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 LISTTED ACTIVITIES THAT HAVE BEEN TRIGGERED BY APPLICATIONS IN TERMS OF THE MINERAL AND PETROLEUM RESOURCES DEVELOPMENT ACT, 2002 (MPRDA) (AS AMENDED)

NAME OF APPLICANT:	**Renaissance Resources (Pty) Ltd**
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FILE REFERENCE NUMBER SAMRAD: **(NC) 30/5/1/2/2/10202 MR**

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**
Tel No.:	**084 208 9088**
Fax No.:	**086 510 7120**
E-mail address:	roosthuizen950@gmail.com
Physical Address:	**Farm Oberon; Kimberley; 8301**
Postal Address:	**P.O. Box 110823, Hadisonpark; 8306**

ii) Appointed by:

Renaissance Resources (Pty) Ltd

iii) Expertise of the EAP

(1) The qualifications of the EAP

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 15 and Portion 23 of the farm Lanyon Vale no 376.** District: Hay Province: Northern Cape Extent: 4 346.5033 ha
Application area (Ha)	4346.5033 ha (Four thousand three hundred and fourty six comma five zero three three hectares.)
Magisterial district:	HAY
Distance and direction from nearest town	The application area is situated between three towns near Niekerkshoop (west south-west). The town Prieska is situated 91.7 km south south-west of the application area. Furthermore, the towns Griequatown and Douglas is situated 83.5 km north north east and 67.3 km east north-east from the proposed mine area respectively.
21 digit Surveyor General Code for each farm portion	15/Lanyonvale 376 - C03100000000037600015 23/Lanyonvale 376 - C03100000000037600023

c) Locality map

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

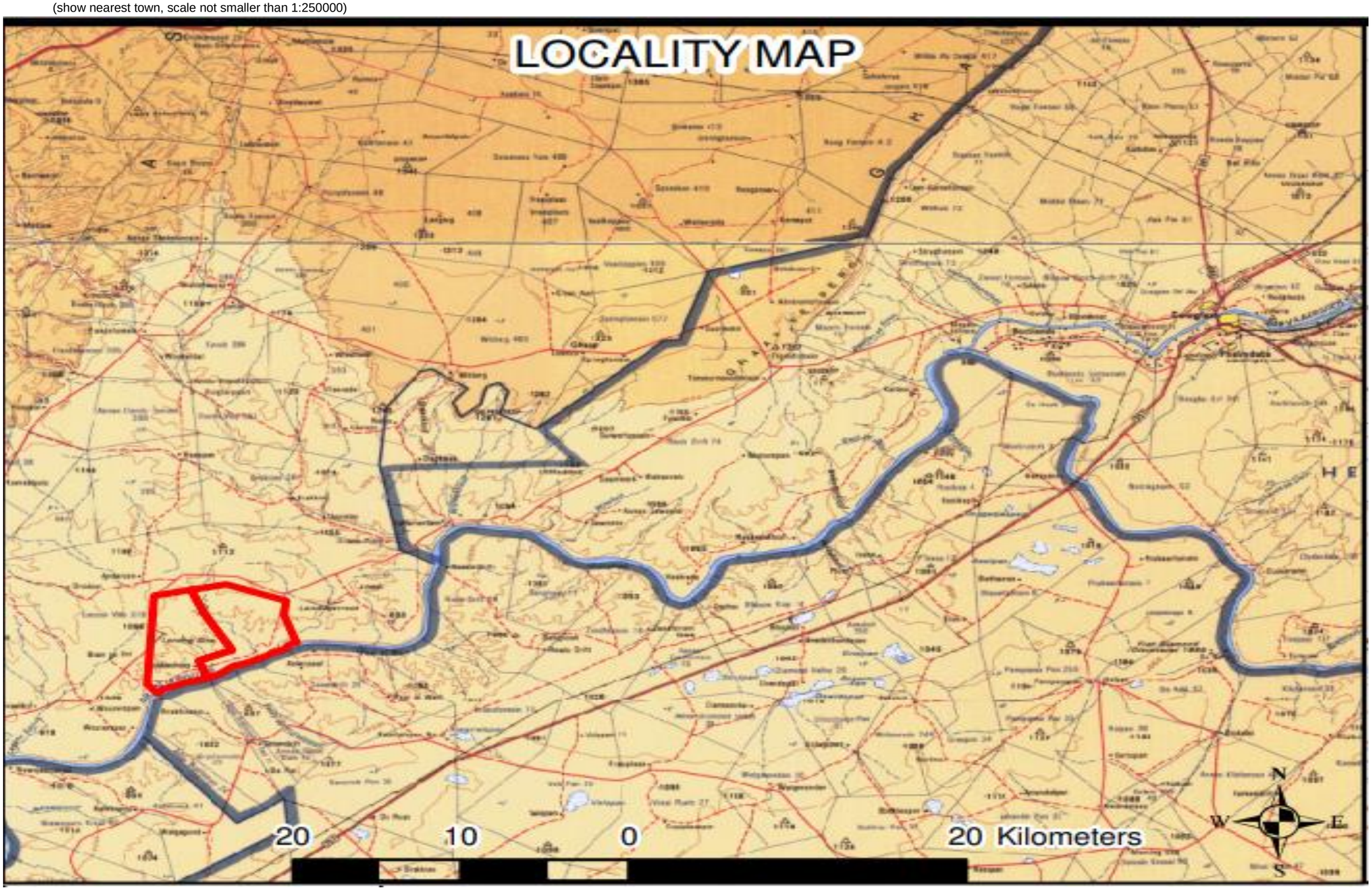

Figure 1. Locality Plan indicating the application areas with a RED figure.

