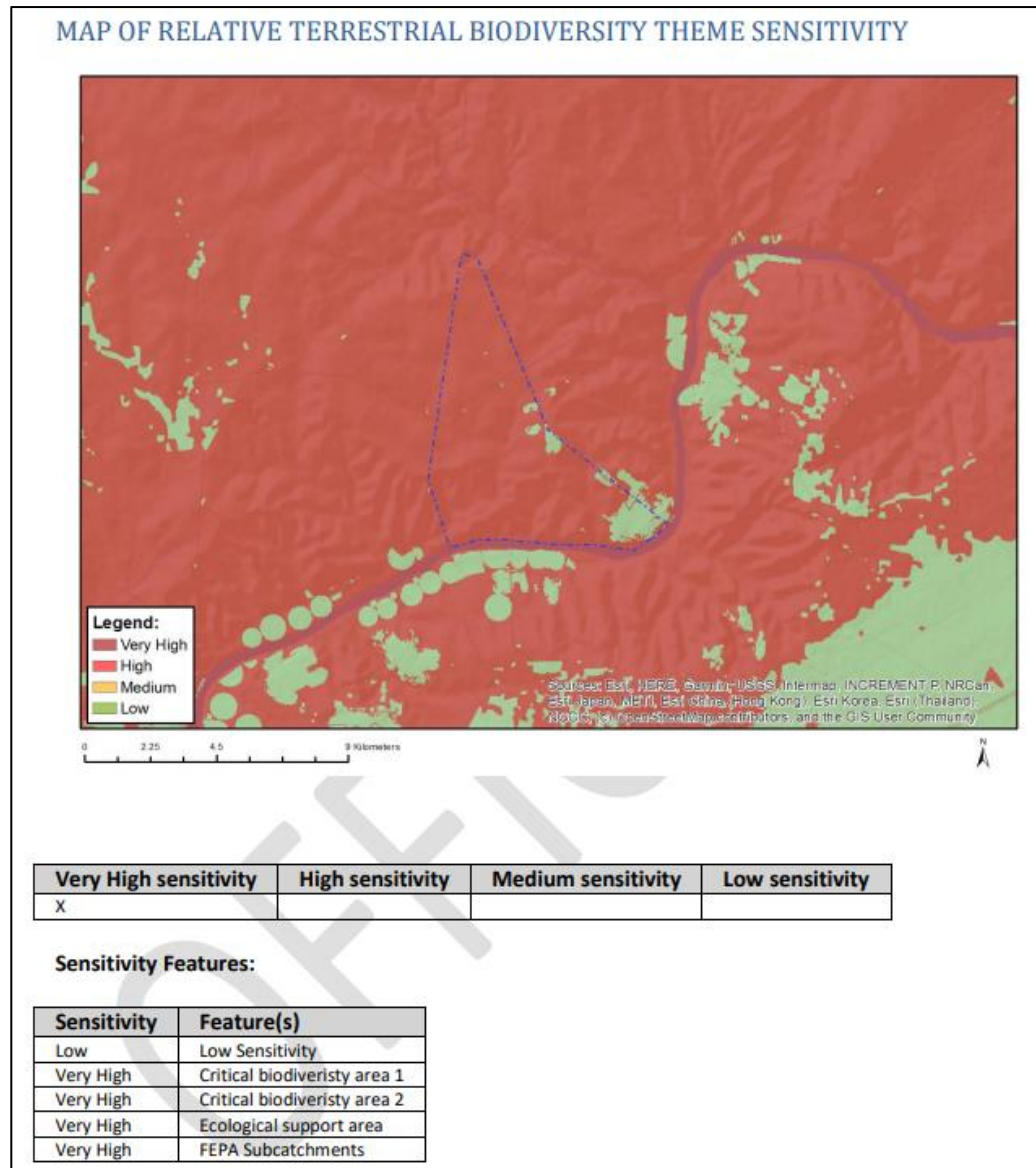


Figure 10. Final site layout plan in terms of the screening tool for Terrestrial Biodiversity.

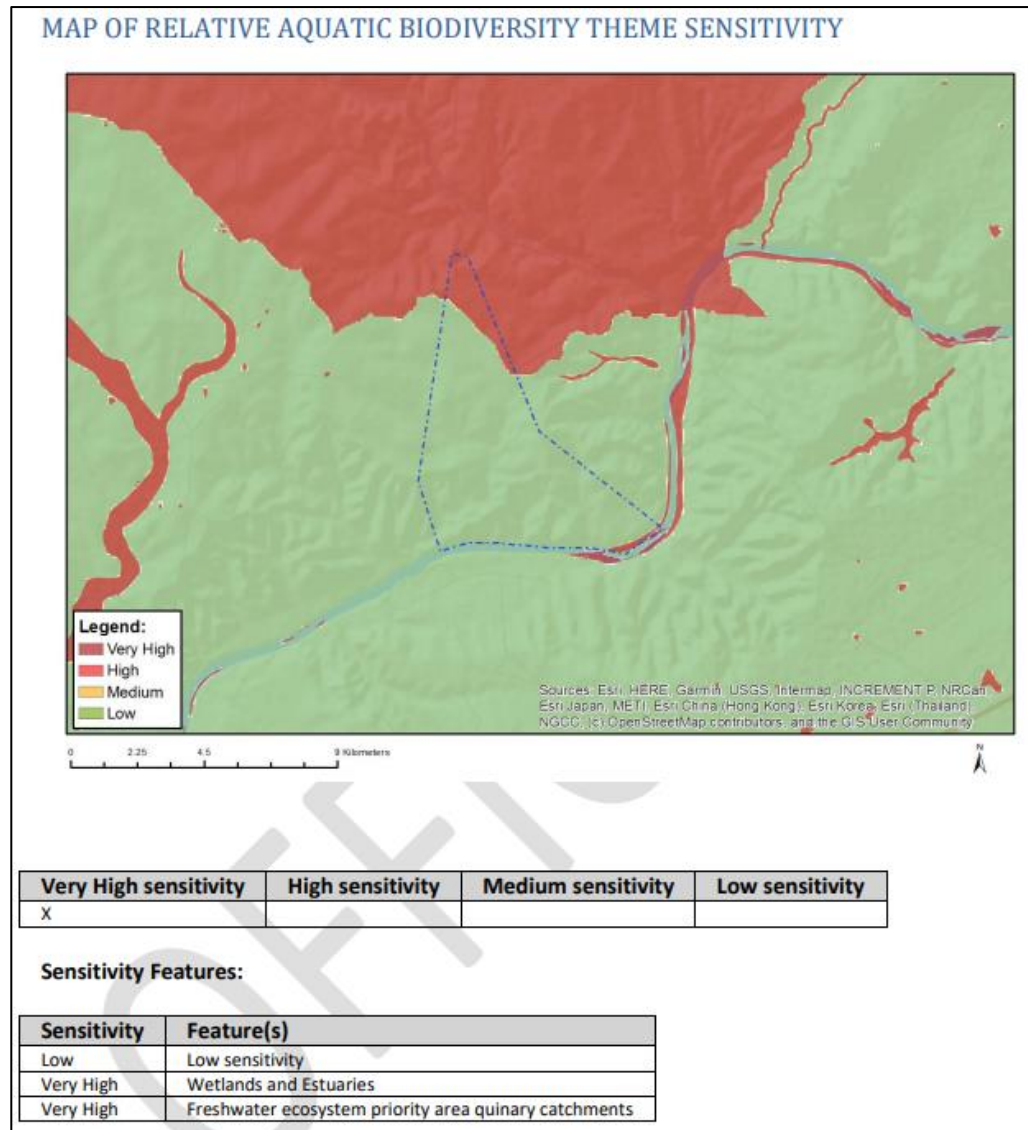


Figure 11. Final site layout plan in terms of the screening tool for Aquatic Biodiversity.

An ecological study which include biodiversity was done by Dr. Elizabeth (Betsie) Milne on the area (Appendix 4). When the final areas for pitting and bulk sampling have been identified, it will be vital to conduct a field assessment to assess the impacts related to these invasive activities on the ecological integrity of the final earmarked areas.

Heritage and Cultural Resources

The Screening Report done for the prospecting right application indicated a low sensitivity for Heritage but a high to very high sensitivity for the proposed prospecting area in terms of Palaeontology.

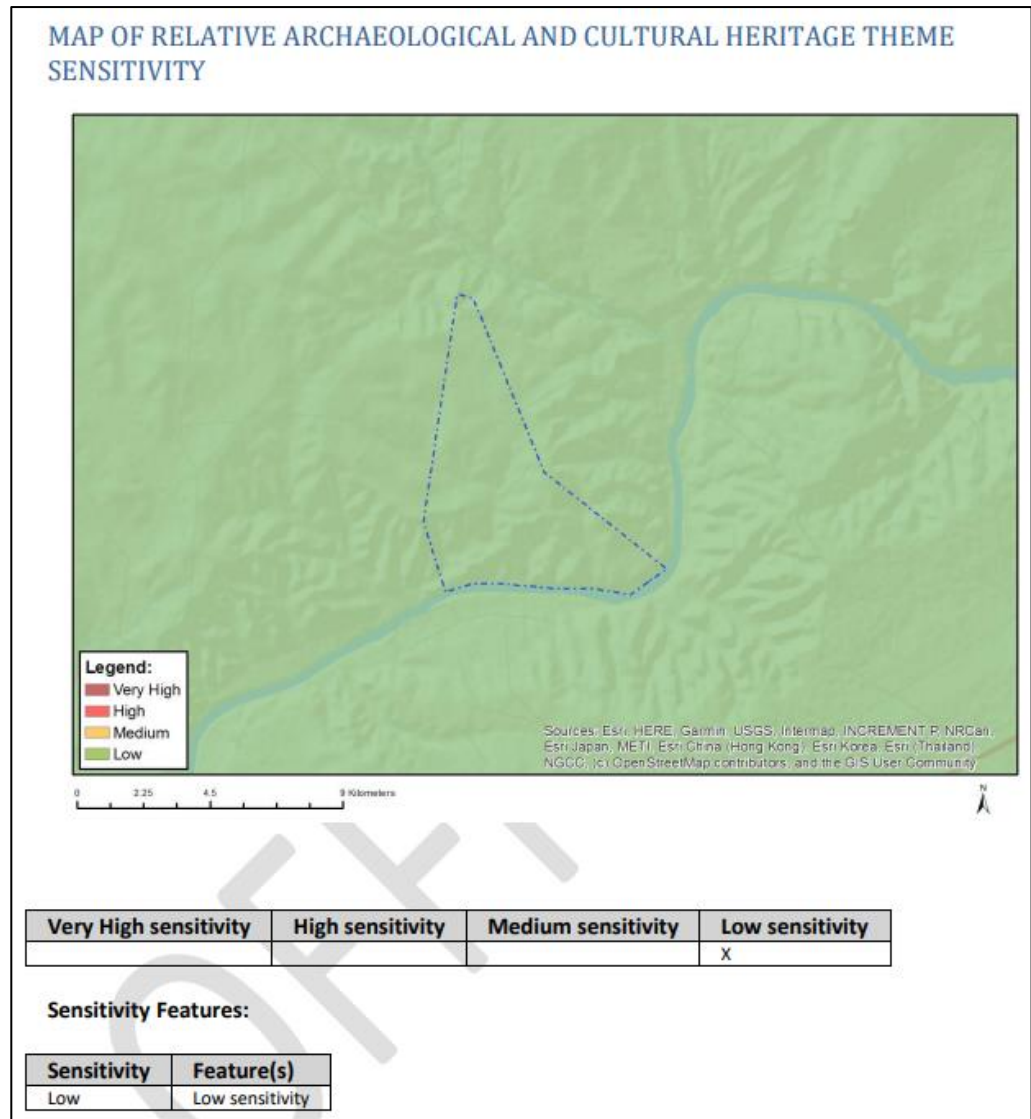


Figure 12. Relative Archaeological and Cultural Heritage Theme Sensitivity for the proposed prospecting area.

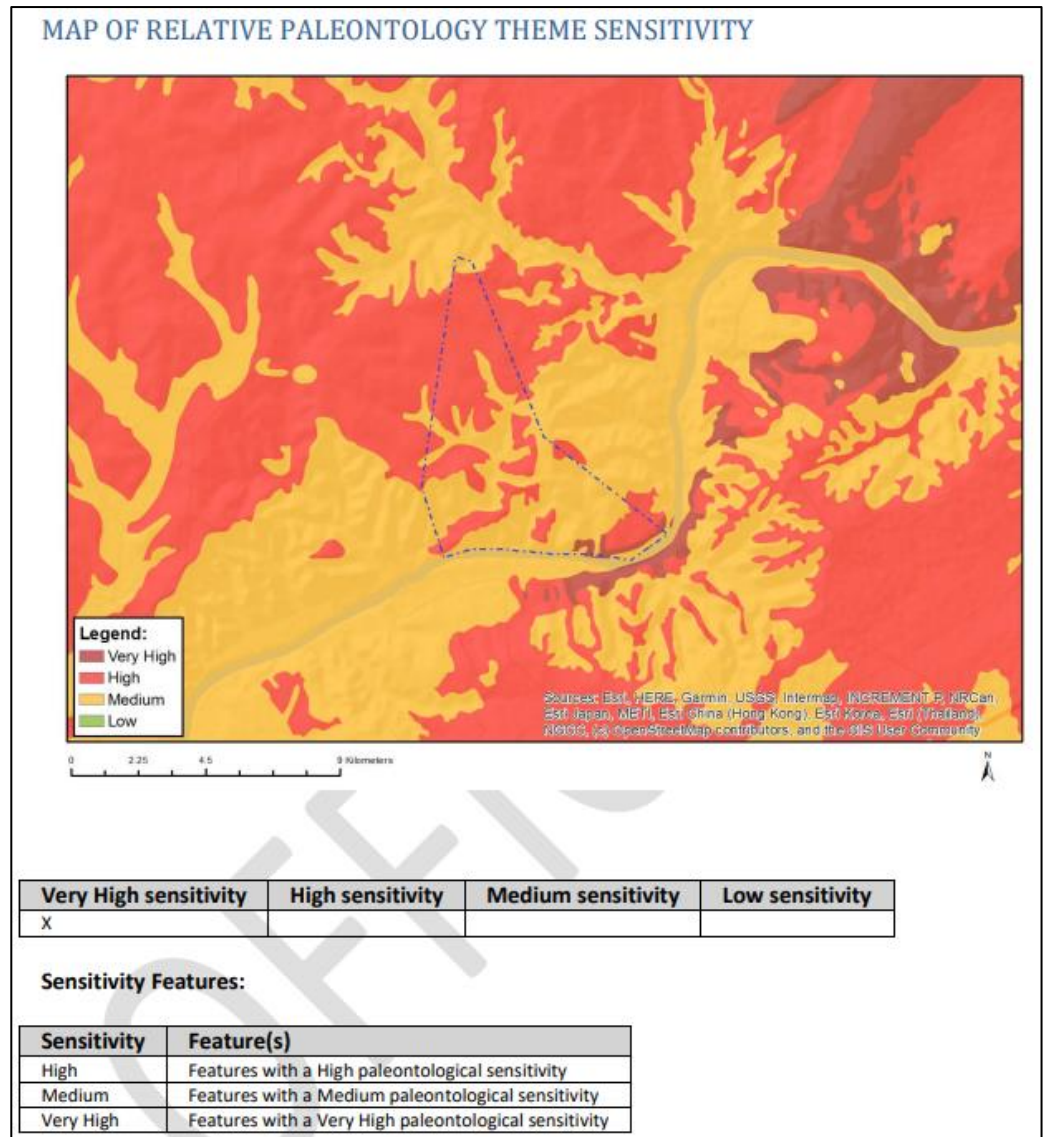


Figure 13. Relative Palaeontological Theme Sensitivity for the proposed prospecting area.

Both a Heritage Impact Assessment and Palaeontological Desk Assessment and an Palaeontological Impact Assessment was conducted by Dr. E. Matenga and Dr. M. Bamford respectively.

The heritage sensitivity of the property is summarised as follows:

The Stone Age

Stone Age material occurs on the property as background scatters that is testimony to the foraging activities of Stone Age communities. This pattern was also observed on Portion 23 of the Farm Lanyon Vale 376 which shares a boundary to the south with Portion 3. Seven (7) out of 10 occurrences were recorded on Portion 3. There was an occasional find of a hand-axe probably dating to the transition from the Early Stone Age to the Middle Stone Age. Otherwise, the scrapers and blades commonly

encountered date to the Middle Stone Age/Late Stone Age period. None of the sites were found to warrant further action.

The Early Iron Age

No material dating to the Early Iron Age was found.

The Later Iron Age

No material dating to the Later Iron Age was found.

Burial grounds

A burial ground with at least 7 graves and one portion with rectangular settings of stones was recorded (LVB08). A servitude of 100 m radius must be reserved around the graves.

Conclusion and recommendations

The Prospecting Right can be approved provided that the recommendations on the protection of the burial ground and disposal of the two stone features (if it becomes necessary) are heeded. Since archaeological deposits may be buried underground, should important artefacts or skeletal material be exposed in the area during operations, such activities should be halted, and the provincial heritage resources authority or SAHRA notified for an investigation and evaluation of the finds undertaken.

PALAEONTOLOGY

Furthermore, Dr. Bamford stated the site lies on three different and potentially fossiliferous strata. The very highly fossiliferous Boomplaas Formation (Ghaap Group, Transvaal Supergroup) adjacent to the eastern part of the Orange River could have trace fossils such as stromatolites or oolites. The highly fossiliferous Quaternary Calcretes and the moderately fossiliferous Quaternary alluvium could have trapped bones or wood, and the Dwyka Group could have fragmented fossils plants or invertebrates.

The site visit and walk through in late September 2022 by the palaeontologist confirmed that there are NO FOSSILS in any of the strata. Cobbles and pebbles are abundant on the surface and in the naturally exposed profiles. It is not known what lies below the surface, therefore, a Fossil Chance Find Protocol should be added to the EMPr. Based on this information it is recommended that no further palaeontological impact assessment is required unless fossils are found by the prospectors, contractor, environmental officer or other designated responsible person once excavations, drilling or sampling activities have commenced. Since the impact will be low, as far as the palaeontology is concerned, the project should be authorised.

Should any other heritage or archaeological features and/or objects be located or observed, a heritage specialist will be contacted immediately. Observed or located heritage features and/or objects may not be disturbed or removed in any way until such time that a heritage specialist has been able to make an assessment as to the significance of the site (or material) in question. If the prospecting operation is approved, the heritage resources if any other had been encountered will be protected through the demarcation of no-go zones and fencing off.

ii) Details of the Public Participation Process Followed

Describe the process undertaken to consult interested and affected parties including public meetings and one on one consultation. NB the affected parties must be specifically consulted regardless of whether or not they attended public meetings. (Information to be provided to affected parties must include sufficient detail of the intended operation to enable them to assess what impact the activities will have on them or on the use of their land.

The process as described by NEMA for Environmental Authorisation was followed. See table 3 below for the identification of Interested and Affected Parties to be consulted with. The landowner, and or occupants and direct neighbours were consulted.

A copy of the draft Scoping Report (burned to disc) was be sent to all identified interested and affected parties on 14 September 2022. All Government Departments identified were also notified by registered letters. The surface owners also received a registered letter.

Notices was also placed on the gates at the entrance of the proposed site and on the gravel road on 08 September 2022 towards the site to invite any other interested parties to come forward and to register. Other notices were brought up at the library to inform the communities in the surrounding area of the proposed prospecting operation.

The draft Scoping Report was also placed at the Douglas public Library along with a notice to notify the public of the proposed prospecting operation as well as to provide access to the draft Scoping Report to the community.

Furthermore, an advert was placed in the DFA Newspaper on 9 September 2022 which invited any other interested or affected party to come forward and register.

Proof of consultation (attendance registers, minutes of meetings and response forms) is attached as Appendix 3. The consultation process is still in process

iii) Summary of issues raised by I&APs

(Complete the table summarising comments and issues raised, and reaction to those responses)

Please refer to Table 3 attached to the EIA EMP

The Environmental attributes associated with the development footprint

alternatives (The environmental attributed described must include socio-economic, social, heritage, cultural, geographical, physical and biological aspects)

(1) Baseline Environment**(a) Type of environment affected by the proposed activity**

(its current geographical, physical, biological, socio-economic, and cultural character)

(1) GEOLOGY

Dr Elizabeth (Betsie) Milne from Boscia Ecological Consulting has been appointed by Wadala Mining to provide an ecological study in order to highlight the ecological characteristics of the proposed mining area, and to determine the possible impact of mining on the diversity and ecological status of the application area, geology was described and included in this report as part of the ecological study.

According to 1:250 000 Geological Map of 2922 Prieska, published by the Council for Geoscience in 1995, the geological features on Beatrys comprise Quaternary, Tertiary, Carboniferous and Vaalian deposits. Most of the northern plateau and some sections in the south comprise calcrete, while the ridge slopes comprise Dwyka tillites of the Karoo Supergroup (Figure 14).

Alluvium is found along the river and major drainage lines (Figure 14). A small section in the south-east comprises Boomplaas oolitic, stromatolitic and algal-mat limestone with interbedded flagstone and quartzite from the Schmidtsdrif subgroup (Ghaap Group) of the Griqualand West Supergroup. Higher terrace diamond deposits are associated with the calcrete, while intermediate terraces are located among the tillites. Lower terrace gravel is associated with the alluvium (Taken out of the ecological study by Boscia Ecological Consulting, January 2023).

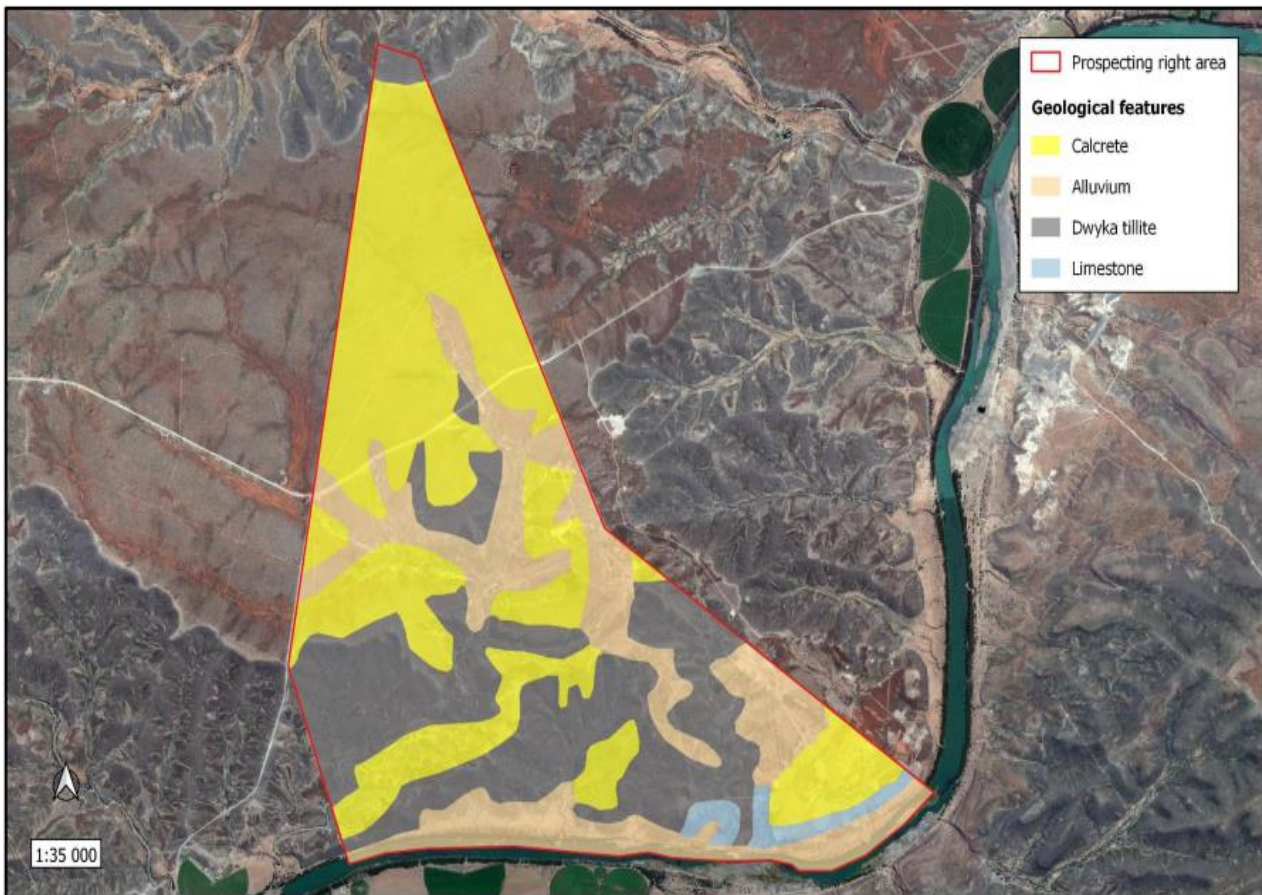


Figure 14. The distribution of geological features in the study area.

The bedrock of the Orange River valley between the confluence of the Vaal and Orange Rivers at Douglas and Prieska is dominated by flat-lying Dwyka tillite and siltstone of the Karoo Supergroup. The Dwyka, typically, comprises matrix-supported diamictite with both local and transported pebbles and boulders as dropstones in a rock-flour matrix. Underlying the Dwyka and exposed where the Orange River has incised through that sequence, are lavas of the Ventersdorp Supergroup, overlain (in places) by sediments of the Transvaal Supergroup, comprising shales, quartzites and dolomites. The bedrock is cut by faults and dolerite dykes, which are rarely exposed. The surface on which the Dwyka was deposited was irregular with several topographic highs.

The present surface of the Dwyka comprises a gently undulating terrain lying at an elevation of between 1,050m and 1,100m amsl. The river has incised into this surface to a depth of between 90m and 150m. Owing to the irregularity of the pre-Dwyka surface, several reaches of the river are superimposed on pre-Dwyka topographic highs, which, due to their relative resistance to erosion, give rise to more rugged topography. Here the Orange River is confined to gorges with increased river gradients. In contrast, the more easily eroded Dwyka has been dissected by minor tributaries of the Orange River, giving rise

to a trellis-type drainage pattern. To the north of the Orange River, the Ghaap Plateau represents an ancient surface of Transvaal Supergroup rocks.

Lower Terraces

Lower elevation terraces (less than about 30 m above present riverbed) of the Orange River are typified by up to 30% sand matrix with a high proportion of zeolite-rich sand lenses and a high proportion of red Drakensberg basalt clasts. These gravels normally exhibit intermediate to low diamond grades. They are typically cobble- pebble gravels with occasional boulders. Clast composition is dominated by andesite (Ventersdorp lava), dolerite, shale, quartzite, and riebeckite, with a low percentage of agate and amygdales. Downstream of Lanyonvale (Wouterspan) BIF makes up +60% of the clast assemblages.

Clast-rounding is moderate and packing is moderate to poor, both of which impact negatively on diamond entrapment potential. Average grades of 0.5-1.2ct/m³ or 0.23-0.54cpht are known with the occurrence of occasional large stones (P Gresse, Pers. Comm., 2005).

The lowest terrace does not appear to be as calcreted as the upper two terraces and mining is, therefore, easier. Lower terrace deposits are generally covered by 1 - 4 m of sand whereas the upper terrace deposits are capped by a hard calcrete layer some 2 - 3 m thick which protected the gravel deposits from erosion and prevented exploitation in the past.

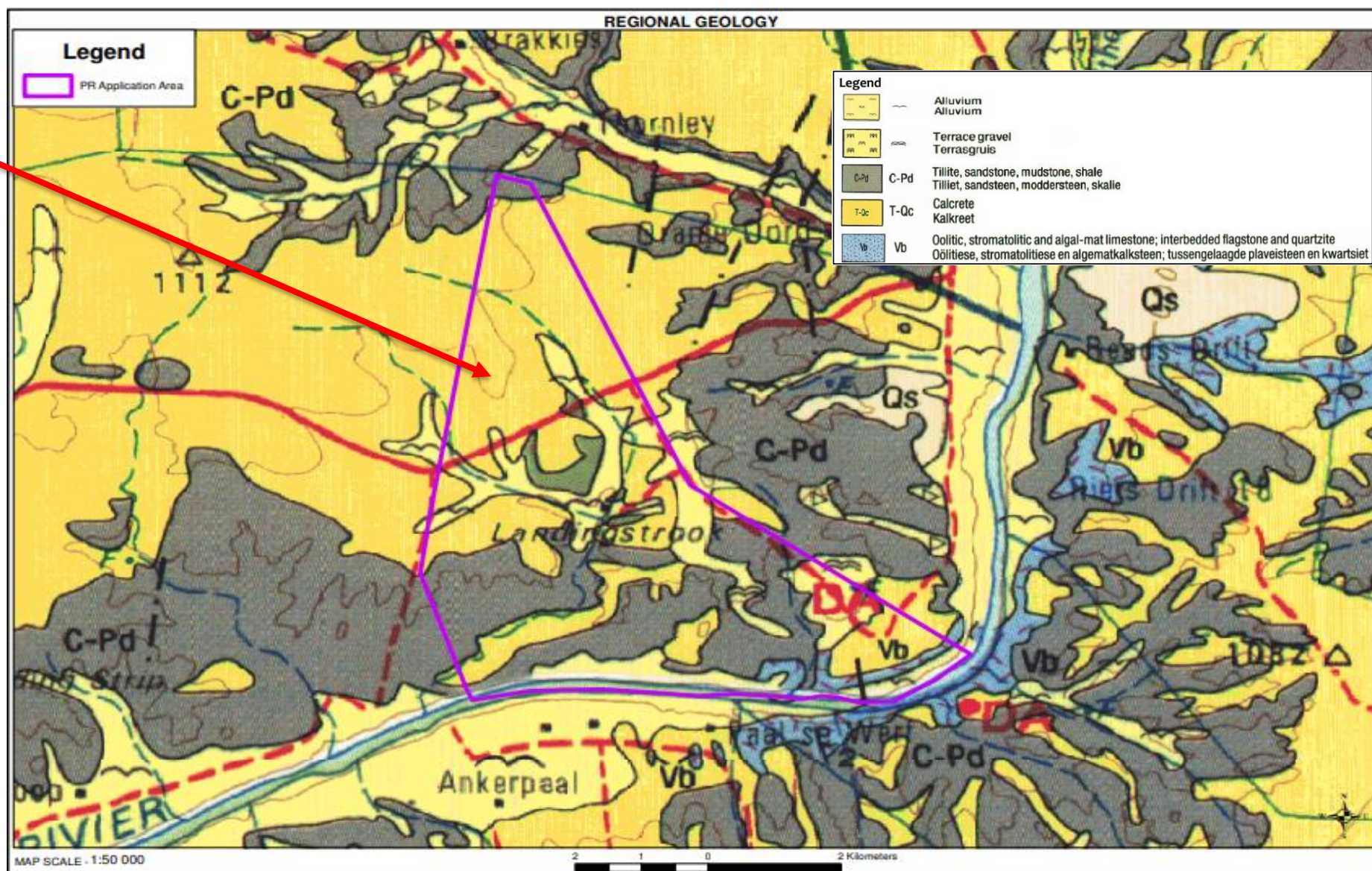


Figure 15. Map indicating the regional geology of the Prospecting right application area.

(2) CLIMATE:

The study area falls within the Northern Upper Karoo (NKu 3) vegetation group of the Nama-Karoo Biome with a small portion along the river bed falling within the Upper Gariep Alluvial Vegetation group that is part of the inland Azonal Vegetation unit.

The Nama-Karoo is an arid biome with a mean annual precipitation (MAP) from 70 mm in the northwest and 500 mm in the southeast of the biome. The MAP for the Northern Upper Karoo vegetation group is 275 mm. Rainfall occurs predominantly in the late Summer (December to April) with the highest rainfall occurring in March mostly in the form of thunderstorms. This region experiences hot Summers ($> 30^{\circ}\text{C}$) and cold Winters (0°C) with extreme temperatures ranging from -5°C in the winter and 43°C in the summer. The mean annual potential (MAPE) evaporation measure for the area is 2615 mm. Frost is common for winters and dust devils and small whirlwinds are common for summer months. (Mucina & Rutherford, 2006)

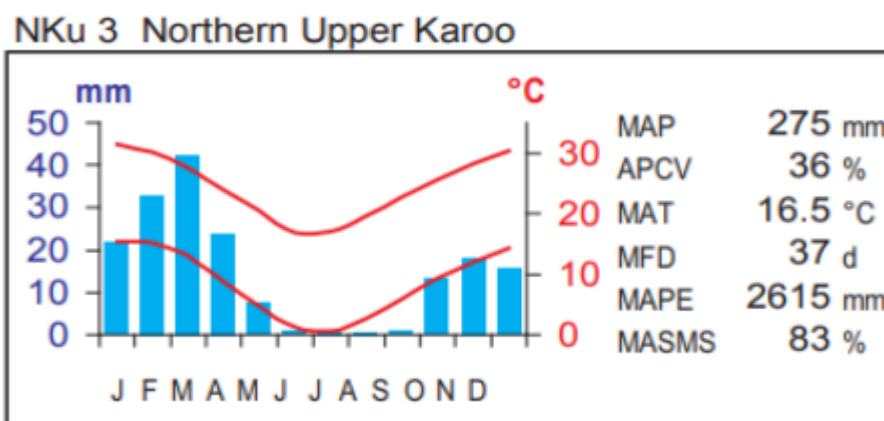


Figure 16. Climate of the Northern Upper Karoo vegetation group (Mucina & Rutherford, 2006).

(Mucina, L. & Rutherford, M.C. (eds) 2006. The vegetation of South Africa, Lesotho and Swaziland. Strelitzia 19. South African National Biodiversity Institute, Pretoria.)

(3) TOPOGRAPHY:

Dr Elizabeth (Betsie) Milne from Boscia Ecological Consulting has been appointed by Wadala Mining to provide an ecological study in order to highlight the ecological characteristics of the proposed mining area, and to determine the possible impact of prospecting on the diversity and ecological status of the application area, topography was described and included in this report as part of the ecological study.

The calcrete plateau and alluvium along the river are characterised by level plains with some relief, while the tillite slopes are characterised by open ridges. Altitude ranges between 940 - 960 m along the alluvium, 980 – 1 000 m on the slopes, and 1 020 – 1 060 m along the calcrete plateau. The terrain is indicated by a level to gentle slope of 1 % on the plateau and 3% on the alluvium but increases to 5 - 8 % on the tillite slopes.

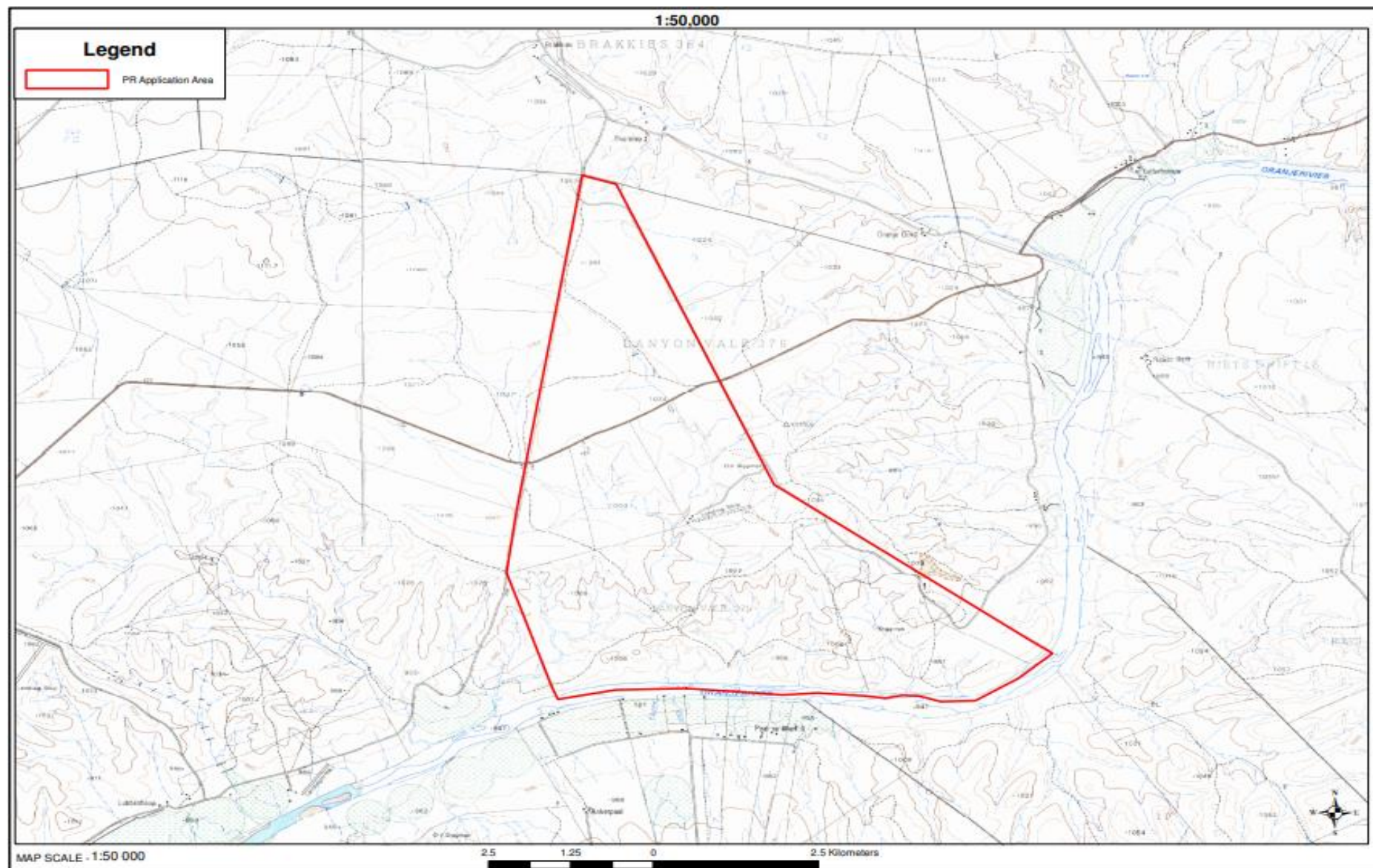


Figure 17. Topographical Map indicating the prospecting right application area in red.

(4) SOILS:

Dr Elizabeth (Betsie) Milne from Boscia Ecological Consulting has been appointed by Wadala Mining to provide an ecological study in order to highlight the ecological characteristics of the proposed mining area, and to determine the possible impact of prospecting on the diversity and ecological status of the application area. Soil was described and included in this report as part of the ecological study.

Land types found on the property include Ag115, Ag143, Fc565 and Ia124 (Figure 18). The calcrete terraces, represented by the Ag115 and Ag124 land type, are characterised by redyellow apedal, freely drained soils, red, with high base status, and are shallow (< 300 mm deep). The slopes, depicted by the Fc565 landtype, comprise Glenrosa and/or Mispah forms, usually shallow, on hard or weathering rock, with lime generally present. The areas along the river (Ia124 landtype) comprise undifferentiated, deep, alluvial deposits.

Soils of the study area have moderately high wind- and water erosion susceptibility. Rainfall erosivity is low due to the arid climate, but the steep terrain of the slopes and drainage networks as well as the sand alluvium along the river are most susceptible to water erosion during flooding events.

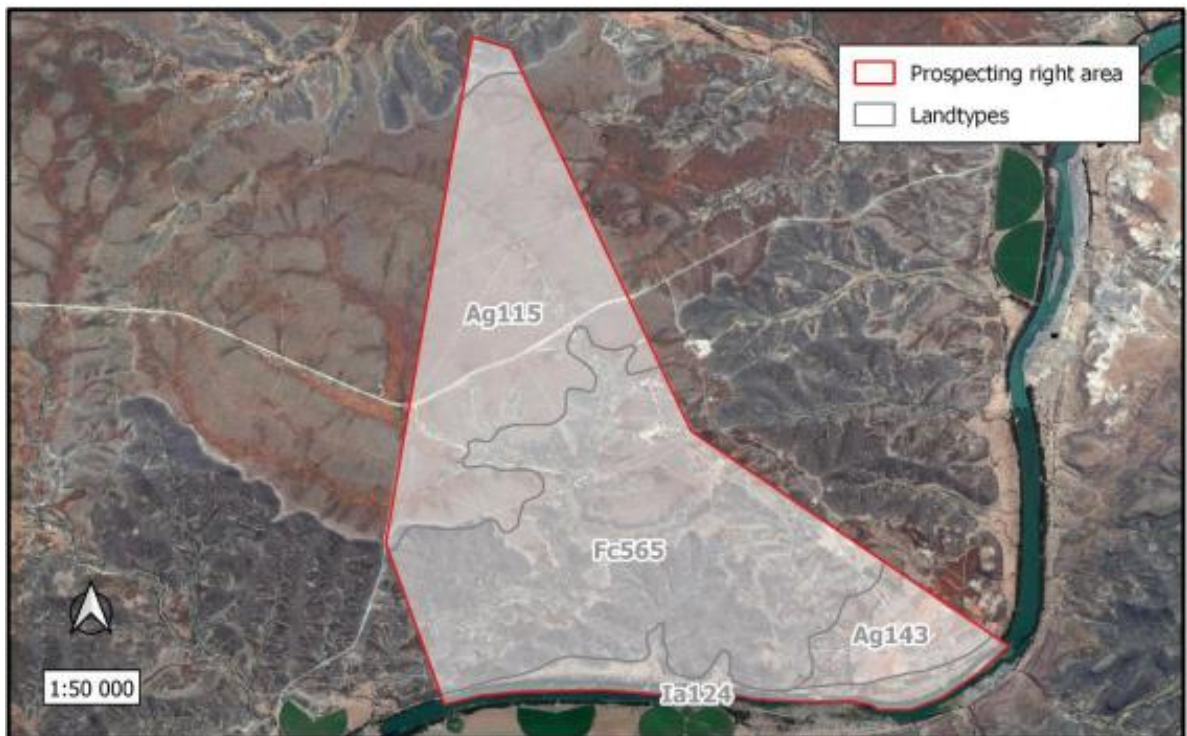


Figure 18. The distribution of land types in the study area.

(5) **LAND CAPABILITY AND LAND USE:**

Dr Elizabeth (Betsie) Milne from Boscia Ecological Consulting has been appointed by Wadala Mining to provide an ecological study in order to highlight the ecological characteristics of the proposed mining area, and to determine the possible impact of mining on the diversity and ecological status of the application area, land use and capability was described and included in this report as part of the ecological study.

The major land uses in the area are mining and agriculture. According to AGIS, the land capability of the study site is moderate along the river, low on the plateau, and very low along the ridge slopes. Irrigation suitability is excellent along the river, but low on the remainder of the site. The region is demarcated for sheep farming, with the grazing capacity on site being 24 ha/LSU.

Apart from the proposed prospecting activities, the prospecting right application area is mainly utilised as natural pastures for livestock grazing. Disturbances from past mining activities and borrow pitting are evident and existing infrastructure include a farm dam, remnant mining infrastructure, a landing strip, and roads (Figure 19).