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)

Figure 2. A map of the area indicating the overall location and extent of PROPOSED listed activities and main infrastructure on the mining site

i) Listed and specified activities

Table 1: Listed and Specified Activities

Name of activity (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.)	Aerial extent of the activity (Ha or m²)	Listed Activity (mark with an X where applicable or affected)	Applicable Listing Notice (GNR544, GNR545 or GNR546 / Not listed GNR983, GNR984, GNR985/ Not listed)
Activity 9: "The development of infrastructure exceeding 1000 metres in length for the bulk transportation of water or storm water- (vii) with an internal diameter of 0.36 metres or more; or (viii) with a peak throughput of 120 litres per second or more;	Water distribution Pipelines	X	NEMA: LN1 (GNR327)
Activity 12: "The development of— 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 system It is anticipated that the operation will establish storm water control berms and trenches to separate clean and dirty water on the mining site.	X	NEMA: LN1 (GNR327)
Activity 13: The development of facilities or infrastructure for the off-stream storage of water, including dams and reservoirs, with a	Possible storage dam and tanks	X	NEMA: LN1 (GNR327)

combined capacity of 50 000 cubic meters or more, unless such storage falls within the ambit of activity 16 in Listing Notice 2 of 2014			
Activity 19: The infilling or depositing of any material of more than 10 cubic metres into, or the dredging, **excavation, removal or moving** of soil, sand, shells, shell grit, pebbles or rock of more than 10 cubic metres from a watercourse;	Possible excavation within the 1:100-year flood line if approval is received from DWA	X	NEMA: LN1 (GNR327)
Activity 24: The development of a road- (ii) a road with a reserve wider than 13,5 meters or where no reserve exists where the road is wider than 8 metres.	Access and haul roads 10 000m²	X	NEMA: LN1 (GNR327)
Activity 17: Any activity including the operation of that activity which requires a **mining right** as contemplated in section 22 of the Mineral and Petroleum Resources Development Act, 2002 (Act No. 28 of 2002), including – (a) associated infrastructure, structures and earthworks, directly related to the extraction of a mineral resource; or (b) the primary processing of a mineral resource including winning, extraction, classifying, crushing, screening or washing; But excluding the secondary processing of a mineral resource, including the smelting, beneficiation, reduction, refining, calcining or gasification of the mineral resource in which case activity 6 in Listing notice 2 applies. The Renaissance operation directly relates to mining of a mineral resource (diamonds) and requires a mining right.	4 346.5033 ha	X	NEMA: LN2 (GNR325)
Activity 14: The development and related operation of facilities or infrastructure for the storage and handling of dangerous goods (fuel), where such storage occurs in containers with a combined capacity of 80 cubic metres or more but not exceeding 500 cubic meters.	2 X 23 000l diesel tanks = 46 000l with capacity for storing of old oils and new oils to be calculated	X	NEMA: LN1 (GNR327)
Activity 15: The clearance of an area of 20 hectares or more of indigenous vegetation, excluding where such clearance of indigenous vegetation is required for-	±350 ha	X	NEMA: LN2 (GNR325)

(i) the undertaking of a linear activity; or (ii) maintenance purposes undertaken in accordance with a maintenance management plan.			
Activity 12(g): 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 list, within an area that has been identified as critically endangered in the National Spatial Biodiversity Assessment 2004; ii. Within critical biodiversity areas identified in bioregional plans;	Lanyon Vale falls into Critical Biodiversity Area 1 and 2 as well as Ecological Support	X	NEMA: LN3 (GNR 324)
Activity 11: The establishment or reclamation of a residue stockpile or residue deposit resulting from activities which require **a mining right**, exploration right or production right in terms of the Mineral and Petroleum Resources Development Act, 2002 (Act No. 28 of 2002)	0.3ha The disposal of inert waste of 10 000 tons, excluding the disposal of such waste for the purposes of levelling and building which has been authorised by other legislation. The continuous establishment and reclamation of temporary stockpiles resulting from activities which require a mining right.		NEMWA: Category B (GNR 633)
Office complexes Temporary workshop facilities Storage facilities Concrete bund walls and diesel depots Ablution facilities Topsoil stockpiles	± 200 m2 ± 300 m2 ± 2 000 m2 ± 250 m2 ± 30 m2 ± 500 m2		Not Listed

Overburden stockpiles Water tanks	5 000 m2 3m x 3m = 9m² each		
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: • Small amounts of low-level hazardous waste in suitable receptacles. • Domestic waste. • Industrial waste.	15m x 30m = 450m²		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)

Basic overview of the mining method

The following is a description of a typical South African alluvial diamond mining operation, which is also being utilized by Renaissance Resources (Pty) Ltd at the Lanyon Vale operation. The mining method being employed is a strip-mining process with oversize material from the gravel scalping and the tailings from the plant, being used as backfill material prior to final rehabilitation.

Gravels are excavated, loaded onto a vibrating grizzley or scalping screen and the +32 mm oversize material is discarded back into the open pit (about 55% reduction). The screen will be moved adjacent to each pit. Once the pit is complete it will be moved to the next pit.

The remaining –32 mm fraction is, loaded and transported to the nearby treatment facility using articulated dump trucks.

Where pans are used the screened material is loaded into a series of 2 sixteen-foot rotary pans, each typically with a treatment capacity of 80 tph. Tracer tests are done regularly to ensure that the pans are operating at the correct density. Concentrate is tapped continuously from each of the pans every three hours into three ton holding bins and transported with enclosed trucks to a final recovery unit or any other facility which is chosen by Renaissance Resources (Pty) Ltd.

Topsoil will be removed from the first block, where after it will be stored separately on the high ground of the proposed mining area. Stored topsoil will be kept separate from overburden and will not be used for the building or maintenance of access roads. Stored topsoil will be adequately protected from being eroded or blown away.

Exposed diamondiferous gravel of Block 1 will then be removed by means of an excavator and loaded onto a tipper truck or front-end loader, which will transport it to the nearby first stage mineral processing plant at the edge of excavation due for backfilling. At this plant the diamondiferous gravel will be sorted by means of a grizzly screen grid or scalping screen and all material larger than 100 mm will be separated from the rest. This material will be used in the backfilling stage.

Screened material smaller than 100 mm will be transported to a stockpiling area at the treatment plant, via front-end loader or tipper. From here it will be transported to a conveyor belt, which will feed it onto a Findlay type screen or if wet, then to scrubber or wet rotary screen and then directly onto 2 X 16 feet washing pans.

The following procedure will be followed in terms of backfilling and rehabilitation:

- The coarse gravel sifted at the grizzly screen, tailing from the pans and fine concentrate will be transported back to and dumped into open Block 1. During this process of backfilling, variation in the dumping sequence of different sized materials will be

followed to ensure better compaction and stability of the reclaimed gravel. This will ensure that the voids surrounding the coarse gravel will be filled up with finer sediments. Compaction will be achieved through the movement of heavy vehicles over the area during the backfilling stage.

- The mining sequence will be followed until the last block is reached. Topsoil stored at the beginning of the mining operation will now be utilized for the final rehabilitation of the last block on the land portion.

Workshop equipment and tools to be used consist of secured container stores containing grease pumps, rigger chains, hydraulic jacks, air compressors, electric testers, welders, grinders, socket sets, gas sets, magnetic drills, hydraulic test instruments, tools, spanners and tool boxes Approximately 18 000 litres of process water will be required by the proposed mining operation per hour per pan however modern technology in de-sanding may reduce water consumption in some areas. The use of closed-circuit water recovery systems on the pans can result in further savings of more than 50% on water requirement.

Process water is sourced from the Orange River for the Lanyon Vale operation. Other sources of water include pumping water from mining excavations or the tailings or slimes disposal facilities and recycling ponds. The production rate of the proposed operation will be approximately 80 tph per pan.

Waste Management

Proper sanitation facilities will be provided for employees. No person will 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 will be adhered to. Non-biodegradable refuse such as glass bottles, plastic bags, etc. will be sorted and stored in separate lockable containers at a central point. It will be disposed of at a recognised disposal facility twice a month. Biodegradable refuse will either be handled as indicated, or be buried in a pit excavated for that purpose and covered with layers of soil when almost full. A final 0,5m thick layer of topsoil will be incorporated where practicable. Provision will be made for the future subsidence of the covering. Refuse will not be dumped in the vicinity of the mining area. Waste material with regard to vehicle repairs will be kept in 200 litres steel containers in the maintenance/farmstead area. This material will be disposed of at a recognised disposal facility once a month.

Access Roads

Access to the area is via an all-weather well-maintained secondary dirt road between Douglas and Prieska running along the north-western bank of the Orange River.
The Activities associated with the Mine that is expected to make use of these roads include: -

- the transportation of mining personnel to and from the site;
- Delivery of supplies and materials;
- the transportation of the product for the market.

These transport operations will make use of passenger vehicles, light delivery vehicles and very limited heavy vehicles.

Haul Roads

There will be one Haul Road to the plant area and one haul road to the mining site. No other haul roads will be constructed. Main haul roads will have a minimum width of 15m. No roads will be wider than 15m. Existing roads will be used as far as practically possible.

e) Policy and Legislative Context

Table 2. Applicable legislation and guidelines used to compile the report

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)	- 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	- Control measures are to be implemented upon the approval of the EMPR.
Constitution of South Africa (Act 108 of 1996)	- Section 24: Environmental right - Section 25: Rights in Property - Section 27: Water and sanitation right	- To be implemented upon the approval of the EMPR.
Environment Conservation Act (Act 73 of 1989) and Regulations (ECA)	- Sections 21, 22, 25, 26 and 28: EIA Regulations, including listed activities that still relate to the existing section of ECA. - Section 28A: Exemptions.	- To be implemented upon the approval of the EMPR.
Fencing Act (Act 31 of 1963)	- 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.	- 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	- Definition, classification, use, operation, modification, disposal or dumping of hazardous substances.	- Noted and Considered measures are to be implemented upon the approval of the EMPR.
Intergovernmental Relations Act (Act 13 of 2005)	- 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	- Entire Act.	- 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	- Entire Act. - Regulations GN R527	- A Mining Right has been applied for (NC) 30/5/1/2/2/10202MR. - Rights and obligations to be adhered to.
National Environmental Management Act (Act 107 of 1998) and Regulations as amended	- 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)	- Control measures are to be implemented upon the approval of the EMPR.