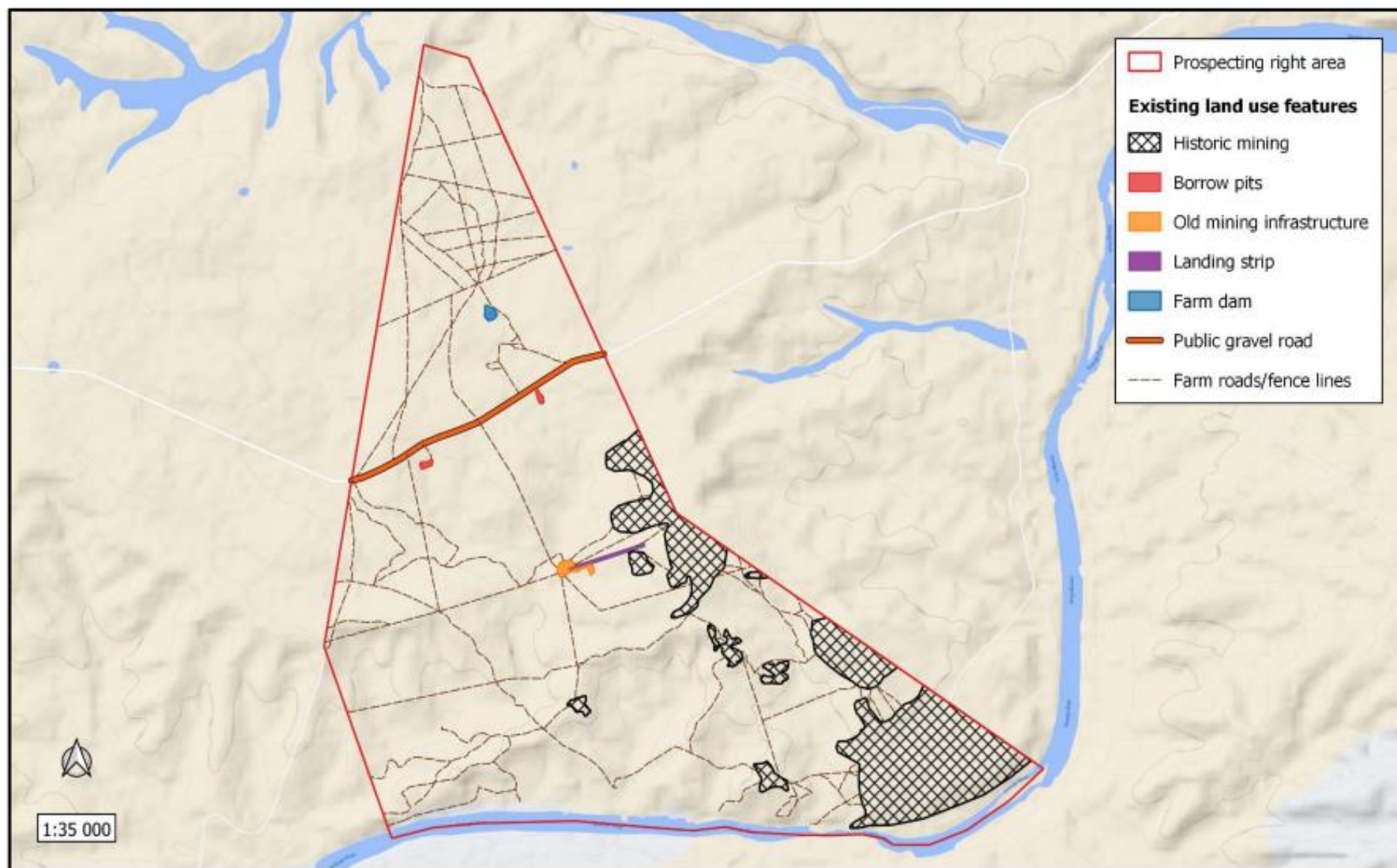


Figure 19. The existing land use features on the prospecting right area.

(6) **NATURAL FAUNA:**

Dr Elizabeth (Betsie) Milne from Boscia Ecological Consulting has been appointed by Wadala Mining to provide an ecological study in order to highlight the ecological characteristics of the proposed prospecting area, and to determine the possible impact of prospecting on the diversity and ecological status of the application area, Fauna was described and included in this report as part of the ecological study.

Faunal communities

According to Section 3(a) and 4(a) of the Northern Cape Nature Conservation (NCNCA) Act No. 9 of 2009, no person may, without a permit by any means hunt, kill, poison, capture, disturb, or injure any protected (Schedule 2) or specially protected (Schedule 1) wild animals. Furthermore, Section 12 (1) of NCNCA states that no person may, on a land of which he or she is not the owner, hunt a wild animal without the written permission from the landowner. According to the act “wild animal” means a live vertebrate or invertebrate animal, and the egg or spawn of such animal. The landscape features on Beatrys provides a few habitat opportunities to faunal communities. Animals likely to be found in the study area are discussed in their respective faunal groups below.

Mammals

As many as 54 terrestrial mammals and nine bat species have been recorded in the region, of which nine are listed either in the IUCN or the Mammal Red List of South Africa, Lesotho and Swaziland. Of these, signs of Aardvark activities were observed in the shrubland on alluvium during the field survey.

Virtually all mammals of the study area are protected; either according to Schedule 1, 2 or 3 of NCNCA. Those that are specially protected are also indicated in the ecological study.

Apart from Aardvark, already discussed, Honey Badger, Ground Pangolin, Aardwolf, African Wild Cat, Cape Fox, Bat-eared Fox and Striped Polecat also have a high chance of occurring across the site, given their wide habitat tolerances. Pangolins, however, are seldomly encountered due to their inconspicuous nature. Similarly, the South African Hedgehog also has a high chance of occurring on site based on their association with open, arid habitat. The Cape Clawless Otter is expected to be restricted to the Orange River.

Black-footed Cat prefers arid habitat, but their conspicuous nature and prospecting activities might cause them to avoid the site. African striped Weasel prefers grassland habitat, and the African Straw-coloured Fruit-bat requires fruit trees. Therefore, these species have a moderate chance to be found on site.

Apart from these special species of conservation concern, Yellow Mongoose were encountered several times on site. Vervet Monkey, a problem animal (Schedule 4) was recorded adjacent to the study area, and other problem animals with a high likelihood to occur on site include Black-backed Jackal and Caracal.

Reptiles

The Beatrys mining area lies within the distribution range of at least 36 reptile species. No listed species are known to occur in the area, but most reptiles of the study area are protected either according to Schedule 1 or 2 of NCNCA. Specially protected species include *Karusasaurus polyzonus* (Southern Karusa Lizard) and *Chamaeleo dilepis dilepis* (Namaqua Chamaeleon). The Karusa Lizard is a rock-dwelling species inhabiting rocky outcrops and could potentially occur along the rocky ridge slopes. The Common Flap-neck Chameleon is typically found high up in bushes or trees and could therefore potentially occur across the site.

South African endemics include *Pachydactylus mariquensis* (Common Banded Gecko), *Lamprophis aurora* (Aurora Snake) and *Homopus femoralis* (Greater Dwarf Tortoise). The Common Banded Gecko prefers sandy soil and sparse vegetation in a variety of habitats such as sandy plains and dry riverbeds.

The Aurora Snake is often found near streams and under rocks and old termitaria, while the Greater Dwarf Tortoise occurs in rocky areas with dense vegetation where they take shelter among rocks or under plants. The drainage lines could potentially provide a special habitat for the Marsh Terrapin.

Amphibians

Fourteen amphibian species are known from the region. The Orange River and associated pools represents suitable habitat for water-dependent species, and the ephemeral drainage lines is expected to also be important during wet periods for breeding. Those frog species that are fairly independent of water (i.e. Bushveld Rain Frog, Boettger's Caco) are expected to take refuge under rocks and logs, soil cracks, sandy substrates, leaf litter and abandoned mounds of termites.

The Giant Bull Frog (*Pyxicephalus adspersus*) is listed as Near Threatened and is protected according to Schedule 1 of the NCNCA. They prefer seasonal shallow grassy pans, vleis and other rain-filled depressions in open flat areas of grassland or savanna, but mainly remain buried up to 1 m underground until conditions become favourable. The site lies within their known distribution, but no ideal habitat for them occurs on site.

All other amphibians of the study area are protected according to Schedule 2 of NCNCA. Raucous Toad (*Amietophrynus rangeri*) and Southern Pygmy Toad

(*Poyntonophrynus vertebralis*) are endemic to South Africa and occur in a variety of terrestrial habitats for most of the time. However, they use temporary waterbodies containing rainwater to breed, including pans, pools, roadsides, farm dams and even quarries, and could potentially occur on site during the rainy season.

Avifauna

The study site does not fall within or near (< 100 km) any of the Important Bird Areas (IBA) defined by Birdlife South Africa. A total number of 261 bird species have been recorded from the region. As many as 25 listed bird species are known from the region, all of which are classified as Vulnerable, Near Threatened, Endangered or Critically Endangered. Furthermore, all birds are protected either according to Schedule 1, 2 or 3 of NCNCA. Those that are specially protected (Schedule 1) are also listed in the ecological study.

Plants, from grass tufts to shrubs and trees provide important micro-habitats to birds and therefore the entire study area is expected to host a diverse avifauna community. The most common bird species of conservation concern expected to occur on site include Kori Bustard (Near Threatened) and Ludwig's Bustard (Endangered). They are expected to be most active in the shrubland on calcrete terraces and tillite slopes.

African Fish-Eagle (Schedule 1 of the NCNCA) was heard calling from the riparian woodland during the field survey and could potentially use the trees along the river for breeding sites. Many of the remaining species of conservation concern are also expected to occur on site either by occasionally passing over, foraging, or nesting.

Fish

In addition to those regulations in the NCNCA pertaining to wild animals, Section 32 and 33 of the NCNCA states that no person may, without a permit angle and not immediately release, catch, import, export, transport, keep, possess, breed, or trade in a specimen of a specially protected (Schedule 1) or protected (Schedule 2) fish.

Seven fish species are expected to be found in the Orange River and are listed in the ecological study, along with their conservation status and sensitivity to physico-chemical and no-flow conditions. They are all listed as least concern. However, they are all protected either according to Schedule 1 or 2 of the NCNCA. Specially protected species include the Vaalorange Smallmouth Yellowfish. Their population is highly fragmented and continuing to experience decline of mature individuals due to the continuing decline in area, extent, and quality of their habitat. They typically occur in pools, riffles and rapids and fast flowing rivers, preferring sand and gravel substrates. They migrate to suitable gravel beds and breed in spring to midsummer after major summer rains.

Invertebrates

Invertebrates dominate inland habitats and play a significant role in the overall function of the ecosystem (Kremen et al. 1993, Weisser and Siemann 2004). In general, they are widely distributed and extremely diverse, which makes it almost impossible to list all species that may possibly occur on site without a dedicated study.

Invertebrates have also not been surveyed as comprehensively as plants, mammals and birds and therefore current available data on their distribution is much scarcer. Nevertheless, key morphospecies and species of conservation concern are discussed here, as well as the major habitats which delimit possible invertebrate communities on site.

Eight invertebrate species of the Northern Cape appear on the IUCN Red Data list of threatened species and are listed in the ecological study. However, none of these species' distribution ranges overlap with that of the study area. In addition, those species that are specially protected according to Schedule 1 of the NCNCA include all Velvet worms as well as some baboon spider species, Stag Beetles and the Flightless Dung Beetle. None of these taxa are known to occur in the study region either.

All Rock- Creeping- and Burrowing Scorpions are protected according to Schedule 2 of the NCNCA, along with several beetles, butterflies, and moths. Of these, Burrowing and Rock Scorpions as well as some Gossamer-winged Butterflies, Skippers, Brush-footed Butterflies and Satyrs have the highest likelihood to be found on site.

Two major habitats delimit possible invertebrate communities in the study area:

i. Terrestrial vegetation classified as Karoo (Picker et al. 2004)

All the terrestrial vegetation communities on site fall within this habitat and represent unique species assemblages, with an above-average representation of beetles, grasshoppers, flies, wasps, and lacewings. The protected butterflies and scorpions discussed above would also be associated with this habitat.

ii. Orange River

Invertebrates expected to be associated with the Orange River include Flatworms, earthworms, leeches, freshwater crabs, mussels and prawn, basket clams, freshwater bivalve- and pulmonate snails, bladder snails, pond snails, prong-gilled mayflies, small squaregill mayflies and numerous other species of mayflies, jewel damselflies, narrowwinged damselflies, clubtail dragonflies, emerald dragonflies, skimmers dragonflies, grass moths, giant water bugs, water boatmen, water striders, water treaders, marsh treaders, creeping water

bugs, water mites, sponges, water scorpions, backswimmers, pygmy backswimmers, riffle bugs, long-horned caddisflies, microcaddisflies, net-spinning caddisflies, diving beetles, riffle beetles, whirligig beetles, water scavenger beetles, long-toed water beetles, minute moss beetles, biting midges, meniscus midges, mosquitoes, house flies, black flies, horse flies, crane flies and nematoceran flies. generalist species like water boatmen, predaceous diving beetles, whirligig beetles, biting midges, non-biting midges and mosquitos.

(7) Flora:

Dr Elizabeth (Betsie) Milne has been appointed by Wadala Mining to provide an ecological study in order to highlight the ecological characteristics of the proposed prospecting area, and to determine the possible impact of prospecting on the diversity and ecological status of the application area natural flora was described and included in this report as part of the ecological study. (Appendix 4).

Broad-scale vegetation patterns

The study area falls within the Nama Karoo and Azonal Vegetation Biomes (Mucina and Rutherford 2006). According to the vegetation map of Mucina and Rutherford (2012), the site is represented by two broad-scale vegetation units, i.e. Northern Upper Karoo and Upper Gariep Alluvial Vegetation (Figure 20).

Northern Upper Karoo is found in the Northern Cape and Free State at altitudes between 1 000 and 1 500 m. It is mainly restricted to the Northern regions of the Upper Karoo plateau from Prieska, Vosburg and Carnarvon in the west to Phillipstown, Petrusville and Petrusburg in the east. The topography is typically flat to gently sloping, with isolated hills in the Upper Karoo Hardeveld (in the south) and Vaalbos Rocky Shrubland (in the northeast). Numerous pans are interspersed in this unit. The vegetation occurs mainly as shrubland dominated by dwarf karoo shrubs, grasses and *Senegalia mellifera*. The geology and soil of this unit varies greatly. Geology includes shales of the Volksrust Formation, Dwyka Group Diamictite, Jurassic Karoo Dolerite sills and sheets, and calcretes of the Kalahari Group.

Soils range from shallow to deep, red-yellow, apedal, freely drained to very shallow Glenrosa and Mispah forms. The most dominant landtypes are Ae, Ag and Fc. It is estimated that about 4 % of the Northern Upper Karoo has been cleared for cultivation or transformed by building of dams; and human settlements are increasing in the north-eastern parts. Erosion is moderate, very low and low, while *Prosopis glandulosa*, considered among the top 12 agriculturally significant invasive alien plants in South Africa, are widely distributed in this unit. The unit is classified as being least threatened and it is

not currently conserved within any formal conservation areas. Endemic plant species known from this unit include *Lithops hookeri*, *Stomatium pluridens*, *Atriplex spongiosa*, *Galenia exigua* and *Manulea deserticola*.

Upper Gariep Alluvial Vegetation is found in the Northern Cape and Free State and includes the broad alluvia of the Orange River, lower Caledon and the lower stretches of the Vaal, Riet and Modder Rivers as far as Groblershoop. The topography is typically flat alluvial terraces that host riparian thicket vegetation (dominated by *Vachellia karroo* and *Diospyros lycioides*), flooded grasslands, reed beds and ephemeral herblands found mainly on sand banks within the river and on the riverbanks. The geology is presented as recent alluvial deposits underlain by Karoo Supergroup sediments and tillites. The soils are typically of the Ia group land types. This unit is subject to flooding during summer. It is estimated that more than 20 % has been transformed for cultivation and the building of dams. Exotic woody species like *Salix babylonica*, *Eucalyptus camaldulensis*, *E. sideroxylon*, *Prosopis* and *Populus* spp. dominate heavily disturbed alluvial vegetation. The unit is classified as being vulnerable and only 3 % is conserved within formal conservation areas, i.e. Tussen Die Riviere, Gariep Dam and Oviston Nature Reserves. No endemic plant species are known from this unit.

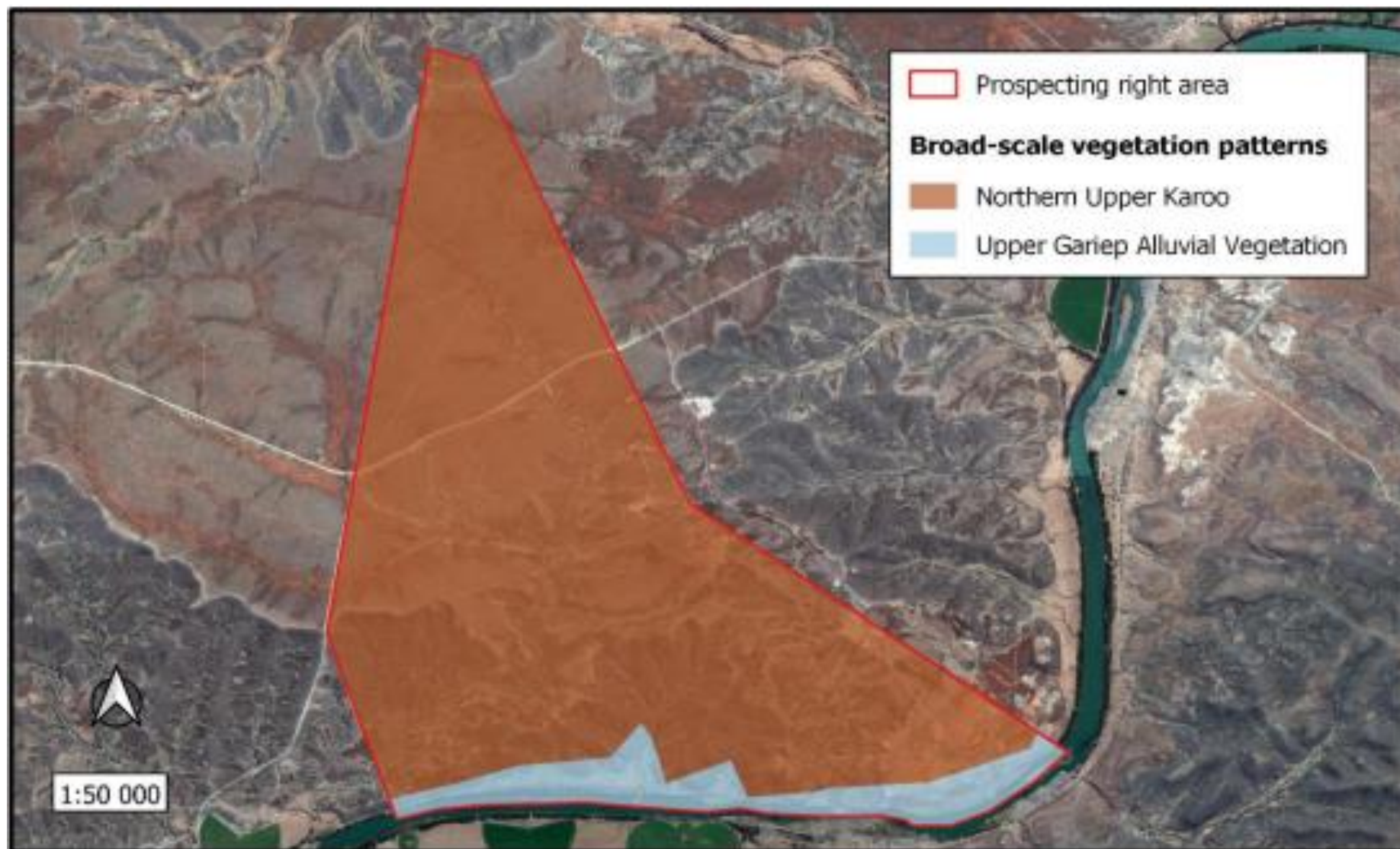


Figure 20. The broad-scale vegetation units (Mucina and Rutherford 2012) present in the study area. (Map taken out of the Ecological study by Dr. B Milne)

Fine-scale vegetation patterns

Plant communities in the study area are delineated according to plant species correspondences and changes in soil structure. They can be divided into five distinct units, which are described below. These descriptions include unique characteristics and the dominant species found in each unit. Areas transformed by historic mining activities are mapped but will not be further described. These areas primarily host vegetation elements from the adjacent pristine habitats that have re-established on the disturbed areas. A complete plant species list, including those species likely to occur here is presented in Appendix 1 of the ecological study.

i) *Senegalia mellifera* - *Enneapogon desvauxii* shrubland on calcrete plateau

This community occurs on the calcrete plateau in the north of the study area, with pockets along the ridges in the south. The vegetation is presented as shrubland with tall shrubs scattered in a short grassy matrix, intermixed with dwarf shrubs. Rocky, calcareous soil covers 10 - 20% of the ground surface and biological soil crusts are prominent.

Senegalia mellifera dominates the tall shrub layer, but *Boscia albitrunca* is also common. Other tall and medium-sized shrubs include *Ehretia rigida*, *Nymania capensis*, *Grewia flava*, *Searsia burchellii*, *S. tridactyla* and *Rhigozum obovatum*. The dwarf shrub layer, dominated by *Roepera lichtensteiniana*, is more diverse and also includes *Pentzia incana*, *Aptosimum albomarginatum*, *A. spinescens*, *Thesium hystrix*, *Pteronia mucronata*, *P. glauca*, *Justicia incana*, *Aizoon asbestinum*, *Felicia fascicularis*, *Pegolettia retrofracta*, *Euryops dregeanus*, *Asparagus suaveolens*, *Leonotis pentadentata*, *Polygala asbestina*, *Barleria rigida*, *Oedera humilis*, *Melhaniania rehmannii* and *Blepharis mitrata*.

The grass layer is predominantly short and dominated by *Enneapogon desvauxii*, but other grasses include *Aristida junciformis*, *Cenchrus ciliaris*, *Aristida adscensionis*, *Eragrostis echinochloidea*, *Stipagrostis obtusa*, *S. uniplumis*, *S. ciliata* and *Fingerhuthia africana*. Herbs include *Acanthopsis hoffmannseggiana*, *Tribulus zeyheri* subsp. *zeyheri*, *Limeum aethiopicum*, *Geigeria ornativa*, and the bulb *Albuca* sp.

ii) *Senegalia mellifera* - *Aristida junciformis* shrubland on tillite ridge slopes

This community covers most of the southern parts of the study area, where it occurs on the rocky slopes of the tillite ridges. Rocks constitute $\pm 20\%$ of the ground cover. The vegetation presents continuous transitions between calcrete and tillite affinities and share many of the species found on the calcrete plateau. Here however, the grassy matrix is dominated by taller species.

Senegalia mellifera dominates the tall shrub layer, but other species include *Cadaba aphylla*, *Searsia tridactyla*, *Boscia albitrunca*, *Nymania capensis*, *Rhigozum obovatum* and *Ehretia rigida*. The diverse dwarf shrub layer includes

Eriocephalus decussatus, *Pteronia mucronata*, *Euryops dregeanus*, *Felicia fascicularis*, *Justicia incana*, *Aizoon asbestinum*, *Barleria rigida*, *Hermannia spinosa*, *Aptosimum albomarginatum*, *A. spinescens*, *A. marlothii*, *Pentzia calcarea* and *Helichrysum lucilioides*.

The grass layer is dominated by *Aristida junciformis*, but the low growing *Enneapogon desvauxii* is also common. Other common grass species include *Stipagrostis obtusa*, *Fingerhuthia africana*, *Eragrostis annulata*, *Aristida adscensionis* and *Cenchrus ciliaris*. Herbs include *Acanthopsis hoffmannseggiana*, *Dicoma capensis*, *Limeum aethiopicum*, *Tribulus zeyheri* subsp. *zeyheri* and *Geigeria ornativa*.

iii) Indigofera alternans - Aizoon schellenbergii low shrubland on deep alluvium This community occurs on deep, consolidated alluvium along the northern banks of the Orange River and along the broader channels in the lower reaches of major drainage systems. It has been subject to severe degradation, with sparse vegetation cover. The vegetation is presented as open low shrubland, dominated by low shrubs and herbs, with taller shrubs and trees scattered across the community.

Trees and tall shrubs include *Vachellia tortilis*, *Boscia albitrunca* and *Rhigozum trichotomum*. The herb *Indigofera alternans* forms dominant mats across the matrix vegetation, but *Helichrysum argyrosphaerum* is also common. The low shrub *Peliostomum leucorrhizum* is abundant here, but other common low shrubs include *Aizoon schellenbergii* and *Aptosimum albomarginatum*. The grass layer is not well developed and seems overgrazed, with *Aristida junciformis* being the only visible grass during the field survey.

The weeds *Argemone ochroleuca* and *Verbesina encelioides* occur widespread across this unit.

iv) Vachellia karroo - Searsia pendulina riparian woodland along the Orange River This community lines the banks of the Orange River where it is presented as a broad, tall tree canopy with sparse undergrowth. The tree canopy is dominated by *Vachellia karroo*, *Ziziphus mucronata* and *Searsia pendulina*, while *Diospyros lycioides* subsp. *lycioides*, *Lycium hirsutum*, and *Asparagus* spp. dominate the woody undergrowth. *Vachellia tortilis* and *Tapinanthus oleifolius* are also found here. The weed *Argemone ochroleuca* dominates the herb layer in the understory.

v) Senegalia mellifera - Searsia lancea riparian woodland along drainage lines This community lines the numerous drainage channels across the study area. It is presented by a narrow woodland, dominated by trees and tall shrubs. *Senegalia mellifera* forms the dominant woody component throughout, but other defining trees and tall shrubs include *Searsia lancea*, *Tarchonanthus*

camphoratus and *Olea europaea* subsp. *africana*. Low shrubs mainly include those associated with the adjacent terrestrial shrublands, such as *Pentzia calcarea*, *Roepera lichtensteiniana* and *Justicia incana*, while grasses include *Fingerhuthia africana*, *Eragrostis rotifer* and *Eragrostis obtusa*. The herb *Phyllanthus maderaspatensis* and the bulb *Ammocharis coranica* are also common here, along with the mat-forming weed *Alternanthera pungens*.

Population of sensitive, threatened, and protected plant species

The SANBI Red List provides information on the national conservation status of South Africa's indigenous plants, which are protected under the National Environmental: Biodiversity Act (Act No. 10 of 2004) (NEMBA), while the National Forests Act (No. 84 of 1998) (NFA) and the Northern Cape Nature Conservation Act (Act No. 9 of 2009) (NCNCA) restricts activities regarding sensitive plant species. Section 15 of the NFA prevents any person to cut, disturb, damage, destroy or remove any protected tree; or collect, remove, transport, export, purchase, sell, donate or in any other manner acquire or dispose of any protected tree, except under a licence granted by the Minister. Section 49 (1) and 50 (1) of the NCNCA states that no person may, without a permit pick, transport, possess, or trade in a specimen of a specially protected (Schedule 1) or protected (Schedule 2) plants. Furthermore, Section 51(2) states that no person may, without a permit, pick an indigenous plant (Schedule 3) in such manner that it constitutes large-scale harvesting.

Most species from the region are classified as least concern; a category which includes widespread and abundant taxa. However, two species are red listed. *Acanthopsis hoffmannseggiana* (Data Deficient – Taxonomically Problematic (DDT)) is a widespread and variable species that possibly contains several taxa, some of which may be of conservation concern and more study is needed to find reliable distinguishing characters to separate individual taxa.

It was recorded on site where they were common on the calcrete plateau and tillite ridge slopes. *Salsola smithii* is also listed as DDT. The entire *Salsola* genus needs taxonomic revision because its species are poorly defined and difficult to separate. Therefore, based on currently available data, the risk of extinction of this species cannot be assessed. It was not recorded during the field survey.

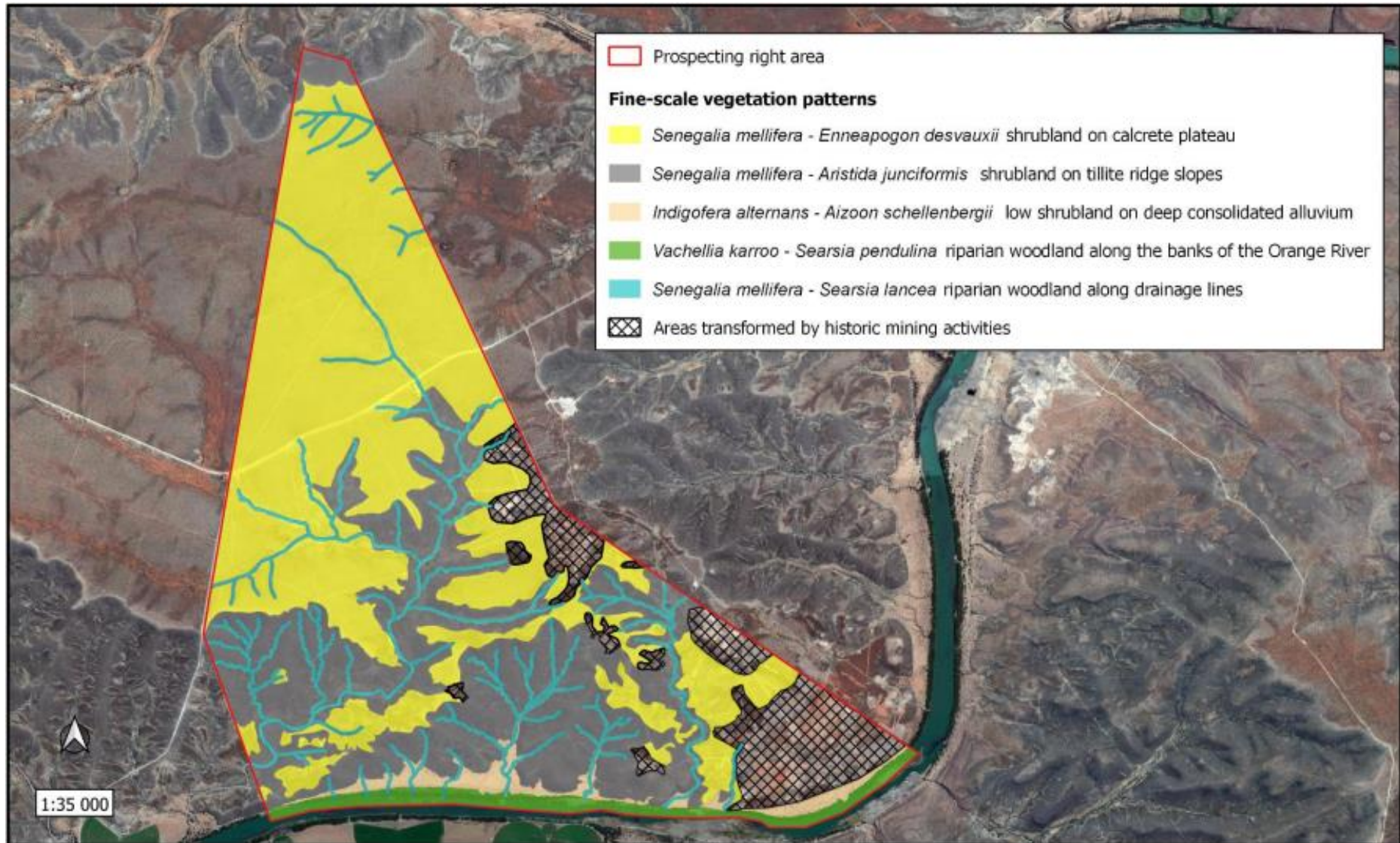


Figure 21. The expected distribution of proposed fine-scale plant communities in the study area. (Map taken out of the Ecological study by Dr. B Milne, 2020)

Species protected in terms of the National Forest Act include *Boscia albitrunca*. It was recorded in the shrublands on alluvium, calcrete plateau and tillite ridge slopes. On the calcrete plateau it occurred at low densities of ± 1 individual per hectare, represented by the entire population size range, i.e. saplings (80 cm (d) x 50 cm (h)), young shrubs (1 (d) x 1 m (h)), stunted shrubs (1 m (d) x 60 cm (h)) and adult trees (3 m (d) x 3 m (h)). The same is true for the population on the ridge slopes, but here they occurred at much lower densities of < 1 individual per hectare. Larger trees of up to 3 m in height x 4 m in diameter were recorded on the alluvium, where they occurred at densities of ± 1 individual per hectare.

To damage or remove any protected trees (seedlings to adults) an application must be submitted to the Northern Cape Department of Agriculture, Forestry and Fisheries (DAFF) and a licence obtained from DAFF at least three months prior to such activities.

In addition to these, specially protected species (Schedule 1) and protected species (Schedule 2) of the NCNCA known from the study region are also listed in the ecological study. Of these, *Nymanianthus capensis* were recorded in the shrublands on calcrete plateau and tillite ridge slopes, while *Olea europaea* subsp. *africana* trees and *Ammocharis coranica* were found along the banks of the drainage channels.

Furthermore, according to Section 51(2) of NCNCA, a permit is required from the Northern Cape, Department of Environment and Nature Conservation (DENC) for any large-scale clearance of all indigenous (Schedule 3) vegetation, before such activities commence.

Weeds and invader plant species

Weeds and invasive species are controlled in terms of the National Environmental Management: Biodiversity (NEMBA) Act 10 of 2004, the Conservation of Agricultural Resources (CARA) Act 43 of 1993, as well as the NCNCA (Schedule 6). These are species that do not naturally occur in a given area and exhibit tendencies to invade that area, and others; at the cost of locally indigenous species. To govern the control of such species, NEMBA and CARA have divided weeds and invader species into categories. All declared weeds and

invasive species recorded on site are listed in Table 5, along with their categories according to CARA, NEMBA and NCNCA.

Table 4. The categorisation of weeds and invader plant species, according to NEMBA and CARA.

NEMBA	CARA
1a Listed invasive species that must be combatted or eradicated.	1 Plant species that must be removed and destroyed immediately. These plants serve no economic purpose and possess characteristics that are harmful to humans, animals and the environment.
1b Listed invasive species that must be controlled.	2 Plant species that may be grown under controlled conditions. These plants have certain useful qualities and are allowed in demarcated areas. In other areas they must be eradicated and controlled.
2 Listed invasive species that require a permit to carry out a restricted activity within an area.	3 Plant species that may no longer be planted. These are alien plants that have escaped from or are growing in gardens and are proven to be invaders. No further planting is allowed. Existing plants may remain (except those within the flood line, 30 m from a watercourse, or in a wetland) and must be prevented from spreading.
3 Listed invasive species that are subject to exemptions and prohibitions	

Table 5. A list of declared weeds and invasive species recorded in the study area.

Scientific name	Common name	CARA	NEMBA	NCNCA
<i>Argemone ochroleuca</i>	White - flowered Mexican poppy	1	1b	S6
<i>Datura ferox</i>	Large thorn apple	1	1b	S6
<i>Eucalyptus camaldulensis</i>	River red gum	2	1b	S6
<i>Prosopis velutina</i>	Velvet mesquite	2	3	S6
<i>Xanthium spinosum</i>	Spiny cocklebur	1	1b	S6

Indicators of bush encroachment

Bush encroacher species are controlled in terms of Regulation 16 of CARA; where land users of an area in which natural vegetation occurs and that contains communities of encroacher. Indicator plants are required to follow sound practices to prevent the deterioration of natural resources and to combat bush encroachment where it occurs. Declared indicators of bush encroachment in the Northern Cape, recorded on site, are listed in Table 6.

Table 6. Declared indicators of bush encroachment in the Northern Cape recorded in the study area.

Scientific name	Common name
<i>Grewia flava</i>	Velvet Raisin
<i>Rhigozum trichotomum</i>	Three – thorn Rhigozum
<i>Senegalia mellifera</i>	Black Thorn
<i>Tarchonanthus camphoratus</i>	Camphor Bush
<i>Vachellia karroo</i>	Sweet Thorn
<i>Vachellia tortilis</i>	Curly-pod Acacia

(8) **SURFACE WATER**

Dr Elizabeth (Betsie) Milne has been appointed by Wadala Mining to provide an ecological study in order to highlight the ecological characteristics of the proposed prospecting area, and to determine the possible impact of prospecting on the diversity and ecological status of the application area surface water was described and included in this report as part of the ecological study. (Appendix 4).

The Beatrys study area falls within the Boegoeberg quaternary catchments D71B and D71C of the Lower Orange Water Management Area (Figure 22). These quaternary catchments have been allocated a Present Ecological State (PES) of 'Largely Natural' (B) and 'Moderately Modified' (C), respectively by Smook et al. (2002) and information regarding their mean annual rainfall, evaporation potential and runoff is provided in Table 7.

Table 7. Catchment characteristics for the Boegoeberg quaternary catchments in which the study area fall, as presented by Smook et al. (2002).

Quaternary catchment	Catchment Area (km ²)	Mean Annual Rainfall (mm)	Mean Annual Evaporation (mm)	Mean Annual Runoff (10 ⁶ m ³)
D71B	2 875	315	2 350	20.01
D71C	1 592	250	2 350	4.75

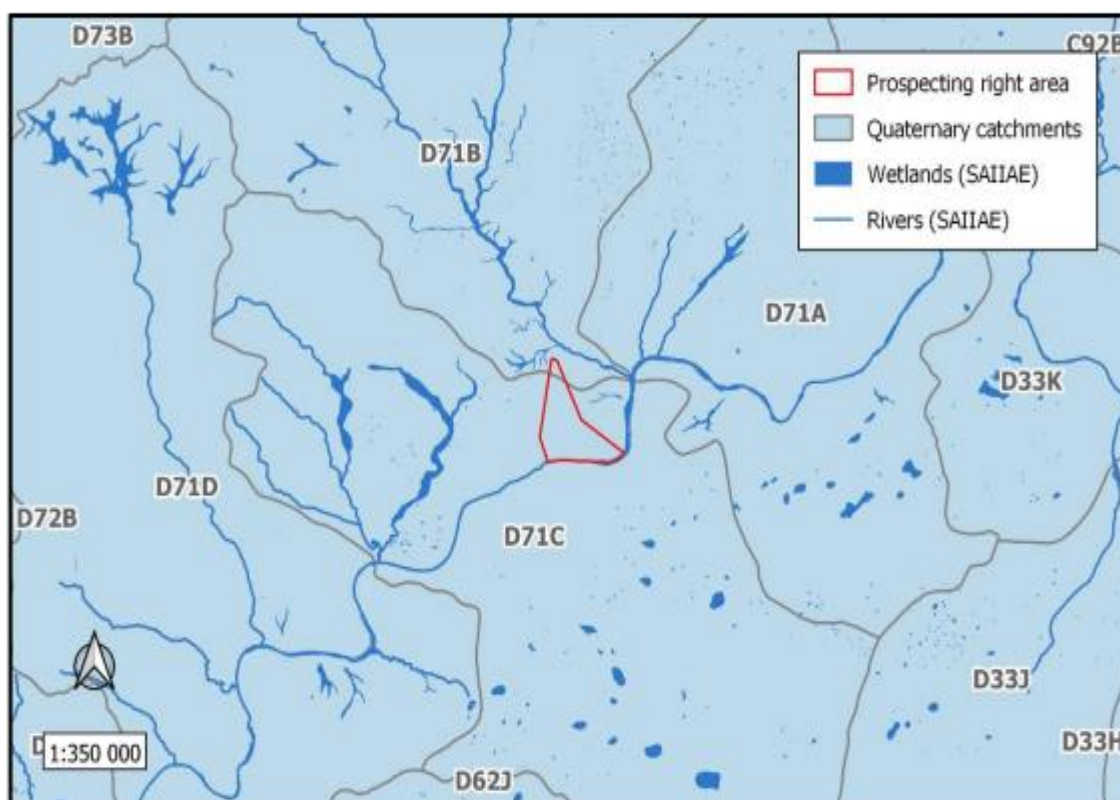


Figure 22. The locality of the proposed prospecting area in relation to the Boegoeberg quaternary catchments of the Lower Orange Water Management Area.

According to the South African Inventory of Inland Aquatic Ecosystems (SAIIAE), the study area falls within the Upper Karoo Bioregion, where 1.9 % (236 551 ha) of the land area is covered by inland wetlands, including depressions, floodplains, seeps and valley-bottom wetland types (Van Deventer et al. 2019). Their spatial extent according to their present ecological status is depicted in Table 8. Most of these wetlands have been moderately to severely modified.

The Orange River, with its associated wetlands and riparian zone, lines the prospecting right border in the south and an extensive network of drainage lines occur on site (Figure 23).

Table 8. Percentage of inland wetland spatial extent according to the present ecological status per wetland type of the Southern Namib Desert Bioregion.

Wetland type	Total Extent (%)	% Natural or near-natural (A/B)	% Moderately modified (C)	% Heavily to severely/critically modified (D/E/F)
Depression	27.9	49	10.6	40.4
Floodplains	27.5	0.4	1.7	98
Seeps	2.8	11.9	76.2	11.9
Valley-bottom	41.8	5.5	35.1	59.4

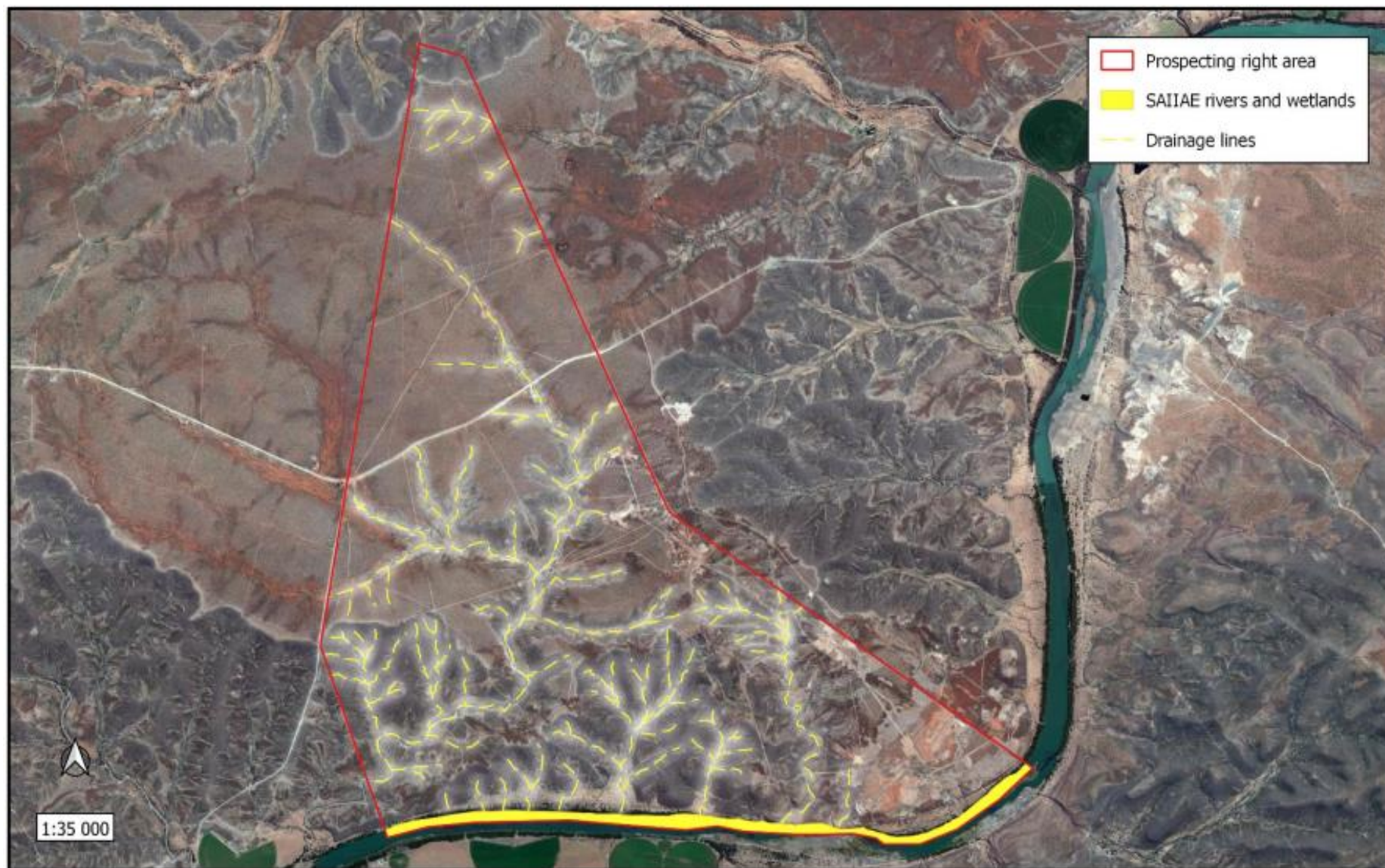


Figure 23. The location of SAIIE wetlands and drainage lines on the proposed prospecting right area.

(9) GROUND WATER:

Groundwater flow is in the direction of the orange river following the surface drainage direction from the hills in the north towards the lowlands and floodplains in the south.

Mean Depth of Water-Table

The mean depth of the water table during summer is approximately 120 m and during winters 140 m.

The quality of ground water is generally good although it does tend to be brackish (mineralised) water in the drier areas

(10) AIR QUALITY AND NOISE:

With reference to the Scheduled processes under the Second Schedule to the Atmospheric Pollution Prevention Act, 1965 (Act No. 45 of 1965): No scheduled process relates to any proposed prospecting activity on the farm.

Existing Sources

The current source of air pollution in the area stems from numerous mining operations along the Orange River and from vehicles traveling on the gravel roads of the area. Farming activity, especially ploughing of the irrigation fields, may generate dust during certain periods of the year.