	- 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)	
National Environmental Management: Air Quality Act (Act 39 of 2004)	- 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)	- 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)	- 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.	- 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.

	Commencement of Threatened or Protected Species Regulations 2007 : 1 June 2007 GNR 150/GG 29657/23-02-2007 Publication of lists of critically endangered, vulnerable and protected species GNR 151/GG 29657/23-02-2007 * Threatened or Protected Species Regulations GNR 152/GG 296547/23-02-2007 * - Sections 65 – 69: These sections deal with restricted activities involving alien species; restricted activities involving certain alien species totally prohibited; and duty of care relating to alien species. - 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 fo 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	- Chapter 2 lists all protected areas.	Applicable. The mining operation does fall within protected areas which is known.

<table>
<tr>
<td>Africa"s natural biodiversity and its landscapes and seascapes.</td>
<td></td>
<td>Sensitivity Features:
<table><tr><th>Sensitivity</th><th>Feature(s)</th></tr><tr><td>Low</td><td>Low Sensitivity</td></tr><tr><td>Very High</td><td>Critical Biodiversity Area 1</td></tr><tr><td>Very High</td><td>Critical Biodiversity Area 2</td></tr><tr><td>Very High</td><td>Ecological Support Area</td></tr></table>
Lanyon Vale falls into Critical Biodiversity Area 1 and 2 as well as Ecological Support Areas and Ecological Support Areas in terms of the screening report.</td>
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<tr>
<td>National Environmental Management: Waste Management Act (Act 59 of 2008)</td>
<td>- 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)
- 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)</td>
<td>- To be implemented upon the approval of the EMPR.</td>
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	- 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	- 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.	- A permit application regarding protected tree species needs to be lodged with DAFF if necessary. - Control measures are to be implemented upon the approval of the EMPR.
National Heritage Resources Act (Act 25 of 1999) and Regulations	- 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 authorities must be notified of a proposed project and must be consulted during HIA process.	- Control measures are to be implemented upon the approval of the EMPR. Fossil finds procedure are attached to the PIA.

	- Regulation GN R548 published on 2 June 2000 in terms of NHRA	
National Water Act (Act 36 of 1998) and regulations as amended, *inter alia* Government Notice No. 704 of 1999	- 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: (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 mining 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))	- A water use application (WULA) must be submitted and will be submitted to run concurrently with the Mining Right application. - Control measures are to be implemented upon the approval of the EMPR.

	- 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)	- Chapters 2, 3, 4 and 6: Nature reserves, miscellaneous conservation measures, protection of wild animals other than fish, protection of Flora.	- Control measures are to be implemented upon the approval of the EMPR.
Occupational Health and Safety Act (Act 85 of 1993) and Regulations	- 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.	- Control measures are to be implemented upon the approval of the EMPR.
Road Traffic Act (Act 93 of 1997) and Regulations	- Entire Act.	- 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.
Spatial Planning and Land Use Management (Act 16 of 2013 (SPLUMA) and regulations	- To provide a framework for spatial planning and land use management in the Republic;	- To be implemented upon the approval of the EMPR.

	- 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	
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 (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	- 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	- To regulate law on veld and forest fires - (Draft regulations s21)	- To be implemented upon approval of the EMPR

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 Renaissance Resources 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 African 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 Renaissance 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.

Renaissance was granted a prospecting right by the DMR to prospect for alluvial diamonds on Portion 15 and Portion 23 of the farm Lanyon Vale no 376. in the District of Hay. The application area is situated between three towns near Niekerkshoop (west south-west). The town Prieska is situated 91.7 km south south-west of the application area. Furthermore, the towns Griequatown and Douglas is situated 83.5 km north north east and 67.3 km east north-east from the proposed mine area respectively.

In order to advance the project and to prove the presence of a minable resource of diamonds Renaissance undertook a in depth investigation mainly obtained through in-depth discussions with previous small-scale diggers and farmers and from consulting geologists who did work on the projects on the farms and a reserve was proven.

Diamond mining, will contribute to South Africa's status in world diamond production and Renaissance's vision is to be an active participant in the industry. Importantly it is a product that is exported and earns foreign exchange.

Should this proven reserve be mined, it would provide a significant contribution to the local community and the economy of the country.

Need

Analysis of the Diamond Industry – ALROSA(website)

The Information on the analysis of the diamond industry was obtained from the ALROSA website who 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

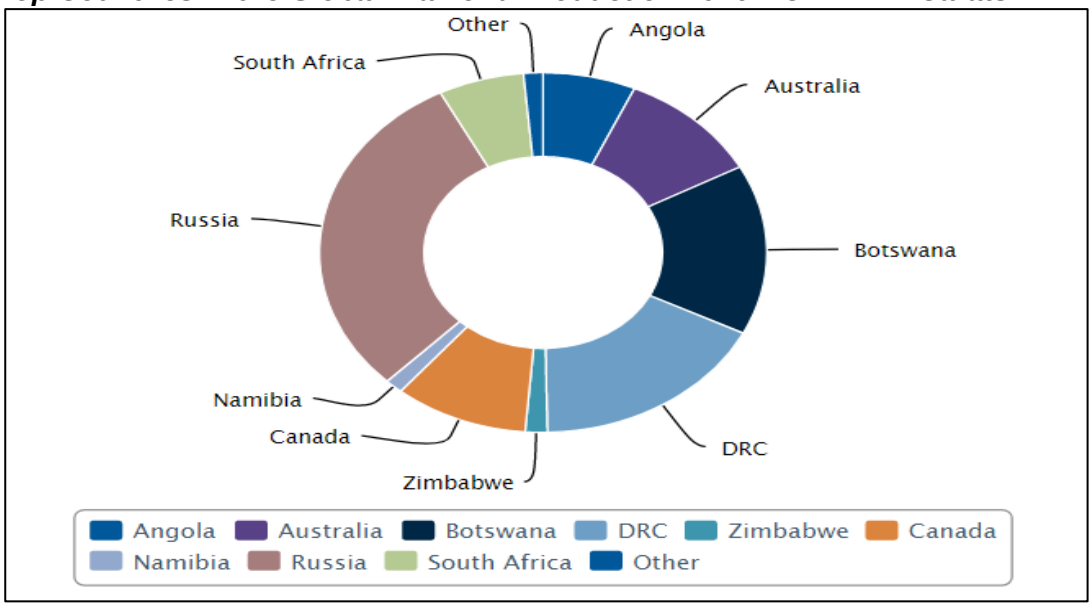


Figure 3. Kimberley Process companies' data Global Diamond Production 2011-16 (thousands of carats)

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

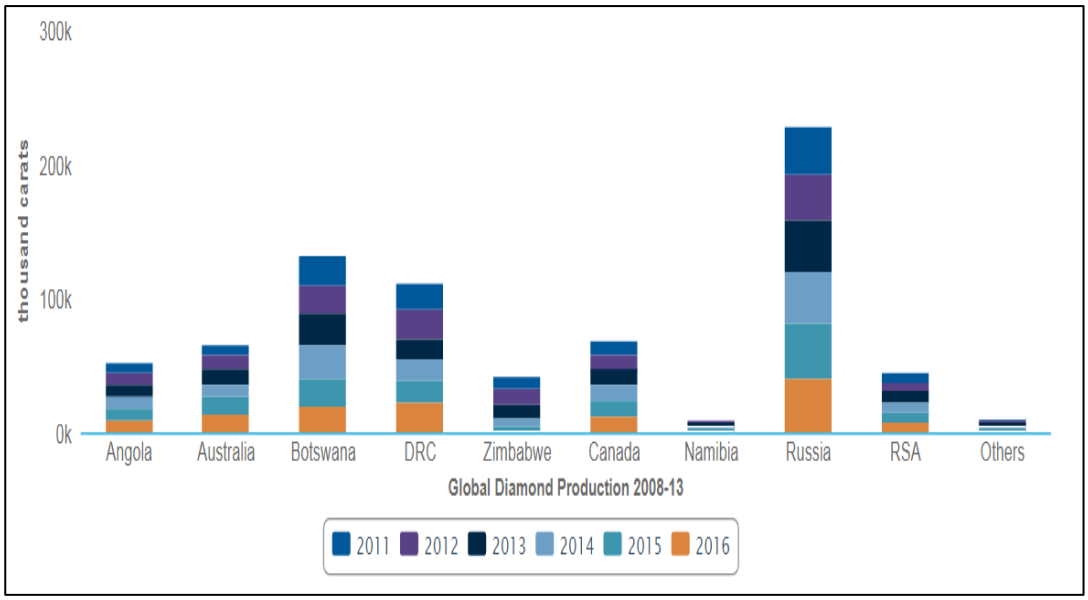


Figure 4. Global Diamond Production 2011-16 (thousands of carats) Kimberley Process companies' data

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).