New Source

The source of air pollution on the farm will be nuisance dust generated by the bulk sampling prospecting process, the loading of gravels onto the transport trucks, the dumping of gravels over each site's primary screen or feeder bins as well as from the movement of trucks and vehicles on the prospecting roads. Gas emissions from machinery will be kept within legal limits.

Areas of Impact

The prevailing wind (occasionally slightly) is from the east (June & October) and the south-west (October - January) but the strongest winds are from the north-west. The average monthly wind speeds are generally below 6.3 m/s.

There is a potential for fall-out dust to impact on the surrounding farm properties – which can be described as the nearest potential area of impact. The dust management programme recommended should include daily dosing of access roads and stockpile areas.

If dust is generated, it is expected to be visible from the surrounding farmland or mines along the Orange River.

Noise

Existing sources:

Noise on site will come from the large vehicles (ADT trucks, front-end loader, back actor), from the working pan.

There are farming operations on both sides of the proposed prospecting operation. Although these operations do generate noise the overall impact can be described as negligible.

The impact would be of more importance regarding the direct worker environment that should adhere to the requirements in terms of the Mine Health and Safety Act. These noise levels will be continuous and the operators will be issued with earplugs.

Noise is normally encountered during the normal operation hours at the processing plant. Processing plant noise and prospecting vehicles are limited between 7am and 5pm every day during the week. Noise levels will be monitored on the prospecting area and where necessary, protective equipment is used in certain areas where machinery is used.

(11) VISUAL ASPECTS:

The prospecting site on Beatrys (Lanyon Vale) will not be visible from any National Roads but could be visible from the gravel road that runs next to the farm and through the farm.

The negative visual impacts associated with the bulk sample sites and the washing pans will however have a negative impact since it will be visible to the landowners. There is however no method of reducing the impact during prospecting operations (operational phase), it can only be mitigation done by doing concurrent rehabilitation of open trenches and bulk sampling pits as prospecting progress.

(12) AREAS OF CULTURAL-HISTORICAL OR ARCHAEOLOGICAL INTEREST

Dr. Edward Matenga has been appointed by Wadala Mining and Consulting to compile a Heritage Impact Assessment in order to determine whether there are any areas of heritage and cultural importance (Appendix 5). This HIA Report was compiled by making use of a desktop study as well as a field survey on the proposed site.

Location and physical setting

Portion 3 (Beatrys) of the Farm Lanyon Vale 376 lies 45 km southwest of Douglas, in the Siyancuma Local Municipality, Northern Cape Province. The farm is situated on the north banks of the Orange River. The Orange River is an important landform and a central feature of the drainage system in the Karoo. The farm lies 35 km downstream from the confluence of the Orange and Vaal Rivers. The two rivers rise in Lesotho and Mpumalanga Province respectively and take a westerly course across the Highveld to their confluence at Douglas. The mid-Orange River forms the southern edge of the Ghaap Plateau. From the banks of the river, the ground rises dramatically in a series of steps culminating in the high plateau, a vast elevated plain c. 1300m AMSL straddling the Northwest and Northern Cape Provinces.

The northern part of Lanyon Vale Portion 3 is generally flat with surface red-brown gravels mixed with calcrete waste and below them a hard calcrete horizon, which is exposed in places. The Rooikoppie gravels are spread over a large area on the farm. They represent a derived or deflation deposit formed on top of the calcrete by the liberation of durable clasts from the calcrete during chemical weathering and deflation. They are stained red by oxidation which creates an iron oxide slip. Occasionally a calcrete hardpan usually buried beneath the gravels. The calcretes deposit is quite extensive with resistant conglomerates forming cliff edges of deeply incised streams.

A southern portion of the farm overlooking the Orange River consists of an elevated mass of glacial tillites. It is believed that millions of years before the present, the thick ice sheets that covered the earth started to melt leaving behind massive deposits of heterogeneous deposits which became the Dwyka tillites that flank the mid-Orange River. Streams cutting across the Dwyka tillites into the Orange River created small valleys, spurs, and low ridges. Resistant calcrete conglomerates from cliff edges overlooking the streams. Vegetation is karoo scrub dominated by the blackthorn *Acacia mellifera* subsp. *Detinens* (haakbos in Afrikaans). Standing on the Ghaap Escarpment, there are engaging sceneries south towards the Orange River and north towards the Ghaap Plateau. (Figures 1-6).



Figure 24. Heritage sites on Portion 3 of the farm Lanyon Vale 376.

The heritage sensitivity of the property is summarised as follows:

The Stone Age

Stone Age material occurs on the property as background scatters that is testimony to the foraging activities of Stone Age communities. This pattern was also observed on Portion 23 of the Farm Lanyon Vale 376 which shares a boundary to the south with Portion 3. Seven (7) out of 10 occurrences were recorded on Portion 3. There was an occasional find of a hand-axe probably dating to the transition from the Early Stone Age to the Middle Stone Age. Otherwise, the scrapers and blades commonly encountered date to the Middle Stone Age/Late Stone Age period. None of the sites were found to warrant further action.

The Early Iron Age

No material dating to the Early Iron Age was found.

The Later Iron Age

No material dating to the Later Iron Age was found.

Burial grounds

A burial ground with at least 7 graves and one portion with rectangular settings of stones was recorded (LVB08). A servitude of 100 m radius must be reserved around the graves.



Figure 25. A burial ground (LVB08) and the proposed 100 m radius servitude

Conclusion and recommendations

The Prospecting Right can be approved provided that the recommendations on the protection of the burial ground and disposal of the two stone features (if it becomes necessary) are heeded. Since archaeological deposits may be buried underground, should important artefacts or skeletal material be exposed in the area during operations, such activities should be halted, and the provincial heritage resources authority or SAHRA notified for an investigation and evaluation of the finds undertaken.

Palaeontology

Dr. Edward Matenga appointed Professor Marion Bamford to compile a Palaeontological Impact Assessment in order to determine whether there are any areas of palaeontological importance (Appendix 6). This PIA Report was compiled by making use of a desktop study as well as a field survey on the proposed site.

The site lies in the north western part of the Karoo basin where the basal rocks of the Transvaal Supergroup are unconformably overlain by early Karoo Supergroup strata. Along the rivers and streams much younger reworked sands and alluvium overlie the older strata.

The Late Archaean to early Proterozoic Transvaal Supergroup is preserved in three structural basins on the Kaapvaal Craton (Eriksson et al., 2006). In South Africa are the Transvaal and Griqualand West Basins, and the Kanye Basin is in southern Botswana. The Griqualand West Basin is divided into the Ghaap Plateau sub-basin and the Prieska sub-basin. Sediments in the lower parts of the basins are very similar but they differ somewhat higher up the sequences.

Several tectonic events have greatly deformed the south western portion of the Griqualand West Basin between the two sub-basins

The Transvaal Supergroup comprises one of world's earliest carbonate platform successions (Beukes, 1987; Eriksson et al., 2006; Zeh et al., 2020). In some areas there are well preserved stromatolites that are evidence of the photosynthetic activity of blue green bacteria and green algae. These microbes formed colonies in warm, shallow seas.

There are two Formations in the Schmidtsdrift Subgroup and occur in both of the sub-basins of the Griqualand West Basin. The lower Boomplaas Formation comprises stromatolitic and oolitic platform carbonates. Only the upper 100m is visible in surface outcrops but it extends another 185m in borehole core (Beukes, 1979, 1983). They represent deep lagoonal deposits, transported oolites and carbonate shelf rocks. The upper Clearwater Formation comprises shales, tuffites and BIF-like cherts and is interpreted as a transgressive deposit over the Boomplaas Formation (ibid; Eriksson et al., 2006).

The Karoo Supergroup rocks cover a very large proportion of South Africa and extend from the northeast (east of Pretoria) to the southwest and across to almost the KwaZulu Natal south coast. It is bounded along the southern margin by the Cape Fold Belt and along the northern margin by the much older Transvaal Supergroup rocks. Representing some 120 million years (300 – 183Ma), the Karoo Supergroup rocks have preserved a diversity of fossil plants, insects, vertebrates and invertebrates.

During the Carboniferous Period South Africa was part of the huge continental landmass known as Gondwanaland and it was positioned over the South Pole. As a result, there were several ice sheets that formed and melted, and covered most of South Africa (Visser, 1986, 1989; Isbell et al., 2012). Gradual melting of the ice as the continental mass moved northwards and the earth warmed, formed fine-grained sediments in the large inland sea. These are the oldest rocks in the system and are exposed around the outer part of the ancient Karoo Basin, and are known as the Dwyka Group. They comprise tillites, diamictites, mudstones, siltstones and sandstones that were deposited as the basin filled. This group has been divided into two formations with Elandsvlei Formation occurring throughout the basin and the upper Mbizane Formation occurring only in the Free State and KwaZulu Natal (Johnson et al., 2006).

The **Quaternary Kalahari sands** form an extensive cover of much younger deposits over much of the Northern Cape Province and Botswana. Haddon and McCarthy (2005) proposed that the Kalahari basin formed as a response to down-warp of the interior of the southern Africa, probably in the Late Cretaceous. This, along with possible uplift along epeirogenic axes, back-tilted rivers into the newly formed Kalahari basin and deposition of the Kalahari Group sediments began. Sediments included basal gravels in river channels, sand and finer sediments. A period of relative tectonic stability during the mid-Miocene saw the silcretisation and calcretisation of older Kalahari Group lithologies, and this was followed in the Late Miocene by relatively minor uplift of the eastern side of southern Africa and along certain epeirogenic

axes in the interior. More uplift during the Pliocene caused erosion of the sand that was then reworked and redeposited by aeolian processes during drier periods, resulting in the extensive dune fields that are preserved today.

There are numerous pans in the Kalahari, generally 3–4 km in diameter (Haddon and McCarthy, 2005). Most pans in the Kalahari Basin are filled by a layer of clayey sand or calcareous clays and are flanked by lunette dunes formed as a result of deflation of the pan floor during arid periods (Lancaster, 1978a, b; Haddon and McCarthy, 2005). At some localities in the south western Kalahari spring-fed tufas have formed at the margins of pans during periods where groundwater discharge was high (Lancaster, 1986). Associated with some palaeo-pans and palaeo-springs are fossil bones, root casts, pollen and archaeological artefacts. Well-known sites are Florisbad and Deelpans in the Free State, Wonderkrater in Limpopo and Bosluispan in the Northern Cape.

Tertiary calcretes cover large parts of the Northern Cape but they are difficult to date and there are several schools of thought (see Partridge et al., 2006). Nonetheless, it is accepted that calcretes form under alternating cycles humid and arid climatic conditions in strata that have calcium carbonate (Netterberg, 1969). More recent research using geophysical techniques to measure uplift of the continent during the Cretaceous and tertiary, combined with the fossil record (Braun et al., 2014) suggest that there were two predominant humid periods during the Tertiary. The whole of the Eocene (56–33 Ma) and a short period during the early Miocene (ca 20–19 Ma) were humid according to their estimation. It is possible that the Northern Cape calcretes formed during one of these periods.

Overlying many of these rocks are loose sands and sand dunes of the Gordonia Formation, Kalahari Group of Neogene Age. The Gordonia Formation is the youngest of six formations and is the most extensive, stretching from the northern Karoo, Botswana, Namibia to the Congo River (Partridge et al., 2006). It is considered to be the biggest palaeo-erg in the world (ibid). The sands have been derived from local sources with some additional material transported into the basin (Partridge et al., 2006). Much of the Gordonia Formation comprises linear dunes that were reworked a number of times before being stabilised by vegetation (ibid).

Palaeontological context

The palaeontological sensitivity of the area under consideration is presented in Figure 26. The site for mining is on the moderately fossiliferous Dwyka Group and the Tertiary-Quaternary sands and calcretes. Along the river are alluvial sand deposits.

The lower Boomplaas Formation comprises stromatolitic and oolitic platform carbonates. These are trace fossils of algal activity. Stromatolites are layer upon layer of minerals precipitated by the photosynthesising algal colonies and form domes or flat laminae. Oolitic limestone is composed up of small spheres called oolites that are cemented together by lime mud. They form when calcium carbonate is deposited on the surface of sand grains rolled

around by wave action on a shallow sea floor. The original algal cells, however, are not preserved.

The Dwyka Group is made up of seven facies that were deposited in a marine basin under differing environmental settings of glacial formation and retreat (Visser, 1986, 1989; Johnson et al., 2006). The mudrock facies consists of dark-coloured, commonly carbonaceous mudstone, shale or silty rhythmite that was formed when the mud or silt in suspension settled. This is the only fossiliferous facies of the Dwyka Group.

The Dwyka *Glossopteris* flora outcrops are very sporadic and rare. Of the seven facies that have been recognised in the Dwyka Group fossil plant fragments have only been recognised from the mudrock facies. They have been recorded from around Douglas only (Johnson et al., 2006; Anderson and McLachlan 1976) although the Dwyka Group exposures are very extensive.

The Tertiary calcretes can trap fossils and artefacts when associated with palaeo-pans or palaeo-springs (Partridge et al., 2006). Where deflation has occurred, for example along the west coast of South Africa, any trapped materials in the different levels can be concentrated in the depo-centre of the pan or dune and thus it can be challenging to interpret the deposit (Felix-Henningsen et al., 2003).

The Aeolian sands of the Gordonia Formation do not preserve fossils because they have been transported and reworked. Conditions required for the preservation of organic material and formation of fossils are burial in a low energy, anoxic environment such as overbank deposits, lake muds or clays (Briggs and McMahon, 2016). Aeolian sands are high energy, well-oxygenated environments. In some regions, the sands may have covered pan or spring deposits and these can trap fossils, and more frequently archaeological artefacts. Usually these geomorphological features can be detected using satellite imagery. No such features are visible.

Exploration and research along the palaeo-rivers of Southern Africa, now only present as abandoned palaeochannels, or captured by the present day rivers, the Vaal and Orange Rivers in this case, the gravels and sands might include transported robust and fragmentary fossils. Examples of these are heavy bone fragments and silicified wood fragments, as well as diamonds (de Wit, 1999; de Wit et al., 2000).

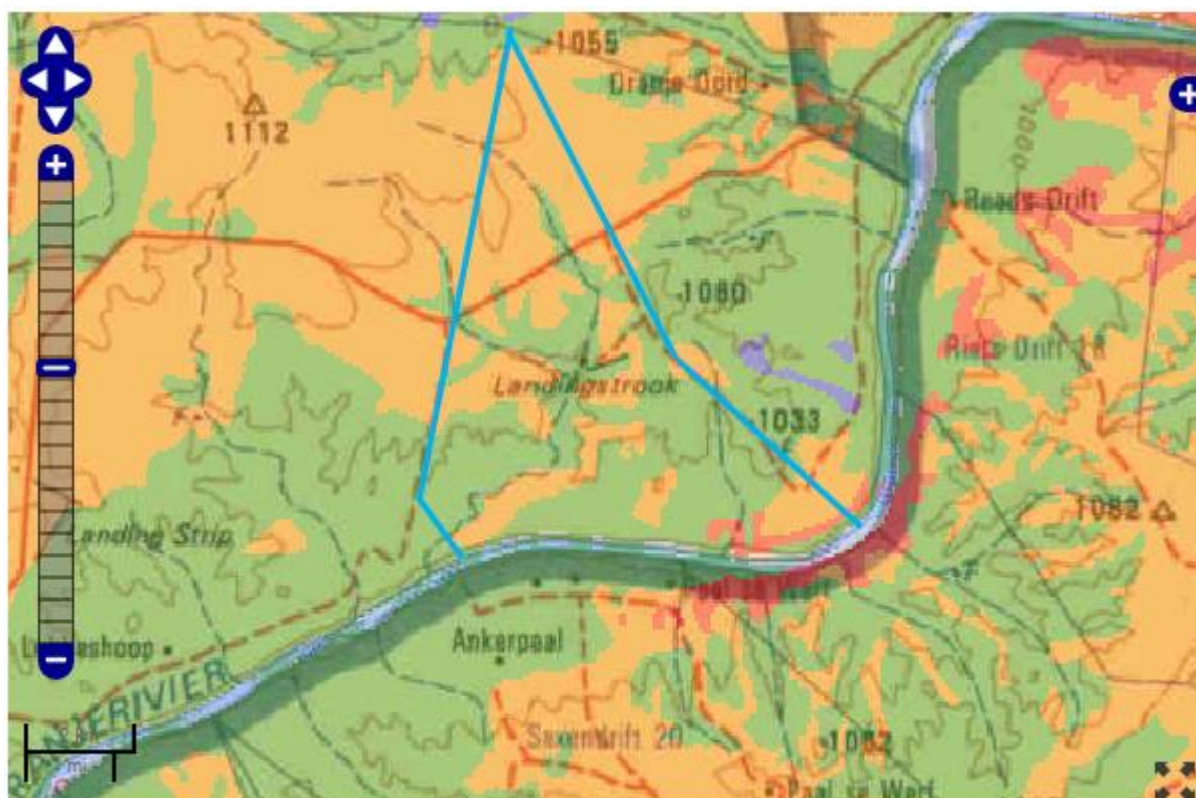


Figure 26. SAHRIS palaeosensitivity map for the site for the proposed Beatrys /Lanyon Vale 376 PRA shown within the blue polygon. Background colours indicate the following degrees of sensitivity: red = very highly sensitive; orange/yellow = high; green = moderate; blue = low; grey = insignificant/zero.

Site visit observations

The site was walked through and visibility was good as the vegetation was fairly sparse. Photographs and observations were made at representative sites for the geology and palaeontology. Although there were many transported boulders, cobbles and pebbles, none of them was a fossil. No fossils of any kind were seen on the land surface or in the existing trenches or erosion gullies (Note, no new excavations were done). Although it was expected to find outcrops of the Boomplaas Formation stromatolitic and oolitic limestone alongside the river, as indicated on the geology map, no dolomite or limestones were recognised.

Based on the nature of the project, surface activities may impact upon the fossil heritage if preserved in the development footprint. The geological structures suggest that the rocks are the correct age and type to preserve fossils. The site visit and walk through confirmed that there were NO TRACE FOSSILS in the Boomplaas Formation, NO FOSSILS in the Dwyka Group tillites, in NO TRAPPED FOSSILS in the calcretes or in Quaternary sand along the river. Since there is a very small chance that fossils from below the ground surface may be disturbed a Fossil Chance Find Protocol has been added to this report. Taking account of the defined criteria, the potential impact to fossil heritage resources is low.

Assumptions and uncertainties

Based on the geology of the area and the palaeontological record as we know it, it can be assumed that the formation and layout of the dolomites, sandstones, shales and sands are typical for the country and some do contain trace fossils, fossil plant, insect, invertebrate and vertebrate material. The site visit and walk through by the palaeontologist confirmed that there are no fossils on the surface and none in the profiles of the stream cuttings. It is not known what is below the ground surface but the occurrence of fossils seems very unlikely based on the site visit observations.

Recommendation

Based on the fossil record for guidance but confirmed by the site visit and walk through there are NO FOSSILS of any kind although three types/ages of fossils could be expected. There was no stromatolitic or oolitic limestone (Boomplaas Formation in the eastern section close to the Orange River). There were no plant fossils of the the early Glossopteris flora even though fossils have been recorded from rocks of a similar age and type in South Africa about 50 km northwest along the Orange River at Blaaukrans (McLachlan and Anderson, 1973b). It is extremely unlikely that any fossils would be preserved in the overlying soils and sands of the Quaternary unless there are traps such as palaeo-pans or palaeo-springs. There is a very small chance that fossils may occur below the ground surface, but based on the erosion profiles the pebble and cobble layers are not fossiliferous. Nonetheless, a Fossil Chance Find Protocol should be added to the EMP. If fossils are found by the prospectors, contractors, environmental officer or other responsible person once excavations and drilling have commenced, then they should be rescued and a palaeontologist called to assess and collect a representative sample.

**ARCHAEOLOGICAL AND HERITAGE CHANCE FINDS PROCEDURE
(Prepared by Edward Matenga (PhD))****HERITAGE SITES AND OBJECTS THAT MIGHT OCCUR IN THE AREA**

The following site types/objects have been encountered in the broader region and are therefore flagged:

- Surface scatters or concentrations of stone tools of the ESA, MSA, LSA periods
- Substantial subsurface occurrences of stone tools
- Rock paintings and rock engravings (petroglyphs) (MSA to LSA period)
- Buildings and objects associated with modern commercial farming from the 19th century
- Graves, burial grounds and human bones

GENERAL

A principal aim of the CFP is to raise awareness of all personnel in the project regarding the prospect of finding archaeological resources that unseen during the Phase 1 scoping heritage assessment and establish a protocol for the protection of these resources. The appointed

Environmental Control Officer (ECO) and Site Manager keep copies of the CPF at the field offices. Training of field personnel on cultural heritage resources that might potentially be found on area should be provided.

PROCEDURE FOR ARCHAEOLOGICAL FINDS

If you discover what you suspect may be a possible archaeological site:

- Stop all work in the area to avoid damaging the site.
- Do not disturb any archaeological remains that you may encounter.
- The finds must be reported to ECO or Site Manager
- The finds must be reported to the heritage authority, i.e., SAHRA and/or the provincial heritage resources agency.
- The heritage authority will send a heritage specialist and /or ask the permit holder to appoint a heritage specialist to make a preliminary assessment of the findings.
- If the potential significance of the finds are deemed to warrant further action and they cannot be avoided, then the heritage specialist will submit a report advising SAHRA accordingly.
- SAHRA will determine the appropriate course of action.

PROCEDURE FOR GRAVES, BURIAL GROUNDS AND HUMAN REMAINS

If you discover what you suspect may be possible human remains:

- Stop all work in the area to avoid damaging the site.
- Do not disturb any possible human remains that you may encounter.
- The finds must be reported to ECO or Site Manager.
- The finds must be reported to the local area station of SAPS.
- The finds must be reported to the SAHRA Burial Grounds and Graves (BGG) Unit.
- The BGG Unit will send a heritage specialist and /or ask the permit holder to appoint a heritage specialist to make a preliminary assessment of the findings.
- If the graves/human remains cannot be avoided SAHRA will require that the human remains be re-interred in a formal cemetery.

(13) BROAD-SCALE ECOLOGICAL PROCESSES:

Critical biodiversity areas and broad-scale processes

The proposed prospecting site falls within critical biodiversity areas, as defined by the Northern Cape Critical Biodiversity Areas Map (Holness and Oosthuysen 2016). This map identifies biodiversity priority areas, called Critical Biodiversity Areas (CBAs) and Ecological Support Areas (ESAs), which, together with protected areas, are important for the persistence of a viable representative sample of all ecosystem types and species as well as the long-term ecological functioning of the landscape. The Orange River and its riparian- and buffer zones are classified as Critical Biodiversity Area One, while the remainder of the pristine

sections on site, which encompass the drainage catchment and all terrestrial habitats, are classified as Critical Biodiversity Area Two. No Protected Areas occur in or near the study area.

Similarly, the Mining and Biodiversity Guidelines (DENC et al. 2013) recognises the buffer along the Orange River to have Highest Biodiversity Importance, which constitute a high risk for mining. However, the remainder of the site is not considered to have any biodiversity importance. These guidelines were developed to identify and categorize biodiversity priority areas sensitive to the impacts of mining to support mainstreaming of biodiversity issues in decision making in the mining sector.

Furthermore, according to the National Web based Environmental Screening Tool the study area is considered to have sensitive environmental features. This tool is a geographically based web-enabled application which allows a proponent intending to apply for environmental authorisation in terms of the Environmental Impact Assessment (EIA) Regulations 2014 (as amended), to screen their proposed site for any environmental sensitivity.

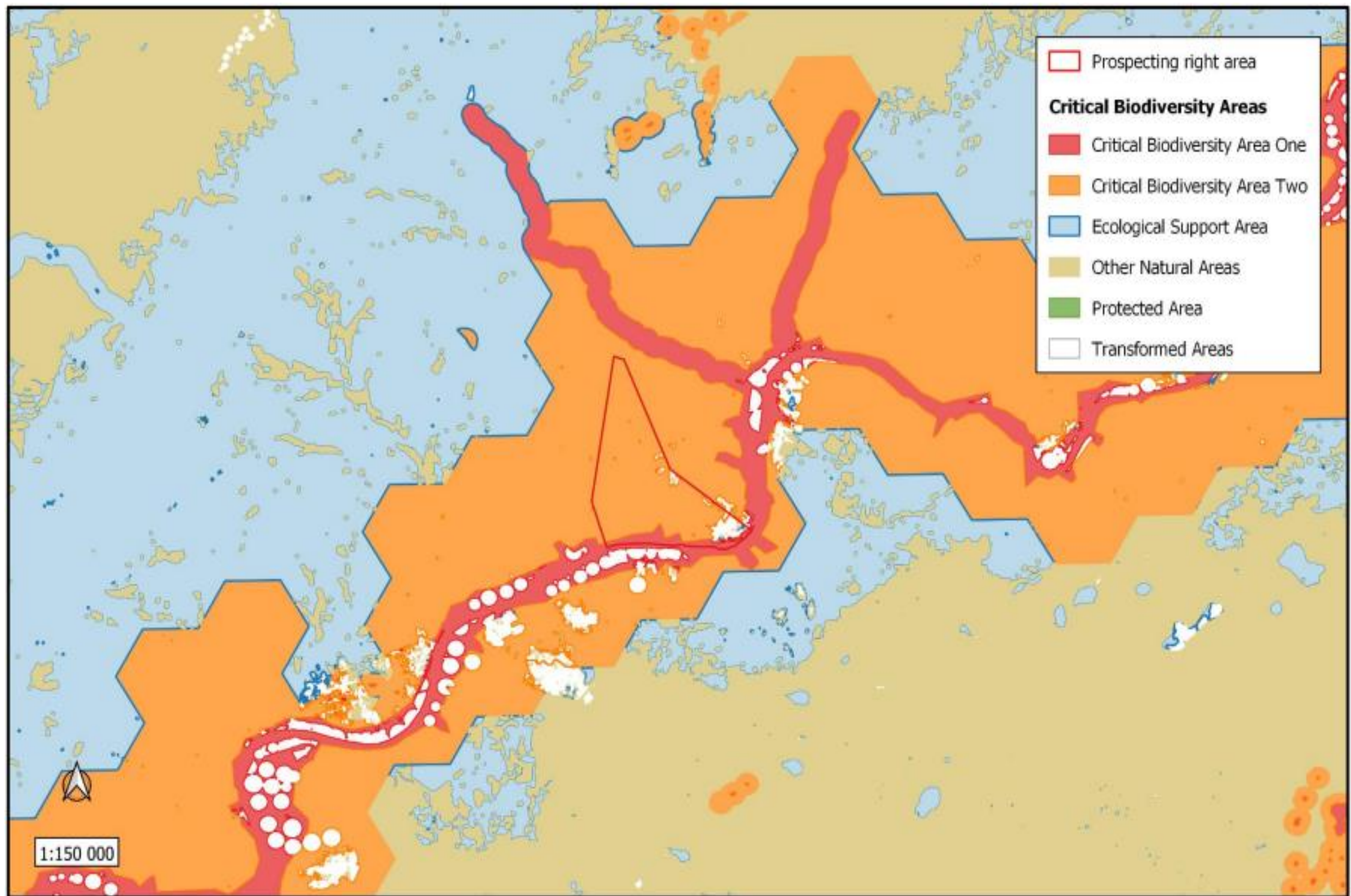


Figure 27. The study area in relation to the Northern Cape Critical Biodiversity Areas.



Figure 28. The study area in relation to the Mining and Biodiversity Guidelines

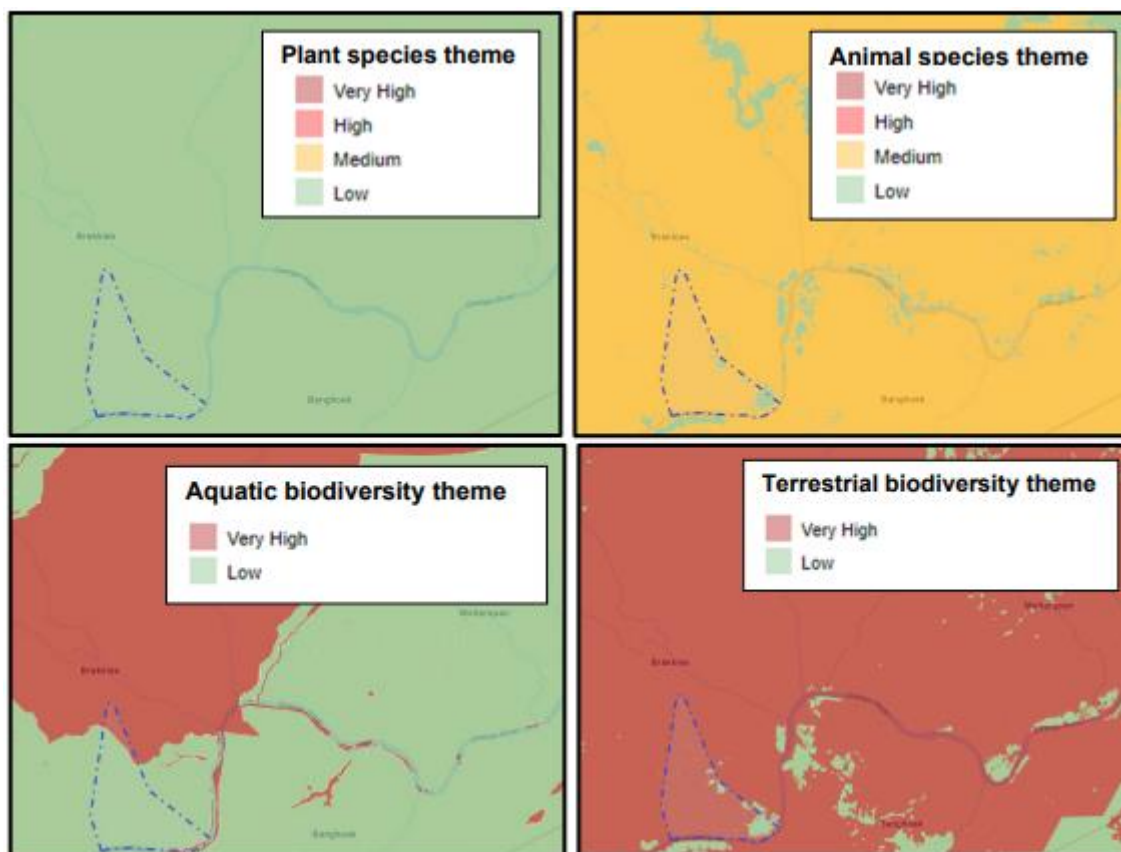


Figure 29. Environmental sensitivities in the study area, according to the National Web based Environmental Screening Tool.

According to the screening tool, Beatrys is of very high sensitivity based on the Terrestrial Biodiversity Theme, which is a direct function of the Critical Biodiversity Areas according to the Northern Cape Critical Biodiversity Areas Map. The Orange River and a small portion in the north is also of very high sensitivity based on the Aquatic Biodiversity Themes. This is due to freshwater ecosystem priority area quinary catchments (north) and wetlands associated with the river (south). Beatrys is of medium sensitivity based on the Animal Species Theme, due to the suitable habitat opportunity for the bird species *Neotis ludwigii* (Ludwig's Bustard), while it is of low sensitivity based on the Plant Species Theme.

According to the Pixley ka Seme Spatial Development Framework, all rivers and wetlands, including a generic buffer of 100m, are regarded as ecological corridors and sensitive. Their mandate is to conserve existing ecological corridors and rehabilitate any remnants of corridors.

Beatrys also falls within the boundary of the Griqualand West Centre (GWC) of Endemism core (Frisby et al. 2019). A centre of plant endemism is an area with high concentrations of plant species with very restricted distributions, known as endemics (Van Wyk and Smith 2001). Relatively small disturbances in a centre of

endemism may easily pose a serious threat to its many range-restricted species. Endemics are specifically vulnerable due to their restricted distribution ranges.

Finally, the study area falls within a region where one of South Africa's largest economically most important alluvial diamond deposits are found, i.e. along the Orange and Vaal Rivers (Gresse 2003). The most significant crop irrigation in the Northern Cape also stretches along these rivers (Durand 2006). These factors increase the operation's cumulative impacts.

(14) SOCIO-ECONOMIC STRUCTURE OF THE REGION:

The Northern Cape is geographically the largest province in South Africa having a land mass of 373,239 km² and covers approximately one third of the country's surface area. It is bordered by the Atlantic Ocean on the west, Namibia on the northwest and Botswana on the north, the Western Cape on the southwest and the Free State on the east.

The Northern Cape is the largest and most sparsely populated province of South Africa. It was created in 1994 when the Cape Province was split up. The Orange River flows through the province, forming the borders with the Free State in the southeast and with Namibia to the northwest. The Orange and Vaal Rivers meet just beyond Douglas at the confluence and are used to irrigate the many agricultural farming activities in and around Douglas.



Figure 30. Locality Map of the Northern Cape. Source: Google Maps (2020).

The demarcation process of 2000 resulted in five district municipalities (ZF Mgcawu DM, John Taolo Gaetsewe DM, Namaqua DM, Francis Baard DM and Pixley ka Seme DM) together comprising twenty-seven Category B municipalities.



Figure 31. Map of District Municipalities in the Northern Cape. Source: Google Maps (2020).

The Siyancuma Local Municipality is situated within the Pixley Ka Seme DM of the Northern Cape Province. It is bordered by the ZF Mgcawu DM in the north and west, Frances Baard DM in the north, Siyathemba LM and Thembelihle LM in the south, and the Free State Province in the east.



Figure 32. Local Municipalities within the Pixley ka Seme District. Source: Google Maps (2020)

Siyancuma Local Municipality is incorporating three urban settlements (Douglas, Griekwastad and Campbell), three restitution areas (Schmidtsdrift, Bucklands and Kahlani/Maselsfontein), rural areas (Ploosburg, Salt Lake, Witput, Belmont, Graspan, Heuningskloof, Volop), commercial farming areas as well as small farming areas.

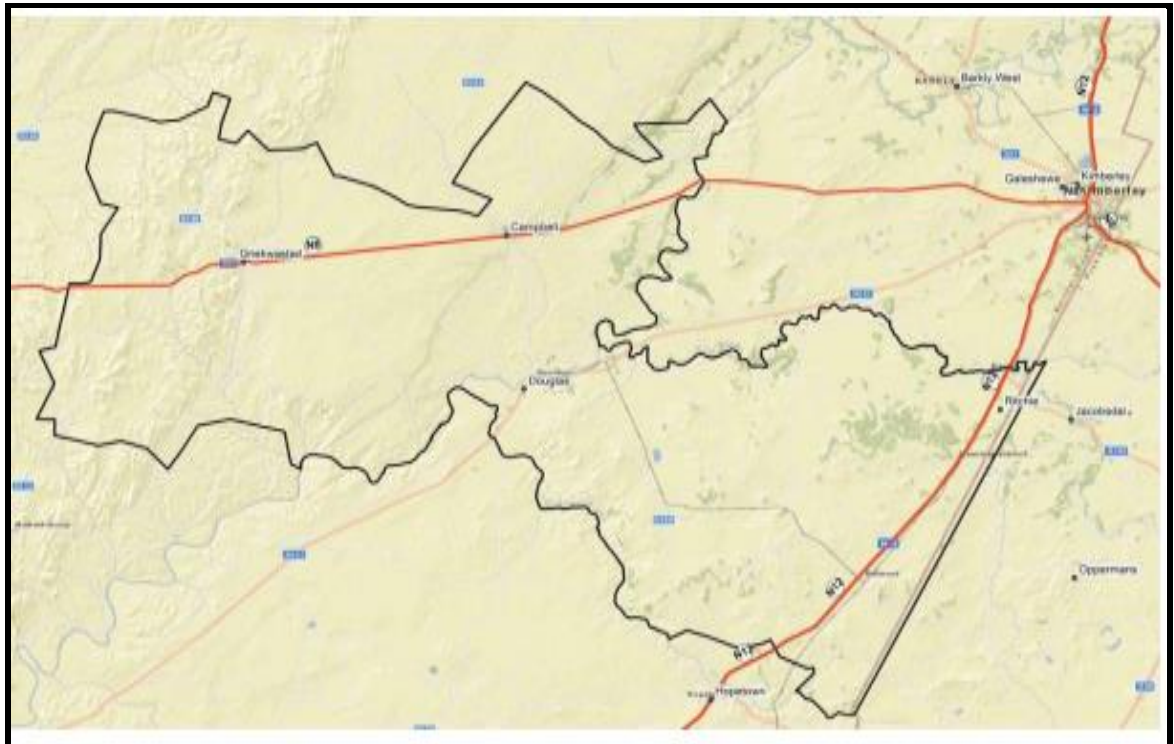


Figure 33. The Siyancuma Local Municipality. Source: Municipal Demarcation Board (2020)

DEMOGRAPHICAL DESCRIPTION

Population Overview

Pixley ka Seme District Municipality has the third largest population in the Northern Cape and shows a slight increase of 9244 from 2011 to 2016. It represents 28,41 % of the Northern Cape population.

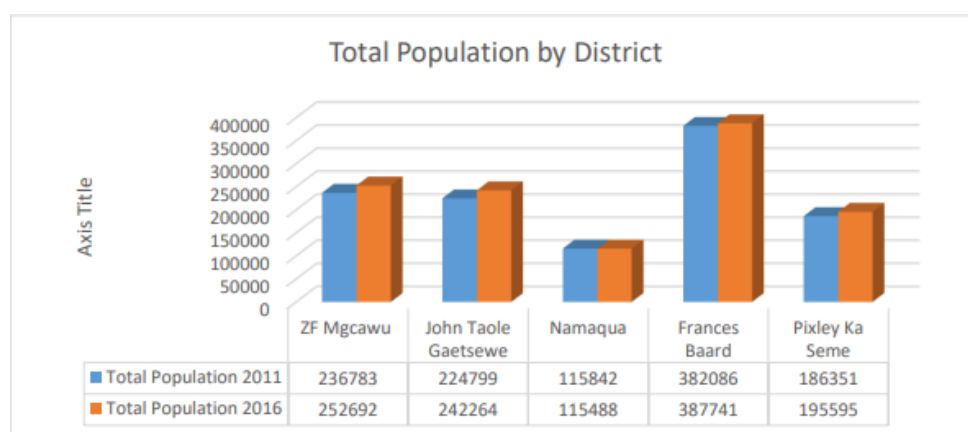
The table and graph below depicts the population figures of the five District Municipalities as in 2011 and 2016:

District	2011	2016
ZF Mgcawu DM	236 783	252 692
John Taole Gaetsewe DM	224 799	242 264
Namaqua DM	115 842	115 488
Francis Baard DM	382 086	387 741
Pixley ka Seme DM	186 351	195 595
TOTAL	1 145 861	1 193 780

Table 3: Total Population by District .

Source: StatsSa (2011)

StatsSa Community Survey (2016)



Graph 1: Total population by District . Source: StatsSA (2011) & StatsSA Community Survey (2016)

From 2001 to 2011, the total population for Siyancuma Local Municipality showed a negative growth rate of -5.6% with the population decreasing from 39 275 to 37 076 (StatsSA 2011). A further negative growth rate of -3.1% was experienced from 2011 to 2016 when the population decreased from 37 076 to 35 938 (Community Survey 2016).

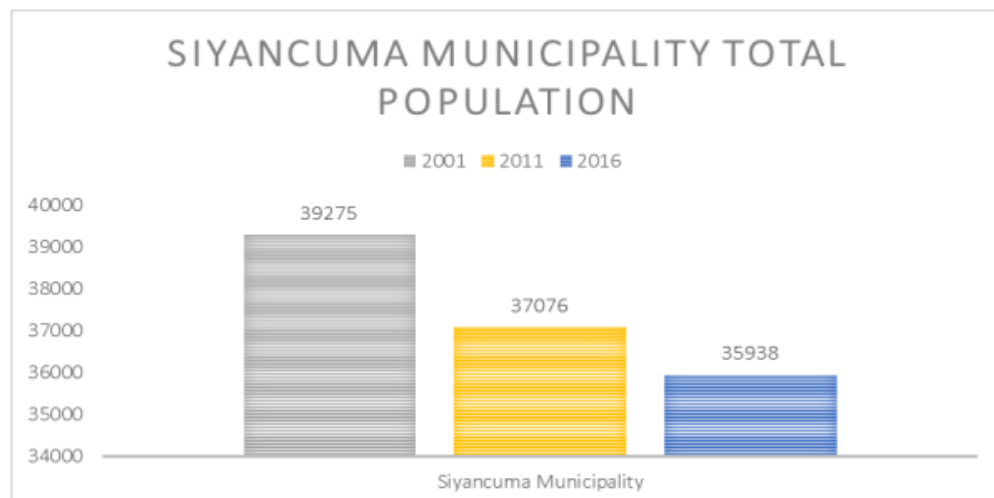
Possible reasons for the decline in population might be:

- Mortality (deaths that occur within a population).

While death is inevitable, the probability of dying is linked to many factors, such as age, sex, race, occupation, social class and diseases like HIV and TB. The incidence of death can reveal much about a population's standard of living and health care.

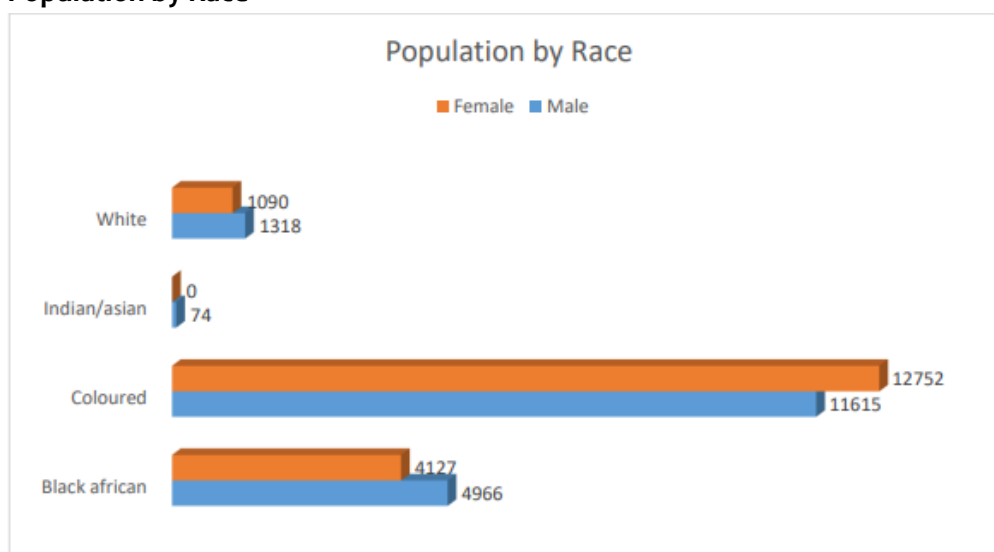
- Migration (the movement of people)

The movement of a people across a specified boundary, for the purpose of establishing a new residence or to seek new job opportunities.



Graph 2: Total population comparison of Siyancuma Local Municipality. Source: StatsSA (2001), StatsSA (2011) & StatsSA Community Survey (2016)

Population by Race



Graph 3: Population by Race. Source: StatsSA Community Survey (2016)

The Siyancuma Municipality's total population of 35 938 (2016) can be broken down as follows:

- Coloured – 67,80 %
- African – 25,30 %
- White – 6,69 %
- Asian – 0,21 %

The overall sex ratio (male : female) is more or less 50:50, although it is 48:52 for Coloureds meaning that there are slightly more Coloured females than males.