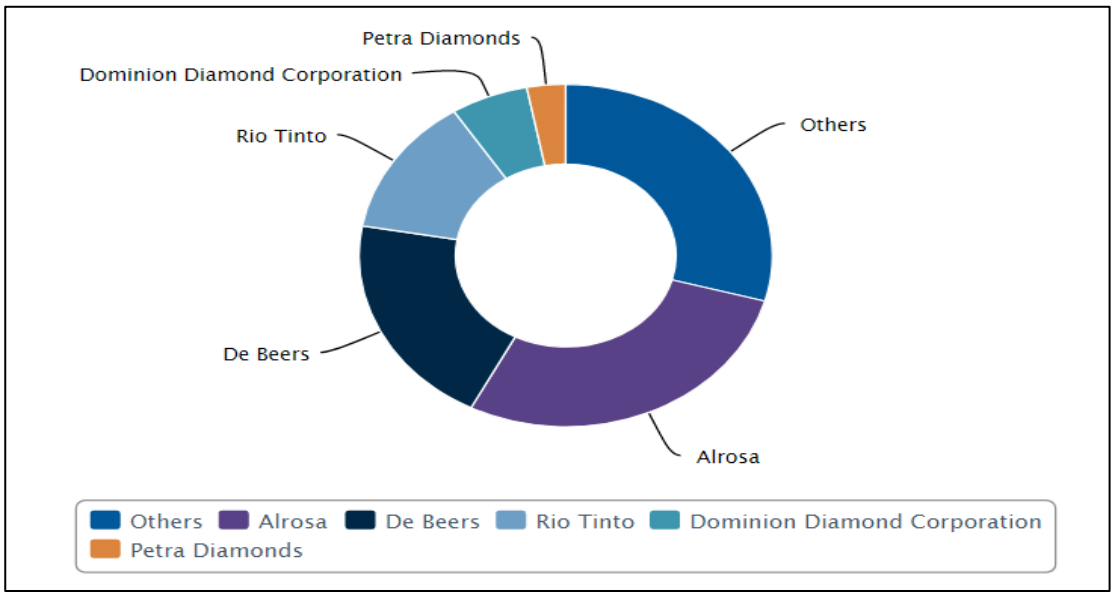


Figure 5. Diamond Production by Leading Companies, 2016(* - including Ekati; Companies' data)

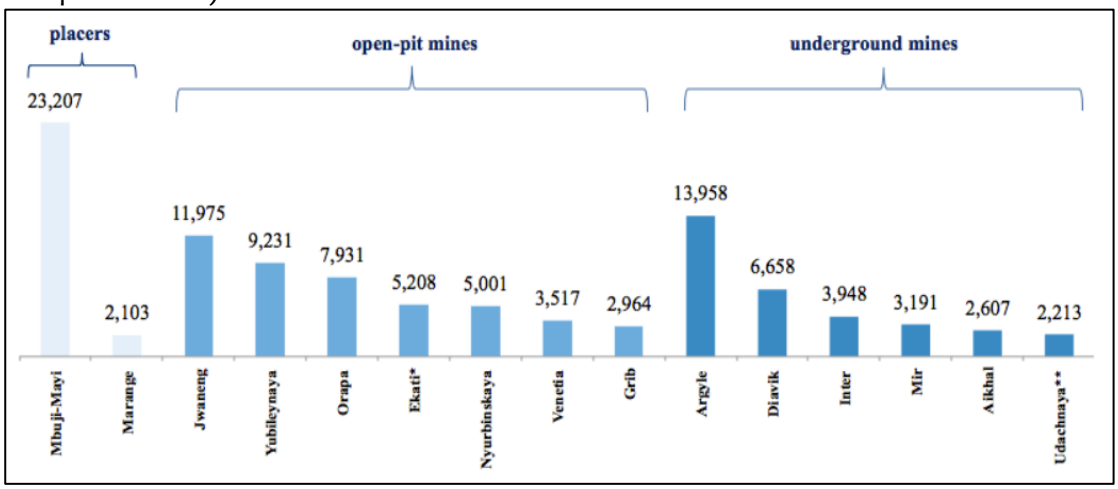


Figure 6. Production Output of the World's Major Diamond Deposits, 2016 (thousand carats) Kimberley Process and companies' data; * - Ekati includes open-pit and underground mining; ** - output, including further development of the open-pit.

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**.**

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.

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.

The location of the mine is determined by the geological location of the mineral resource.

- No trial mining has taken place at the Lanyon Vale project. Only 3 bulk samples were made on the project with an estimated amount of 29 970 ton excavated.
- Two bulk samples were excavated by Rockwell Diamonds on Terrace B at Wouterspan, located 200m southwest of Lanyon Vale on the same elevation as the projected terraces as found on Lanyon Vale.

(1) During 2016, a total of 94 380 ton of gravel was treated at terrace B to recover 585ct (72 stones) at an average grade of 0.62 cpht and stone size of 8.12ct/stone, which included the recovery of a number of large stones (76.83ct, 64.03ct, 45.08ct, 44.66ct, 29.21ct, 27.41ct and 26.98ct). Gravels were screened at an effective 8mm bottom cut-off, resulting in the higher average stone sizes than normal. During the period under review, 965.1ct (116 stones) were sold for an average of US$1,884/ct (Including terrace B and other areas on Wouterspan).

(2) During 2017, under the guidance of the CP, a total of 58 760 ton of fluvial- alluvial gravel was treated from terrace B, recovering a total of 235ct at an average grade of 0.4 cpht. Average selling price during this period was US$2,000/ct. All gravel derived from bulk samples on terrace B were processed through Rockwell's plant (on the Wouterspan property) to determine average sample grade.

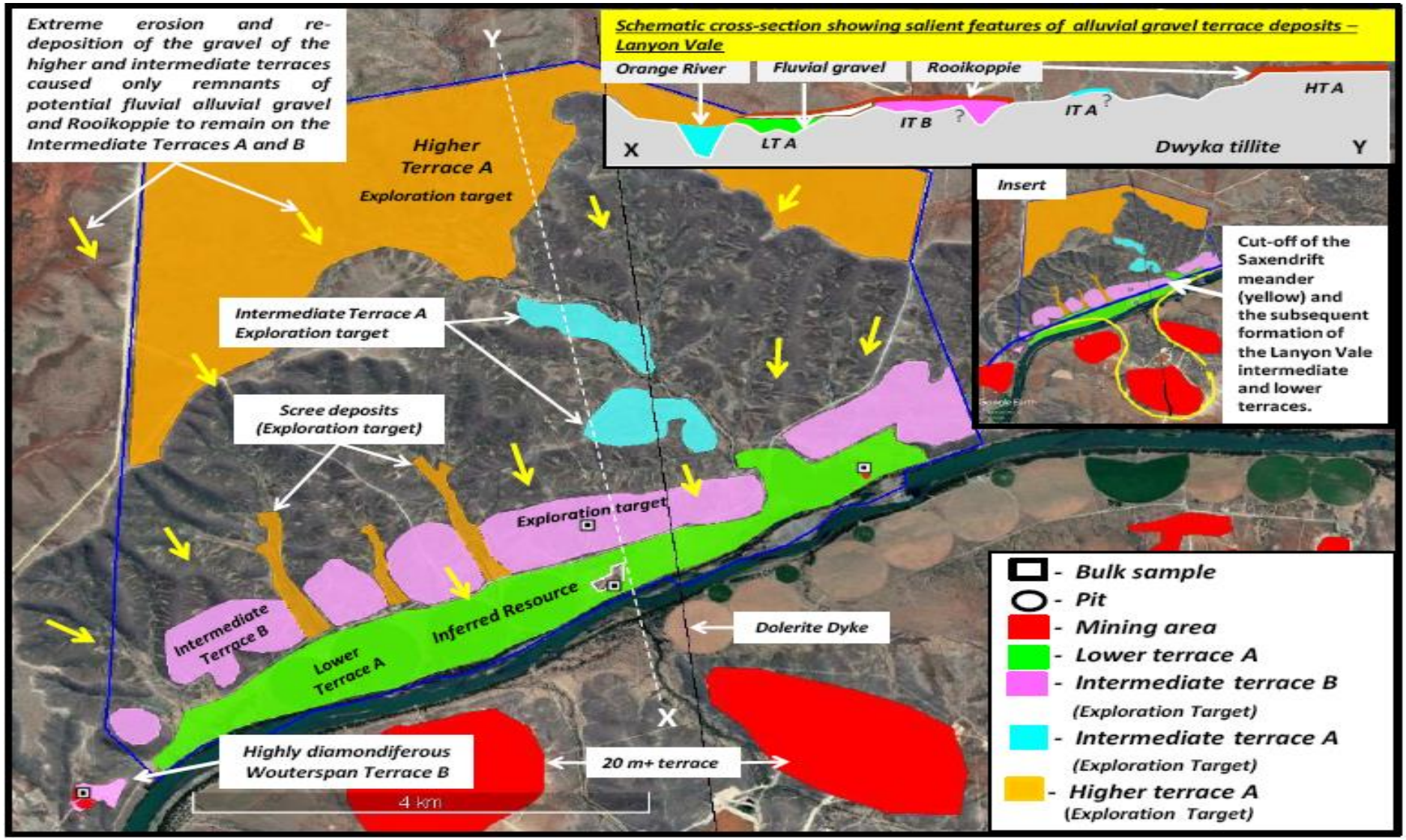


Figure 8. Property maps showing extrapolation of the inferred resources beyond nominal sample spacing.

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:

The registered description of the land to which the mining right application relates:

Property:	**Portion 15 and Portion 23 of the farm Lanyon Vale no 376.**
District:	Hay
Province:	Northern Cape
Extent:	4 346.5033 ha

The property on which the Mining right was applied for is determined by the 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 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 project. A water application will be submitted to 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 Mining Right had been selected based on the assumption of alluvial gravels and indication of the presence of alluvial gravels, it will not be viable to consider an alternative site for the mine. Alternatives for land are thus not available, as the mining 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 planned mining technique is that of an opencast alluvial diamond mining operation with oversize material from the gravel scalping and the tailings from the plant, being used as backfill material prior to final rehabilitation. Gravels are excavated, loaded and transported to the nearby treatment facility using articulated

dump trucks. No irrigation pivots will be disturbed or mined without prior agreement from the farm owners.

Alternatives considered: -

The mining blocks is within the target area known to carry diamonds and therefore no alternative to the application area can be considered. The only alternative land use on the area that will be selected for the processing plant is agriculture / grazing; however, the applicant's main economic activity is mining and for this reason does not favour any other alternative land use.

(c) The design or layout of the activity:

The site infrastructure will need to be strategically placed by incorporating mining 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 mining as well as limited additional impact on the environmental (non-perennial drainage lines, pivots the river and wind direction), heritage resources and discussions with the relevant interested and affected parties.