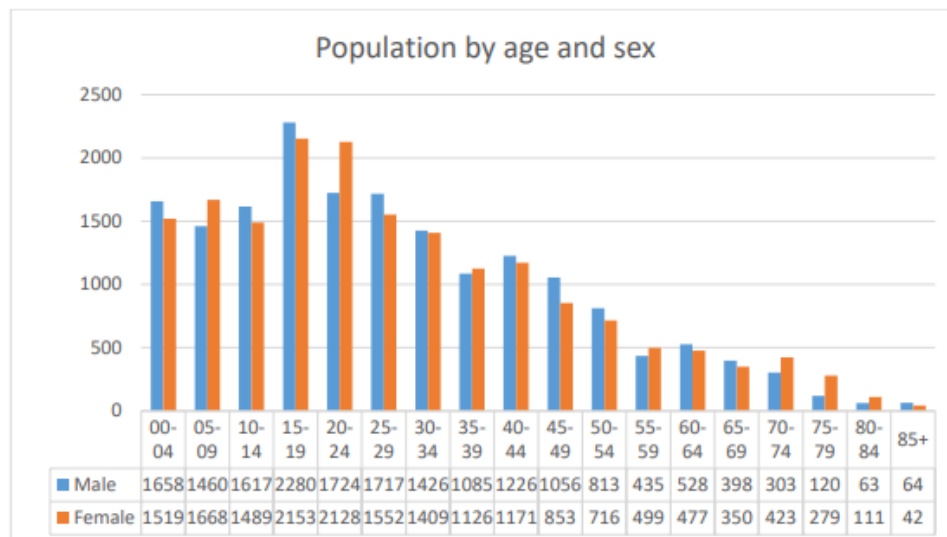
Population by age and sex

Demographic information from the 2016 Community Survey structured the Siyancuma total population as follow:

Population under 15: 26,2 %

Population 15 to 64: 67,8 %

Population over 64: 6,0 %



Graph 4: Population by age and sex. Source: StatsSA Community Survey (2016)

It is further evident from the information in the graph that:

- age group 15 – 19 is the highest. This group represents education grades 9 – 12, and forms 12,4 % of the total population.
- age group 20 – 34 represents the youth component and forms 27,7 % of the total population. This group characterises the economically active group and will have an impact on the employment and income levels within the municipality.
- from age 70, the mortality rate is higher for males than for females.

EDUCATION OVERVIEW

Level of Education (age 20+)

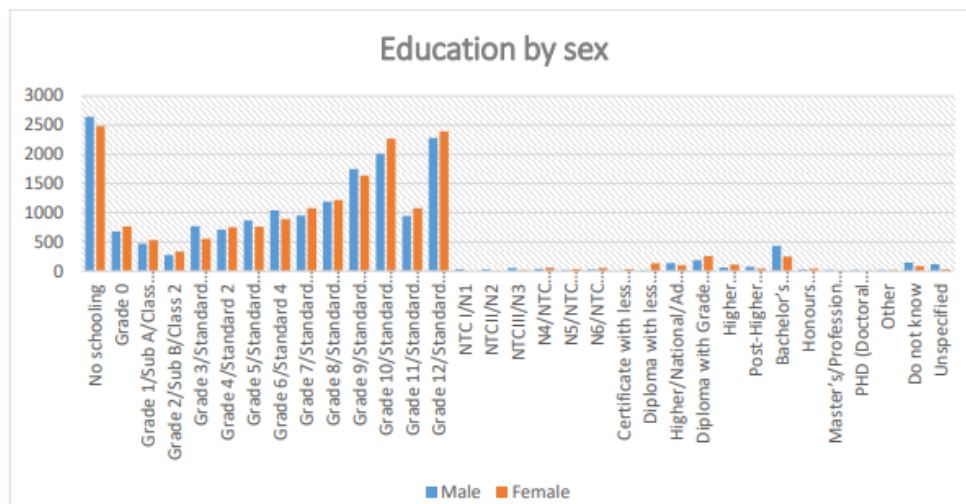
	2016	2011
No schooling	9,7 %	16,7 %
Matric	20,4 %	16,8 %
Higher education	8,9 %	5,4 %

Table 9: Level of education (age 20+). StatSA Community Survey (2016) StatsSA (2011)

The statistics above represent the level of education of the population above the age of 20. It is of significance, because it shows an increase in matric and higher education qualifications of 3,6% and 3,5% respectively from 2011 to 2016, while the figure for people with no schooling decreases with 7,0%. This represents a positive improvement in terms of increasing the levels of literacy within the municipality.

Education by sex

The graph below illustrates that more females (7369) than males (6979) completed grades 9 to 12, while slightly more males (1134) than females (1123) have a post matric qualification. People with no schooling stood at 2483 females and 2642 males in 2016, which is 14,2 % of the total population.



Graph 5: Education by sex. Source: StatsSA Community Survey (2016)

HEALTH OVERVIEW

The sectoral approach that was adopted to analyse the present health facilities of the Pixley Ka Seme district revealed that the National Government has adopted a primary health care strategy that includes making such services available within walking distance of communities.

The strategy also includes improvement in sanitation and drinking water supply, etc. Thus the health care systems that presently exist in the District consist of:

- District Hospitals
- Community Healthcare Centres

TOWNS	HOSPITALS/ CHC's	CLINICS
Schmidsdrift	-	1
Campbell	-	1
Griekwastad	1	1
Douglas	1	2
TOTAL	2	5

Table 10: Municipal Health Centres. Source: Siyancuma Municipality (2020)

OVERVIEW OF THE HOUSING SITUATION

Household Dynamics

	2016	2011
Number of Households	10 191	9578
Average household size	3,5	3,8
Female headed households	36,4 %	35,7 %
Formal dwellings	82,0 %	73,0 %
Housing owned	50,3 %	39,6 %

Table 11: Household Dynamics. StatsSA Community Survey (2016) StatsSA (2011)

Household Services

	2016	2011
Flush toilet connected to sewerage	59,7 %	53,4 %
Weekly refuse removal	71,9 %	62,3 %
Piped water inside dwelling	41,5 %	41,4 %
Electricity for lighting	89,1 %	82,2 %

Table 12: Household Services. StatsSA Community Survey (2016) StatsSA (2011)

Housing Backlogs

Formalised, serviced sites (ready for top structures)

TOWN	WARD	TOWNSHIP	DESCRIPTION	NUMBER OF UNITS
DOUGLAS	2	Breipaal	Old Dalton Plakkers	177
	2	Breipaal	Akkerlaan Plakkers	86
	2	Breipaal	New Dalton Plakkers	282
	4	Bongani	Riemvasmaak	405
	3	Bongani	Phomolong Plakkers	31
	3	Bongani	Area next to reservoirs	50
	3	Bongani	Infills	200
GRIEKWASTAD	1	Rainbow		34
	1	Rainbow		13
	7	Vaalblok	Area between Vaalblok and Mathlomola	457
CAMPBELL	7	Campbell	Area next to the landfill site	190
SCHMIDTSDRIFT	6	Zone 4	Zone 4	539
	6	Zone 5	Zone 5	161
			TOTAL	2625

Table 13: Formalised, serviced sites (1). Source: Siyancuma Local Municipality (2020)

Formalised, serviced sites (ready for engineering services)

TOWN	WARD	TOWNSHIP	DESCRIPTION	NUMBER OF UNITS
DOUGLAS	2	Breipaal	Weslaan Plakkers	50
	2	Breipaal	Madibas Plakkers	46
	2	Breipaal	Midblock Plakkers	326
	5	Breipaal	Poppiestr.Plakkers	19
	5	Breipaal	Atherthon Plakkers	65
	4	Bongani	Area next to Bosman Canal	150
GRIEKWASTAD	7	Mathlomola		22
	7	Mathlomola		42
TOTAL				720

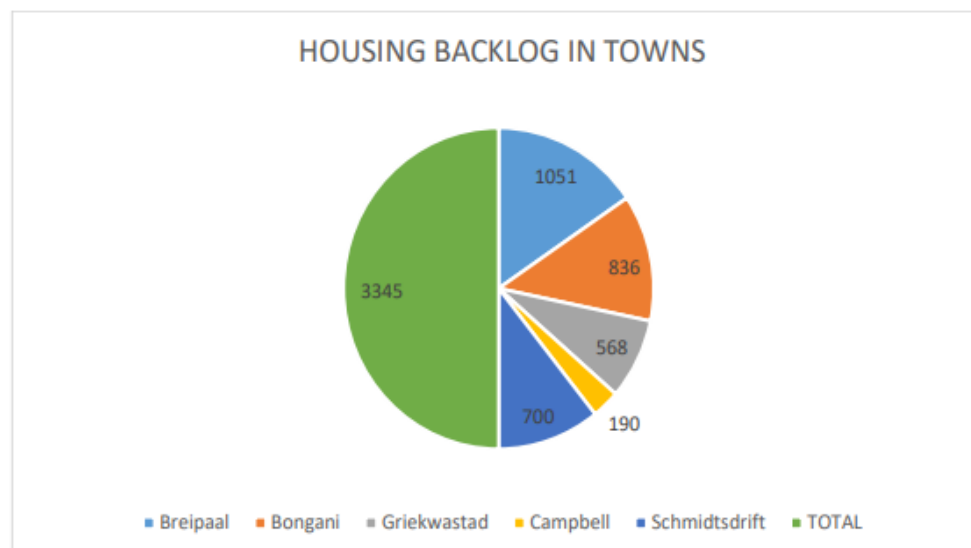
Table 14: Formalised, serviced sites (2). Source: Siyancuma Local Municipality (2020)

Total Housing Backlog

(Top Structures + Engineering Services)

TOWN	BACKLOG
Breipaal	1051
Bongani	836
Griekwastad	568
Campbell	190
Schmidtsdrift	700
TOTAL	3345

Table 15: Total Housing Backlog. Source: Siyancuma Local Municipality (2020)



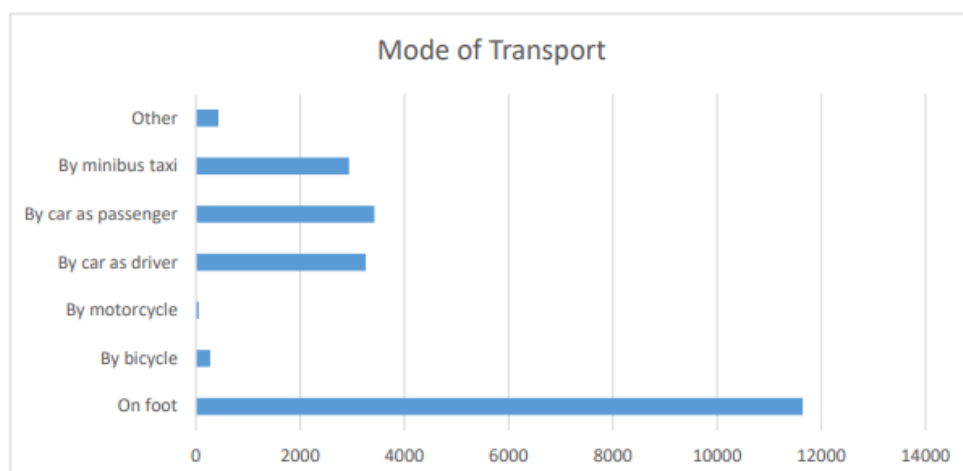
Graph 6: Total Housing Backlog. Source: Siyancuma Local Municipality (2020)

INFRASTRUCTURE AND SOCIAL AMENITIES

Transport

Transport includes activities such as providing passenger or freight transport by rail, road, water or air, auxiliary activities such as terminal parking facilities, cargo handling and activities, and postal activities and telecommunication.

The majority of people in Siyancuma do not have own transport and walk on foot to their places of employment or businesses in town. A small percentage are dependant on other modes of transport like minibus taxis and bicycles.

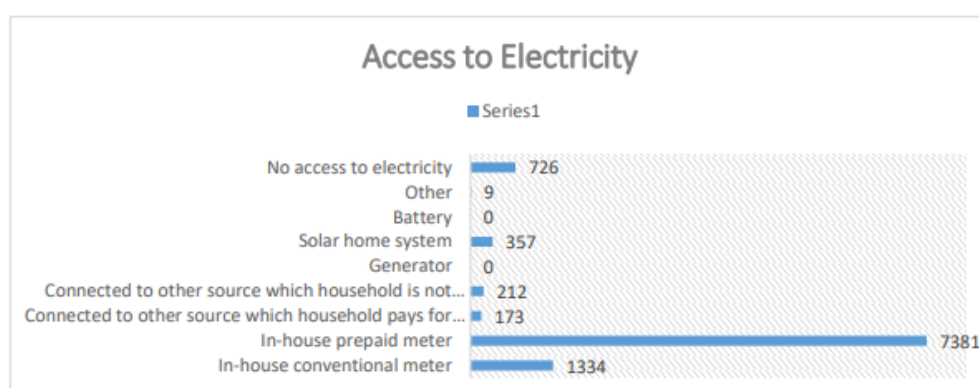


Graph 7: Mode of Transport. Source: StatsSA Community Census (2016)

Energy Supply

Siyancuma Local Municipality is currently facing a big challenge in terms of electricity bulk supply due to the expansion of informal areas. Another challenge is the fact that electrical infrastructure, eg. transformers, are dilapidated and need to be repaired or replaced at very high costs.

According to the Community Survey of 2016, most households (7381) are using in-house prepaid meters, followed by in-house conventional meters (1334). A new trend is taking root where people are installing solar home systems, and 357 such systems were already installed in 2016.



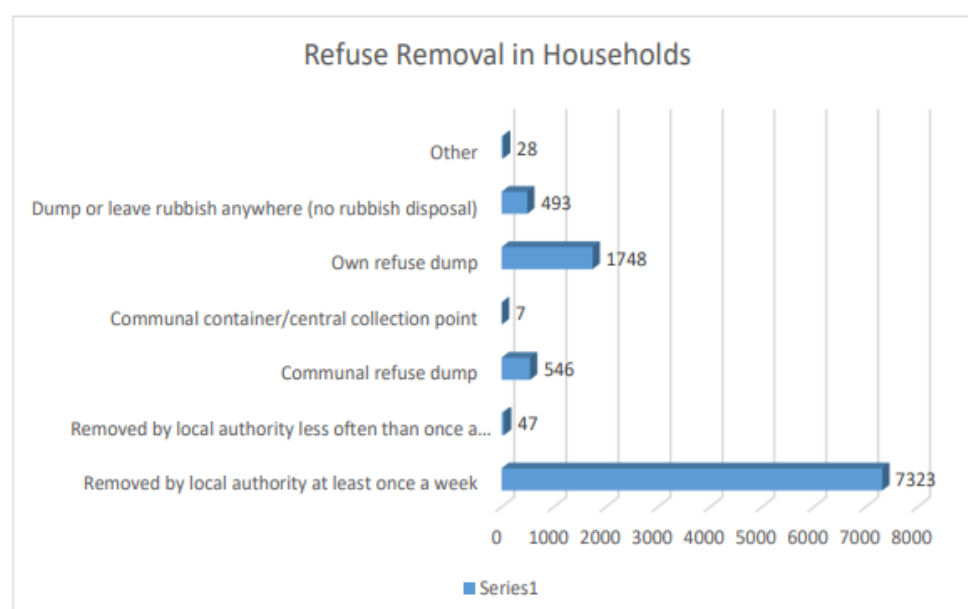
Graph 8: Access to Electricity. Source: StatsSA Community Survey (2016)

Refuse Removal

The following table depicts the days on which refuse are being removed in the different towns of the Siyancuma Local Municipality:

TOWN	TOWNSHIP	MON	TUE	WED	THU	FRI
DOUGLAS	Town			✕		
	Bongani				✕	
	Breipaal		✕			
	Businesses	✕				✕
GRIEKWASTAD	Town			✕		
	Rainbow Valley			✕		
	Mathlomola		✕			
	Vaalblok		✕			
	Riemvasmaak		✕			
	Businesses		✕			
CAMPBELL	Town		✕			
	Boven Campbell		✕			
	Township			✕		
	Informal area				✕	

Table 16: Refuse removal in towns. Source: Siyancuma Local Municipality (2020)

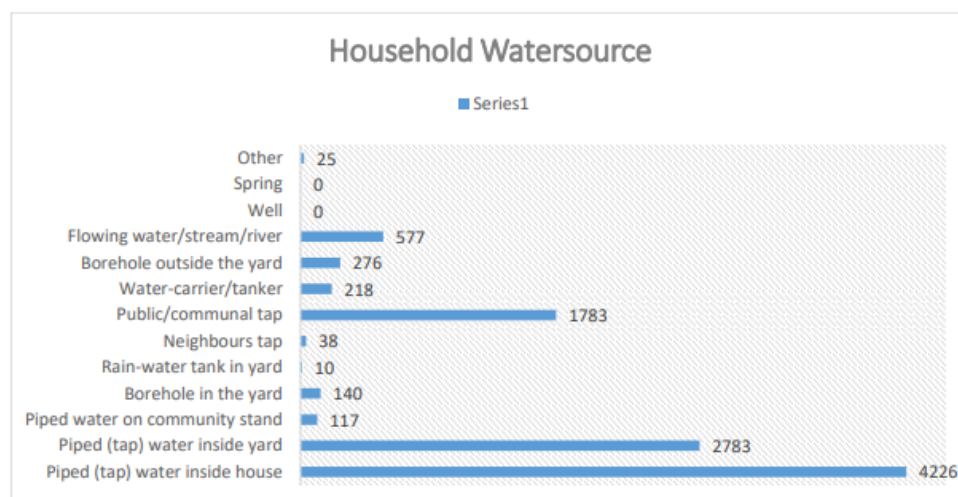


Graph 9: Refuse Removal in Households. Source: StatsSA Community Survey (2016)

The graph above illustrates that refuse is being removed at least once a week, to the tune of 7323 households. However a substantial number of people are still dumping domestic and garden waste on illegal dumping sites. This poses a serious environmental and health risk/ hazard. Communal dumping sites are not registered and licensed at the moment and efforts are underway to get them licensed.

Water

Most households in the Siyancuma Local Municipality area have access to water inside the house followed by taps inside the yard. However, many households are still dependant on communal taps.

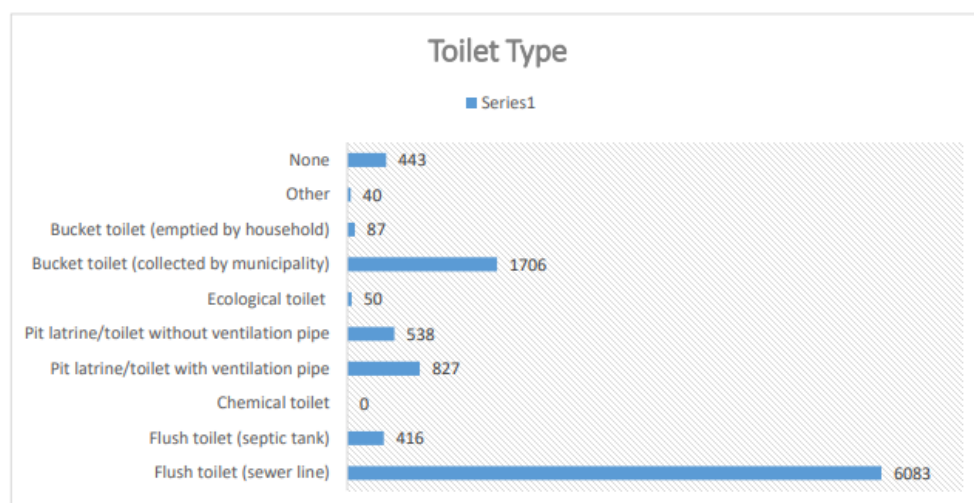


Graph 10: Household Watersource. Source: StatsSA Community Survey (2016)

Sanitation

Sewerage and sanitation are basic needs of communities which can pose serious health and hygiene risks for communities and the environment at large if not properly managed and monitored. According to the White Paper on Basic Household Sanitation, 2001, basic sanitation is defined as: “The minimum acceptable basic level of sanitation is:

- (a) Appropriate health and hygiene awareness and behaviour;
- (b) A system for disposing of human excreta, household waste water and refuse, which is acceptable and affordable to the users, safe, hygienic and easily accessible and which does not have an unacceptable impact on the environmental and
- (c) A toilet facility for each household”



Graph 11: Toilet Type. Source: StatsSA Community Survey (2016)

From the graph above the majority of toilets (6083) are flush toilets, followed by bucket toilets (1706) which are still being collected by the municipality.

Public Facilities

Towns	Multipurpose Centres	Town Halls
Schimidsdrift	0	0
Campbell	0	1
Griekwastad	0	2
Douglas	0	2
Total	0	5

Table 17: Community Halls. Source: Siyancuma Local Municipality (2020)**Cemeteries**

Towns	Cemeteries
Schimidsdrift	1
Campbell	1
Griekwastad	3
Douglas	3
Saltlake	1
Total	6

Table 18: Cemeteries. Source: Siyancuma Local Municipality (2020)**Opportunities for Growth and Development**

According to municipality's LED Strategy, an analyses of the economic indicators indicate opportunities for economic growth in the following sectors:

- ☐ Agriculture and agro-processing.
- ☐ Manufacturing.
- ☐ Tourism.
- ☐ Transport and infrastructure.
- ☐ Wholesale and retail, and
- ☐ Mining and value adding – beneficiation.

(15) **SENSITIVE LANDSCAPES:**

“Sensitive Environments” that have statutory protection are the following:–

1. Limited development areas (Section 23 of the Environmental Conservation Act, 1989 (Act 73 of 1989).
2. Protected natural environments and national heritage sites.
3. National, provincial, municipal and private nature reserves.
4. Conservation areas and sites of conservation significance.
5. National monuments and gardens of remembrance.
6. **Archaeological and palaeontological sites.**
7. Graves and burial sites.
8. Lake areas, offshore islands and the admiralty reserve.
9. Estuaries, lagoons, wetlands and lakes.
10. **Streams and river channels and their banks.**
11. Dunes and beaches.
12. Caves and sites of geological significance.
13. Battle and burial sites.
14. Habitat and/or breeding sites of Red Data Book species.
15. Areas or sites of outstanding natural beauty.
16. Areas or sites of special scientific interest.
17. Areas or sites of special social, cultural or historical interest.
18. Declared national heritage sites.
19. Mountain catchment areas.
20. Areas with eco-tourism potential.

The relevant specialists will be appointed to conduct specialist studies to assess whether there are any sensitive landscapes within the application area.

(b) Description of the current land uses

(1) Land Use before Prospecting:

Dr Elizabeth (Betsie) Milne has been appointed by Wadala Mining to provide an ecological study in order to highlight the ecological characteristics of the proposed prospecting area, and to determine the possible impact of prospecting on the diversity and ecological status of the application area land capability and land use was described and included in this report as part of the ecological study. (Appendix 4).

The major land uses in the area are mining and agriculture. According to AGIS, the land capability of the study site is moderate along the river, low on the plateau, and very low along the ridge

slopes. Irrigation suitability is excellent along the river, but low on the remainder of the site. The region is demarcated for sheep farming, with the grazing capacity on site being 24 ha/LSU.

(2) Evidence of Disturbance: -

Disturbances from past mining activities and borrow pitting are evident.

(3) Existing Structures: -

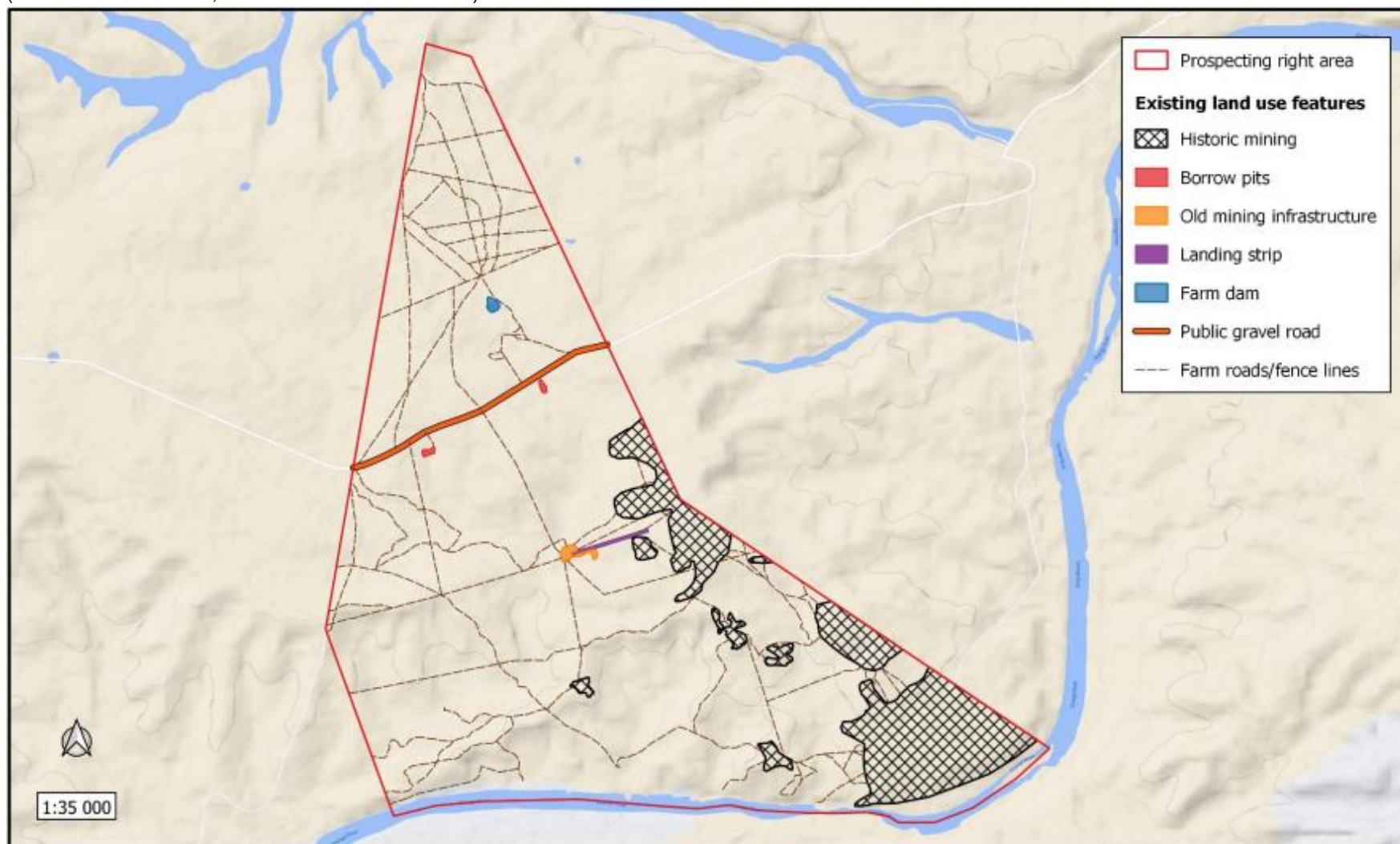
Existing infrastructure include a farm dam, remnant mining infrastructure, a landing strip, and roads.

(c) Description of specific environmental features and infrastructure on the site

The infrastructure on site is comprehensively discussed in section d(ii) as part of the prospecting methodology discussion, as well as in section g as part of the prospecting footprint description. Furthermore, a comprehensive description of the environment was presented in section g (iv) (A) as part of the baseline report.

(d) Environmental and current land use map

(Show all environmental, and current land use features)

**Figure 34.** Environmental and current land use map on 1:50 000 topographical map.

v) Impacts and risks identified including the nature, significance, consequence, extent, duration and probability of the impacts, including the degree to which these impacts

(Provide a list of the potential impacts identified of the activities described in the initial site layout that will be undertaken, as informed by both the typical known impacts of such activities, and as informed by the consultations with affected parties together with the significance, probability, and duration of the impacts. Please indicate the extent to which they can be reversed, the extent to which they may cause irreplaceable loss of resources, and can be avoided, managed or mitigated)

Environmental Factor	Nature of Impact	Significance	Probability	Duration	Consequence Extent	Management / mitigation
PHYSICAL						
Geology and Mineral Resource	Sterilisation of mineral resources	Low	Certain for life of operation	Residual	On-site	<ul style="list-style-type: none"> Ensure that optimal use is made of the available mineral resource.
Topography	Changes to surface topography Development of infrastructure; and residue deposits.	Low to Medium	Possible for life of Operation	Residual	On site	<ul style="list-style-type: none"> Prospecting continuously, if possible and does not influence prospecting and safety requirements. Employ effective rehabilitation strategies to restore surface topography of prospecting areas and plant site. Stabilise the mine residue deposits. All temporary infrastructures should be demolished during closure.
Soils	Soil Erosion During clearing of an area for drilling and the excavation of minerals, construction of	Low to Medium	Possible, Frequently	Decommissioning	Local	<ul style="list-style-type: none"> Bare ground exposure should be minimised at all times regarding surface area and duration. Re-establishment of plant cover on disturbed areas

	<p>infrastructure and roads, stockpiling, natural events.</p> <p>Vegetation will be stripped for construction of new roads and prospecting areas and these areas will be bare and highly susceptible to erosion. Any topsoil-, overburden- and ore stockpiles can be eroded by wind, rain and flooding. Exposed sediments in the watercourses can be carried away during runoff causing downstream sediment deposition. Any leaking pipes can also cause additional water erosion.</p>					<p>must take place as soon as possible, once</p> <ul style="list-style-type: none"> activities in the area have ceased. No new roads, infrastructure or prospecting areas should be developed over watercourses, including drainage lines. Disturbances during the rainy season should be monitored and controlled. Any potential run-off from exposed ground should be controlled with flow retarding barriers. Regular monitoring during the prospecting operation should be carried out to identify areas where erosion is occurring; followed by appropriate remedial actions.
	Nature of Impact	Significance	Probability	Duration	Consequence Extent	Management / mitigation
	<p>Loss of soil fertility</p> <p>During clearing of an area for drilling and</p>	Medium to High	Certain for life of operation	Residual	On-site	<ul style="list-style-type: none"> Topsoil needs to be removed and stored separately during prospecting and the

	<p>the excavation of minerals, construction of infrastructure and roads, stockpiling.</p> <p>Topsoil contains living organisms that naturally regulate the ecological functioning of a habitat. Therefore, any disturbances to the intact soil profile can result in soil sterilisation which will directly affect vegetation communities. Apart from the direct disturbances caused by the prospecting activities, loss of soil fertility can also occur through soil compaction by dump loads as well as heavy machinery and vehicles.</p>					<p>construction of roads, infrastructure and stockpile areas.</p> <ul style="list-style-type: none"> • These topsoil stockpiles must be kept as small as possible in order to prevent compaction and the formation of anaerobic conditions. • Topsoil must be stockpiled for the shortest possible timeframes to ensure that the quality of the topsoil is not impaired. • Topsoil must not be handled when the moisture content exceeds 12 %. • Topsoil stockpiles must by no means be mixed with sub-soils. • The topsoil should be replaced as soon as possible on to the disturbed areas, thereby allowing for the re-growth of the seed bank contained within the topsoil. • For restoration of the affected areas without topsoil, soils can be sourced from other sustainable areas and
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						<p>chemically changed to match with the surrounding environment.</p> <ul style="list-style-type: none"> To restore areas where compacted soil occurs, a ripper blade or deep plow can be pulled across the affected area to alleviate compaction. Encourage the growth of natural plant species in all affected areas by sowing indigenous seeds or by planting seedlings.
	Nature of Impact	Significance	Probability	Duration	Consequence Extent	Management / mitigation
	<p>Soil pollution</p> <p>During clearing of an area for drilling and the excavation of minerals, construction of infrastructure and roads, stockpiling, oil and petrochemical spills.</p> <p>Topsoil contains living organisms and seed banks that provide ecological resilience against</p>	Medium to High	Certain for life of operation	Residual	On site	<ul style="list-style-type: none"> Topsoil needs to be removed and stored separately during prospecting and the construction of roads, infrastructure and stockpile areas. These topsoil stockpiles must be kept as small as possible in order to prevent compaction and the formation of anaerobic conditions. Topsoil must be stockpiled for the shortest possible timeframes to ensure that

	<p>disturbances, and any disturbances to the intact soil profile will change its ability to sustain natural ecological functioning. Vehicles and prospecting equipment may potentially leak hazardous fluids on the soil surface, which will cause soil pollution. Apart from the direct disturbances caused by the prospecting activities, soil compaction by dump loads as well as heavy machinery and vehicles will cause a decrease in large pores, and subsequently the water infiltration rate into soil.</p>					<p>the quality of the topsoil is not impaired.</p> <ul style="list-style-type: none"> • Topsoil must not be handled when the moisture content exceeds 12 %. • Topsoil stockpiles must by no means be mixed with sub-soils. • The topsoil should be replaced as soon as possible on to the disturbed areas, thereby allowing for the re-growth of the seed bank contained within the topsoil. • For restoration of the affected areas without topsoil, soils can be sourced from other sustainable areas and chemically changed to match with the surrounding environment. • To restore areas where compacted soil occurs, a ripper blade or deep plow can be pulled across the affected area to alleviate compaction. • Encourage the growth of natural plant species in all affected areas by sowing
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						<p>indigenous seeds or by planting seedlings.</p> <ul style="list-style-type: none"> • Vehicles and machinery should be regularly serviced and maintained. • Refuelling and vehicle maintenance must take place in well demarcated areas and over suitable drip trays to prevent soil pollution. • Drip trays must be available on site and installed under all stationary vehicles. • Spill kits to clean up accidental spills from any accidental spillages must be well-marked and available on site. • Workers must undergo induction to ensure that they are prepared for rapid clean-up. • Any soil or area that is contaminated must be cleaned immediately by removing the soil and disposing it as hazardous waste in the correct manner.
Land Capability	Loss of land capability through topsoil	Low	Possible for life of operation	Residual	On-site	<ul style="list-style-type: none"> • Employ appropriate rehabilitation strategies to restore land capability.

	removal, disturbances and loss of fertility.					
Land use	Loss of land use due to poor placement of surface infrastructure and ineffective rehabilitation.	Low	Possible for life of operation	Residual	On-site	<ul style="list-style-type: none"> Carefully plan the placement of infrastructure and employ rehabilitation strategies to restore land capability.
Ground Water Quantity	Nature of Impact	Significance	Probability	Duration	Consequence Extent	Management / mitigation
	Hydrocarbon spills from vehicles and fuel storage areas may contaminate the groundwater resource locally	Medium-High	Possible infrequently	Residual	Regional	<ul style="list-style-type: none"> Any refuelling or vehicle maintenance must take place in well demarcated areas and over suitable drip trays to prevent soil pollution. Drip trays must be available on site and installed under all vehicles during maintenance. Spill kits to clean up accidental spills from any accidental spillages must be well marked and available on site. Workers must undergo induction to ensure that they are prepared for rapid clean-up procedures. Vehicles and machinery should be regularly serviced and maintained.

						<ul style="list-style-type: none"> No excavations should take place in the river, drainage lines or depressions.
Environmental Factor	Nature of Impact	Significance	Probability	Duration	Consequence Extent	Management / mitigation
Surface Water Alteration destruction of watercourses During excavation of minerals, construction of infrastructure and roads, stockpiling.	During prospecting activities there is a possibility that the watercourses on site (Orange River and drainage lines) might be altered or indirectly affected. This includes direct prospecting within the watercourses as well as development of roads, infrastructure or stockpiles within their active zones, catchment areas, or buffer zones. Such activities can completely change the hydrologic regime or habitat conditions of the watercourses, which will not only compromise their ecological functioning, but also	Medium to High	Possible, infrequent	Permanent	Regional	<ul style="list-style-type: none"> All activities associated with the prospecting operation must be planned to avoid any disturbances to the watercourses and their buffer zones. No new roads should be created across a watercourse and no prospecting should take place in them. If this is unavoidable, a water use license to alter the beds and banks of each earmarked watercourse should be obtained from DWS prior to such activities. Employ sound rehabilitation measures to restore characteristics of all affected watercourses.

Siltation of surface water During clearing of an area for the excavation of minerals, construction of infrastructure and roads, stockpiling, natural events	have downstream effects.					
	Vegetation will be stripped in preparation for the prospecting areas and associated infrastructure. These bare areas will be very susceptible to water erosion without plants to stabilise the soil, creating potential sediment source zones. High runoff events could potentially cause the drainage lines and river to be filled with silt from prospecting areas if the sediment source zones lie along the drainage paths towards these watercourses. This may lead to a change in hydrologic regime or character of the watercourses.	Low Medium	Possible, infrequent	Residual	Regional	<ul style="list-style-type: none"> • Bare ground exposure should always be minimised in terms of the surface area and duration. • Re-establishment of plant cover on disturbed areas must take place as soon as possible once • activities in the area have ceased. • No new roads, infrastructure or prospecting areas should be developed over watercourses. • Disturbances during the rainy season should be monitored and controlled. • Any potential run-off from exposed ground should be controlled with flow retarding barriers. • Regular monitoring during the prospecting operation should be carried out to identify areas • where erosion is occurring; followed by appropriate remedial actions.
Environmental Factor	Nature of Impact	Significance	Probability	Duration	Consequence Extent	Management

Indigenous Flora	<p>Loss of and disturbance to indigenous vegetation</p> <p>During clearing of an area for drilling and the excavation of minerals, construction of infrastructure and roads, stockpiling.</p> <p>The Beatrys prospecting activities is expected to destroy a large area of natural vegetation. It is expected that the ecological functioning and biodiversity will take many years to fully recover. Vehicle traffic and prospecting activities generate lots of dust which can reduce the growth success and seed dispersal of many small plant species in the</p>	Low - Medium	Certain for life of operation	Residual	On-site	<ul style="list-style-type: none"> • Implement best practise principles to minimise the footprint of transformation, by keeping to existing roads and earmarked areas where possible. • Implement effective avoidance measures to limit any activities in the highly sensitive areas, by applying the no-go principles. • Ensure measures for the adherence to a maximum speed limit of 40 km/h to minimise dust fallout and associated effects on plants in the adjacent pristine areas. • Encourage the growth of natural plant species in all affected areas by sowing indigenous seeds or by planting seedlings. • The setup of a small nursery is advisable to maximise translocation and re-establishment efforts of affected areas. • Apply for permits to authorise the clearance of indigenous plants from
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	adjacent pristine areas.					DENC at least three months before such activities will commence.
	<p>Loss of flora with conservation concern</p> <p>Removal of plant species of conservation concern during clearing of an area for drilling and excavations, construction of infrastructure and roads, stockpiling. Intentional removal of these plant species for non-mine related purposes, e.g. illegal plant trade, fire-wood, medicinal, ornamental purposes.</p> <p>There are a few plant species of conservation concern present on the Beatrys Prospecting Right area as discussed in this report. Many of the</p>	Medium to High	Certain for life of operation	Residual	On-site	<ul style="list-style-type: none"> The footprint areas of the prospecting activities must be scanned for Red Listed and protected plant species prior to any destructive activities by means of a search-and-rescue operation. It is recommended that these plants are identified and marked prior to intended activity. These plants should ideally be incorporated into the design layout and left in situ. However, due to the nature of the proposed prospecting activities they will most likely all be removed or relocated if possible. The relevant permits from DAFF and/or DENC should be applied for at least three months before such activities will commence. The setup of a small nursery is advisable to maximise translocation and re-establishment

	<p>species are found in the core prospecting area and therefore it is likely that the prospecting operation will impact on their population dynamics. The most significant concern is the loss of <i>Boscia albitrunca</i> recruits. Saplings are rarely visible during clearance operations and therefore the younger populations often get wiped out. Furthermore, any illegal harvesting of plant species of conservation concern for whatever reason by staff, contractors or secondary land users could have devastating effects on the population of these species.</p>					<p>efforts of all the rescued plants.</p> <ul style="list-style-type: none"> • A management plan should be implemented to ensure proper establishment of ex situ individuals and should include a monitoring programme for at least two years after re-establishment in order to ensure successful translocation. • The designation of an environmental officer is recommended to render guidance to the staff and contractors with respect to suitable areas for all related disturbance and must ensure that all contractors and workers undergo Environmental Induction prior to commencing with work on site. Environmental inductions should occur in the appropriate languages for the workers. • All those working on site must be educated about the conservation importance of the flora occurring on site as well as
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						<p>the legislation relating to protected species.</p> <ul style="list-style-type: none"> • Employ regulatory measures to ensure that no illegal harvesting takes place.
	<p>Introduction or spread of alien species</p> <p>During clearing of an area for the drilling and excavation of minerals, construction of infrastructure and roads, stockpiling, improper rehabilitation practises.</p> <p>Several weeds and invasive species occur on site, especially in and around the transformed habitats, which indicates the effect of anthropogenic disturbances. Any anthropogenic disturbances to natural vegetation, especially the</p>	Low to Medium	Possible, frequently	Residual	Local	<ul style="list-style-type: none"> • Implement best practise principles to minimise the footprint of transformation, by keeping to existing roads and earmarked areas where possible. • Mechanical methods of control should be implemented pro-actively as soon as invasive species start to emerge. • Regular follow-up monitoring of invasive control areas needs to be implemented to ensure effective eradication. • Encourage proper rehabilitation of disturbed areas through soil restoration and reseedling of indigenous plant species.

	<p>clearance of large areas of land, provide opportunities for invasive plants to increase. This is due to their opportunistic nature of dispersal and establishing in disturbed areas. If invasive plants establish in disturbed areas, it may cause an impact beyond the boundaries of the affected site, because they spread easily to neighbouring habitats where they outcompete indigenous species. Invasive species are thus a threat to surrounding natural vegetation and can result in the decrease of biodiversity as well as reduction in the ecological value and land use potential. Therefore, if alien invasive species are not controlled and managed, their</p>					
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	propagation into new areas could have a high impact on the surrounding natural vegetation in the long term. With proper mitigation, the impacts can be substantially reduced.					
	<p>Encouragement of bush encroachment</p> <p>During clearing of an area for drilling and the excavation of minerals, construction of infrastructure and roads, stockpiling, improper rehabilitation practises.</p> <p>The extent of bush encroaching species on site is high, especially regarding the densities of <i>Senegalia mellifera</i>. Bush encroachment is a natural</p>	Low	Possible, infrequently	Residual	On-site	<ul style="list-style-type: none"> • Mechanical methods of control should be implemented pro-actively when encroaching species form dense stands. • Regular follow-up monitoring of encroached control areas needs to be implemented to ensure effective eradication. • Encourage proper rehabilitation of disturbed areas through soil restoration and reseedling of indigenous plant species.

	<p>phenomenon characterised by the excessive expansion of certain indigenous shrub species at the expense of other indigenous plant species. Overgrazing is generally one of the main causes of bush encroachment, but any surface disturbances where the grassland matrix is removed can lead to the expansion of encroaching shrubs and trees. When the areas surrounding the shrubs area cleared, it causes an open niche for these competitive species to establish and outcompete the surrounding plants, eventually forming dense and impenetrable stands. This lowers the potential for future land use and decreases biodiversity. With</p>					
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	proper mitigation, the impacts can be substantially reduced. In fact, the proposed prospecting activities could reduce the extent of these shrubs significantly. By clearing large stands of shrubs and subsequently effectively rehabilitating the cleared areas, it can benefit biodiversity.					
Environmental Factor	Nature of Impact	Significance	Probability	Duration	Consequence Extent	• Management
Fauna	<p>Loss, damage and fragmentation of natural habitats</p> <p>During clearing of an area for the excavation of minerals, construction of infrastructure and roads, stockpiling.</p> <p>Fragmentation of habitats typically leads to the loss of</p>	Medium – High	Certain for life of operation	Residual	Regional	<ul style="list-style-type: none"> • All activities associated with the prospecting operation must be planned, where possible to encourage faunal dispersal and should minimise dissection or fragmentation of any important faunal habitat type. • The extent of the earmarked area should be demarcated on site layout plans. No staff,

	<p>migration corridors, in turn resulting in degeneration of the affected population's genetic make-up. This can be in the form of small-scale fragmentation for reptiles, amphibians, and invertebrates, to more large-scale fragmentation that hinder dispersal of birds and plants. It also includes the degradation of aquatic habitats, like the ephemeral drainage channels and Orange River, which has landscape-level connectivity. Fragmentation of habitats usually results in a subsequent loss of genetic variability between meta-populations occurring within the region. Pockets of</p>					<p>contractors or vehicles may leave the demarcated area except those authorised to do so.</p> <ul style="list-style-type: none"> • Those pristine areas surrounding the earmarked area that are not part of the demarcated area should be considered as a no-go zone for employees, machinery or even visitors. • No new roads should be created across a watercourse. • No prospecting should take place in the ephemeral drainage channels or river. • If watercourse disturbances are unavoidable, a water use license to alter the beds and banks of these watercourses should be obtained from DWS prior to such activities. • Employ sound rehabilitation measures to restore characteristics of all affected terrestrial and aquatic habitats.
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	fragmented natural habitats hinder the growth and development of populations. The prospecting activities is expected to result in the loss of connectivity and fragmentation of natural terrestrial habitats on a local scale but could have regional scale effects if any of the watercourses are severely impacted.					
	<p>Disturbance, displacement and killing of fauna</p> <p>Vegetation clearing; increase in noise and vibration; human and vehicular movement on site resulting from prospecting activities.</p> <p>The transformation of natural habitats will result in the loss of micro habitats, affecting individual</p>	Low to Medium	Certain, for life of operation	Decommissioning	Local	<ul style="list-style-type: none"> Careful planning of the operation is needed to avoid the destruction of pristine habitats and minimise the overall disturbance footprint. The extent of the prospecting activities should be demarcated on site layout plans, and no personnel or vehicles may leave the demarcated area except if authorised. Areas surrounding the earmarked site, not part of the demarcated area,

	<p>species and ecological processes. This will result in the displacement of faunal species that depend on such habitats, e.g. birds that nest in trees or animals residing in holes in the ground or among rocks. Increased noise and vibration will disturb and possibly displace wildlife. Fast moving vehicles cause road kills of small mammals, birds, reptiles, amphibians and a large number of invertebrates. Intentional killing of snakes, reptiles, vultures and owls will negatively affect their local populations.</p>					<p>should be considered as a no-go zone.</p> <ul style="list-style-type: none"> • No prospecting should take place in the drainage lines or river and no new roads should be created across these watercourses. If unavoidable, a water use license to alter the beds and banks of each earmarked watercourse should be obtained from DWS prior to such activities. • If any of the protected wildlife species are directly threatened by habitat destruction or displacement during the prospecting operation, then the relevant permits from DENC should be obtained followed by the relevant mitigation procedures stipulated in the permits. • Everyone on site must undergo environmental induction for awareness on not capturing or harming species that are often persecuted out of
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						<p>superstition and to be educated about the conservation importance of the fauna occurring on site.</p> <ul style="list-style-type: none">• Reptiles, amphibians, mammals, special invertebrates or active bird nests exposed during the clearing operations should be captured for later release or translocation by a qualified expert.• Employ measures that ensure adherence to a speed limit of 40 km/h as well as driving mindfully to lower risks of animals being killed on the roads or elsewhere on site. No excavation should take place in the river, drainage lines or depressions.• Everyone on site must undergo environmental induction for awareness on not harming or collecting species that are often persecuted out of superstition and to be educated about the conservation importance
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						<p>of the fauna occurring on site.</p> <ul style="list-style-type: none"> • Reptiles and amphibians that are exposed during the clearing operations should be captured for later release or translocation by a qualified expert. • Employ measures that ensure adherence to the speed limit on public roads as well as driving mindfully on farm tracks to lower the risk of animals being killed while traversing the property.
Compromise of broadscale ecological processes	Transformation of intact habitat on a cumulative basis would contribute to the fragmentation of the landscape and would potentially disrupt the connectivity of the landscape for fauna and flora and impair their ability to respond to environmental fluctuations. The habitats on site are	Medium to high	Certain for live of operation	Residual	Regional	<ul style="list-style-type: none"> • Implement best practise principles to minimise the footprint of transformation, by keeping to existing roads and earmarked areas where possible. • Apply for the relevant permits from DENC and DAFF. • No new roads should be created across a watercourse and no prospecting should take place in them. If this is unavoidable, a water use

	<p>vulnerable to cumulative disturbances, due to the vast extent of transformation through mining and agriculture in the region and historic mining activities on site. Fragmentation of these habitats through loss of keystone species will destroy connectivity of vital ecological corridors and it will disrupt the food web, which might have cascading effects on a landscape level over the long-term.</p>					<p>license to alter the beds and banks of each earmarked watercourse should be obtained from DWS prior to such activities.</p> <ul style="list-style-type: none"> • Employ sound rehabilitation measures to restore characteristics of all affected habitats. • For restoration of the affected areas without topsoil, soils can be sourced from other sustainable areas and chemically changed to match with the surrounding environment. • To restore areas where compacted soil occurs, a ripper blade or deep plow can be pulled across the affected area to alleviate compaction. • Encourage the growth of natural plant species in all affected areas by sowing indigenous seeds or by planting seedlings. • The setup of a small nursery is advisable to maximise translocation
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						and re-establishment efforts of affected areas.
Environmental Factor	Nature of Impact	Significance	Probability	Duration	Consequence Extent	Management
Air Quality	Sources of atmospheric emission associated with the prospecting operation are likely to include fugitive dust from materials handling operations, wind erosion of stockpiles, and vehicle entrainment of road dust.	Low	Certain for life of operation	Residual	Local	<ul style="list-style-type: none"> Vegetation must be removed when soil stripping is required only. These areas should be limited to include those areas required for prospecting only, hereby reducing the surface area exposed to wind erosion. Adequate demarcation of these areas should be undertaken. Control options pertaining to topsoil removal, loading and dumping are generally limited to wet suppression. Where it is logistically possible, control methods for gravel roads should be utilised to reduce the re-suspension of particulates. Feasible methods include wet suppression, avoidance of unnecessary traffic, speed control and avoidance of track-on of material onto paved and treated roads.

						<ul style="list-style-type: none"> The length of time where diamond prospecting areas are exposed should be restricted. Prospecting should not be delayed after vegetation has been cleared and topsoil removed where possible. Dust suppression methods should, where logistically possible, be implemented at all areas that may/are exposed for long periods of time. For all Prospecting activities management should undertake to implement health measures in terms of personal dust exposure, for all its employees.
SOCIAL SURROUNDINGS						
Environmental Factor	Nature of Impact	Significance	Probability	Duration	Consequence Extent	Management
Noise Impacts	Clearing of footprint areas, stripping of stockpiling of topsoil.	Low	Possible Infrequently	Decommissioning	Local	Equipment and/or machinery which will be used must comply with the manufacturer's specifications on acceptable noise levels
	Construction activities	Low	Possible Infrequently	Decommissioning	Local	Equipment and/or machinery which will be used must comply with the

	Noise increase at the prospecting site.					manufacturer's specifications on acceptable noise levels
	Construction of internal Roads	Low	Possible Infrequently	Decommissioning	Local	Equipment and/or machinery which will be used must comply with the manufacturer's specifications on acceptable noise levels
	Assembly plant equipment Noise increase at the prospecting site.	Low	Possible Infrequently	Decommissioning	Local	Equipment and/or machinery which will be used must comply with the manufacturer's specifications on acceptable noise levels
	Construction of the Mine Residue dump, soil stock pile and material stock pile. Noise increase at the prospecting site.	Low	Possible Infrequently	Decommissioning	Local	Equipment and/or machinery which will be used must comply with the manufacturer's specifications on acceptable noise levels
	Clearing of new open cast prospecting areas, stripping and stockpiling of topsoil. Noise increase at the prospecting site.	Low	Possible Infrequently	Decommissioning	Local	Equipment and/or machinery which will be used must comply with the manufacturer's specifications on acceptable noise levels
	Diesel generators Noise increase at the prospecting site.	Low	Possible Infrequently	Decommissioning	Local	Equipment and/or machinery which will be used must comply with the manufacturer's specifications on acceptable noise levels.
	Additional traffic to and from the mine	Low	Possible Infrequently	Decommissioning	Local	Equipment and/or machinery which will be used must

						comply with the manufacturer's specifications on acceptable noise levels
	Maintenance activities at the different sites.	Low	Possible Infrequently	Decommissioning	Local	Equipment and/or machinery which will be used must comply with the manufacturer's specifications on acceptable noise levels
	Backfill of prospecting footprint area	Low	Possible Infrequently	Decommissioning	Local	Equipment and/or machinery which will be used must comply with the manufacturer's specifications on acceptable noise levels
	Planting of grass and vegetation at the rehabilitated areas	Low	Possible Infrequently	Decommissioning	Local	<ul style="list-style-type: none"> Equipment and/or machinery which will be used must comply with the manufacturer's specifications on acceptable noise levels Planting of grass and/or vegetation should be limited to daytime only
	Removal of infra-structure	Low	Possible Infrequently	Decommissioning	Local	<ul style="list-style-type: none"> Equipment and/or machinery which will be used must comply with the manufacturer's specifications on acceptable noise levels Removal of infrastructure should be limited to daytime only. Noise survey to be carried out to monitor the noise

						levels during these activities.
Visual impacts	Potential visual impact on gravel road	Low Regional	Certain	Construction, Operation and Decommissioning	Local Site	The design of the proposed prospecting development will determine the visual impact. As the visual impact would be low.
	Potential Visual Impact on the surrounding land users/ residents	Low Regional	Highly Likely	Construction, Operation and Decommissioning	Local Site	The design of the proposed prospecting development will determine the visual impact.
	Potential visual impact of the proposed development on the Sense of Place	Low Regional	Highly Likely	Construction, Operational and Decommissioning	Local Site	Design of the proposed development can ensure that the development forms part of the area and is aesthetically pleasing.
	Potential visual impact of the proposed development on the construction phase of the surrounding land users in close proximity	Low Regional	Highly Likely	Construction	Local Site	<ul style="list-style-type: none"> • Wetting of exposed areas should be undertaken as required to prevent dust pollution having a negative visual impact. • Ensure that the design fits into the surrounding environment and it is aesthetically pleasing. • Ensure that rubble, litter and disused construction materials are managed and removed regularly; • Ensure that all infrastructure and the site and general surrounds are maintained in a neat and appealing way;

	Potential visual impact of the proposed development on the operational phase of the surrounding land users in close proximity.	Low Regional	Highly likely	Operational	Local Site	<ul style="list-style-type: none"> Wetting of exposed areas should be undertaken as required to prevent dust pollution having a negative visual impact. Ensure that the design fits into the surrounding environment and it is aesthetically pleasing. Ensure that all infrastructure and the site and general surroundings are maintained in a neat and appealing way; Rehabilitation of disturbed areas and re-establishment of vegetation;
Traffic	Potential negative impacts on traffic safety and deterioration of the existing road networks.	Low	Low Likelihood	Decommissioning	Local	<ul style="list-style-type: none"> Utilise existing access roads, where applicable; implement measures that ensure adherence to traffic rules.
Heritage resources	The Deterioration of sites of cultural and heritage importance.	Medium	Uncertain	Decommissioning	Local	<ul style="list-style-type: none"> Any heritage and cultural resources (e.g. ruins, historic structures, etc.) must be protected and preserved by the delineation of a no-go zone. Should any further resources be disturbed,

						<p>exposed or uncovered during site preparations, these should immediately be reported to an accredited archaeologist. Burial remains should not be disturbed or removed until inspected by an archaeologist.</p> <p>PROCEDURE FOR ARCHAEOLOGICAL FINDS</p> <p>If you discover what you suspect may be a possible archaeological site:</p> <ul style="list-style-type: none">• Stop all work in the area to avoid damaging the site.• Do not disturb any archaeological remains that you may encounter.• The finds must be reported to ECO or Site Manager• The finds must be reported to the heritage authority, i.e., SAHRA and/or the provincial heritage resources agency.• The heritage authority will send a heritage specialist and /or ask the permit holder to appoint a heritage specialist to make
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						<p>a preliminary assessment of the findings.</p> <ul style="list-style-type: none">• If the potential significance of the finds are deemed to warrant further action and they cannot be avoided, then then heritage specialist will submit a report advising SAHRA accordingly.• SAHRA will determine the appropriate course of action. <p>PROCEDURE FOR GRAVES, BURIAL GROUNDS AND HUMAN REMAINS</p> <ul style="list-style-type: none">• If you discover what you suspect may be possible human remains:• Stop all work in the area to avoid damaging the site.• Do not disturb any possible human remains that you may encounter.• The finds must be reported to ECO or Site Manager.• The finds must be reported to the local area station of SAPS.• The finds must be reported to the SAHRA Burial
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						<p>Grounds and Graves (BGG) Unit.</p> <ul style="list-style-type: none"> The BGG Unit will send a heritage specialist and /or ask the permit holder to appoint a heritage specialist to make a preliminary assessment of the findings. If the graves/human remains cannot be avoided SAHRA will require that the human remains be re-interred in a formal cemetery.
Environmental Factor	Nature of Impact	Significance	Probability	Duration	Consequence Extent	Management
Socio-Economic	Population Impacts Employment Opportunities and skills Inequities	Medium Positive	Decommissioning	Start-up and Construction	Positive Local	<ul style="list-style-type: none"> Training of potential future employees, contract workers and/or community members should focus on prospecting related skills which would furthermore equip trainees/beneficiaries with the necessary portable skills to find employment at the available employment sectors within the study area. Multi-skilling is thus not necessarily the

						<p>preferred training and skills development method.</p> <ul style="list-style-type: none"> • Training courses should be accredited and certificates obtained should be acceptable by other related industries.
	Impact on daily living and movement patterns	Low Negative	Probable	Start-up and Construction	Negative Local	<ul style="list-style-type: none"> • Dust suppression methods should be strictly implemented if and where required • All vehicles should be in a good condition and adhere to the road worthy standards • Dust creation should be kept to the minimum by adhering to the speed limits on the gravel road • The construction of additional access roads should be limited. • Speeding of vehicles must be strictly monitored.
	Safety and Security Risks	Low Negative	Highly Probable	Construction	Negative Local	<ul style="list-style-type: none"> • A Fire/Emergency Management Plan should be developed and implemented at the outset of the prospecting operation. • Open fires for cooking and related purposes should not be allowed on site.

						<ul style="list-style-type: none"> • Appropriate firefighting equipment should be on site and workers should be appropriately trained for fire fighting • The prospecting area should be fenced or access to the area should be controlled to avoid animals or people entering the area without authorisation. • The prospecting site should be clearly marked and “danger” and “no entry” signs should be erected. • Speed limits on the local roads surrounding the prospecting sites should be enforced. • Speeding of prospecting vehicles must be strictly monitored • Local procurement and job creation should receive preference.
	Health Impacts	Low Negative	Highly probable	Construction	Negative Local	<ul style="list-style-type: none"> • Maximise the employment of locals where possible • First aid supplies should be available at various points at the prospecting site • The general health of prospecting workers

						should be monitored on an on-going basis
	Community Infrastructure Needs Impact on Infrastructure and Services	Low Negative	Highly probable	Construction	Negative Local	<ul style="list-style-type: none"> • Maximise the employment of locals where possible • Maintenance of the roads frequently used by prospecting traffic should be discussed and negotiated with the Northern Cape Department of Roads and Public Works
	Heritage Features	Low Negative	Highly probable	Construction	Negative Local	<ul style="list-style-type: none"> • Any heritage features (e.g. buildings and/or artefacts) on site must be protected and monitored • Should it be necessary, such heritage features should be assessed and be recorded by an accredited Heritage Impact Specialist or archaeologist
	Intrusion Impacts Visual Impact and Sense of Place	Low Negative	Probable	Construction	Negative Local	<ul style="list-style-type: none"> • The prospecting site should be kept litter free • Site rehabilitation on certain sections of the site should occur as soon as the prospecting process allows • The recommendations made by the Visual Impact Assessment should be adhered to.

	Noise Impact	Low Negative	Probable	Construction	Negative Local	<ul style="list-style-type: none"> The mitigation measures of the Noise Impact Assessment should be implemented Vehicles should be in a good working order Prospecting activities should be kept to normal working hours e.g. 7 am until 5 pm during weekdays
	Intrusion Impacts Visual Impact and Sense of Place	Low Negative	Possible for life of operation	Operational	Negative Local	<ul style="list-style-type: none"> Recommendations and mitigation measures as part of the EMP should be strictly implemented. Prospecting areas should be rehabilitated as soon as the Prospecting Works Programme allows
	Noise Impact	Low Negative	Probable	Operational	Negative Local	<ul style="list-style-type: none"> Recommendations and mitigation measures proposed by the Noise Impact Assessment should be strictly implemented Noise generating activities should be kept to normal working hours (e.g. 7 am until 5 pm) where possible
Interested and Affected Parties	Loss of trust and a good standing relationship between the IAP's and the prospecting company.	Low to medium	Possible	Construction, Operational and Decommissioning	Local	<ul style="list-style-type: none"> Maintain active communication with IAPs. Ensure transparent communication with IAPs at all times.

						<ul style="list-style-type: none">• IAPs must be kept up to date on any changes in the prospecting operation.• A complaints management system should be maintained by the mine to ensure that all issues raised by community members are followed up and addressed appropriately.
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- vi) **Methodology used in determining and ranking the nature, significance, consequences, extent, duration and probability of potential environmental impacts and risks**(Describe how the significance, probability, and duration of the aforesaid identified impacts that were identified through the consultation process was determined in order to decide the extent to which the initial site layout needs revision)

Methodology used in determining and ranking the nature, severity, consequences, extent, duration and probability of potential environmental impacts and risks

The Different environmental components on which the project (can) have an impact are:

1. **Geology**
2. **Topography**
3. **Soil**
4. **Land Capability**
5. **Land Use**
6. **Flora (Vegetation)**
7. **Fauna**
8. **Surface Water**
9. **Ground Water**
10. **Air Quality**
11. **Noise and vibration**
12. **Archaeological and Cultural Sites**
13. **Sensitive Landscapes**
14. **Visual Aspects**
15. **Socio-Economic Structures**
16. **Interested and Affected Parties**

Impact Assessment

Before the impact assessment could be done the different project Activities/infrastructure components were identified.

1	Processing Plant: 2 x 16 feet
2	Ablution Facilities: In terms of sewage the decision was made to use chemical toilets which can be serviced regularly by the service provider.
3	Clean & Dirty water system: Berms It is anticipated that the operations will establish storm water control berms and trenches to separate clean and dirty water on the prospecting site.
4	Fuel Storage facility (Concrete Bund walls and Diesel tanks): It is anticipated that the operation will utilize 2 x 23 000 litre diesel tanks. These tanks must be placed in bund walls, with a capacity of 1.5 times the volume of the diesel tanks. A concrete floor must be established where the re-fuelling will take place.
5	Prospecting Area: Area applied for to pit and trench for diamond (bulk sampling).
6	Roads (both access and haulage roads in the mine site) Although it is recommended that the operation utilize existing roads as far as possible, it is anticipated that the prospecting operation will create additional 1.5 km of roads, with a width of 8 meters where no reserve exists and where the reserve exists 15 metres. The current access road is deemed adequate for service road into the prospecting site.
7	Salvage yard (Storage and laydown area).
8	Product Stockpile area.
9	Waste disposal site Waste disposal site (domestic and industrial waste): It is anticipated that the operation will establish a dedicated, fenced waste disposal site with a concrete floor and bund wall. The following types of waste will be disposed of in this area: <ul style="list-style-type: none"> • Small amounts of low-level hazardous waste in suitable receptacles. • Domestic waste. • Industrial waste.
10	Temporary Workshop Facilities and Wash Bay
11	Water distribution pipeline
12	Water tank : It is anticipated that the operation will establish 1 x 10 000 litre water tanks with purifiers for potable water.

The criteria used to assess the significance of the impacts are shown in the table 19 below/overleaf. The limits were defined in relation to prospecting characteristics. Those for probability, intensity/severity and significance are subjective, based on rule-of-thumb

and experience. Natural and existing mitigation measures were considered. These natural mitigation measures were defined as natural conditions, conditions inherent in the project design and existing management measures, which alleviate impacts. The significance of the impacts was calculated by using the following formula:

$$(\text{Severity} + \text{Extent} + \text{Duration}) \times \text{Probability weighting}$$

For the impact assessment, the different project activities and associated infrastructure were identified and considered in order to identify and analyse the various possible impacts.

Table 19. Significance of impacts is defined as follows.

SIGNIFICANCE				
Colour Code	Significance rating	Rating	Negative Impact	Positive Impact
	Very low	3 -16	Acceptable/Not serious	Marginally Positive
	Low	17 - 22	Acceptable/Not serious	Marginally Positive
	Medium-Low	23 -33	Acceptable/Not desirable	Moderately Positive
	Medium	34 - 48	Generally undesirable	Beneficial
	Medium-High	49 - 56	Generally unacceptable	Important
	High	57 - 70	Not Acceptable	Important
	Very High	90 - 102	Totally unacceptable	Critically Important

Significance of impacts is defined as follows:

Very Low - Impact would be negligible. Almost no mitigation and/or remedial activity would be needed, and any minor steps which might be needed would be easy, cheap and simple.

Low - Impact would have little real effect. Mitigation and/or remedial activity would be either easily achieved or little would be required or both.

Medium Low- Impact would be real but not substantial within the bounds of those which could occur. Mitigation and/or remedial activity would be both feasible and fairly easily possible.

Medium - Impact would be real but not substantial within the bounds of those which could occur. Mitigation and/or remedial activity would be feasible and possible.

Medium High- Impact would be real but could be substantial within the bounds of those which could occur. Mitigation and/or remedial activity would be both feasible and possible but may be difficult and or costly.

High - Impacts of substantial order. Mitigation and/or remedial activity would be feasible but difficult, expensive, time consuming or some combination of these.

Before any assessment can be made the following evaluation, criteria need to be described.

Table 20. Explanation of PROBABILITY of impact occurrence

Weight	Probability of Impact Occurrence	Explanation of Probability
1	Improbable	<20% sure of particular fact or likelihood of impact occurring
2	Low Probability Possible	20 – 39% sure of particular fact or likelihood of impact occurring
3	Probable /Likely	40 – 65% sure of particular fact or likelihood of impact occurring
4	Highly Probable /Likely	66 – 85% sure of particular fact or likelihood of impact occurring
5	Definite	86% - 100% sure of particular fact or likelihood of impact occurring

Table 21. Explanation of EXTENT of impact

Weight	Extent of Impact	Explanation of Extent
1	Footprint	Direct and Indirect impacts limited to the activity, such as footprint occurring within the total site area of impact only.
2	Surrounding Area Site	Direct and Indirect impacts affecting environmental elements within 2 km of site
3	Local Municipality Local	Direct and Indirect impacts affecting environmental elements within the Siyancuma area
4	Regional/District Regional	Direct and Indirect impacts affecting environmental elements within the Pixley Ka Seme District
5	Provincial	Direct and Indirect impacts affecting environmental elements in the Northern Cape Province

Table 22. Explanation of DURATION of impact

Weight	Duration of Impact	Explanation of Duration
1	Temporary (Very Short)	Less than 1 year
2	Short term	1 to 5 years
3	Medium term	6 to 15 years
4	Long term (Life of project)	16 to 50 years
5	Very Long term	Longer than 50 years
6	Permanent	Permanent

Table 23. Explanation of SEVERITY of the impact

Weight	Impact Severity	Explanation of Severity
1	No Impact	There will be no impact at all – not even a very low impact on the system or any of its parts.
2	Very Low	Impact would be negligible. In the cast of negative impacts, almost no mitigation and/or remedial activity would be needed, and any minor steps which might be needed would be easy, cheap and simple. In the case of positive impacts alternative means would almost all likely to be better, if one or a number of ways, then this means of achieving the benefit.
3	Low	Impact would be of a low order and with little real effect. In the case of negative impacts, mitigation and/or remedial activity would be either easily achieved or little would be required or both. In the case of positive impacts alternative means for achieving this benefit would be easier, cheaper, more effective, less time-consuming, or some combination of these.
4	Moderately Severe	Impact would be real but not substantial within the bounds of those which could occur. In the case of negative impacts, mitigation and/or remedial activity would be both feasible and fairly easily possible. In the case of positive impacts other means other means of covering these benefits would be about equal in cost and effort.
5	High Severance	Impacts of substantial order. In the case of negative impacts, mitigation and/or remedial activity would be feasible but difficult, expensive, time consuming or some combination of these. In the case of positive impacts other means of achieving this benefit would be feasible, but these would be more difficult, expensive, time-consuming or some combination of these.
6	Very High Severity	Of the highest order possible within the bounds of impacts which could occur, in the case of negative impacts, there would be no possible mitigation and/or remedial activity to offset the impact at the spatial or time scale for which was predicted. In the case of positive impacts there is no real alternative to achieving the benefit.

vii) The positive and negative impacts that the proposed activity (in terms of the initial site layout) and alternatives will have on the environment and the community that may be affected

(Provide a discussion in terms of advantages and disadvantages of the initial site layout compared to alternative layout options to accommodate concerns raised by affected parties)

During construction and operation of the prospecting, there is a possibility of sterilisation of the mineral reserves and resources due to improper placement of infrastructure. The infrastructure and excavations will alter the topography by adding features to the landscape. Topsoil removal and alluvial bulk sampling will unearth the natural topography. The construction of infrastructure and various facilities in the prospecting area can also result in loss of soil due to erosion. Vegetation where present

will be stripped in preparation for placement of temporary prospecting infrastructure, and therefore the areas will be bare and susceptible to erosion. The topsoil that is stripped and piled on surrounding areas can be eroded by wind and rain. The soil will be carried away during runoff. The declared areas will be rehabilitated, but full restoration of soil might only occur over some time, subsequent to the re-establishment of vegetation. Furthermore, improper stockpiling and soil compaction can result in soil sterilisation. Leaching can also occur, resulting in the loss of nutrients.

During the construction and prospecting operation, there is a possibility that equipment might leak oil, thus causing surface spillages. The hydrocarbon soil contamination will render the soil unusable unless they are decontaminated. The storage of fuels on site might have an impact on soil if the tanks that are available on site are not properly monitored and maintained to avoid leakages. Then there is the potential that contaminated soil can be carried through runoff to contaminate water resources and soil stockpiled for rehabilitation. Soil pollution is therefore possible, but through mitigation it can be minimised.

The loss of land capability and land use can occur in two ways. Firstly, through topsoil removal, disturbances, and loss of soil fertility; and secondly through the improper placement of infrastructure. The site has a land capability for limited grazing, but grazing activities can still be performed in areas not earmarked for prospecting, and with proper rehabilitation the land capabilities and land use potential can be restored.

If oil and fuel spillages occur, then it will seep into the underlying aquifers and contaminate ground water. Improper handling of hazardous material will cause contamination of nearby surface water resources during runoff episodes. Lack of storm control structures will lead to erosion of stockpiles during heavy rains and runoff will carry suspended solids into the downstream environment. This might cause high silt load and affect stream flow.

Construction and prospecting activities on site will reduce the natural habitat for ecological systems to continue their operation. It is not expected that the areas of high ecological function will rehabilitate following disturbance events. Vehicle traffic generates lots of dust which can reduce the growth success and seed dispersal of many small plant species. It is expected that protected species if present will be destroyed during the prospecting operation, the necessary permits will be obtained after the specialist studies have been completed to confirm the presence of the protected species.

While general clearing of the area and prospecting activities destroy natural vegetation, invasive plants can increase due to their opportunistic nature in disturbed areas. If invasive plant establishes in disturbed areas, it may cause an impact beyond the boundaries of the prospecting site. These alien invasive species are thus a threat to surrounding natural vegetation and can result in the decrease of biodiversity and ecological value of the area. Therefore, if alien invasive species are not controlled and managed, their propagation into new areas could have a high impact on the surrounding

natural vegetation in the long term. With proper mitigation, the impacts can be substantially reduced.

The transformation of natural habitats to prospecting and associated infrastructure will result in the loss of habitat affected individual species, and ecological processes. In turn this will result in the displacement of faunal species dependent upon such habitat. Increased noise and vibration due to prospecting activities will disturb and possibly displace birds and other wildlife. Fast moving vehicles take a heavy toll in the form of road kills of small mammals, birds, reptiles, amphibians and a large number of invertebrates. The construction of the temporary prospecting and associated infrastructure will result in the loss of connectivity and fragmentation of natural habitat. Fragmentation of habitat will lead to the loss of migration corridors, in turn resulting in degeneration of the affected population's genetic make-up. This results in a subsequent loss of genetic variability between meta-populations occurring within the site. Pockets of fragmental natural habitats hinder the growth and development of populations.

During the prospecting operation the abovementioned activities have potential for dust generation. It is anticipated that the extent of dust emissions would vary substantially from day to day depending on the level of activity and the specific operations. The mine will add a certain amount of noise to the existing noise in the area. However, levels of noise generated by prospecting activities are low.

The impact of site generated trips on the traffic of the existing roads is experienced to be low. Nevertheless, if road safety is not administered it can have a high impact on the safety of fellow road users.

The prospecting operation, especially during construction, will create a number of new employment opportunities. The magnitude of this impact will depend on the number of people that will be employed and the number of contractors sourced. An influx of people into the area will possibly impact on safety and security of local residents. During the decommissioning and at closure of the mine, staff will most likely be retrenched. This can potentially flood the job market, resulting in people being unable to find new employment for a long period of time. It is normally more difficult for people with highly specialised skills to find employment immediately. Those with fewer skills have more flexibility in the job market.

Economic slump of the local towns after mine closure is an associated potential impact, although small due to the small scale of the operation. Income streams from wage bills as well as goods and services contracts (at all geographical levels) will come to an end, reducing the monetary income of individuals and mine-related businesses. People who have derived income directly or indirectly from the project may be inclined to leave the region in search of employment or business opportunities. This could result in further decline of the economy of the region as well as the abandonment of infrastructure. The loss of the prospecting workforce income will also impact upon non-mine related industries within the local and regional areas, particularly the rental property market and

retail and service industries who would have received income during the life of mine from the salaried workforce.

It is likely, however that there will be residual positive economic impacts that are not fully reversed with the closure of the prospecting operation, and that the economy will not decline to its original level prior to the development of this project. This is because the prospecting operation will generate substantial income for the regional and local economy, both directly and indirectly, during its life.

It is difficult to predict the actual impact of the prospecting closure in advance, but it is acceptable to assume that the prospecting closure will have a negative impact on the local and regional economy with a high probability of occurrence, a medium severity due to small scale and a medium significance.

Positive impacts include employment and training opportunities for people in the local community and local contractors; social upliftment and community development programmes; economic benefits.

viii) The possible mitigation measures that could be applied and the level of risk

(With regard to the issues and concerns raised by affected parties provide a list of the issues raised and an assessment/discussion of the mitigations or site layout alternatives available to accommodate or address their concerns, together with an assessment of the impacts or risks associated with the mitigation or alternatives considered)

Geology and mineral resource

Level of risk: Low

Mitigation measures

- Ensure that optimal use is made of the available mineral resource through proper planning.
- The diamond deposit should be delineated first and all infrastructure positions should be selected with the main aim of avoiding sterilization of future resources.
- No dumping of materials prior to approval by mine manager.

Topography

Level of risk: Low-Medium

Mitigation measures

- Prospecting continuously, if possible, otherwise when they become available;
- Employ effective rehabilitation strategies to restore surface topography and controlled dumping and plant site;
- Stabilise the mine residue deposits;
- All temporary infrastructures should be demolished during closure.

Soil erosion

Level of risk: Low - Medium

Mitigation measures

- Bare ground exposure should be minimised at all times regarding surface area and duration.
- Re-establishment of plant cover on disturbed areas must take place as soon as possible, once activities in the area have ceased.
- No new roads, infrastructure or prospecting areas should be developed over watercourses, including drainage lines.
- Disturbances during the rainy season should be monitored and controlled.
- Any potential run-off from exposed ground should be controlled with flow retarding barriers.
- Regular monitoring during the prospecting operation should be carried out to identify areas where erosion is occurring; followed by appropriate remedial actions.

Alteration of soil character and quality

Level of risk: Medium - High

Mitigation measures

- Topsoil needs to be removed and stored separately during prospecting and the construction of roads, infrastructure and stockpile areas.
- These topsoil stockpiles must be kept as small as possible in order to prevent compaction and the formation of anaerobic conditions.
- Topsoil must be stockpiled for the shortest possible timeframes to ensure that the quality of the topsoil is not impaired.
- Topsoil must not be handled when the moisture content exceeds 12 %.
- Topsoil stockpiles must by no means be mixed with sub-soils.
- The topsoil should be replaced as soon as possible on to the disturbed areas, thereby allowing for the re-growth of the seed bank contained within the topsoil.
- For restoration of the affected areas without topsoil, soils can be sourced from other sustainable areas and chemically changed to match with the surrounding environment.
- To restore areas where compacted soil occurs, a ripper blade or deep plow can be pulled across the affected area to alleviate compaction.
- Encourage the growth of natural plant species in all affected areas by sowing indigenous seeds or by planting seedlings.
- Vehicles and machinery should be regularly serviced and maintained.
- Refuelling and vehicle maintenance must take place in well demarcated areas and over suitable drip trays to prevent soil pollution.
- Drip trays must be available on site and installed under all stationary vehicles.
- Spill kits to clean up accidental spills from any accidental spillages must be well-marked and available on site.
- Workers must undergo induction to ensure that they are prepared for rapid clean-up.
- Any soil or area that is contaminated must be cleaned immediately by removing the soil and disposing it as hazardous waste in the correct manner.

Loss of soil fertility

Level of risk: Medium-high

Mitigation measures

- Topsoil needs to be removed and stored separately during prospecting and the construction of roads, infrastructure and stockpile areas.
- These topsoil stockpiles must be kept as small as possible in order to prevent compaction and the formation of anaerobic conditions.
- Topsoil must be stockpiled for the shortest possible timeframes to ensure that the quality of the topsoil is not impaired.
- Topsoil must not be handled when the moisture content exceeds 12 %.
- Topsoil stockpiles must by no means be mixed with sub-soils.
- The topsoil should be replaced as soon as possible on to the disturbed areas, thereby allowing for the re-growth of the seed bank contained within the topsoil.
- For restoration of the affected areas without topsoil, soils can be sourced from other sustainable areas and chemically changed to match with the surrounding environment
- To restore areas where compacted soil occurs, a ripper blade or deep plow can be pulled across the affected area to alleviate compaction.
- Encourage the growth of natural plant species in all affected areas by sowing indigenous seeds or by planting seedlings.

Land capability and land use

Level of risk: Low - Medium

Mitigation measures

- Employ appropriate rehabilitation strategies to restore land capability.
- Carefully plan the placement of infrastructure and employ rehabilitation strategies to restore land capability.

Ground water

Level of risk: Medium – High

Mitigation measures

- Any refuelling or vehicle maintenance must take place in well demarcated areas and over suitable drip trays to prevent soil pollution.
- Drip trays must be available on site and installed under all vehicles during maintenance.
- Spill kits to clean up accidental spills from any accidental spillages must be well marked and available on site.
- Workers must undergo induction to ensure that they are prepared for rapid clean-up procedures.
- Vehicles and machinery should be regularly serviced and maintained.
- No excavations should take place in the river, drainage lines or depressions.

Surface water

Alteration / destruction of watercourses

Level of risk: Medium-High

Mitigation measures

- All activities associated with the prospecting operation must be planned to avoid any disturbances to the watercourses and their buffer zones.
- No new roads should be created across a watercourse and no prospecting should take place in them. If this is unavoidable, a water use license to alter the beds and banks of each earmarked watercourse should be obtained from DWS prior to such activities.
- Employ sound rehabilitation measures to restore characteristics of all affected watercourses.

Surface water

Siltation of surface water

Level of risk: Low- Medium

Mitigation measures

- Bare ground exposure should always be minimised in terms of the surface area and duration.
- Re-establishment of plant cover on disturbed areas must take place as soon as possible once activities in the area have ceased.
- No new roads, infrastructure or prospecting areas should be developed over watercourses.
- Disturbances during the rainy season should be monitored and controlled.
- Any potential run-off from exposed ground should be controlled with flow retarding barriers.
- Regular monitoring during the prospecting operation should be carried out to identify areas where erosion is occurring; followed by appropriate remedial actions.

Indigenous flora

Loss of indigenous vegetation

Level of risk: Low to medium

Mitigation measures

- Implement best practise principles to minimise the footprint of transformation, by keeping to existing roads where possible.
- Implement effective avoidance measures to limit any activities in the watercourses, by applying the no-go principles around the watercourses, including their buffer zones.
- Ensure measures for the adherence to the speed limit to minimise dust plumes.
- Encourage the growth of natural plant species by sowing indigenous seeds or by planting seedlings where major vegetation clearances have taken place.
- Seeds and seedlings for this region can be acquired from reukaroo@gmail.com.
- Apply for permits to authorise the clearance of indigenous plants from DENC at least three months before such activities will commence.

Indigenous flora

Loss of Red data and / or protected floral species

Level of risk: Medium - High

Mitigation measures

- The footprint areas of the prospecting activities must be scanned for Red Listed and protected plant species prior to any destructive activities by means of a search-and-rescue operation.
- It is recommended that these plants are identified and marked prior to intended activity. These plants should ideally be incorporated into the design layout and left in situ. However, due to the nature of the proposed prospecting activities they will most likely all be removed or relocated if possible. The relevant permits from DAFF and/or DENC should be applied for at least three months before such activities will commence.
- The setup of a small nursery is advisable to maximise translocation and re-establishment efforts of all the rescued plants.
- A management plan should be implemented to ensure proper establishment of ex situ individuals and should include a monitoring programme for at least two years after re-establishment in order to ensure successful translocation.
- The designation of an environmental officer is recommended to render guidance to the staff and contractors with respect to suitable areas for all related disturbance and must ensure that all contractors and workers undergo Environmental Induction prior to commencing with work on site. Environmental inductions should occur in the appropriate languages for the workers.
- All those working on site must be educated about the conservation importance of the flora occurring on site as well as the legislation relating to protected species.
- Employ regulatory measures to ensure that no illegal harvesting takes place.

Introduction or spread of alien species

Level of risk: Low - Medium

Mitigation measures

- Implement best practise principles to minimise the footprint of transformation, by keeping to existing roads and earmarked areas where possible.
- Mechanical methods of control should be implemented pro-actively as soon as invasive species start to emerge.
- Regular follow-up monitoring of invasive control areas needs to be implemented to ensure effective eradication.
- Encourage proper rehabilitation of disturbed areas through soil restoration and reseedling of indigenous plant species.

Encouraging bush encroachment

Level of risk: Low

Mitigation measures

- Mechanical methods of control should be implemented pro-actively when encroaching species form dense stands.
- Regular follow-up monitoring of encroached control areas needs to be implemented to ensure effective eradication.

- Encourage proper rehabilitation of disturbed areas through soil restoration and reseedling of indigenous plant species.

Fauna

Habitat fragmentation

Level of risk: Medium-high

Mitigation measures

- All activities associated with the prospecting operation must be planned, where possible to encourage faunal dispersal and should minimise dissection or fragmentation of any important faunal habitat type.
- The extent of the earmarked area should be demarcated on site layout plans. No staff, contractors or vehicles may leave the demarcated area except those authorised to do so.
- Those pristine areas surrounding the earmarked area that are not part of the demarcated area should be considered as a no-go zone for employees, machinery or even visitors.
- No new roads should be created across a watercourse.
- No prospecting should take place in the ephemeral drainage channels or river.
- If watercourse disturbances are unavoidable, a water use license to alter the beds and banks of these watercourses should be obtained from DWS prior to such activities.
- Employ sound rehabilitation measures to restore characteristics of all affected terrestrial and aquatic habitats.

Fauna

Disturbance, displacement and killing of fauna

Level of risk: Low - Medium

Mitigation measures

- Careful planning of the operation is needed to avoid the destruction of pristine habitats and minimise the overall disturbance footprint.
- The extent of the prospecting activities should be demarcated on site layout plans, and no personnel or vehicles may leave the demarcated area except if authorised. Areas surrounding the earmarked site, not part of the demarcated area, should be considered as a no-go zone.
- No prospecting should take place in the drainage lines or river and no new roads should be created across these watercourses. If unavoidable, a water use license to alter the beds and banks of each earmarked watercourse should be obtained from DWS prior to such activities.
- If any of the protected wildlife species are directly threatened by habitat destruction or displacement during the prospecting operation, then the relevant permits from DENC should be obtained followed by the relevant mitigation procedures stipulated in the permits.

- Everyone on site must undergo environmental induction for awareness on not capturing or harming species that are often persecuted out of superstition and to be educated about the conservation importance of the fauna occurring on site.
- Reptiles, amphibians, mammals, special invertebrates or active bird nests exposed during the clearing operations should be captured for later release or translocation by a qualified expert.
- Employ measures that ensure adherence to a speed limit of 40 km/h as well as driving mindfully to lower risks of animals being killed on the roads or elsewhere on site.

Air quality

Level of risk: Low - Medium

Mitigation measures

- Vegetation must be removed when soil stripping is required only. These areas should be limited to include those areas required for prospecting only, hereby reducing the surface area exposed to wind erosion. Adequate demarcation of these areas should be undertaken.
- Control options pertaining to topsoil removal, loading and dumping are generally limited to wet suppression.
- Where it is logistically possible, control methods for gravel roads should be utilised to reduce the re-suspension of particulates. Feasible methods include wet suppression, avoidance of unnecessary traffic, speed control and avoidance of track-on of material onto paved and treated roads.
- The length of time where prospecting areas are exposed should be restricted. Prospecting should not be delayed after vegetation has been cleared and topsoil removed where possible.
- Dust suppression methods should, where logistically possible, be implemented at all areas that may/are exposed for long periods of time.
- For all Prospecting activities management should undertake to implement health measures in terms of personal dust exposure, for all its employees.

Noise and vibration

Level of risk: Low

Mitigation measures

- The mitigation measures of the Noise Impact Assessment should be implemented
- Vehicles should be in a good working order
- Prospecting activities should be kept to normal working hours e.g., 7 am until 5 pm during weekdays

Visual impacts

Level of risk: Low

Mitigation measures

Mitigation measures may be considered in two categories:

Primary measures that intrinsically comprise part of the development design through an iterative process. Mitigation measures are more effective if they are implemented from project inception when alternatives are being considered; and

Secondary measures designed to specifically address the remaining negative effects of the final development proposals:

- During the prospecting phases the following mitigation measures should be implemented to minimise the visual impact.
- Ensure that the design fits into the surrounding environment and it is aesthetically pleasing.
- Restrict the activities and movement of workers and vehicles to the immediate site and existing access roads.
- Ensure that rubble, litter and disused materials are managed and removed regularly.
- Ensure that all infrastructure and the site and general surrounds are maintained in a neat and appealing way.
- Reduce and control dust emitting activities through the use of approved dust suppression techniques; and
- Restrict activities to daylight hours in order to negate or reduce the visual impacts associated with lighting or restrict lighting to certain areas.
- During operational phase, the following mitigation measures should be implemented to minimise the visual impact.
- Ensure that the design fits into the surrounding environment and it is aesthetically pleasing.
- Ensure that all infrastructure and the site and general surroundings are maintained in a neat and appealing way;
- Rehabilitation of disturbed areas and re-establishment of vegetation;

Traffic and road safety

Level of risk: Low

Mitigation measures

- Utilise existing access roads, where applicable; implement measures that ensure adherence to traffic rules.

Heritage resources

Level of risk: Low-Medium

Mitigation measures

- Any heritage and cultural resources (e.g., ruins, historic structures, etc.) must be protected and preserved by the delineation of a no-go zone.
- Should any further resources be disturbed, exposed or uncovered during site preparations, these should immediately be reported to an accredited archaeologist. Burial remains should not be disturbed or removed until inspected by an archaeologist.

PROCEDURE FOR ARCHAEOLOGICAL FINDS

If you discover what you suspect may be a possible archaeological site:

- Stop all work in the area to avoid damaging the site.
- Do not disturb any archaeological remains that you may encounter.
- The finds must be reported to ECO or Site Manager
- The finds must be reported to the heritage authority, i.e., SAHRA and/or the provincial heritage resources agency.
- The heritage authority will send a heritage specialist and /or ask the permit holder to appoint a heritage specialist to make a preliminary assessment of the findings.
- If the potential significance of the finds are deemed to warrant further action and they cannot be avoided, then the heritage specialist will submit a report advising SAHRA accordingly.
- SAHRA will determine the appropriate course of action.

PROCEDURE FOR GRAVES, BURIAL GROUNDS AND HUMAN REMAINS

If you discover what you suspect may be possible human remains:

- Stop all work in the area to avoid damaging the site.
- Do not disturb any possible human remains that you may encounter.
- The finds must be reported to ECO or Site Manager.
- The finds must be reported to the local area station of SAPS.
- The finds must be reported to the SAHRA Burial Grounds and Graves (BGG) Unit.
- The BGG Unit will send a heritage specialist and /or ask the permit holder to appoint a heritage specialist to make a preliminary assessment of the findings.
- If the graves/human remains cannot be avoided SAHRA will require that the human remains be re-interred in a formal cemetery.

Socio-economic

Level of risk: Low

Mitigation measures

In order to ensure that negative impacts are minimised and positives are enhanced, the following is recommended:

- The mine must ensure that false expectations are not created regarding job creation.
- Jobs must be allocated as advertised and in so far as is possible to local inhabitants.
- Contractors and employees should not be permitted to wander outside the prospecting area.
- Uncontrolled settlement of contractors and workers outside of the site will be prevented.
- The expectations of what benefits can accrue to the community must be managed from the initiation of the project.
- Commitments as set out in the SLP must be attained.

Interested and affected parties

Level of risk: Low - Medium

Mitigation measures

- Maintain active communication with IAPs.

- Ensure transparent communication with IAPs at all times.
- IAPs must be kept up to date on any changes in the prospecting operation.
- A complaints management system should be maintained by the mine to ensure that all issues raised by community members are followed up and addressed appropriately.

ix) Motivation where no alternative sites were considered

No alternative location for the proposed prospecting operation was considered, as the proposed alluvial diamond deposits occur in this area. There is therefore no other alternative with regard to the overall prospecting footprint.

x) Statement motivating the alternative development location within the overall site (Provide a statement motivating the final site layout that is proposed)

This is an application for a Prospecting Right for the searching or looking for possible diamond deposits. The geological nature of the application area lends itself to the possible occurrence of diamonds. There is no alternative development location for the site as this is the area with the possible mineable resource.

h) Full description of the process undertaken to identify, assess and rank the impacts and risks the activity will impose on the preferred site (In respect of the final site layout plan) through the life of the activity (Including (i) a description of all environmental issues and risks that are identified during the environmental impact assessment process and (ii) an assessment of the significance of each issue and risk and an indication of the extent to which the issue and risk could be avoided or addressed by the adoption of mitigation measures)

The most profound impacts expected to be related to the proposed prospecting operation include cumulative loss of intact habitat and biodiversity on a landscape level, as well as potential loss in soil fertility and loss of *Boscia albitrunca* recruits. Saplings are rarely visible during clearance operations and therefore the younger populations often get wiped out completely. Permit applications need to be lodged with the Northern Cape Department of Environment and Nature Conservation three months prior to any removal of protected species. Similarly, a licence application regarding protected trees should be lodged with Department of Agriculture, Forestry and Fisheries three months prior to any potential disturbances to the *Boscia albitrunca* trees. If any of the watercourses will be impacted, then a general authorisation or water use license should be obtained from Department of Water and Sanitation, prior to such activities.

The destruction of the natural plant species and habitats is inevitable due to the nature of the proposed prospecting operation, but the significance of the impacts will ultimately be affected by the success of the mitigation measures implemented during the operation. In my opinion, authorisation for the proposed operation can be granted. However, the applicant should commit to the strict adherence of effective avoidance, management, mitigation, and rehabilitation measures.

i) Assessment of each identified potentially significant impact and risk

(This section of the report must consider all the known typical impacts of each of the activities (including those that could or should have been identified by knowledgeable persons) and not only those that were raised by registered interested and affected parties)

ACTIVITY Whether listed or not listed.	POTENTIAL IMPACT (e.g. dust, noise, drainage surface disturbance, fly rock, surface water contamination, groundwater, contamination, air pollution)...	ASPECTS AFFECTED	PHASE In which impact is anticipated (e.g. construction, commissioning, operational, Decommissionin g, closure, post closure)	SIGNIFICANCE IF NOT MITIGATED	MITIGATION TYPE (modify, remedy, control or stop) through (e.g. noise control measures, storm water control, dust control, rehabilitation, design measures, blasting controls, avoidance, relocation, alternative activity	SIGNIFICANC E IF MITIGATION
Ablution Facilities Chemical Toilets	Soil contamination Possible Groundwater contamination	Soil Groundwater Odours	Construction Commissioning Operational Decommissioning Closure	Low	Maintenance of sewage facilities on a regular basis. Removal of chemical toilets on closure	Low
Clean & Dirty water systems:	Surface disturbance Soil contamination Surface water contamination	Soil Surface Water	Construction Commissioning Operational Decommissioning Closure	Low	It will be necessary to divert storm water around dumps areas by a berm that will prevent surface run-off into the drainage areas. The re-vegetation of disturbed areas is important to prevent erosion and improve the rate of infiltration. Erosion channels that may develop before vegetation has established should be rehabilitated by filling, levelling and re- vegetation where topsoil is washed away. Maintenance of trenches Monitoring and maintenance of oil traps in relevant areas. Drip trays used.	Low

					<p>Immediately clean hydrocarbon spill.</p> <p>Linear infrastructure such as roads and pipes will be inspected at least monthly to check that the associated water management infrastructure is effective in controlling erosion.</p> <p>Maintain a buffer zone of 100 m around the streams. Note that these buffer zones are essential to ensure healthy functioning and maintenance of wetland.</p>	
Fuel Storage facilities (Diesel tanks)	<p>Groundwater contamination</p> <p>Removal and disturbance of vegetation cover and natural habitat of fauna</p> <p>Soil contamination</p> <p>Surface disturbance</p>	<p>Soil</p> <p>Groundwater</p> <p>Surface water</p>	<p>Construction</p> <p>Commissioning</p> <p>Operational</p> <p>Decommissioning</p> <p>Closure</p>	Medium	<p>Maintenance of Diesel tanks and bund walls.</p> <p>Oil traps</p> <p>Drip tray at re-fuelling point.</p> <p>Refuelling must take place in well demarcated areas and over suitable drip trays to prevent soil pollution.</p> <p>Spill kits to clean up accidental spills from earthmoving machinery must be well-marked and available on site.</p> <p>Workers must undergo induction to ensure that they are prepared for rapid clean-up procedures.</p> <p>All facilities where dangerous materials are stored must be contained in a bund wall.</p> <p>Vehicles and machinery should be regularly serviced and maintained.</p>	Low
Prospecting Area.	<p>Dust</p> <p>Noise</p>	<p>Air quality</p> <p>Fauna</p> <p>Flora</p> <p>Groundwater</p> <p>Noise and vibration</p>	<p>Commissioning</p> <p>Operational</p> <p>Decommissioning</p> <p>Closure</p>	Medium	<p>Access control</p> <p>Dust control and monitoring</p> <p>Noise and vibration control and monitoring</p> <p>Continuous rehabilitation</p> <p>Storm water run-off control</p>	Low

	<p>Removal and disturbance of vegetation cover and natural habitat of fauna</p> <p>Soil contamination</p> <p>Surface disturbance</p> <p>Surface water contamination</p>	<p>Soil</p> <p>Surface Water</p> <p>Topography</p> <p>Safety</p>			<p>Immediately clean hydrocarbon spill</p> <p>Drip trays</p> <p>MRD stability control and monitoring</p> <p>Erosion control</p> <p>Noise control</p> <p>Well maintained equipment</p> <p>Selecting equipment with lower sound power levels;</p> <p>Taking advantage during the design stage of natural topography as a noise buffer;</p> <p>Develop a mechanism to record and respond to complaints.</p> <p>Maintain a buffer zone of 100 m around the streams. Note that these buffer zones are essential to ensure healthy functioning and maintenance of wetland.</p> <p>The extent of the prospecting area should be demarcated on site layout plans (preferably on disturbed areas or those identified with low conservation importance).</p> <p>Appointment of a full-time ECO must render guidance to the staff and contractors with respect to suitable areas for all related disturbance, and must ensure that all contractors and workers undergo Environmental Induction prior to commencing with work on site.</p> <p>All those working on site must undergo environmental induction with regards to fauna and in particular awareness about not harming or collecting species such as</p>	
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					<p>snakes, tortoises and owls which are often persecuted out of superstition. All those working on site must be educated about the conservation importance of the fauna and flora occurring on site.</p> <p>The environmental induction should occur in the appropriate languages for the workers who may require translation.</p> <p>Reptiles and amphibians that are exposed during the clearing operations should be captured for later release or translocation by a qualified expert.</p> <p>Employ measures that ensure adherence to the speed limit.</p> <p>Careful consideration is required when planning the placement for stockpiling topsoil and the creation of access routes in order to minimise the overall prospecting footprint.</p> <p>The Footprint areas of the prospecting activities must be scanned for Red Listed and protected plant species prior to prospecting;</p> <p>Snares & traps removed and destroyed;</p>	
Salvage yard (Storage and laydown area)	<p>Possible Groundwater contamination</p> <p>Removal and disturbance of vegetation cover and natural habitat of fauna</p> <p>Soil contamination</p>	<p>Fauna</p> <p>Flora</p> <p>Groundwater</p> <p>Soil</p> <p>Surface Water</p>	<p>Construction</p> <p>Commissioning</p> <p>Operational</p> <p>Decommissioning</p> <p>Closure</p>	Medium	<p>Access Control</p> <p>Maintenance of fence</p> <p>Storm water run-off control</p> <p>Immediately clean hydrocarbon spill</p>	Low

	Surface disturbance Surface water contamination					
Stockpile area	Dust Possible Groundwater contamination Surface water contamination Noise Removal and disturbance of vegetation cover and natural habitat of fauna Surface disturbance	Air Quality Fauna Flora Noise Soil Surface Water	Commissioning Operational Decommissioning Closure	Medium	Dust Control and monitoring Noise control and monitoring Drip trays Storm water run-off control Immediately clean hydrocarbon spills Rip disturbed areas to allow re-growth of vegetation cover Noise control Well maintained equipment Selecting equipment with lower sound power levels; Taking advantage during the design stage of natural topography as a noise buffer; Develop a mechanism to record and respond to complaints.	Low
Waste disposal site (domestic and industrial waste):	Groundwater contamination Contamination of soil Surface water contamination	Groundwater Soil Surface water	Construction Commissioning Operational Decommissioning Closure	Medium	Storage of Waste within receptacles Storage of hazardous waste on concrete floor with bund wall Removal of waste on regular intervals	Low
Roads (both access and haulage road on the prospecting site):	Dust Groundwater contamination Noise Removal and disturbance of vegetation cover and natural habitat of fauna	Air quality Fauna Flora Groundwater Noise and vibration Soil Surface water	Construction Commissioning Operational Decommissioning Closure	Medium	Maintenance of roads Dust control and monitoring Noise control and monitoring Speed limits Storm water run-off control Erosion control Immediately clean hydrocarbon spills Rip disturbed areas to allow re-growth of vegetation cover Noise control	Low

	Soil contamination Surface disturbance				Well maintained equipment Selecting equipment with lower sound power levels; Taking advantage during the design stage of natural topography as a noise buffer; Develop a mechanism to record and respond to complaints. Linear infrastructure such as roads and pipelines will be inspected at least monthly to check that the associated water management infrastructure is effective in controlling erosion.	
Temporary Workshop Facilities and Wash bays	Groundwater contamination Removal and disturbance of vegetation cover and natural habitat of fauna Soil contamination	Groundwater Soil Surface water	Construction Commissioning Operational Decommissioning Closure	Medium	Concrete floor with oil/water separator Storm water run-off control Immediately clean hydrocarbon spills	Low
Water distribution Pipelines	Surface disturbance	Fauna Flora Surface Water	Construction Commissioning Operational Decommissioning Closure	Medium	Monitor pipeline for water leaks Maintenance of pipeline Linear infrastructure such as roads and pipelines will be inspected at least monthly to check that the associated water management infrastructure is effective in controlling erosion.	Low
Water tanks: 1 X 10 000 litre water tanks and purifiers for potable water for each site.	Surface disturbance	Fauna Flora Surface Water	Construction Commissioning Operational Decommissioning Closure	Medium	Maintain water tanks and structures	Low

j) **Summary of specialist reports**

(This summary must be completed if any specialist reports informed the impact assessment and final site layout process and must be in the following tabular form):-

LIST OF STUDIES UNDERTAKEN	RECOMMENDATIONS OF SPECIALIST REPORTS	SPECIALIST RECOMMENDATIONS THAT HAVE BEEN INCLUDED IN THE EIA REPORT (Mark with an X where applicable)	REFERENCE TO APPLICABLE SECTION OF REPORT WHERE SPECIALIST RECOMMENDATIONS HAVE BEEN INCLUDED
<p>ECOLOGICAL AND WETLAND ASSESSMENT REPORT ECOLOGICAL ASSESSMENT REPORT Kimswa Mining (Pty) Ltd Beatry's Diamond Prospecting Operation By Dr Betsie Milne January 2023 APPENDIX 4</p>	<p>CONCLUSION, RECOMMENDATIONS AND OPINION REGARDING AUTHORISATION</p> <p>Five habitats were identified on site, of which the Orange River, drainage lines and their riparian buffer zones are the most sensitive to prospecting. The shrublands on the calcrete plateau, tillite ridge slopes and alluvium host a widespread occurrence of <i>Boscia albitrunca</i> and is considered to be of high sensitivity. Furthermore, the substrate of the low shrubland on alluvium poses high runoff and sedimentation risks to the adjacent watercourses, which further increases its sensitivity.</p> <p>The most profound impacts expected to be related to the proposed prospecting operation include cumulative loss of intact habitat and biodiversity on a landscape level, as well as potential loss in soil fertility and loss of <i>Boscia albitrunca</i> recruits. Saplings are rarely visible during clearance operations and therefore the younger populations often get wiped out completely. Permit applications need to be lodged with the Northern Cape Department of Environment and Nature Conservation three months prior to any removal of protected species. Similarly, a licence application regarding protected trees should be lodged with Department of Agriculture, Forestry and Fisheries three months prior to any potential disturbances to the <i>Boscia albitrunca</i> trees. If any of the watercourses will be impacted, then a general authorisation or water use license should be obtained from Department of Water and Sanitation, prior to such activities.</p> <p>The destruction of the natural plant species and habitats is inevitable due to the nature of the proposed prospecting operation, but the significance of the impacts will ultimately be affected by the success of the mitigation measures implemented during the operation. In my opinion, authorisation for the proposed operation can be granted. However, the applicant should commit to the strict adherence of effective avoidance, management, mitigation, and rehabilitation measures.</p>	X	Contained in the mitigation measures and EMPR

Heritage Impact Assessment and Palaeontological Desk Assessment for a Prospecting Right Application on Dr. Edward Matenga APPENDIX 5	CONCLUSION AND RECOMMENDATIONS The Prospecting Right Application can be approved provided that the recommendation on the protection of the burial ground is heeded. Since archaeological deposits may be buried underground, should important artefacts or skeletal material be exposed in the area during operations, such activities should be halted, and the provincial heritage resources authority or SAHRA notified for an investigation and evaluation of the finds undertaken.	X	Contained in the mitigation measures and EMPR
Palaeontological Impact Assessment for the proposed Prospecting Right Application for Prof. Marion K. Bamford 17 October 2022 APPENDIX 6	Recommendation Based on the fossil record for guidance but confirmed by the site visit and walk through there are NO FOSSILS of any kind although three types/ages of fossils could be expected. There was no stromatolitic or oolitic limestone (Boomplaas Formation in the eastern section close to the Orange River). There were no plant fossils of the the early Glossopteris flora even though fossils have been recorded from rocks of a similar age and type in South Africa about 50 km northwest along the Orange River at Blaaukrans (McLachlan and Anderson, 1973b). It is extremely unlikely that any fossils would be preserved in the overlying soils and sands of the Quaternary unless there are traps such as palaeo-pans or palaeo-springs. There is a very small chance that fossils may occur below the ground surface, but based on the erosion profiles the pebble and cobble layers are not fossiliferous. Nonetheless, a Fossil Chance Find Protocol should be added to the EMPr. If fossils are found by the prospectors, contractors, environmental officer or other responsible person once excavations and drilling have commenced, then they should be rescued and a palaeontologist called to assess and collect a representative sample.	X	Contained in the mitigation measures and EMPR

Attach copies of the Specialist Reports as appendices

k) Environmental impact statement**(i) Summary of the key findings of the environmental impact assessment;**

- The Ablution facilities will have a very low impact on groundwater and soil in case of an emergency spill after mitigation.
- The Clean & Dirty water systems may have a low impact on groundwater, soil and surface water after mitigation.
- The Fuel Storage facilities (Diesel tanks) may have a low impact on groundwater, soil, and surface water after mitigation.
- The Prospecting Area may have a low impact on air quality fauna, flora, noise, soil, surface water and topography after mitigation.
- The Salvage yard (Storage and laydown area) may have a low impact on fauna, flora, groundwater, soil and surface water after mitigation.
- The Residue stockpiles area may have a low impact on air quality, fauna, flora, noise, soil and surface water after mitigation.
- The waste disposal sites (domestic and industrial waste) may have a low impact on groundwater, soil, and surface water after mitigation.
- The Roads (both access and haulage road on the prospecting site) may have a low impact on air quality, fauna, flora, noise, soil and surface water after mitigation.
- The Workshops and Wash bays may have a low impact on groundwater, soil and surface water after mitigation.
- The Water tanks may have a low impact on fauna, flora, and surface water after mitigation.

From the assessment of impacts throughout all the phases it is clear that though the impacts may occur directly as a result of the proposed start in prospecting operations, the impacts are mostly of medium significance before mitigation. According to the assessment carried out by the EAP the majority of the impacts can be reduced to a low significance with the appropriate mitigation measures in place.

The EAPs and environmental consultants responsible for the compilation of this document, and the associated PPP are of the opinion based on the presented specialist assessments and impact assessment that the Environmental Authorization application should be authorised.

The following mitigation measures are crucial and should form part of the environmental authorisation to ensure that the applicant manages impacts adequately:

- Adhere to the approved Environmental Management Programme
- Adhere to the Emergency procedures Report and implement spill clean-up procedures
- Apply for relevant permits with authorities for the removal of indigenous tree species and indigenous vegetation if applicable.
- Major spills should be reported within 24hr to the Department of Water and Sanitation and the NCDENC.

The nature of impacts can vary widely depending on the type of physical environment, the size of the activity and the perceptions and values of each of the affected parties. It was the objective of the assessment to identify both positive and negative impacts. The existing information was reviewed to assess the present status of the environment and the extent to which they have already been modified. The planned activities and associated infrastructure were used as reference to assess potential impacts.

In general, the environmental impacts associated to the prospecting operation are rather negative, while the social impacts are more beneficial. Impacts on vegetation are likely to be most profound, because the prospecting operation will constitute clearance of indigenous vegetation and most likely also the removal of protected species if any is encountered. Soil erosion and surface water deterioration are likely to be possible important impacts if appropriate management strategies are not practised.

Positive impacts include the demarcation and subsequent protection of heritage resources and the eradication of alien invasive species. Positive social impacts include the creation of jobs, social upliftment, training opportunities, community development and numerous economic benefits.

To conclude, it must be accepted that any activities will have both physical and social impacts. Therefore, the destruction of the natural environmental features within the prospecting area is inevitable. The significance of the impacts will however be affected by the success of the mitigation measures implemented and the rehabilitation programme for the prospecting area.

(ii) Final Site Map;

Provide a map at an appropriate scale which superimposes the proposed overall activity and its associated structures and infrastructure on the environmental sensitivities of the preferred site indicated any areas that should be avoided, including buffers. Attach as **Appendix (Figure 26)**

The final site map below indicates the prospecting application area in which all prospecting will take place. Existing roads are also depicted.

The sensitivity map for the Kimsa Mining prospecting operation is illustrated in Figure 36. All watercourses in the study area are also unique habitats protected in terms of the National Water Act (Act No 36 of 1998). These units are essentially **no-go areas**.

The only other buffers that must be implemented is the 100m away from any fixed infrastructure like the roads that runs on the farm in terms of the Mine Health and Safety Act, 1996 (Act no 29 of 1996) Regulations relating to surveying, mapping and mine plans. These regulations states that a prospecting operation must take reasonable measures to ensure that-

- No prospecting operations are carried out within a horizontal distance of 100 (one hundred) metres from reserve land, buildings, roads, railways, dams or any

other structure whatsoever including such structures beyond the prospecting boundaries, or any surface, which it may be necessary to protect in order to prevent any significant risk, unless a lesser distance has been determined safe by risk assessment and all restrictions and conditions determined in terms of the risk assessment are complied with;

- A burial ground with at least 7 graves and one portion with rectangular settings of stones was recorded (LVBo8). A servitude of 100 m radius must be reserved around the graves.

Please see Final Site Map below.

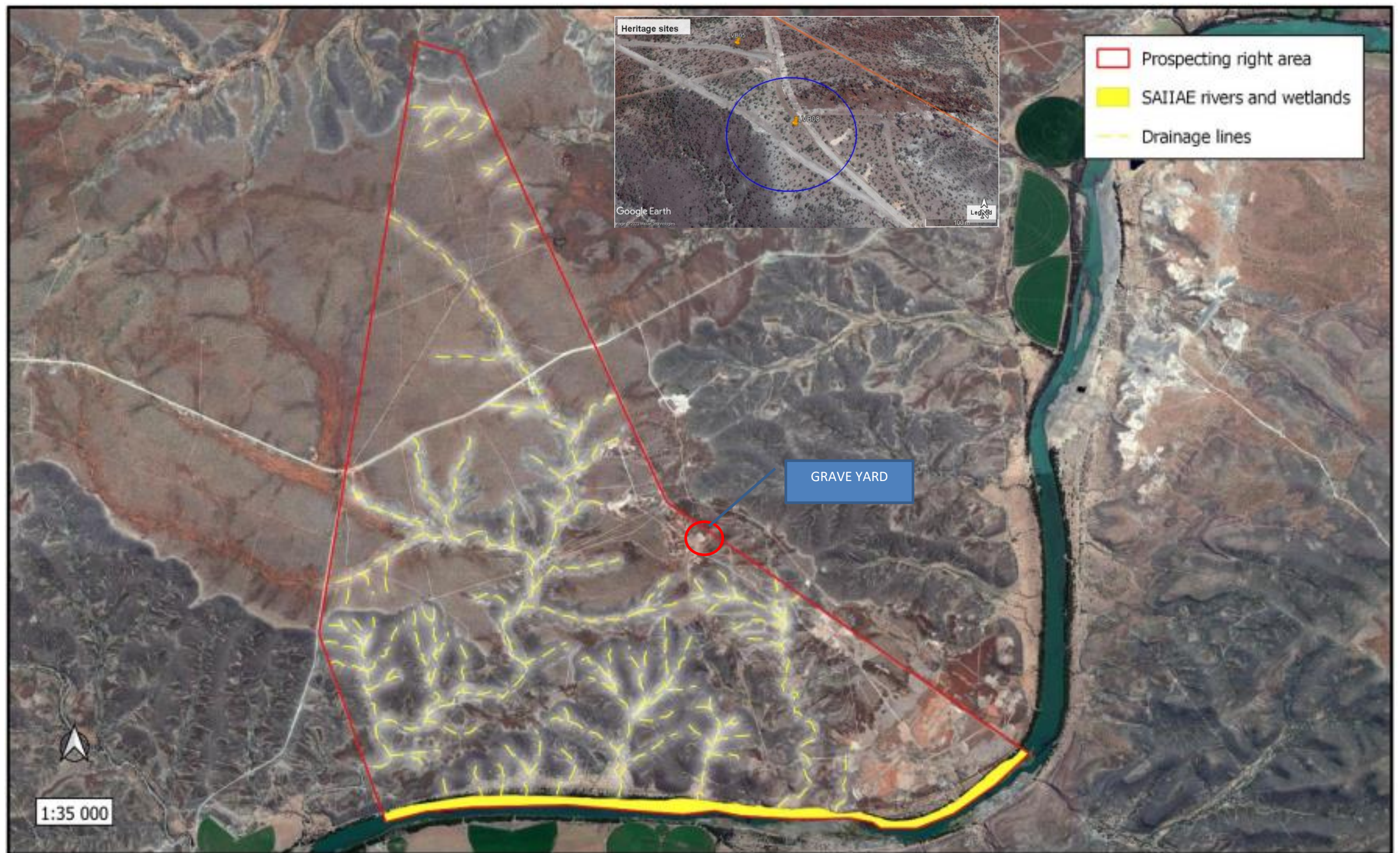


Figure 35. The delineation of watercourses on the proposed prospecting right area, along with their buffer requirements. (Dr. B Milne, Ecological report).

(iii) Summary of the positive and negative implications and risks of the proposed activity and identified alternatives;

During construction and operation of the prospecting, there is a possibility of sterilisation of the mineral reserves and resources due to improper placement of infrastructure. The infrastructure and excavations will alter the topography by adding features to the landscape. Topsoil removal and prospecting will unearth the natural topography. The construction of infrastructure and various facilities in the prospecting area can also result in loss of soil due to erosion. Vegetation where present will be stripped in preparation for placement of temporary prospecting infrastructure, and therefore the areas will be bare and susceptible to erosion. The topsoil that is stripped and piled on surrounding areas can be eroded by wind and rain. The soil will be carried away during runoff. The declared areas will be rehabilitated, but full restoration of soil might only occur over some time, subsequent to the re-establishment of vegetation. Furthermore, improper stockpiling and soil compaction can result in soil sterilisation. Leaching can also occur, resulting in the loss of nutrients.

During the construction and prospecting operation, there is a possibility that equipment might leak oil, thus causing surface spillages. The hydrocarbon soil contamination will render the soil unusable unless they are decontaminated. The storage of fuels on site might have an impact on soil if the tanks that are available on site are not properly monitored and maintained to avoid leakages. Then there is the potential that contaminated soil can be carried through runoff to contaminate water resources and soil stockpiled for rehabilitation. Soil pollution is therefore possible, but through mitigation it can be minimised.

The loss of land capability and land use can occur in two ways. Firstly, through topsoil removal, disturbances and loss of soil fertility; and secondly through the improper placement of infrastructure. The site has a land capability for grazing and limited agriculture, but grazing activities can still be performed in areas not earmarked for prospecting, and with proper rehabilitation the land capabilities and land use potential can be restored.

If oil and fuel spillages occur, then it will seep into the underlying aquifers and contaminate groundwater. Improper handling of hazardous material will cause contamination of nearby surface water resources during runoff episodes. Lack of storm control structures will lead to erosion of stockpiles during heavy rains and runoff will carry suspended solids into the downstream environment. This might cause high silt load and affect stream flow.

Construction and prospecting activities on site will reduce the natural habitat for ecological systems to continue their operation. Vehicle traffic generates lots of dust which can reduce the growth success and seed dispersal of many small plant species. It is expected that protected species if present can be destroyed during the bulk sampling operation.

While general clearing of the area and prospecting activities destroy natural vegetation, invasive plants can increase due to their opportunistic nature in disturbed areas. If invasive plant establishes in disturbed areas, it may cause an impact beyond the boundaries of the prospecting site. These alien invasive species are thus a threat to surrounding natural vegetation and can result in the decrease of biodiversity and ecological value of the area. Therefore, if alien invasive species are not controlled and managed, their propagation into new areas could have a high impact on the surrounding natural vegetation in the long term. With proper mitigation, the impacts can be substantially reduced.

The transformation of natural habitats to prospecting and associated infrastructure will result in the loss of habitat affected individual species, and ecological processes. In turn this will result in the displacement of faunal species dependent upon such habitat. Increased noise and vibration due to prospecting activities will disturb and possibly displace birds and other wildlife. Fast moving vehicles take a heavy toll in the form of road kills of small mammals, birds, reptiles, amphibians and a large number of invertebrates. The construction of the temporary prospecting and associated infrastructure will result in the loss of connectivity and fragmentation of natural habitat. Fragmentation of habitat will lead to the loss of migration corridors, in turn resulting in degeneration of the affected population's genetic make-up. This results in a subsequent loss of genetic variability between meta-populations occurring within the site. Pockets of fragmental natural habitats hinder the growth and development of populations.

During the prospecting operation the abovementioned activities have potential for dust generation. It is anticipated that the extent of dust emissions would vary substantially from day to day depending on the level of activity and the specific operations. The mine will add a certain amount of noise to the existing noise in the area. However, levels of noise generated by prospecting activities are low.

The impact of site generated trips on the traffic of the existing roads is experienced to be low. Nevertheless, if road safety is not administered it can have a high impact on the safety of fellow road users.

It is likely, however that there will be residual positive economic impacts that are not fully reversed with the closure of the prospecting operation, and that the economy will not decline to its original level prior to the development of this project. This is because the prospecting operation will generate substantial income for the regional and local economy, both directly and indirectly, during its life.

It is difficult to predict the actual impact of the prospecting closure in advance, but it is acceptable to assume that the prospecting closure will have a negative impact on the local and regional economy with a high probability of occurrence, a medium severity due to small scale and a medium significance.

Positive impacts include employment and training opportunities for people in the local community and local contractors; social upliftment and community development programmes; economic benefits.

The prospecting activities and associated infrastructure by itself will thus not introduce new social risks and hazards, but only increase the probability and scale of those already associated with the existing prospecting activities

On a more detailed level, the following **positive** impacts are anticipated:

- The creation of job opportunities in the area, and associated local economic development;
- Economic and revenue contribution to the local municipal area, as well as the District and adjacent municipalities;
- The involvement of Kimsa Mining with regards to training and capacity building of its employees and subsequent improvement of the livelihoods of the employees' families, as well as its efforts in sustaining the socio-economic development of the communities in close proximity to the operation;
- The positive impact of prospecting activity on the regional and local economy; and
- Positive impact of extensive local procurement focus.

Negative impacts as a result of the prospecting activity refer to:

- Inconvenience and intrusion impacts during the project such as the inflow of an additional workforce to the area, the possible influx of jobseekers, possible increase in the criminal activities (safety and security issues), disruption of social networks, as well as possible health risks;
- Disruptions in the daily living and movement patterns (increased traffic and possible dust pollution);
- Additional pressure on infrastructure development and maintenance;
- General intrusion impacts such as visual and noise pollution

From a social perspective it can be concluded that the proposed Kimsa Mining Project would not result in permanent damaging social impacts. The socio-economic benefits associated with the prospecting activity outweigh the negative social impacts. It is thus concluded that the proposed project is acceptable from a social point of view, provided that mitigation measures are implemented.

Negative impacts on the area are expected to be temporary and can be mitigated to a large extent if the recommendations of the EMPR are adhered to e.g., ongoing environmental management and rehabilitation once the mine reaches its end of life.

I) Proposed impact management objectives and the impact management outcomes for inclusion in the EMPr

Based on the assessment and where applicable the recommendations from specialist reports, the recording of proposed impact management objectives, and the impact management outcomes for the development for inclusion in the EMPr as well as conditions of authorisation.

Topography

- All prospecting areas must be rehabilitated if and when possible and made safe so as to reflect as far as possible the pre-prospecting topography of the area.
- All temporary features e.g., plant, containers and stockpiling must be removed and handled in the prescribed manner during rehabilitation.

Soil

Alteration of soil character and quality

- Topsoil needs to be removed and stored separately during prospecting and the construction of roads, infrastructure and stockpile areas.
- These topsoil stockpiles must be kept as small as possible in order to prevent compaction and the formation of anaerobic conditions.
- Topsoil must be stockpiled for the shortest possible timeframes to ensure that the quality of the topsoil is not impaired.
- Topsoil must not be handled when the moisture content exceeds 12 %.
- Topsoil stockpiles must by no means be mixed with sub-soils.
- The topsoil should be replaced as soon as possible on to the disturbed areas, thereby allowing for the re-growth of the seed bank contained within the topsoil.
- For restoration of the affected areas without topsoil, soils can be sourced from other sustainable areas and chemically changed to match with the surrounding environment.
- To restore areas where compacted soil occurs, a ripper blade or deep plow can be pulled across the affected area to alleviate compaction.
- Encourage the growth of natural plant species in all affected areas by sowing indigenous seeds or by planting seedlings.
- Vehicles and machinery should be regularly serviced and maintained.
- Refuelling and vehicle maintenance must take place in well demarcated areas and over suitable drip trays to prevent soil pollution.
- Drip trays must be available on site and installed under all stationary vehicles.
- Spill kits to clean up accidental spills from any accidental spillages must be well-marked and available on site.
- Workers must undergo induction to ensure that they are prepared for rapid clean-up.
- Any soil or area that is contaminated must be cleaned immediately by removing the soil and disposing it as hazardous waste in the correct manner.

Loss of soil fertility

- Topsoil needs to be removed and stored separately during prospecting and the construction of roads, infrastructure and stockpile areas.
- These topsoil stockpiles must be kept as small as possible in order to prevent compaction and the formation of anaerobic conditions.

- Topsoil must be stockpiled for the shortest possible timeframes to ensure that the quality of the topsoil is not impaired.
- Topsoil must not be handled when the moisture content exceeds 12 %.
- Topsoil stockpiles must by no means be mixed with sub-soils.
- The topsoil should be replaced as soon as possible on to the disturbed areas, thereby allowing for the re-growth of the seed bank contained within the topsoil.
- For restoration of the affected areas without topsoil, soils can be sourced from other sustainable areas and chemically changed to match with the surrounding environment.
- To restore areas where compacted soil occurs, a ripper blade or deep plow can be pulled across the affected area to alleviate compaction.
- Encourage the growth of natural plant species in all affected areas by sowing indigenous seeds or by planting seedlings.

Soil erosion

- Bare ground exposure should be minimised at all times regarding surface area and duration.
- Re-establishment of plant cover on disturbed areas must take place as soon as possible, once activities in the area have ceased.
- No new roads, infrastructure or prospecting areas should be developed over watercourses, including drainage lines.
- Disturbances during the rainy season should be monitored and controlled.
- Any potential run-off from exposed ground should be controlled with flow retarding barriers.
- Regular monitoring during the prospecting operation should be carried out to identify areas where erosion is occurring; followed by appropriate remedial actions

Vegetation and Floristics

Loss of indigenous vegetation

- Implement best practise principles to minimise the footprint of transformation, by keeping to existing roads and earmarked areas where possible.
- Implement effective avoidance measures to limit any activities in the highly sensitive areas, by applying the no-go principles.
- Ensure measures for the adherence to a maximum speed limit of 40 km/h to minimise dust fallout and associated effects on plants in the adjacent pristine areas.
- Encourage the growth of natural plant species in all affected areas by sowing indigenous seeds or by planting seedlings.
- The setup of a small nursery is advisable to maximise translocation and re-establishment efforts of affected areas.
- Apply for permits to authorise the clearance of indigenous plants from DENC at least three months before such activities will commence.

Loss of Red data and/or protected floral species

- The footprint areas of the prospecting activities must be scanned for Red Listed and protected plant species prior to any destructive activities by means of a search-and-rescue operation.

- It is recommended that these plants are identified and marked prior to intended activity. These plants should ideally be incorporated into the design layout and left in situ. However, due to the nature of the proposed prospecting activities they will most likely all be removed or relocated if possible. The relevant permits from DAFF and/or DENC should be applied for at least three months before such activities will commence.
- The setup of a small nursery is advisable to maximise translocation and re-establishment efforts of all the rescued plants.
- A management plan should be implemented to ensure proper establishment of ex situ individuals and should include a monitoring programme for at least two years after re-establishment in order to ensure successful translocation.
- The designation of an environmental officer is recommended to render guidance to the staff and contractors with respect to suitable areas for all related disturbance and must ensure that all contractors and workers undergo Environmental Induction prior to commencing with work on site. Environmental inductions should occur in the appropriate languages for the workers.
- All those working on site must be educated about the conservation importance of the flora occurring on site as well as the legislation relating to protected species.
- Employ regulatory measures to ensure that no illegal harvesting takes place.

Introduction or spread of alien species

- Implement best practise principles to minimise the footprint of transformation, by keeping to existing roads and earmarked areas where possible.
- Mechanical methods of control should be implemented pro-actively as soon as invasive species start to emerge.
- Regular follow-up monitoring of invasive control areas needs to be implemented to ensure effective eradication.
- Encourage proper rehabilitation of disturbed areas through soil restoration and reseedling of indigenous plant species.

Encouraging bush encroachment

- Mechanical methods of control should be implemented pro-actively when encroaching species form dense stands.
- Regular follow-up monitoring of encroached control areas needs to be implemented to ensure effective eradication.
- Encourage proper rehabilitation of disturbed areas through soil restoration and reseedling of indigenous plant species.

Fauna

Habitat fragmentation

- All activities associated with the prospecting operation must be planned, where possible to encourage faunal dispersal and should minimise dissection or fragmentation of any important faunal habitat type.
- The extent of the earmarked area should be demarcated on site layout plans. No staff, contractors or vehicles may leave the demarcated area except those authorised to do so.

- Those pristine areas surrounding the earmarked area that are not part of the demarcated area should be considered as a no-go zone for employees, machinery or even visitors.
- No new roads should be created across a watercourse.
- No prospecting should take place in the ephemeral drainage channels or river.
- If watercourse disturbances are unavoidable, a water use license to alter the beds and banks of these watercourses should be obtained from DWS prior to such activities.
- Employ sound rehabilitation measures to restore characteristics of all affected terrestrial and aquatic habitats.

Disturbance, displacement and killing of fauna

- Careful planning of the operation is needed to avoid the destruction of pristine habitats and minimise the overall disturbance footprint.
- The extent of the prospecting activities should be demarcated on site layout plans, and no personnel or vehicles may leave the demarcated area except if authorised. Areas surrounding the earmarked site, not part of the demarcated area, should be considered as a no-go zone.
- No prospecting should take place in the drainage lines or river and no new roads should be created across these watercourses. If unavoidable, a water use license to alter the beds and banks of each earmarked watercourse should be obtained from DWS prior to such activities.
- If any of the protected wildlife species are directly threatened by habitat destruction or displacement during the prospecting operation, then the relevant permits from DENC should be obtained followed by the relevant mitigation procedures stipulated in the permits.
- Everyone on site must undergo environmental induction for awareness on not capturing or harming species that are often persecuted out of superstition and to be educated about the conservation importance of the fauna occurring on site.
- Reptiles, amphibians, mammals, special invertebrates or active bird nests exposed during the clearing operations should be captured for later release or translocation by a qualified expert.
- Employ measures that ensure adherence to a speed limit of 40 km/h as well as driving mindfully to lower risks of animals being killed on the roads or elsewhere on site.

Broadscale Ecological processes

- Implement best practise principles to minimise the footprint of transformation, by keeping to existing roads and earmarked areas where possible.
- Apply for the relevant permits from DENC and DAFF.
- No new roads should be created across a watercourse and no prospecting should take place in them. If this is unavoidable, a water use license to alter the beds and banks of each earmarked watercourse should be obtained from DWS prior to such activities.
- Employ sound rehabilitation measures to restore characteristics of all affected habitats.
- For restoration of the affected areas without topsoil, soils can be sourced from other sustainable areas and chemically changed to match with the surrounding environment.
- To restore areas where compacted soil occurs, a ripper blade or deep plow can be pulled across the affected area to alleviate compaction.

- Encourage the growth of natural plant species in all affected areas by sowing indigenous seeds or by planting seedlings.
- The setup of a small nursery is advisable to maximise translocation and re-establishment efforts of affected areas.

Surface water

Alteration/destruction of watercourses

- All activities associated with the prospecting operation must be planned to avoid any disturbances to the watercourses and their buffer zones.
- No new roads should be created across a watercourse and no prospecting should take place in them. If this is unavoidable, a water use license to alter the beds and banks of each earmarked watercourse should be obtained from DWS prior to such activities.
- Employ sound rehabilitation measures to restore characteristics of all affected watercourses.

Siltation of surface water

- Bare ground exposure should always be minimised in terms of the surface area and duration.
- Re-establishment of plant cover on disturbed areas must take place as soon as possible once activities in the area have ceased.
- No new roads, infrastructure or prospecting areas should be developed over watercourses.
- Disturbances during the rainy season should be monitored and controlled.
- Any potential run-off from exposed ground should be controlled with flow retarding barriers.
- Regular monitoring during the prospecting operation should be carried out to identify areas where erosion is occurring; followed by appropriate remedial actions.

Groundwater

- Vehicle- and equipment maintenance must only be allowed within the maintenance area. Only emergency breakdowns may be allowed in other areas.
- The following procedure must be followed if a vehicle or piece of equipment would break down inside an excavation and outside of the maintenance area.
 - Drip pans must be placed at all points where diesel, oil or hydraulic fluid may drip and in so doing contaminate the soil.
 - All efforts must be made to move the broken-down vehicle or piece of equipment to the maintenance area.
 - If the vehicle/piece of equipment cannot be moved, the broken part must firstly be drained of all fluid. The part must then be removed and taken to the maintenance area.
- No repairs may be allowed outside the maintenance area except for emergencies.
- Equipment used as part of the proposed operation must be adequately maintained so as to ensure that the oil, diesel, grease or hydraulic fluid does not leak during the operation.
- Fuel and other petrochemicals must be stored in steel receptacles that comply with SANS 10089-1:2003 (SABS 089-1:2003) standards. An adequate bund wall, 150% of volume of the

largest storage receptacle, must be provided for fuel and diesel areas to accommodate any spillage or overflow of these substances. The area inside the bund wall must be lined with an impervious lining to prevent infiltration of the fuel into the soil (and ultimately groundwater).

- Proper sanitation facilities must be provided for employees. No person may pollute the workings with faeces or urine, misuse the facilities provided or inappropriately foul the surrounding environment with faeces or urine.
- Acceptable hygienic and aesthetic practices must be adhered to.
- The workshops, washing bays and sewage tanks should be constructed far away from significant aquifer systems.
- SOP for storage, handling and transport of different hazardous materials.
- Place oil traps (drip trays) under stationary vehicles, only re-fuel at fuelling stations, construct structures to trap fuel spills at fuelling stations, immediately clean oil and fuel spills and dispose of contaminated material at licensed sites only.
- Ensure good housekeeping rules.

Air Quality

To limit the creation of nuisance dust the following management guidelines must be followed:

- Avoidance of unnecessary removal of vegetation.
- Routine spraying of unpaved site areas and roads utilized by the prospecting operation with water.
- Speed limits of vehicles inside the prospecting area must be strictly controlled to avoid excessive dust or the excessive deterioration of the roads to be used.
- Continuous dumping and rehabilitation of disturbed areas.
- All cleared, disturbed or exposed areas must be re-vegetated as soon as practically possible to prevent the formation of additional sources of dust.

Noise

- Working hours must be kept between sunrise and sunset as far as possible.
- As a minimum, ambient noise levels emanating from the prospecting activities may not exceed 82dBA at the site boundary.
- The Company must comply with the Occupational Noise Regulations of the Occupational Health and Safety Act, Act 85 of 1993.
- The company must comply with the measures for good practice with regard to management of noise related impacts during the operation.
- The management objective must be to reduce any level of noise, shock and lighting that may have an effect on persons or animals, both inside the plant area and that which may migrate outside the plant area.
- When the equivalent noise exposure, as defined in the South African Bureau of Standards Code of Practice for the Measurement and Assessment of Occupational Noise for Hearing Conservation Purposes, SABS 083 as amended, in any place at or in any mine or works where persons may travel or works exceeds 82 dB (A), the site manager will take the necessary steps to reduce the noise below this level.

- Hearing protection must be provided to all employees where attenuation cannot be implemented.
- If any complaints are received from the public or state department regarding noise levels the levels will be monitored at prescribed monitoring points.

Mechanical equipment

- All mechanical equipment must be in good working order and vehicles must adhere to the relevant noise requirements of the Road Traffic Act.
- All vehicles in operation must be equipped with a silencer on its exhaust system.
- Safety measures, which generate noise such as reverse gear alarms on large vehicles, must be appropriately calibrated / adjusted.

Safety

- No employees may reside on the prospecting site.
- Access and haul roads must be maintained.
- Security access point to ensure monitoring of access to the site.

Archaeology:

- Any heritage and cultural resources (e.g., ruins, historic structures, etc.) must be protected and preserved by the delineation of a no-go zone.
- Should any further resources be disturbed, exposed or uncovered during site preparations, these should immediately be reported to an accredited archaeologist. Burial remains should not be disturbed or removed until inspected by an archaeologist.

PROCEDURE FOR ARCHAEOLOGICAL FINDS

If you discover what you suspect may be a possible archaeological site:

- Stop all work in the area to avoid damaging the site.
- Do not disturb any archaeological remains that you may encounter.
- The finds must be reported to ECO or Site Manager
- The finds must be reported to the heritage authority, i.e., SAHRA and/or the provincial heritage resources agency.
- The heritage authority will send a heritage specialist and /or ask the permit holder to appoint a heritage specialist to make a preliminary assessment of the findings.
- If the potential significance of the finds are deemed to warrant further action and they cannot be avoided, then the heritage specialist will submit a report advising SAHRA accordingly.
- SAHRA will determine the appropriate course of action.

PROCEDURE FOR GRAVES, BURIAL GROUNDS AND HUMAN REMAINS

If you discover what you suspect may be possible human remains:

- Stop all work in the area to avoid damaging the site.
- Do not disturb any possible human remains that you may encounter.
- The finds must be reported to ECO or Site Manager.
- The finds must be reported to the local area station of SAPS.
- The finds must be reported to the SAHRA Burial Grounds and Graves (BGG) Unit.

- The BGG Unit will send a heritage specialist and /or ask the permit holder to appoint a heritage specialist to make a preliminary assessment of the findings.
- If the graves/human remains cannot be avoided SAHRA will require that the human remains be re-interred in a formal cemetery.

Visual

- Security Lights must be fixed at an angle to ensure that it does not cause a disturbance to the surrounding environment at night.
- Prospecting Areas must be subject to progressive controlled backfilling and made safe (including the re-establishment of vegetation).
- Permanent structures or features that are part of the proposed prospecting operation must be kept neat and well presented.
- Waste material of any description must be removed from the prospecting area on a regular basis and be disposed of at a recognized landfill facility.

The **impact management objectives** for the Kimsa Mining planned prospecting operation should include:

- To ensure efficient extraction of the diamonds and to prevent the sterilization of any diamond reserves.
- To limit the alteration of the surrounding topography
- To manage and preserve soil types
- To prevent the loss of land capability
- To ensure the continuation of economically viable land use.
- To ensure that the surrounding ground water resources are not adversely affected to the detriment of the health and welfare of nearby communities; and to ensure suitable quality of ground water resources.
- To ensure that the surrounding surface water resources are not adversely affected to the detriment of the health and welfare of nearby communities; and to ensure suitable quantity and quality of ground water resources.
- The non-perennial stream is classified as a water system according to GN704 and is a natural storm water accumulation stream. No water system shall be mined before an authorization is obtained from DWS. This water system will however not be mined.
- Rehabilitation of disturbed areas during the prospecting life cycle as well as during closure phase has to be done to minimize erosion and/or pollution of natural streams.
- To contain soils and materials within demarcated areas and prevent contamination of storm water runoff.
- To minimise the loss of natural vegetation.
- To prevent the proliferation of alien invasive plants species.
- To protect the wildlife and bird species.
- To protect the natural habitat of wildlife and bird species.
- To maintain visual integrity; and to minimise the extent of the generation of dust in order to minimise the aspect of nuisance and health impacts to sensitive receptors.
- To minimise noise and vibration to a level that disturbances felt by the communities are limited.
- To reduce the impact on visual quality due to intrusive infrastructure, activities and facilities.

- To ensure that all traffic generated by the proposed prospecting development does not negatively impact on existing road networks and infrastructure; and to ensure traffic safety.
- To preserve the historical and cultural artefacts located on site in compliance with the South African Heritage Resources Act, 1999 (Act No 25 of 1999).
- To ensure that the current socio-economic status quo is improved.
- To be transparent and practise effective communication; in order to maintain good relationships with all interested and affected parties.

m) Final proposed alternatives

(Provide an explanation for the final layout of the infrastructure and activities on the overall site as shown on the final site map together with the reasons why they are the final proposed alternatives which respond to the impact management measures, avoidance, and mitigation measures identified through the assessment)

The consideration of alternatives is a critical component of the EIA process, where an appropriate range of alternatives require consideration whilst achieving the desired objective of the proposed project. In order to ensure that the proposed project enables sustainable prospecting, a number of feasible options will be explored. The various alternatives in terms of land use, project infrastructure, method and proceeding without the prospecting operation will be assessed in terms of logistical practicality, environmental acceptability and economic feasibility. Alternatives for the locality of the prospecting operation will however not form part of this consideration, as the location of the prospecting site is determined by the possible geological location of the mineral resource.

n) Aspects for inclusion as conditions of Authorisation

Any aspects which have not formed part of the EMP that must be made conditions of the Environmental Authorisation

The general conditions; including management of activity, monitoring, recording and reporting to the Department, commissioning of the activity, operation of the activity, site closure and decommissioning as well as non-compliances; as required in terms of the Environmental Impact Assessment Regulations promulgated in terms of NEMA (Act 107 of 1998) as well as objectives and requirements of relevant legislation, policies and guidelines must be included in the Authorization.

Permit applications need to be lodged with the Northern Cape Department of Environment and Nature Conservation three months prior to any removal of protected species. Similarly, a licence application regarding protected trees should be lodged with Department of Agriculture, Forestry and Fisheries three months prior to any potential disturbances to the *Boscia albitrunca* trees. If any of the watercourses will be impacted, then a general authorisation or water use license should be obtained from Department of Water and Sanitation, prior to such activities.

Since archaeological deposits may be buried underground, should important artefacts or skeletal material be exposed in the area during operations, such activities should be halted, and the provincial heritage resources authority or SAHRA notified for an investigation and evaluation of the finds undertaken. A burial ground with at least 7 graves and one portion with

rectangular settings of stones was recorded (LVBo8). A servitude of 100 m radius must be reserved around the graves.

o) Description of any assumptions, uncertainties and gaps in knowledge

(Which relate to the assessment and mitigation measure proposed)

The above mitigation measures are tried and tested over many years in the diamond prospecting industry. The Company must monitor the potential impacts throughout the life of operation, and mitigate any deviations detected. This has been proven to be very effective in existing operations.

The EAP who compiled this document and the specialists who compiled the respective specialist reports have extensive knowledge in their field and it is therefore assumed that the above assumptions are adequate and that the information provided is correct, the following assumptions and limitation were noted by the specialist.

Assumptions and limitations on the Ecological Study conducted

The study took place during early summer, which is not an optimal time of the year. The area received good rainfall during the previous season, but most grasses and annuals were still dormant during the time of the field survey and therefore the vegetation was not in a favourable state for the assessment. Furthermore, due to the brief duration of the survey and lack of seasonal coverage, the species lists reflected in this report cannot be regarded as fully representative. Ideally, a site should be visited during different seasons to ensure the variation in species presence and habitat conditions are captured. However, this is rarely possible due to time and cost constraints related to prospecting and mining right application processes. The survey was nevertheless conducted in a manner to ensure all representative communities were traversed, to include most of the common and important species present.

Limitation noted on the Heritage impact assessment study conducted

Thick colonies of blackthorn (*Acacia mellifera*) scrub covering much of the portion of the farm south of the main access road constrained the ground survey. Furthermore, it appears that after the mine works, which have a significant footprint on the northern boundary of this portion, ceased about 10 years ago, the farm returned to grazing, access roads, as well as the improvised fords across streams that cut through the tillite deposits have not been maintained. Several attempts to cross the streams with a vehicle from the were not successful. Walking surveys were thus relatively easier in a band c 1000 m wide along the northern boundary fence. Furthermore, no arrangements had been made for access to the portion of the farm north of the main access road.

Assumptions and uncertainties on the Palaeontological study conducted

Based on the geology of the area and the palaeontological record as we know it, it can be assumed that the formation and layout of the dolomites, sandstones, shales and sands are typical for the country and some do contain trace fossils, fossil plant, insect, invertebrate and vertebrate material. The site visit and walk through by the palaeontologist confirmed that there are no fossils on the surface and none in the profiles of the stream cuttings. It is not known what

is below the ground surface but the occurrence of fossils seems very unlikely based on the site visit observations.

p) Reasoned opinion as to whether the proposed activity should or should not be authorised

i) Reasons why the activity should be authorized or not.

There are no significant reasons why the activity should not be authorised. However, if the proposed management and mitigation measures are not properly applied or if the prospecting operation intentionally disregards any of these measures, it will negatively affect the environment and have more long-term consequences. Therefore, the competent authority should take all the necessary steps to ensure that the prospecting operation complies with the conditions set out in the approval of the EMPR.

ii) Conditions that must be included in the authorisation.

(1) Specific conditions to be included into the compilation and approval of EMPr

The general conditions; including management of activity, monitoring, recording and reporting to the Department, commissioning of the activity, operation of the activity, site closure and decommissioning as well as non-compliances; as required in terms of the Environmental Impact Assessment Regulations promulgated in terms of NEMA (Act 107 of 1998) as well as objectives and requirements of relevant legislation, policies and guidelines must be included in the Authorization.

(2) Rehabilitation requirements

A Detailed rehabilitation plan is included in the EMPR as diamond prospecting consist of continuous stripping and backfilling operations. The operation had to provide to the DMR, a financial rehabilitation guarantee to the amount as calculated in terms of the financial quantum Guideline and approved by the DMR.

Infrastructure areas

On completion of the prospecting operation, the various surfaces, including the access road, the office area, storage areas and the plant site, will finally be rehabilitated as follows: All other material on the surface will be removed to the original topsoil level where possible. This material will then be backfilled into any open pits. Any compacted area will then be ripped to a depth of 300mm, where possible, the topsoil or growth medium returned and landscaped.

All infrastructures, equipment, plant, and other items used during the operational period will be removed from the site.

On completion of operations, all buildings, structures or objects on the office site will be dealt with in accordance with regulation 44 of the Minerals and Petroleum Resources Development Act, 2002.

Topsoil and Stockpile Deposits:

Disposal Facilities: Waste material of all description inclusive of receptacles, scrap, rubble and tyres should be removed entirely from the prospecting area and disposed of at a recognized landfill facility. It should not be permitted to be buried or burned on the site.

Ongoing Seepage, Control of Rain Water:

Water Quality Management in accordance with the South African Water Quality Guidelines must be adhered to in order to provide timely and accurate water data to the Department of Water and Sanitation (DWS) as well as to manage impacts caused by the activity. Specific objectives of such a program are to:

- Determine whether water quality comply with water quality standards.
- Provide timely data for intervention as and when required.
- Assess the status of water quality in the surrounding areas.
- Provide analytical water quality information describing trends (present conditions and changes).

The objectives are to limit the adverse effect of pollutants in the water resource. The setting of in-stream Resource Water Quality Objectives (RWQO) is based on the South African Water Quality Guidelines.

Water Monitoring Points

Surface water: The Orange River which is a perennial river does border the prospecting area. If the bulk sampling stage of the project is reached ground water will be sourced from the Orange River with permission from DWS. Monitoring will only take place by collecting surface water samples every quarter if possible and required by DWS.

Long Term Stability and Safety: It should be the objective of prospecting management to ensure the long-term stability of all rehabilitated areas including the backfilled depressions. This should be done by the monitoring of all areas until a closure certificate has been issued.

Final rehabilitation in respect of erosion and dust control: Self-sustaining vegetation will result in the control of erosion and dust and no further rehabilitation is deemed necessary, unless vegetation growth is not returned to a desirable state by the time of prospecting closure.

Final Rehabilitation Roads:

- After rehabilitation has been completed, all roads should be ripped or ploughed, fertilized and providing the landowner does not want them to remain that way and with written approval from the Director: Mineral Development of the Department of Mineral Resources.

Submission of Information:

- Reports on rehabilitation and monitoring should be submitted annually to the Department of Mineral Resources – Kimberley, as described in Regulation 55 and NEMA (amended).

Maintenance (Aftercare):

- Maintenance after closure should include the regular inspection and monitoring and/or completion of the re-vegetation programme.
- The aim of the Environmental Management Programme is for rehabilitation to be stable and self-sufficient, so that the least possible aftercare is required.
- The aim with the closure of the mine should be to create an acceptable post-mine environment and land-use. Therefore, all agreed commitments should be implemented by Mine Management.

After-effects Following Closure:

Acid Mine Drainage: No potential for bad quality leachate or acid mine drainage development is associated with diamond mine closure.

Long Term Impact on Ground Water: No after effect on the groundwater yield or quality is expected.

Long-term Stability of Rehabilitated Land: One of the main aims of any rehabilitated ground should be to obtain a self-sustaining and stable end result. The concurrent monitoring of all material and replacement of topsoil where available should be ensured.

q) Period for which the Environmental Authorisation is required

5 years. With the option to renew for a further 3 years.

r) Undertaking

Confirm that the undertaking required to meet the requirements of this section is provided at the end of the EMPr and is applicable to both the Basic Assessment Report and the Environmental Management Programme Report.

The undertaking required to meet the requirements of this section is provided at the end of the EMPR and is applicable to both the Environmental Impact Assessment Report and the Environmental Management Programme Report.

s) Financial Provision

State the amount that is required to both manage and rehabilitate the environment in respect of rehabilitation

i) Explain how the aforesaid amount was derived

The total cost to rehabilitate and mitigate the Kimsa Mining (Pty) Ltd Beatrys operational site as it stands currently (risking premature rehabilitation) is estimated to be R 788 885 according to the DMR calculations.

ii) Confirm that this amount can be provided from operating expenditure

(Confirm that the amount, is anticipated to be an operating cost and is provided for as such in the Mining Work Programme, Financial and Technical Competence Report or Prospecting Work Programme as the case may be)

It is confirmed that the amount for outstanding rehabilitation can be provided from operating expenditure.

t) Deviations from the approved scoping report and plan of study**i) Deviations from the methodology used in determining the significance of potential environmental impacts and risks**

(Provide a list of activities in respect of which the approved scoping report was deviated from, the reference in this report identifying where the deviation was made, and a brief description of the extent of the deviation)

Not applicable – No deviations from the methodology proposed in the Scoping Report.

ii) Motivation for the deviation

Not applicable – No deviations from the methodology proposed in the Scoping Report.

u) Other information required by the competent Authority**i) Compliance with the provisions of sections 24 (4)(a) and (b) read with section 24 (3)(a) and (7) of the National Environmental Management Act (Act 107 of 1998), the EIA Report must include the:-****(1) Impact on the socio-economic conditions of any directly affected person**

(Provide the results of investigation, assessment, and evaluation of the impact of the mining, bulk sampling or alluvial diamond prospecting on any directly affected person including the landowner, lawful occupier, or, where applicable, potential beneficiaries of any land restitution claim, attach the investigation report as **Appendix 2.19.1** and confirm that the applicable mitigation is reflected in 2.5.3; 2.11.6 and 2.12 therein)

From a social perspective the following objectives and measures should be included as part of the Social Management Plan (SMP) as part of the Environmental Management Plan (EMP).

It should be noted that the responsibility of the mitigation lies with the owner, operator, and/or with the local municipality. The mitigation measures would have to form part of the respective stakeholder's expenditure predictions or operations and management within the area; therefore, the monitoring activities cannot be expressed in financial terms.

From a social perspective it can be concluded that the proposed Kimsa Mining Project would not result in permanent damaging social impacts. The socio-economic benefits associated with the prospecting operation outweigh the negative social impacts. It is thus concluded that the proposed project is acceptable from a social point of view, provided that mitigation measures are implemented.

- (2) Impact on any national estate referred to in section 3(2) of the National Heritage Resources Act** (Provide the results of investigation, assessment, evaluation of the impact of the mining, bulk sampling or alluvial diamond prospecting on any national estate referred to in section 3(2) of the National Heritage Resources Act, 1999 (Act No. 25 of 1999) with the exception of the national estate contemplated in section 3(2)(i)(vi) and (vii) of that Act, attach the investigation report as **Appendix 2.19.2** and confirm that the applicable mitigation is reflected in 2.5.3; 2.11.6 and 2.12 herein)

Dr. Edward Matenga has been appointed by Wadala Mining and Consulting to compile a Heritage Impact Assessment in order to determine whether there are any areas of heritage and cultural importance (Appendix 5). This HIA Report was compiled by making use of a desktop study as well as a field survey on the proposed site.

The heritage sensitivity of the property is summarised as follows:

The Stone Age

Stone Age material occurs on the property as background scatters that is testimony to the foraging activities of Stone Age communities. This pattern was also observed on Portion 23 of the Farm Lanyon Vale 376 which shares a boundary to the south with Portion 3. Seven (7) out of 10 occurrences were recorded on Portion 3. There was an occasional find of a hand-axe probably dating to the transition from the Early Stone Age to the Middle Stone Age. Otherwise, the scrapers and blades commonly encountered date to the Middle Stone Age/Late Stone Age period. None of the sites were found to warrant further action.

The Early Iron Age

No material dating to the Early Iron Age was found.

The Later Iron Age

No material dating to the Later Iron Age was found.

Burial grounds

A burial ground with at least 7 graves and one portion with rectangular settings of stones was recorded (LVBo8). A servitude of 100 m radius must be reserved around the graves.

Conclusion and recommendations

The Prospecting Right can be approved provided that the recommendations on the protection of the burial ground and disposal of the two stone features (if it becomes necessary) are heeded. Since archaeological deposits may be buried underground, should important artefacts or skeletal material be exposed in the area during operations, such activities should be halted, and the provincial heritage resources authority or SAHRA notified for an investigation and evaluation of the finds undertaken.

Palaeontology

Dr. Edward Matenga appointed Professor Marion Bamford to compile a Palaeontological Impact Assessment in order to determine whether there are any areas of palaeontological importance (Appendix 6). This PIA Report was compiled by making use of a desktop study as well as a field survey on the proposed site.

Site visit observations

The site was walked through and visibility was good as the vegetation was fairly sparse. Photographs and observations were made at representative sites for the geology and palaeontology. Although there were many transported boulders, cobbles and pebbles, none of them was a fossil. No fossils of any kind were seen on the land surface or in the existing trenches or erosion gullies (Note, no new excavations were done). Although it was expected to find outcrops of the Boomplaas Formation stromatolitic and oolitic limestone alongside the river, as indicated on the geology map, no dolomite or limestones were recognised.

Based on the nature of the project, surface activities may impact upon the fossil heritage if preserved in the development footprint. The geological structures suggest that the rocks are the correct age and type to preserve fossils. The site visit and walk through confirmed that there were NO TRACE FOSSILS in the Boomplaas Formation, NO FOSSILS in the Dwyka Group tillites, in NO TRAPPED FOSSILS in the calcretes or in Quaternary sand along the river. Since there is a very small chance that fossils from below the ground surface may be disturbed a Fossil Chance Find Protocol has been added to this report. Taking account of the defined criteria, the potential impact to fossil heritage resources is low.

Assumptions and uncertainties

Based on the geology of the area and the palaeontological record as we know it, it can be assumed that the formation and layout of the dolomites, sandstones, shales and sands are typical for the country and some do contain

trace fossils, fossil plant, insect, invertebrate and vertebrate material. The site visit and walk through by the palaeontologist confirmed that there are no fossils on the surface and none in the profiles of the stream cuttings. It is not known what is below the ground surface but the occurrence of fossils seems very unlikely based on the site visit observations.

Recommendation

Based on the fossil record for guidance but confirmed by the site visit and walk through there are NO FOSSILS of any kind although three types/ages of fossils could be expected. There was no stromatolitic or oolitic limestone (Boomplaas Formation in the eastern section close to the Orange River). There were no plant fossils of the the early Glossopteris flora even though fossils have been recorded from rocks of a similar age and type in South Africa about 50 km northwest along the Orange River at Blaaukranz (McLachlan and Anderson, 1973b). It is extremely unlikely that any fossils would be preserved in the overlying soils and sands of the Quaternary unless there are traps such as palaeo-pans or palaeo-springs. There is a very small chance that fossils may occur below the ground surface, but based on the erosion profiles the pebble and cobble layers are not fossiliferous. Nonetheless, a Fossil Chance Find Protocol should be added to the EMPr. If fossils are found by the prospectors, contractors, environmental officer or other responsible person once excavations and drilling have commenced, then they should be rescued and a palaeontologist called to assess and collect a representative sample.

ARCHAEOLOGICAL AND HERITAGE CHANCE FINDS PROCEDURE (Prepared by Edward Matenga (PhD))

HERITAGE SITES AND OBJECTS THAT MIGHT OCCUR IN THE AREA

The following site types/objects have been encountered in the broader region and are therefore flagged:

- Surface scatters or concentrations of stone tools of the ESA, MSA, LSA periods
- Substantial subsurface occurrences of stone tools
- Rock paintings and rock engravings (petroglyphs) (MSA to LSA period)
- Buildings and objects associated with modern commercial farming from the 19th century
- Graves, burial grounds and human bones

GENERAL

A principal aim of the CFP is to raise awareness of all personnel in the project regarding the prospect of finding archaeological resources that unseen during the Phase 1 scoping heritage assessment and establish a protocol for the protection of these resources. The appointed Environmental Control Officer (ECO) and Site Manager keep copies of the CPF at the field offices. Training of field personnel on cultural heritage resources that might potentially be found on area should be provided.

PROCEDURE FOR ARCHAEOLOGICAL FINDS

If you discover what you suspect may be a possible archaeological site:

- Stop all work in the area to avoid damaging the site.

- Do not disturb any archaeological remains that you may encounter.
- The finds must be reported to ECO or Site Manager
- The finds must be reported to the heritage authority, i.e., SAHRA and/or the provincial heritage resources agency.
- The heritage authority will send a heritage specialist and /or ask the permit holder to appoint a heritage specialist to make a preliminary assessment of the findings.
- If the potential significance of the finds are deemed to warrant further action and they cannot be avoided, then the heritage specialist will submit a report advising SAHRA accordingly.
- SAHRA will determine the appropriate course of action.

PROCEDURE FOR GRAVES, BURIAL GROUNDS AND HUMAN REMAINS

If you discover what you suspect may be possible human remains:

- Stop all work in the area to avoid damaging the site.
- Do not disturb any possible human remains that you may encounter.
- The finds must be reported to ECO or Site Manager.
- The finds must be reported to the local area station of SAPS.
- The finds must be reported to the SAHRA Burial Grounds and Graves (BGG) Unit.
- The BGG Unit will send a heritage specialist and /or ask the permit holder to appoint a heritage specialist to make a preliminary assessment of the findings.
- If the graves/human remains cannot be avoided SAHRA will require that the human remains be re-interred in a formal cemetery.

v) Other matters required in terms of sections 24(4)(a) and (b) of the Act

(the EAP managing the application, must provide the competent authority with detailed, written proof of an investigation as required by section 24(4)(b)(i) of the Act and motivation if no reasonable or feasible alternatives, as contemplated in sub-regulation 22(2)(h), exist. The EAP must attach such motivation as **Appendix 4**)

There are no alternatives, as the application area applied for is the area where the applicant has proven diamonds and has found potential for a diamond prospecting operation.

PART B

ENVIRONMENTAL MANAGEMENT PROGRAMME REPORT

1) Draft environmental management programme

- a) Details of the EAP** (Confirm that the requirement for the provision of the details and expertise of the EAP are already included in PART A, section 1(a) herein as required)

I hereby confirm that the requirement for the provision of the details and expertise of the EAP is already included in Part A as required.

- b) Description of the Aspects of the Activity** (Confirm that the requirement to describe the aspects of the activity that are covered by the draft environmental management programme is already included in PART A, section (1)(h) herein as required)

I hereby confirm that the requirement for the aspects of the activity is already included in Part A as required.

c) Composite Map

(Provide a map (Attached as an Appendix) at an appropriate scale which superimposes the proposed activity, its associated structures, and infrastructure on the environmental sensitivities of the preferred site, indicating any areas that any areas that should be avoided, including buffers)

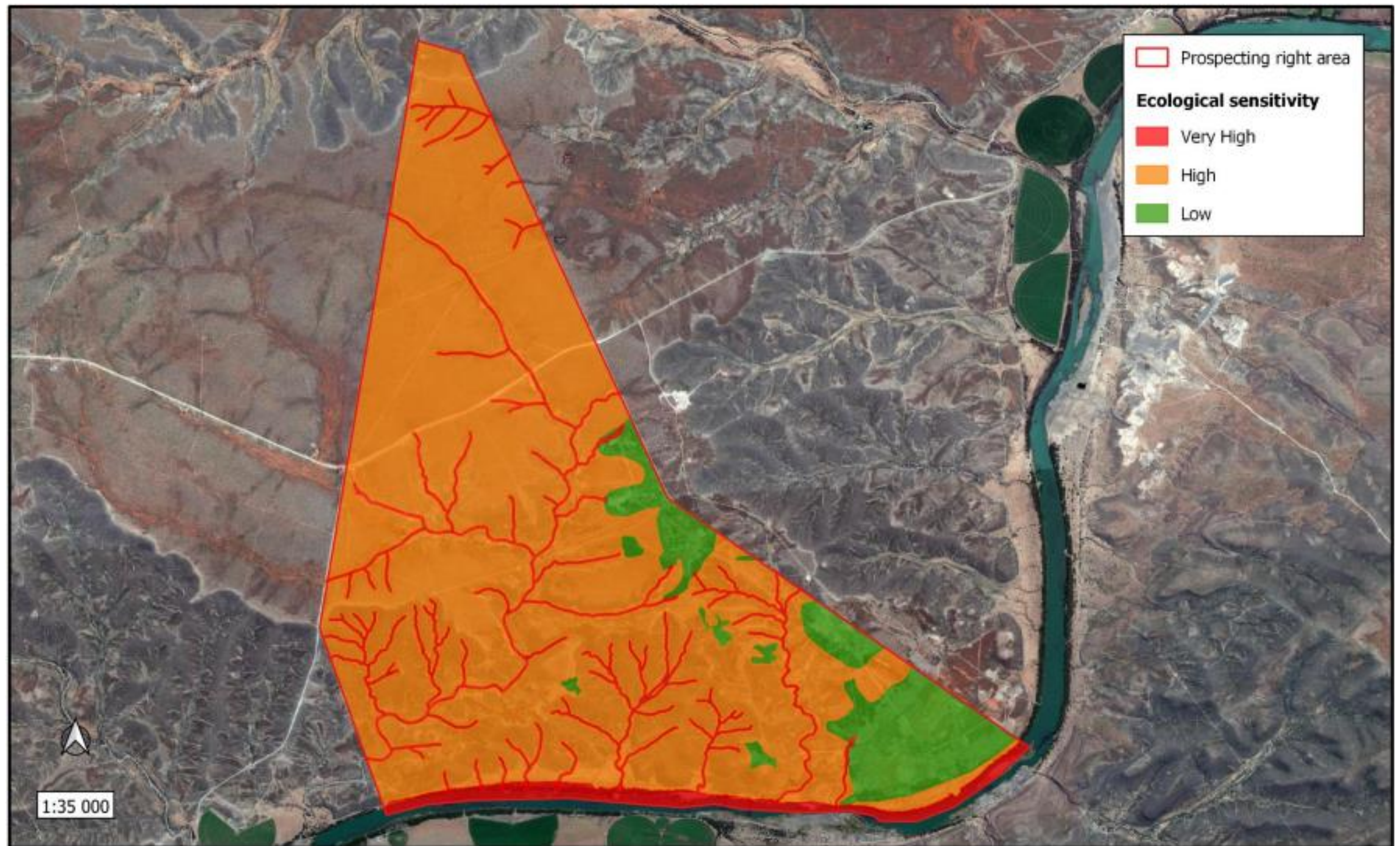


Figure 36. A sensitivity map for the Kimsa Mining prospecting area indicating areas of high (orange) and very high (red) sensitivity.

d) Description of impact management objectives including management statements

i) Determination of closure objectives (ensure that the closure objectives are informed by the type of environment described in 2.4 herein)

The main closure objectives of the Company's planned prospecting operation are:

- To restore the site to its current land capability in a sustainable manner.
- To prevent the sterilization of any diamond reserves.
- To prevent the establishment of any permanent structures or features.
- To manage and limit any impact to the surface and groundwater aquifers in such a way that an acceptable water quality and yield can still be obtained when a closure certificate is issued.
- To establish a stable and self-sustainable vegetation cover.
- To limit and rehabilitate any erosion features and prevent any permanent impact to the soil capability.
- To limit and manage the visual impact of the prospecting activities.
- To safeguard the safety and health of humans and animals on the site.
- To close the prospecting operation efficiently, cost effectively and in accordance with Government Policy.

The key aim decommissioning and closure is to ensure that all the significant impacts are ameliorated. All rehabilitated areas should be left in a stable, self-sustainable state. Proof of this should be submitted at closure. Specific objectives include:

Rehabilitation of infrastructure areas

The objectives for the removal of infrastructure and the subsequent rehabilitation of the areas they occupied include:

- To ensure that infrastructure identified for removal is successfully demolished and removed.
- To ensure that infrastructure identified to remain after prospecting closure is maintained until the issue of a closure certificate.
- The removal, decommissioning and disposal of all prospecting infrastructure, will comply with all conditions contained in the MPRDA. To this end, decommissioning and rehabilitation of all infrastructure areas will follow the following principles:
 - The plant and associated disused infrastructure will be dismantled or demolished. Any building foundations will be removed and land exposed to the demolition and dismantling of infrastructure and all other disturbed land will be rehabilitated.
 - Rubble will be disposed of at a suitable site. The site will be selected in consultation with DENC.

- Any surface water management infrastructure will be maintained to ensure they are stable and functional.
- Just before closure, when disturbed land has been rehabilitated and erosion is controlled by vegetation cover, all disused surface water management facilities will be decommissioned.

Mine Residue Dump

The objectives pertaining to the effective management and rehabilitation of the Mine Residue Dump include:

- To ensure that the Mine Residue Dump deposits are stable and that there is an acceptably low risk of failure of these deposits during the decommissioning phase and following mine closure; To establish self-sustainable vegetation cover on the Mine Residue dump so that the visual impact of the Mine Residue dump is improved and in order to prevent erosion.

Management principles pertaining to Mine Residue dump include:

- The Mine Residue dump/s will continuously be inspected by a suitable qualified professional engineer to ensure their stability. If they are unstable, the appropriate remedial measures will be implemented.
- Inspection and monitoring should continue until a suitable qualified profession engineer has confirmed the long-term stability of the Mine Residue dump.
- Any infrastructure or facilities that serve the Mine Residue dump will be maintained to ensure that they are both stable and functional.

Maintenance

The necessary agreements and arrangement will be made by the Kimswa Mining prospecting operation to ensure that all natural physical, chemical and biological processes for which a closure condition were specified are monitored until they reach a steady state or for three (3) years after closure or as long as deemed necessary at the time.

- Such processes include erosion of the rehabilitated areas, Residue dump, rehabilitated surfaces, surface water drainage, air quality, surface water quality, ground water quality, vegetative re-growth, weed encroachment.
- The closure plan will be reviewed yearly.
- Rehabilitation of the land will be maintained until a closure certificate is granted or until the land use is regarded as sustainable.
- All rehabilitated areas will be monitored and maintained until such time as required to enable the prospecting activity to apply for closure of these different areas.

Performance assessments

As per the MPRDA and associated Regulations, as well as NEMA and associated Regulations, this Environmental Management Programme will be continually assessed in terms of its appropriateness and adequacy. In order to achieve this, the Kimsa Mining prospecting operation will undertake the following:

- Implement the necessary monitoring programmes, as discussed as part of this EMPR;
- Conduct performance assessments of this EMPR biennially; and
- Compile and submit the afore-mentioned performance assessment reports to the DMR. The frequency of the performance assessments will be biennially. An independent and competent person will undertake all performance assessments.

Decommissioning and closure objectives

The key aim decommissioning and closure is to ensure that all the significant impacts are ameliorated. All rehabilitated areas will be left in a stable, self-sustainable state. Proof of this will be submitted at closure. Specific objectives include:

- To identify potential post-closure land uses in consultation with the surrounding land owners and land users. This should be done during the operational phase of the prospecting operation;
- Rehabilitate disturbed land to a state suitable for its post-closure uses;
- Rehabilitate disturbed land and mine residue deposits to a state that facilitates compliance with applicable environmental quality objectives;
- Keep relevant authorities informed of the progress of the decommissioning phase;
- Submit monitoring data to the relevant authorities;
- Maintain required pollution control facilities and rehabilitated land until closure.

Negative economic impacts

The objective is to alleviate the negative socio-economic impacts that will result from mine closure. Management principles to achieve this include:

- The Kimsa Mining prospecting operation will undertake a carefully planned step-wise decommissioning process.
- Closure planning will form an integral part of prospect planning.
- Strategies for sustainable development have been and will continue to be developed by the project in collaboration with district and local authorities, local businesses and other interested parties. Early warning of impending closure will be given to IAPs.
- In conjunction with long-term closure planning, the operation will actively participate in regional and local planning to enhance the economic benefits of the project through development of alternative forms of income generation.

- The Kimsa Mining prospecting operation will initiate and participate in regional planning exercises that will mitigate the impacts of closure of the operation, the local and regional economies and associated abandonment of community infrastructures surrounding the prospecting activities.

ii) The process for managing any environmental damage, pollution, pumping and treatment of extraneous water or ecological degradation as a result of undertaking a listed activity

There won't be a need for this, as based on the specialist reports. No pitting or trenching will go deep enough to encounter any groundwater.

iii) Potential risk of Acid Mine Drainage (Indicate whether or not the mining can result in acid mine drainage)

No potential risk for Acid Mine Drainage exists.

iv) Steps taken to investigate, assess, and evaluate the impact of acid mine drainage

Not applicable, there is no potential risk of acid mine drainage.

v) Engineering or mine design solutions to be implemented to avoid or remedy acid mine drainage

Not applicable, there is no potential risk of acid mine drainage.

vi) Measures that will be put in place to remedy any residual or cumulative impact that may result from acid mine drainage

There is no residual or cumulative impact that may result from acid mine drainage.

vii) Volumes and rate of water use required for the mining, trenching or bulk sampling operation

The only activity relating to the cost of water in the prospecting operation relates to dust suppression in the prospecting area and on the roads when hauling and transporting material to the processing plant on the farms as part of the rehabilitation process.

It must however be noted that the water supply to the activities will be sourced from the Orange River. The necessary Water Use Licence will be applied for.

viii) Has a water use licence been applied for?

A Water use Licence application (WULA) will be prepared and submitted as soon as the EIA EMP has been submitted as this document and the Right is a minimum requirement for the application.

ix) Impact to be mitigated in their respective phases

Measure to rehabilitate the environment affected by the undertaking of any listed activity

ACTIVITY Whether listed or not listed. (E.g. Excavations, blasting, stockpiles, discard dumps or dams, Loading, hauling and transport, Water supply dams and boreholes, accommodation, offices, ablution, stores, workshops, processing plant, storm water control, berms, roads, pipelines, power lines, conveyors, etc... etc... etc.).	PHASE of operation in which activity will take place. State; Planning and design, Pre-Construction, Construction, Operational, Rehabilitation, Closure, Post closure.	SIZE AND SCALE of disturbance (volumes, tonnages and hectares or m²)	MITIGATION MEASURES (describe how each of the recommendations in herein will remedy the cause of pollution or degradation and migration of pollutants)	COMPLIANCE WITH STANDARDS (A description of how each of the recommendations herein will comply with any prescribed environmental management standards or practices that have been identified by Competent Authorities)	TIME PERIOD FOR IMPLEMENTATION Describe the time period when the measures in the environmental management programme must be implemented Measures must be implemented when Required. With regard to Rehabilitation specifically this must take place at the earliest opportunity. .With regard to Rehabilitation, therefore state either:-.. Upon cessation of the individual activity or. Upon the cessation of mining, bulk sampling or alluvial diamond prospecting as the case may be.
Ablution facilities Chemical toilets	Construction Commissioning Operational Decommissioning Closure	Chemical toilets for 30m²	Maintenance of chemical toilets Removal of chemical toilets upon closure		Removal of chemical toilets upon closure of the Prospecting Right.
Clean & Dirty water systems: Berms	Construction Commissioning Operational Decommissioning Closure	This area also includes the re-fuel and lubrication station, wash bay and office area. Due	Maintenance of berms and trenches Oil traps used in relevant areas. Drip trays used.		Upon cessation of the individual activity (continuous rehabilitation)

		to the nature of activity in this area, lining of this catchment dam is proposed. The storage water will be used for prospecting activities for example dust suppression, prospecting process, wash bay, etc.	Immediately clean hydrocarbon spill.		
Fuel Storage facility (Diesel tanks)	Construction Commissioning Operational Decommissioning Closure	Concrete, bricks, and steel	Maintenance of diesel tanks and bund walls. Oil traps Drip tray at re-fuelling point Immediately clean hydrocarbon spill.		Removal of diesel tanks upon closure of Prospecting Right.
Prospecting Area.	Commissioning Operational Decommissioning Closure	Provision is made for a maximum footprint (at full production) of 20 hectares at any one time.	No dumping of materials prior to approval by exploration geologist; Proper planning of excavations Access control Dust control and monitoring		Upon cessation of the individual activity (continuous rehabilitation)

			Noise control and monitoring Continuous rehabilitation Stormwater run-off control Immediately clean hydrocarbon spill Drip trays Dump control and monitoring Erosion control		
Salvage yard (Storage and laydown area)	Construction Commissioning Operational Decommissioning Closure	No construction material, area to be levelled with a grader and fenced with a gate and access control	Access control Maintenance of fence Storm water run-off control Immediately clean hydrocarbon spill		Removal of fence around salvage yard and ripping of salvage yard area upon closure of the prospecting right.
Residue Stockpile area	Commissioning Operational Decommissioning Closure	Provision is made for a maximum footprint (at full production) of 0.02ha for the stockpile area at any one time.	Dust control and monitoring Noise control and monitoring Drip trays Storm water run-off control. Immediately clean hydrocarbon spills. Rip disturbed areas to allow re-growth of vegetation cover		Ripping of stockpile area upon closure of prospecting right.

Waste disposal site (domestic and industrial waste):	Construction Commissioning Operational Decommissioning Closure	5m x 10m = 50m ²	Storage of Waste within receptacles Storage of hazardous waste on concrete floor with bund wall Removal of waste on regular intervals		Removal of waste receptacles, breaking and removal of rubble from the concrete floors and bund walls upon closure of prospecting right.
Roads (both access and haulage road on the mine site):	Construction Commissioning Operational Decommissioning Closure	Additional mine haul road	Maintenance of roads Dust control and monitoring Noise control and monitoring Speed limits Storm water run-off control Erosion control Immediately clean hydrocarbon spills Rip disturbed areas to allow re-growth of vegetation cover		Upon cessation of the individual activity (continuous rehabilitation) Ripping of roads upon closure of the prospecting right.
Workshop and Wash bay	Construction Commissioning Operational Decommissioning Closure	500m ² Concrete and Steel	Concrete floor with oil/water separator Storm water run-off control Immediately clean hydrocarbon spills		Removal of wash bay equipment, breaking and removal of rubble from the concrete floors and bund walls upon closure of prospecting right
Water distribution Pipeline	Construction Commissioning Operational Decommissioning	HDPE Pipes	Maintain water pipeline and structures		Removal of pipeline upon closure of the prospecting right.

	Closure				
Water tanks:	Construction Commissioning Operational Decommissioning Closure	3m X 3m = 9m ²	Maintain water tanks and structures		Removal of water tank and steel structure upon closure of the prospecting right.

e) Impact Management Outcomes

(A description of impact management outcomes, identifying the standard of impact management required for the aspects contemplated in paragraph())

ACTIVITY Whether listed or not listed.	POTENTIAL IMPACT (e.g. dust, noise, drainage surface disturbance, fly rock, surface water contamination, groundwater, contamination, air pollution)....	ASPECTS AFFECTED	PHASE In which impact is anticipated (e.g. construction, commissioning, operational, Decommissioning, closure, post closure)	MITIGATION TYPE (modify, remedy, control or stop) through (e.g. noise control measures, storm water control, dust control, rehabilitation, design measures, blasting controls, avoidance, relocation, alternative activity	STANDARD TO BE ACHIEVED (impact avoided, noise levels, dust levels, rehabilitation standards, end use objectives) etc.
Ablution facilities Chemical Toilets	Soil contamination Possible Groundwater contamination	Soil Groundwater	Construction Commissioning Operational Decommissioning Closure	Maintenance of sewage facilities on a regular basis. Removal of chemical toilets on closure	Minimize the potential for a chemical spill on soil, which could infiltrate to groundwater.
Clean & Dirty water systems:	Surface disturbance Groundwater Contamination Soil contamination Surface water contamination	Soil Groundwater Surface Water	Construction Commissioning Operational Decommissioning Closure	It will be necessary to divert storm water around dump areas by construction of a cut-off berm that will prevent surface run-off into the prospecting area. The re-vegetation of disturbed areas is important to prevent erosion and improve the rate of infiltration. Erosion channels that may	Safety ensured. Minimize potential for hydrocarbon spills to infiltrate into groundwater. Rehabilitation standards and closure objectives to be met.

				<p>develop before vegetation has established should be rehabilitated by filling, levelling and re-vegetation where topsoil is washed away.</p> <p>Maintenance of trenches Monitoring and maintenance of oil traps in relevant areas. Drip trays used. Immediately clean hydrocarbon spill.</p> <p>Linear infrastructure such as roads and pipelines will be inspected at least monthly to check that the associated water management infrastructure is effective in controlling erosion.</p> <p>Maintain a buffer zone of 100 m around the streams. Note that these buffer zones are essential to ensure healthy functioning and maintenance of wetland.</p>	
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				Effluents and waste should be recycling and re-use as far as possible.	
Fuel Storage facility (Diesel tanks)	Groundwater contamination Removal and disturbance of vegetation cover and natural habitat of fauna Soil contamination Surface disturbance	Soil Groundwater Surface water	Construction Commissioning Operational Decommissioning Closure	Maintenance of Diesel tanks and bund walls. Oil traps Drip tray at re-fuelling point. Refuelling must take place in well demarcated areas and over suitable drip trays to prevent soil pollution. Spill kits to clean up accidental spills from earthmoving machinery must be well-marked and available on site. Workers must undergo induction to ensure that they are prepared for rapid clean-up procedures. All facilities where dangerous materials are stored must be contained in a bund wall. Vehicles and machinery should be regularly serviced and maintained.	Minimize potential for hydrocarbon spills to infiltrate into groundwater. Rehabilitation standards and closure objectives to be met.

Prospecting Area	Dust Noise Removal and disturbance of vegetation cover and natural habitat of fauna Soil contamination Surface disturbance Surface water contamination	Air quality Fauna Flora Groundwater Noise and vibration Soil Surface Water Topography Safety	Commissioning Operational Decommissioning Closure	Access control Dust control and monitoring Noise and vibration control and monitoring Continuous rehabilitation Storm water run-off control Immediately clean hydrocarbon spill Drip trays Dump stability control and monitoring Erosion control Noise control Well maintained equipment Selecting equipment with lower sound power levels; Taking advantage during the design stage of natural topography as a noise buffer; Develop a mechanism to record and respond to complaints. Maintain a buffer zone of 100 m around the streams. Note that these buffer zones are essential to ensure healthy	Safety ensured. Dust levels minimized Minimize potential for hydrocarbon spills to infiltrate into groundwater Noise levels minimized Rehabilitation standards and closure objectives to be met. Erosion potential minimized.
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				<p>functioning and maintenance of wetland.</p> <p>Prospecting activities must be planned, where possible in order to encourage faunal dispersal and should minimise dissection or fragmentation of any important faunal habitat type.</p> <p>The extent of the prospecting area should be demarcated on site layout plans (preferably on disturbed areas or those identified with low conservation importance). Appointment of a full-time ECO must render guidance to the staff and contractors with respect to suitable areas for all related disturbance, and must ensure that all contractors and workers undergo Environmental Induction prior to commencing with work on site.</p> <p>All those working on site must undergo</p>	
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				<p>environmental induction with regards to fauna and in particular awareness about not harming or collecting species such as snakes, tortoises and owls which are often persecuted out of superstition.</p> <p>All those working on site must be educated about the conservation importance of the fauna and flora occurring on site.</p> <p>The environmental induction should occur in the appropriate languages for the workers who may require translation.</p> <p>Reptiles and amphibians that are exposed during the clearing operations should be captured for later release or translocation by a qualified expert.</p> <p>Employ measures that ensure adherence to the speed limit.</p> <p>Careful consideration is required when planning the placement for</p>	
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				<p>stockpiling topsoil and the creation of access routes in order to avoid the destruction of habitats and minimise the overall prospecting footprint. The Footprint areas of the prospecting activities must be scanned for Red Listed and protected plant species prior to prospecting; Snares & traps removed and destroyed; and Maintenance of firebreaks.</p> <p>It will be necessary to divert storm water around dump areas by construction of a temporary berm that will prevent surface run-off into the drainage lines.</p> <p>The re-vegetation of disturbed areas is important to prevent erosion and improve the rate of infiltration. Erosion channels that may develop before vegetation has established should be</p>	
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				rehabilitated by filling, levelling and re-vegetation where topsoil is washed away.	
Salvage yard (Storage and laydown area)	Groundwater contamination Removal and disturbance of vegetation cover and natural habitat of fauna Soil contamination Surface disturbance Surface water contamination	Fauna Flora Groundwater Soil Surface Water	Construction Commissioning Operational Decommissioning Closure	Access Control Maintenance of fence Storm water run-off control Immediately clean hydrocarbon spill	Minimize potential for hydrocarbon spills to infiltrate into groundwater Rehabilitation standards and closure objectives to be met. Erosion potential minimized.
Gravel Stockpile area	Dust Noise Removal and disturbance of vegetation cover and natural habitat of fauna Surface disturbance	Air Quality Fauna Flora Noise Soil Surface Water	Commissioning Operational Decommissioning Closure	Dust Control and monitoring Noise control and monitoring Drip trays Storm water run-off control Immediately clean hydrocarbon spills Rip disturbed areas to allow re-growth of vegetation cover Noise control	Dust levels minimized Minimize potential for hydrocarbon spills to infiltrate into groundwater Noise levels minimized Rehabilitation standards and closure objectives to be met. Erosion potential minimized.

				Well maintained equipment Selecting equipment with lower sound power levels; Taking advantage during the design stage of natural topography as a noise buffer; Develop a mechanism to record and respond to complaints.	
Waste disposal site (domestic and industrial waste):	Groundwater contamination Contamination of soil Surface water contamination	Groundwater Soil Surface water	Construction Commissioning Operational Decommissioning Closure	Storage of Waste within receptacles Storage of hazardous waste on concrete floor with bund wall Removal of waste on regular intervals	Minimize potential for hydrocarbon spills to infiltrate into groundwater Noise levels minimized Rehabilitation standards and closure objectives to be met.
Roads (both access and haulage road on the prospecting site):	Dust Noise Removal and disturbance of vegetation cover and natural habitat of fauna Soil contamination Surface disturbance	Air quality Fauna Flora Noise and vibration Soil Surface water	Construction Commissioning Operational Decommissioning Closure	Maintenance of roads Dust control and monitoring Noise control and monitoring Speed limits Storm water run-off control Erosion control Immediately clean hydrocarbon spills	Dust levels minimized Minimize potential for hydrocarbon spills to infiltrate into groundwater Noise levels minimized Rehabilitation standards and closure objectives met. Erosion potential minimized.

				<p>Rip disturbed areas to allow re-growth of vegetation cover</p> <p>Noise control</p> <p>Well maintained equipment</p> <p>Selecting equipment with lower sound power levels;</p> <p>Taking advantage during the design stage of natural topography as a noise buffer;</p> <p>Develop a mechanism to record and respond to complaints.</p> <p>Linear infrastructure such as roads and pipelines will be inspected at least monthly to check that the associated water management infrastructure is effective in controlling erosion.</p>	
Workshop and Wash bay	<p>Removal and disturbance of vegetation cover and natural habitat of fauna</p> <p>Soil contamination</p>	<p>Groundwater</p> <p>Soil</p> <p>Surface water</p>	<p>Construction</p> <p>Commissioning</p> <p>Operational</p> <p>Decommissioning</p> <p>Closure</p>	<p>Concrete floor with oil/water separator</p> <p>Storm water run-off control</p> <p>Immediately clean hydrocarbon spills</p>	<p>Minimize potential for hydrocarbon spills to infiltrate into groundwater</p> <p>Noise levels minimized</p> <p>Rehabilitation standards and closure objectives to be met.</p>

					Erosion potential minimized.
Water distribution Pipeline	Surface disturbance	Fauna Flora Surface Water	Construction Commissioning Operational Decommissioning Closure	Monitor pipeline for water leaks Maintenance of pipeline Linear infrastructure such as roads and pipelines will be inspected at least monthly to check that the associated water management infrastructure is effective in controlling erosion.	Rehabilitation standards and closure objectives to be met. Erosion potential minimized.
Water tanks:	Surface disturbance	Fauna Flora Surface Water	Construction Commissioning Operational Decommissioning Closure	Maintain water tanks and structures	Safety ensured. Rehabilitation standards and closure objectives to be met.

f) Impact Management Actions

(A description of impact management actions, identifying the manner in which the impact management objectives and outcomes contemplated in paragraph (c)

ACTIVITY Whether listed or not listed.	POTENTIAL IMPACT (e.g. dust, noise, drainage surface disturbance, fly rock, surface water contamination, groundwater, contamination, air pollution)...	MITIGATION TYPE (modify, remedy, control or stop) through (e.g. noise control measures, storm water control, dust control, rehabilitation, design measures, blasting controls, avoidance, relocation, alternative activity	TIME PERIOD FOR IMPLEMENTATION Describe the time period when the measures in the environmental management programme must be implemented. Measures must be implemented when required. With regard to Rehabilitation specifically this must take place at the earliest opportunity. With regard to Rehabilitation, therefore state either:- Upon cessation of the individual activity or Upon the cessation of mining, bulk sampling or diamond prospecting as the case may be.	COMPLIANCE WITH STANDARDS (A description of how each of the recommendations in 2.11.6 read with 2.12 and 2.15.2 herein will comply with any prescribed environmental management standards or practices that have been identified by Competent Authorities)
Ablution Facilities Chemical Toilets.	Soil contamination Groundwater contamination	Maintenance of sewage facilities on a regular basis. Removal of facility on closure	Removal of facility upon closure of the Prospecting Right.	The following must be placed at the site and is applicable to all activities: <ul style="list-style-type: none"> • Relevant Legislation; • Acts; • Regulations • COP's • SOP's Management and staff must be trained to understand the

				<p>contents of these documents and to adhere thereto.</p> <ul style="list-style-type: none"> • Environmental Awareness training must be provided to employees. • The operation must have a rehabilitation and closure plan. • Management and staff must be trained to understand the contents of these documents, and to adhere thereto. <p>Annual performance Assessment Reports and quantum Calculations must be done to ensure that the operation adheres to the contents of the EIA and EMP documents.</p>
Clean & Dirty water systems: Berms	<p>Surface disturbance</p> <p>Groundwater Contamination</p> <p>Soil contamination</p> <p>Surface water contamination</p>	<p>It will be necessary to divert storm water around prospecting areas by construction of a berm that will prevent surface run-off into the prospecting area.</p> <p>The re-vegetation of disturbed areas is important to prevent erosion and improve the rate of infiltration. Erosion channels that may develop before vegetation has established</p>	<p>Upon cessation of the individual activity (continuous rehabilitation)</p> <p>Levelling of stormwater berms upon closure of Prospecting Right</p>	<p>The following must be placed at the site and is applicable to all activities:</p> <ul style="list-style-type: none"> • Relevant Legislation; • Acts; • Regulations • COP's • SOP's

		<p>should be rehabilitated by filling, levelling and re-vegetation where topsoil is washed away.</p> <p>Maintenance of trenches Monitoring and maintenance of oil traps in relevant areas. Drip trays used. Immediately clean hydrocarbon spill.</p> <p>Linear infrastructure such as roads and pipelines will be inspected at least monthly to check that the associated water management infrastructure is effective in controlling erosion.</p> <p>Maintain a buffer zone of 100 m around the streams. Note that these buffer zones are essential to ensure healthy functioning and maintenance of wetland. confining works in specific area or season, restoration (and possibly enhancement) of disturbed areas, etc. Effluents and waste should be recycling and re-use as far as possible.</p>		<p>Management and staff must be trained to understand the contents of these documents and to adhere thereto.</p> <ul style="list-style-type: none"> • Environmental Awareness training must be provided to employees. • The operation must have a rehabilitation and closure plan. • Management and staff must be trained to understand the contents of these documents, and to adhere thereto. <p>Annual performance Assessment Reports and quantum Calculations must be done to ensure that the operation adheres to the contents of the EIA and EMP documents.</p>
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Fuel facility tanks)	Storage (Diesel)	<p>Groundwater contamination</p> <p>Removal and disturbance of vegetation cover and natural habitat of fauna</p> <p>Soil contamination</p> <p>Surface disturbance</p>	<p>Maintenance of Diesel tanks and bund walls.</p> <p>Oil traps</p> <p>Drip tray at re-fuelling point.</p> <p>Refuelling must take place in well demarcated areas and over suitable drip trays to prevent soil pollution.</p> <p>Spill kits to clean up accidental spills from earthmoving machinery must be well-marked and available on site.</p> <p>Workers must undergo induction to ensure that they are prepared for rapid clean-up procedures.</p> <p>All facilities where dangerous materials are stored must be contained in a bund wall.</p> <p>Vehicles and machinery should be regularly serviced and maintained.</p>	Removal of diesel car upon closure of Prospecting Right.	<p>The following must be placed at the site and is applicable to all activities:</p> <ul style="list-style-type: none"> • Relevant Legislation; • Acts; • Regulations • COP's • SOP's <p>Management and staff must be trained to understand the contents of these documents and to adhere thereto.</p> <ul style="list-style-type: none"> • Environmental Awareness training must be provided to employees. • The operation must have a rehabilitation and closure plan. • Management and staff must be trained to understand the contents of these documents, and to adhere thereto. <p>Annual performance Assessment Reports and quantum Calculations must be done to ensure that the operation adheres to the contents of the EIA and EMP documents.</p>
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Prospecting Area.	<p>Dust</p> <p>Noise</p> <p>Removal and disturbance of vegetation cover and natural habitat of fauna</p> <p>Soil contamination</p> <p>Surface disturbance</p> <p>Surface water contamination</p>	<p>Access control</p> <p>Dust control and monitoring</p> <p>Noise and vibration control and monitoring</p> <p>Continuous rehabilitation</p> <p>Storm water run-off control</p> <p>Immediately clean hydrocarbon spill</p> <p>Drip trays</p> <p>Dump stability control and monitoring</p> <p>Erosion control</p> <p>Noise control</p> <p>Well maintained equipment</p> <p>Selecting equipment with lower sound power levels;</p> <p>Taking advantage during the design stage of natural topography as a noise buffer;</p> <p>Develop a mechanism to record and respond to complaints.</p> <p>Maintain a buffer zone of 100 m around the streams. Note that these buffer zones are essential to ensure healthy functioning and maintenance of wetland. Effluents and waste should be recycling and re-use as far as possible.</p> <p>Prospecting activities must be planned, where possible in order</p>	<p>Upon cessation of the individual activity (continuous rehabilitation)</p>	<p>The following must be placed at the site and is applicable to all activities:</p> <ul style="list-style-type: none"> • Relevant Legislation; • Acts; • Regulations • COP's • SOP's <p>Management and staff must be trained to understand the contents of these documents and to adhere thereto.</p> <ul style="list-style-type: none"> • Environmental Awareness training must be provided to employees. • The operation must have a rehabilitation and closure plan. • Management and staff must be trained to understand the contents of these documents, and to adhere thereto. <p>Annual performance Assessment Reports and quantum Calculations must be done to ensure that the operation adheres</p>
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		<p>to encourage faunal dispersal and should minimise dissection or fragmentation of any important faunal habitat type. The extent of the prospecting area should be demarcated on site layout plans (preferably on disturbed areas or those identified with low conservation importance).</p> <p>Appointment of a full-time ECO must render guidance to the staff and contractors with respect to suitable areas for all related disturbance, and must ensure that all contractors and workers undergo Environmental Induction prior to commencing with work on site.</p> <p>All those working on site must undergo environmental induction with regards to fauna and in particular awareness about not harming or collecting species such as snakes, tortoises and owls which are often persecuted out of superstition. All those working on site must be educated about the conservation importance of the fauna and flora occurring on site.</p>		<p>to the contents of the EIA and EMPr documents.</p>
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		<p>The environmental induction should occur in the appropriate languages for the workers who may require translation.</p> <p>Reptiles and amphibians that are exposed during the clearing operations should be captured for later release or translocation by a qualified expert.</p> <p>Employ measures that ensure adherence to the speed limit.</p> <p>Careful consideration is required when planning the placement for stockpiling topsoil and the creation of access routes in order to avoid the destruction of habitats and minimise the overall prospecting footprint.</p> <p>The Footprint areas of the prospecting activities must be scanned for Red Listed and protected plant species prior to prospecting;</p> <p>Snares & traps removed and destroyed; and</p> <p>Maintenance of firebreaks.</p> <p>It will therefore be necessary to divert storm water around dump areas by construction of a berm that will prevent surface run-off into the drainage channels.</p>		
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		The re-vegetation of disturbed areas is important to prevent erosion and improve the rate of infiltration. Erosion channels that may develop before vegetation has established should be rehabilitated by filling, levelling and re-vegetation where topsoil is washed away.		
Salvage yard (Storage and laydown area)	<p>Surface Water contamination</p> <p>Groundwater contamination</p> <p>Removal and disturbance of vegetation cover and natural habitat of fauna</p> <p>Soil contamination</p> <p>Surface disturbance</p> <p>Surface water contamination</p>	<p>Access Control</p> <p>Maintenance of fence</p> <p>Storm water run-off control</p> <p>Immediately clean hydrocarbon spill</p>	Removal of fence around salvage yard and ripping of salvage yard area upon closure of the prospecting right.	<p>The following must be placed at the site and is applicable to all activities:</p> <ul style="list-style-type: none"> • Relevant Legislation; • Acts; • Regulations • COP's • SOP's <p>Management and staff must be trained to understand the contents of these documents and to adhere thereto.</p> <ul style="list-style-type: none"> • Environmental Awareness training must be provided to employees. • The operation must have a rehabilitation and closure plan.

				<ul style="list-style-type: none"> Management and staff must be trained to understand the contents of these documents, and to adhere thereto. <p>Annual performance Assessment Reports and quantum Calculations must be done to ensure that the operation adheres to the contents of the EIA and EMP documents.</p>
Stockpile area	<p>Surface Water contamination</p> <p>Removal and disturbance of vegetation cover and natural habitat of fauna</p> <p>Soil contamination</p> <p>Surface disturbance</p> <p>Surface water contamination</p>	<p>Dust Control and monitoring</p> <p>Noise control and monitoring</p> <p>Drip trays</p> <p>Storm water run-off control</p> <p>Immediately clean hydrocarbon spills</p> <p>Rip disturbed areas to allow re-growth of vegetation cover</p> <p>Noise control</p> <p>Well maintained equipment</p> <p>Selecting equipment with lower sound power levels;</p> <p>Develop a mechanism to record and respond to complaints.</p>	<p>Dust levels minimized</p> <p>Minimize potential for hydrocarbon spills to infiltrate into groundwater</p> <p>Noise levels minimized</p> <p>Rehabilitation standards and closure objectives to be met.</p> <p>Erosion potential minimized.</p>	<p>The following must be placed at the site and is applicable to all activities:</p> <ul style="list-style-type: none"> Relevant Legislation; Acts; Regulations COP's SOP's <p>Management and staff must be trained to understand the contents of these documents and to adhere thereto.</p> <ul style="list-style-type: none"> Environmental Awareness training must be provided to employees.

				<ul style="list-style-type: none"> The operation must have a rehabilitation and closure plan. Management and staff must be trained to understand the contents of these documents, and to adhere thereto. <p>Annual performance Assessment Reports and quantum Calculations must be done to ensure that the operation adheres to the contents of the EIA and EMP documents.</p>
Waste disposal site (domestic and industrial waste):	<p>Groundwater contamination</p> <p>Surface Water contamination</p> <p>Contamination of soil</p> <p>Surface water contamination</p>	<p>Storage of Waste within receptacles</p> <p>Storm water control</p> <p>Ground water monitoring</p> <p>Storage of hazardous waste on concrete floor with bund wall</p> <p>Removal of waste on regular intervals</p>	Removal of waste receptacles, breaking and removal of rubble from the concrete floors and bund walls upon closure of prospecting right.	<p>The following must be placed at the site and is applicable to all activities:</p> <ul style="list-style-type: none"> Relevant Legislation; Acts; Regulations COP's SOP's <p>Management and staff must be trained to understand the contents of these documents and to adhere thereto.</p>

				<ul style="list-style-type: none"> Environmental Awareness training must be provided to employees. The operation must have a rehabilitation and closure plan. Management and staff must be trained to understand the contents of these documents, and to adhere thereto. <p>Annual performance Assessment Reports and quantum Calculations must be done to ensure that the operation adheres to the contents of the EIA and EMP documents.</p>
Roads (both access and haulage road on the prospecting site):	Dust Surface Water contamination Groundwater contamination Noise Removal and disturbance of vegetation cover	Maintenance of roads Dust control and monitoring Noise control and monitoring Speed limits Storm water run-off control Erosion control Immediately clean hydrocarbon spills Rip disturbed areas to allow re-growth of vegetation cover Noise control Well maintained equipment Selecting equipment with lower sound power levels;	Upon cessation of the individual activity (continuous rehabilitation) Ripping of roads upon closure of the prospecting right.	<p>The following must be placed at the site and is applicable to all activities:</p> <ul style="list-style-type: none"> Relevant Legislation; Acts; Regulations COP's SOP's <p>Management and staff must be trained to understand the</p>

	<p>and natural habitat of fauna</p> <p>Soil contamination</p> <p>Surface disturbance</p>	<p>Develop a mechanism to record and respond to complaints.</p> <p>Linear infrastructure such as roads and pipelines will be inspected at least monthly to check that the associated water management infrastructure is effective in controlling erosion.</p>		<p>contents of these documents and to adhere thereto.</p> <ul style="list-style-type: none"> • Environmental Awareness training must be provided to employees. • The operation must have a rehabilitation and closure plan. • Management and staff must be trained to understand the contents of these documents, and to adhere thereto. <p>Annual performance Assessment Reports and quantum Calculations must be done to ensure that the operation adheres to the contents of the EIA and EMP documents.</p>
Workshop and Wash Bay	<p>Surface Water contamination</p> <p>Removal and disturbance of vegetation cover and natural habitat of fauna</p> <p>Soil contamination</p>	<p>Concrete floor with oil/water separator</p> <p>Storm water run-off control</p> <p>Immediately clean hydrocarbon spills</p>	<p>Removal of wash bay equipment, breaking and removal of rubble from the concrete floors and bund walls upon closure of prospecting right</p>	<p>The following must be placed at the site and is applicable to all activities:</p> <ul style="list-style-type: none"> • Relevant Legislation; • Acts; • Regulations • COP's • SOP's

				<p>Management and staff must be trained to understand the contents of these documents and to adhere thereto.</p> <ul style="list-style-type: none"> • Environmental Awareness training must be provided to employees. • The operation must have a rehabilitation and closure plan. • Management and staff must be trained to understand the contents of these documents, and to adhere thereto. <p>Annual performance Assessment Reports and quantum Calculations must be done to ensure that the operation adheres to the contents of the EIA and EMP documents.</p>
Water distribution Pipeline	Surface disturbance	<p>Monitor pipeline for water leaks</p> <p>Maintenance of pipeline</p> <p>Linear infrastructure such as roads and pipelines will be inspected at least monthly to check that the associated water management infrastructure is effective in controlling erosion.</p>	Removal of pipeline upon closure of the prospecting right.	<p>The following must be placed at the site and is applicable to all activities:</p> <ul style="list-style-type: none"> • Relevant Legislation; • Acts; • Regulations • COP's • SOP's

				<p>Management and staff must be trained to understand the contents of these documents and to adhere thereto.</p> <ul style="list-style-type: none"> • Environmental Awareness training must be provided to employees. • The operation must have a rehabilitation and closure plan. • Management and staff must be trained to understand the contents of these documents, and to adhere thereto. <p>Annual performance Assessment Reports and quantum Calculations must be done to ensure that the operation adheres to the contents of the EIA and EMP documents.</p>
Water tanks:	Surface disturbance	Maintain water tanks and structures	Removal of water tank and steel structure upon closure of the prospecting right.	<p>The following must be placed at the site and is applicable to all activities:</p> <ul style="list-style-type: none"> • Relevant Legislation; • Acts; • Regulations

				<ul style="list-style-type: none">• COP's• SOP's <p>Management and staff must be trained to understand the contents of these documents and to adhere thereto.</p> <ul style="list-style-type: none">• Environmental Awareness training must be provided to employees.• The operation must have a rehabilitation and closure plan.• Management and staff must be trained to understand the contents of these documents, and to adhere thereto. <p>Annual performance Assessment Reports and quantum Calculations must be done to ensure that the operation adheres to the contents of the EIA and EMP documents.</p>
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i) Financial Provision**(1) Determination of the amount of Financial Provision****(a) Describe the closure objectives and the extent to which they have been aligned to the baseline environment described under Regulation 22(2)(d) as described in 2.4 herein.**

The key aim of decommissioning and closure is to ensure that all the significant impacts are ameliorated and that the environment is returned to its original state, based on the baseline information, as far as is practically possible. Therefore, all rehabilitated areas should be left in a stable, self-sustainable state and proof of this should be submitted at closure.

The baseline environmental information is usually determined by reviewing all applicable information available for the site and the overall region. This information is gathered through a combination of on-site observations, spatial information and specialist baseline studies. Information regarding current land uses and existing biophysical environment gathered from interested and affected parties during the public consultation process are also taken into consideration when describing the baseline environment.

General closure objectives include the following:

- Adhere to all statutory and other legal requirements;
- Identify potential post-closure land uses in consultation with the future landowner, surrounding land owners and land users; well in advance, before closure and preferably during the operational phase of the operation;
- Remove, decommission and dispose all infrastructures, and ensure that these processed comply with all conditions contained in the MPRDA
- Rehabilitate disturbed land to a state suitable for its post-closure uses, and which are stable, sustainable and aesthetically acceptable on closure;
- Rehabilitate disturbed land and mine residue deposits to a state that facilitates compliance with applicable environmental quality objectives;
- Physically stabilise remaining structures to minimise residual risks;
- Ensure the health and safety of all stakeholders during closure and post closure and that future land users are not exposed to unacceptable risks;

- To alleviate the negative socio-economic impacts that will result from closure;
- Promote biodiversity and ecological sustainability as far as practically possible;
- Keep relevant authorities informed of the progress of the decommissioning phase;
- To ensure that all natural physical, chemical and biological processes for which a closure condition were specified are monitored until they reach a steady state, for two years after closure, or for as long as deemed necessary at the time and to submit such monitoring data to the relevant authorities;
- Maintain required facilities and rehabilitated land until closure.

(b) Confirm specifically that the environmental objectives in relation to closure have been consulted with landowner and interested and affected parties.

The process as described by NEMA for Environmental Authorisation was followed. See table 3 below for the identification of Interested and Affected Parties to be consulted with. The landowner, and or occupants and direct neighbours were consulted.

A copy of the draft Scoping Report (burned to disc) was be sent to all identified interested and affected parties on 14 September 2022. All Government Departments identified were also notified by registered letters. The surface owners also received a registered letter.

Notices was also placed on the gates at the entrance of the proposed site and on the gravel road on 08 September 2022 towards the site to invite any other interested parties to come forward and to register. Other notices were brought up at the library to inform the communities in the surrounding area of the proposed prospecting operation.

The draft Scoping Report was also placed at the Douglas public Library along with a notice to notify the public of the proposed prospecting operation as well as to provide access to the draft Scoping Report to the community.

Furthermore, an advert was placed in the DFA Newspaper on 9 September 2022 which invited any other interested or affected party to come forward and register.

The EIA EMP document was put on disc and was distributed to all the registered parties per registered mail during March 2023.

Consultation process:

Proof of consultation (attendance registers, minutes of meetings and response forms) is attached as Appendix '3'. The consultation process is ongoing

(c) Provide a rehabilitation plan that describes and shows the scale and aerial extent of the main mining activities, including the anticipated mining area at the time of closure.

The rehabilitation of land disturbed by the operation during the life of the Prospecting Right will be accompanied by ongoing monitoring of the environment, until a stable state is reached. The main objectives are to have an uncontaminated, rehabilitated and safe environment, and to restore the area and habitats to a condition acceptable for obtaining a closure certificate.

Final rehabilitation of the site is expected to be within 5 years after the right has been granted. Final rehabilitation will be executed systematically and will consist of the elements and procedures as listed below. More realistic closure elements will be fully determined by a Professional Mine Surveyor once the operation is active.

Dismantling of processing plant and related structures:

- The processing plant in total is expected to cover an area of **900m²**, of which all should be dismantled and removed. This includes related infrastructures, equipment, machinery, screening plant, and other items used during the processing activities, such as conveyor belts, pipelines and power lines.
- The topography should then be restored to its natural contours, and any compacted area should be ripped to a depth no deeper than 300 mm;
- The prepared surfaces should then be covered with 300 mm of topsoil or suitable growth medium, which includes a viable seed bank; in order to encourage restoration of natural vegetation.

Demolition of steel buildings and structures:

- All steel buildings and structures are expected to amount to **±500 m²**. These include mobile stores, workshops, offices, ablutions, water tanks, etc. Those in disuse and which cannot be sold, donated, or used for future purposes should be dismantled and removed or demolished.

- Any associated foundations associated with dismantled steel buildings and structures should also be demolished to 1 m below ground level;
- The topography should then be restored to its natural contours, and any compacted area should be ripped to a depth no deeper than 300 mm;
- The prepared surfaces should then be covered with 300 mm of topsoil or suitable growth medium, which includes a viable seed bank; in order to encourage restoration of natural vegetation.

Demolition of reinforced concrete buildings and structures

- All brick buildings and concrete structures are expected to amount to $\pm 0 \text{ m}^2$. These include French drains, wash bays, refuelling depots and concrete floors. Those in disuse and which cannot be donated or used for future purposes should be demolished.
- The foundations of these buildings should also be demolished and to a depth of 1 m below ground level;
- The topography should then be restored to its natural contours, and any compacted area should be ripped to a depth no deeper than 300 mm;
- The prepared surfaces should then be covered with 300 mm of topsoil or suitable growth medium, which includes a viable seed bank; in order to encourage restoration of natural vegetation.

Rehabilitation of access roads

- Mine roads in total, is expected to cover an area of $1\,500 \text{ m}^2$ (1,5 ha). After general site rehabilitation has been completed, all redundant roads should be ripped or ploughed.
- The prepared surfaces should then be covered with 300 mm of topsoil or suitable growth medium, which includes a viable seed bank; in order to encourage restoration of natural vegetation.

Demolition and rehabilitation of electrified railway lines

- There are no electrified railway lines associated with the Prospecting activities.

Demolition and rehabilitation of non-electrified railway lines

- There are no non-electrified railway lines associated with the Prospecting activities.

Demolition of housing and/or administration facilities

- There are no other housing or administration facilities associated with the Prospecting activities, other than those in the form of

mobile containers. These were however included in the section for demolition of steel buildings and structures.

Opencast rehabilitation including final voids and ramps

- Opencasts and ramps associated with the Prospecting activities are expected to cover ± 20 ha at any one time.
- In-filling of the pits should take place concurrently and by obtaining material from the closest adjacent excess material heaps;
- The topography should then be shaped to the natural contours;
- The prepared surfaces should finally be covered with 300 mm of topsoil or suitable growth medium, which includes a viable seed bank; in order to encourage restoration of natural vegetation.

Sealing of shafts, adits and inclines

- There are no shafts associated with the Prospecting activities.

Rehabilitation of overburden and spoils

- The total final overburden and spoils are estimated to amount to 0.6 ha and includes waste dumps as well as earth walls. Pre-planning should be conducted in order to decide the fate of these features. For example, if the material from these features will be used for in-filling, or if the features will remain after closure.
- The slopes of those features selected to remain after closure, should be downgraded to such an extent that they are not visually intrusive to the skyline after closure, and/or at least have an average outer slope of 1:3 (18°); or as predetermined by a specialist, depending on the type of material;
- The prepared surfaces should then be covered with 300 mm of topsoil or suitable growth medium, which includes a viable seed bank; in order to encourage restoration of natural vegetation, to ensure stability, improve the visual impact, and minimise erosion.

Rehabilitation of processing waste deposits and evaporation ponds with pollution potential

- No processing waste deposits and evaporation ponds with pollution potential are associated with the Prospecting activities.

Rehabilitation of processing waste deposits and evaporation ponds with no pollution potential

- The processing waste deposits on the Prospecting area is estimated to cover an area of $\pm 0,3$ ha. Pre-planning should be conducted in order to decide the fate of this feature. For example, if the material from these features will be used for in-filling, or if the features will remain after closure.

- The toe trenches should be backfilled by obtaining material from the closest adjacent heaps deemed appropriate for such purpose;
- The slopes of those features selected to remain after closure, should be downgraded to such an extent that they are not visually intrusive to the skyline after closure, and/or at least have an average outer slope of 1:3 (18°); or as predetermined by a specialist, depending on the type of material;
- For backfilled trenches the topography should be shaped to be in line with the natural contours, but where compaction occurred, the areas should be ripped to a depth no deeper than 300 mm;
- The prepared surfaces should then be covered with 300 mm of topsoil or suitable growth medium, which includes a viable seed bank; in order to encourage restoration of natural vegetation, to ensure stability, improve the visual impact, and minimise erosion.

Storm water management

Storm water runoff arising from the upper and outer slopes of the rehabilitated residue deposit should be managed to

- (1) prevent uncontrolled runoff from the residue deposit, which in turn creates surface erosion and resultant damage to the cover material and could also expose deposited material;
- (2) route the runoff arising from the rehabilitated residue deposit into the surrounding surface water drainage regime in a manner that would limit the creation of secondary erosion in the receiving surface water environment and/or possible damage to downstream surface infrastructure; and
- (3) allow for the control routing of the runoff collected on the rehabilitated residue deposit across cut-off, seepage or solution trenches provided to handle excess contaminated seepage from the residue deposit.

Rehabilitation of subsided areas

The EAP is not currently aware of any areas of subsidence on site. However, any potential for such occurrences should be actively investigated and should be included in the rehabilitation plan, if and when such areas are identified.

General surface rehabilitation

- Final surface rehabilitation of areas disturbed by prospecting and related activities should be aligned to the selected final land use. General surface rehabilitation encompasses the reinstatement of natural topography, the top soiling and the re-vegetation of all those areas where infrastructure have been dismantled and removed or demolished. It also includes any industrial waste or scrap material that need to be removed from site. The total area that will need

general surface rehabilitation at the time mine closure is estimated to be ± 1 ha.

River diversions

No river diversions are planned.

Fencing

It is not known at this stage if any fencing is planned.

Water management

No treatment of water will be necessary for the Prospecting activities.

Maintenance and aftercare

Maintenance and aftercare should be planned for two to three years after prospecting production have ceased and should include the following:

- Annual fertilising of rehabilitated areas.
- Monitoring of surface and subsurface water quality,
- Control of alien plants, and
- General maintenance, including rehabilitation of cracks and subsidence.

Specialist study

- A screening level risk assessment should be completed by a specialist environmental practitioner during the closure of the prospecting operation in order to ensure that all of the rehabilitation objectives have been met and that all of the potential risks have been eliminated and/or are controlled. This assessment should specifically emphasis on those risks relating to river disturbances, groundwater quality and slope stabilities, but should not neglect progress made in natural vegetation restoration or success in alien invasive eradications. The current average specialist fees are estimated at R 50 000.

(d) Explain why it can be confirmed that the rehabilitation plan is compatible with the closure objectives.

The rehabilitation plan was primarily designed with the closure objectives in mind and therefore it relates to all the various objectives as set out above in Section 1) g) 1) a) of this EMPR. In general, the main objectives are to have an uncontaminated, rehabilitated and safe environment, and to restore the prospecting area to a condition acceptable for obtaining a closure certificate. Each and every element in the rehabilitation plan was designed in order to meet these closure objectives.

- (e) Calculate and state the quantum of the financial provision required to manage and rehabilitate the environment in accordance with the applicable guideline.**

The current, preliminary mine closure and rehabilitation costs amounts to R 788 885 (Please see table 24 below for calculation).

- (g) Confirm that the financial provision will be provided as determined.**

It is hereby confirmed that the financial provision will be provided as determined.

Table 24: Financial Quantum

No.	Description	Unit	A	B	C	D	E=A*B*C*D
			Quantity	Master Rate	Multiplication factor	Weighting factor 1	Amount (Rands)
Remark:							
1	Dismantling of processing plant and related structures (including overland conveyors and powerlines)	m3	900	18,42	1	1,1	18235,8
2 (A)	Demolition of steel buildings and structures	m2	500	256,63	1	1,1	141146,5
2(B)	Demolition of reinforced concrete buildings and structures	m2	0	378,15	1	1,1	0
3	Rehabilitation of access roads	m2	1 500	2,29	1	1,1	3778,5
4 (A)	Demolition and rehabilitation of electrified railway lines	m	0	445,73	1	1,1	0
4 (A)	Demolition and rehabilitation of non-electrified railway lines	m	0	243,13	1	1,1	0
5	Demolition of housing and/or administration facilities	m2	0	513,26	1	1,1	0
6	Opencast rehabilitation including final voids and ramps	ha	5	261224,38	0,04	1,1	57469,3636
7	Sealing of shafts adits and inclines	m3	0	137,77	1	1,1	0
8 (A)	Rehabilitation of overburden and spoils	ha	0,6	179372,28	1	1,1	118385,7048
8 (B)	Rehabilitation of processing waste deposits and evaporation ponds (non-polluting potential)	ha	0,3	223404,93	1	1,1	73723,6269
8 (C)	Rehabilitation of processing waste deposits and evaporation ponds (polluting potential)	ha	0	648873,81	1	1,1	0
				1	1,1		
9	Rehabilitation of subsided areas	ha	0	150197,24	1	1,1	0
10	General surface rehabilitation	ha	1	142093,10	1	1,1	156302,41
11	River diversions	ha	0	142093,1	1	1,1	0
12	Fencing	m	0	162,08	1	1,1	0
13	Water management	ha	0	54027,79	1	1,1	0
14	2 to 3 years of maintenance and aftercare	ha	1	18909,73	1	1,1	20800,703
15 (A)	Specialist study	Sum	0			1,1	0
15 (B)	Specialist study	Sum	0			1,1	0
					Sub Total 1		589842,6083
1	Preliminary and General		35390,5565		weighting factor 2 1,05		37160,08432
2	Contingencies		58984,26083				58984,26083
					Subtotal 2		685986,95
					VAT (15%)		102898,04
					Grand Total		788885

Mechanisms for monitoring compliance with and performance assessment against the environmental management programme and reporting thereon, including

- g) Monitoring of Impact Management Actions**
- h) Monitoring and Reporting Frequency**
- i) Responsible persons**
- j) Time Period for Implementing Impact Management Actions**
- k) Mechanisms for Monitoring Compliance**

SOURCE ACTIVITY	IMPACTS REQUIRING MONITORING PROGRAMMES	FUNCTIONAL REQUIREMENTS FOR MONITORING	ROLES AND RESPONSIBILITIES (FOR THE EXECUTION OF THE MONITORING PROGRAMMES)	MONITORING AND REPORTING FREQUENCY and TIME PERIODS FOR IMPLEMENTING IMPACT MANAGEMENT ACTIONS
Topography	To minimise the reduction of land capability.	To ensure that rehabilitation post-prospecting slopes are stable, free draining and no slopes have an angle in excess of 20°.	Site Manager/ Environmentalists	Monitoring will be done on an <i>annual basis</i> to ensure that the levels and the slopes are in order.
Soil	To prevent soil pollution; To limit soil compaction; To curb soil erosion; and To reinstate a growth medium able to sustain plant life.	Soil depth and chemical composition will be tested and possible erosion damage will be assisted and rectified.	Site Manager/ Environmentalists	Monitoring will be done on an <i>annual basis</i> or after a heavy rain event.
Air Quality	To control the incidence of unacceptable levels of dust pollution on site.	To ensure that the mine minimizes dust omissions, so that dust does not become a nuisance for affected parties and a health hazard.	Site Manager/Foreman appointed SHE Consultant	Visual inspections will be done and managed by dust suppression by a water tanker. Quarterly tests will also be conducted by a Safety Health and Environmental Consultant and submitted to Mine Health and Safety for monitoring purposes.
Fauna	To minimise vegetation destruction in prospecting areas, and therefore a habitat for wildlife; and To eliminate poaching and the extermination of animal species within the boundaries of the study area as well as the surrounding areas.	To ensure that the species diversity and abundance is not significantly reduces.	Site Manager/ Environmentalists	Monitoring will be done at rehabilitated area on an <i>annually basis</i> to investigate species diversity and abundance.
Flora	To minimise the destruction of vegetation units; and To control invasion of exotic and invasive plant species.	To ensure that the rehabilitated areas become self-maintaining.	Site Manager/ Environmentalists	Monitoring will be done at the rehabilitated areas on a <i>twice a year basis</i> (mid-summer and mid-winter), where species diversity and vegetation cover will be investigated.
Noise and Vibration	To ensure that the legislated noise and ground vibration levels will be adhered to at all times.	The management objective will be to reduce any level of noise, shock and lighting that may have an effect on persons or animals, both inside the plant	The engineer during the construction phase and the responsible person (Engineering/	Quarterly reports on fall-out noise monitoring will be conducted as required by legislation.

	To control the incidence of unacceptable noise levels on site.	and that which may migrate outside the plant area.	Environmental Department) during the Operational phase of the project. The site engineer and independent qualified environmental noise and vibration specialist.	If any complaints are received from the public or state department regarding noise levels the levels will be monitored at prescribed monitoring points.
Surface Water	To conserve water; and To eliminate the contamination of run-off.	There are no sources in the vicinity of the mine. The non-perennial stream will be monitored by collecting surface water samples during the rainy season.	Site Manager/Water Supply	The Orange River is a perennial river. Monitoring will take place, by collecting surface water samples quarterly out of the Orange River.

l) Indicate the frequency of the submission of the performance assessment report

Auditing of compliance with environmental authorisation, the environmental management programme and the closure plan should be conducted biennially by an independent EAP and an Environmental Audit Report should be compiled in such a way that it meets the requirements in terms of Regulation 34 of the National Environmental Management Act 107 of 1998): Environmental Impact Assessment Regulation, 2014.

The rehabilitation plan should also be reviewed biennially in order to fulfil the requirements of Section 41(3) of the MPRDA and should be conducted by an independent EAP. Subsequently, an Annual Rehabilitation Plan should be developed to meet the various requirements set out in the National Environmental Management Act (No 107 of 1998) (NEMA) Regulations pertaining to the financial provision for prospecting, exploration, mining or production operations (as amended in 2015).

These reports should be submitted biennially to the Northern Cape DMR offices in Kimberley.

m) Environmental Awareness Plan

The objective of the environmental awareness plan is to ensure that:

- Training needs are identified and all personnel whose work may create a significant impact upon the environment have received appropriate training;
- All employees are aware of the impact of their activities
- Procedures are established and maintained to make appropriate employees aware of:
 - The significant environmental impacts (actual or potential) of their work activities and environmental benefits of improved personal performance,
 - Their roles and responsibilities in achieving conformance with environmental policies, procedures, and any implementation measures,
 - The potential consequences of departure from specified operating procedures.
- Personnel performing tasks, which can cause significant environmental impacts, are competent in terms of appropriate education, training and / or experience.

Environmental awareness will be part of the existing training and development plan. Key personnel with environmental responsibilities will be identified and the following principles will apply:

- Procedures will be developed to facilitate training of employees, on-site service providers and contractors;
- Environmental awareness will focus on means to enhance the ability of personnel and ensure compliance with the environmental requirements;

Top management will build awareness and motivate and reward employees for achieve environmental objectives;

- Environmental policies will be availed to prospecting employees and contractors;
- Environmental inductions will be conducted for employees, contractors and visitors;
- There will be an ongoing system of identifying training needs.

General environmental awareness training as part of the induction at the Kimsa Mining prospecting operations should focus on the following:

- General environmental awareness
- The mine policies and vision concerning environmental management
- Legal requirements
- Prospecting activities and their potential impacts
- Different management measures to manage identified impacts
- Mine personnel's role in implementing environmental management objectives and targets.

(1) Manner in which the applicant intends to inform his or her employees of any environmental risk which may result from their work.

It is the responsibility of management to ensure that all employees, contractors and visitors are trained to understand the impacts of their tasks on the environment and to reduce them wherever possible. Environmental awareness should be part of the existing training and development plan. Key personnel with environmental responsibilities should be identified and the following principles should be applied:

- Procedures should be developed to facilitate training of employees, on-site service providers and contractors;
- Environmental awareness should focus on means to enhance the ability of personnel and ensure compliance with the environmental requirements;
- Top management should build awareness and motivate and reward employees for achieving environmental objectives;
- There should be an ongoing system of identifying training needs.
- An environmental, health and safety induction programme should be provided to all employees, contractors and visitors prior to commencing work or entering the site, and they should sign acknowledgement of the induction. An attendance register and agenda/programme should be filed for each induction.
- A daily "toolbox talk" should be held prior to commencing work, which will include discussions on health, safety and environmental considerations. The toolbox talks should be led by the site manager or the appointed supervisor/s.
- Refresher training should also be given to permanent employees and long-term contractors on an annual basis, to ensure that all are competent to perform their

duties, thereby eliminating negative impacts on their safety, health and environment.

General environmental awareness training as part of the induction at the Kimsa Mining prospecting operation should focus on the following:

- General environmental awareness, which incorporates environmental, ecological and heritage elements;
- The mine policies and vision concerning environmental management;
- Legal requirements;
- Mine activities and their potential impacts;
- Different management measures to manage identified impacts;
- Mine personnel's role in implementing environmental management objectives and targets.

Environmental awareness topics to be covered in training should include:

- Natural resource management and conservation;
- Biodiversity awareness and conservation principles;
- Heritage resource awareness and preservation principles;
- Hazardous substance use and storage;
- Waste management; and
- Incident and emergency actions and reporting;

(2) Manner in which risks will be dealt with in order to avoid pollution or the degradation of the environment.

Environmental incident reporting will be a vital part of communication in order to deal with risks and ultimately avoid pollution or the degradation of the environment. Such communication should take place through the management, administrative and worker sectors of the operation, as well as contractors and visitors. Employees should be required to report any and all environmentally related problems, incidents and pollution, so that the appropriate mitigation actions can be implemented timeously. In the event of an environmental incident, the reporting procedure as indicated in the table below should be followed.

ENVIRONMENTAL INCIDENT REPORTING STRUCTURE	ACTIONS REQUIRED
Person causing or observing the incident	The first person causing or observing the incident shall report the incident to an immediate supervisor where the environmental incident is observed.
Line management in the relevant area of responsibility where the incident occurred	<p>Line management in the relevant area of responsibility where the incident occurred shall:</p> <ul style="list-style-type: none"> Investigate the incident and record the following information: <ul style="list-style-type: none"> - How the incident happened; - The reasons the incident happened; - How rehabilitation or clean up needs to take place; - The nature of the impact that occurred; - The type of work, process or equipment involved; - Recommendations to avoid future such incidents and/or occurrences; Inform the environmental manager/ECO and the Operations Manager on a daily basis of all incidents that were reported on site; Consult with the relevant department/person for recommendations on actions to be taken or implemented where appropriate (e.g. clean-ups). Assist the Environmental Manager and/or Operations Manager with applicable data in order to accurately capture the incident into the reporting database; Ensure that remediation measures are implemented as soon as possible.
Site managers	<p>The site managers shall:</p> <ul style="list-style-type: none"> Forward a copy of the incident form to other line managers; Forward a copy of the incident form to the Environmental manager/ECO;

	<ul style="list-style-type: none">• Inform the relevant department/person on a weekly basis of the incident by e-mail or by submitting a copy of the incident report. Once a High Risk Incident (any incident which results from a significant aspect and has the potential to cause a significant impact on the environment) occurred it must be reported immediately to the Environmental Manager and the Operations Manager by telephone or email to ensure immediate response/action.• Forward a copy of the completed Incident Reporting Form (and where applicable a copy of the incident investigation) to the relevant department/person.
Environmental manager/ECO	<p>The appointed environmental manager or ECO shall:</p> <ul style="list-style-type: none">• Complete an incident assessment form to assess what level of incident occurred;• Make recommendations for clean-up and/or appropriate alternate actions;• Enter actions necessary to remediate environmental impacts into the database in conjunction with the responsible line manager;• Enter the incident onto the database in order to monitor the root causes of incidents;• Include the reported incidents in an appropriate monthly/quarterly report;• Highlight all incidents for discussion at HSEC meetings.

n) Specific information required by the Competent Authority

(Among others, confirm that the financial provision will be reviewed annually)

According to Section 41 (3) of the MPRDA the holder of a prospecting right must annually assess (and revise, if necessary) the total quantum of environmental liability for the operation and ensure that financial provision is sufficient to cover the current liability (in the event of premature closure) as well as the end-of-operation liability.

An Annual Rehabilitation Plan should be developed to match the various requirements set out in the NEMA regulations pertaining to the financial provision for prospecting, exploration, mining or production operations (as amended in 2015).

An environmental audit report will be done biennially (every second year).

Officials in the DMR Regional Offices are required to assess, review and approve the quantum of financial provision submitted (that is, the monetary value of the financial provision that has been computed by the holder of a prospecting right, mining right or mining permit during the annual review) as being sufficient to cover the environmental liability at that time and for closure of the site at that time.

It is hereby confirmed that the financial provision shall be reviewed annually.

2) **UNDERTAKING**

The EAP herewith confirms

- a) the correctness of the information provided in the reports;
- b) the inclusion of comments and inputs from stakeholders and I&APs;
- c) the inclusion of inputs and recommendations from the specialist reports where relevant; and
- d) the acceptability of the project in relation to the finding of the assessment and level of mitigation proposed.



Signature of the Environmental Assessment Practitioner:

Wadala Mining and Consulting Pty Ltd

Name of Company:

Date: 6 March 2023

- END -