The following infrastructure will be established and will be associated with the mining operation outside 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.
- 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 mine site.
- 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.
- Mining Area: Opencast mining to mine for alluvial diamonds.
- 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 mining operation will create an additional 2 - 4 km of roads, with a width of 15 meters.
- Salvage yard (Storage and laydown 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.

In terms of water use alternatives; the operation is located next to the Vaal River and the Mining area is next to the 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 to the environment.

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 (opencast method) 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 standard. No provincial roads will be used.
At the processing plant the run of mine will be fed onto a grizzly for the screening out oversize material. The gravel will be processed through a screening section 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 will be negotiated with the Farm owner outside the 1:100-year flood line. This area will be used for all processing and stockpiling operations with an agreement entered into with the relevant Farm owner).

- **Technology**

At the processing plant the run of mine will be fed onto a grizzly for the screening out oversize material. The gravel will be processed through a screening section 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 will be negotiated with the Farm owner. This area will be used for all processing and stockpiling operations with an agreement entered into with the relevant Farm owner).

Alternatives considered: -

The planned mining activities include (opencast method) 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 mining method for the mining and extraction of alluvial diamonds.

(e) The operational aspects of the activity:

The gravels will be loaded with an excavator on to dump trucks for conveyance to the Processing Plant. At the Processing Plant the run of mine gravels will be fed onto a grizzly for screening out oversize material. The material will be processed through a screening section for delivery to a recovery plant. Concentrate from the recovery plant will be processed through an X-Ray/Sortex plant to extract the diamonds. An area will be used for all processing and dumping operations outside the 1:100-year floodline. The expected lifespan of the mine is 10 years.

Mining activities will primarily make use of existing roads created by previous mining activities, but there is a possibility for additional roads that could be created.

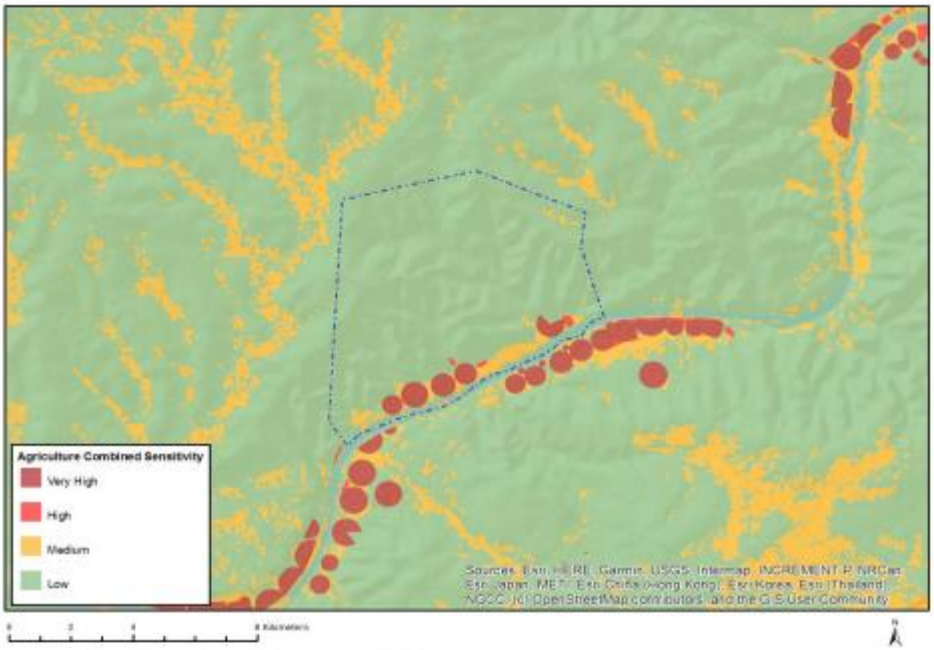
Alternatives considered: -

The conventional opencast load-haul-mining method has been proven to be the most economic viable method currently being used by the diamond fraternity.

(f) The option of not implementing the activity:

Potential land use includes grazing (game farming), agricultural (pivots) and mining. The majority of the area is classified to have potential for grazing land and agricultural use for crop yield. Therefore, mining activities are believed to be one of the economically beneficial options for the areas.

MAP OF RELATIVE AGRICULTURE THEME SENSITIVITY



Very High sensitivity	High sensitivity	Medium sensitivity	Low sensitivity
X			

Sensitivity Features:

Sensitivity	Feature(s)
High	Annual Crop Cultivation / Planted Pastures Rotation;Land capability;01. Very low/02. Very low/03. Low-Very low/04. Low-Very low/05. Low
High	Annual Crop Cultivation / Planted Pastures Rotation;Land capability;06. Low-Moderate/07. Low-Moderate/08. Moderate
Low	Land capability;01. Very low/02. Very low/03. Low-Very low/04. Low-Very low/05. Low
Medium	Land capability;06. Low-Moderate/07. Low-Moderate/08. Moderate
Very High	Pivot Irrigation;Land capability;01. Very low/02. Very low/03. Low-Very low/04. Low-Very low/05. Low
Very High	Pivot Irrigation;Land capability;06. Low-Moderate/07. Low-Moderate/08. Moderate

Socio-Economy

The operation will make provision for ±23 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.

Heritage and Cultural Resources

The screening report done for the mining right application indicated a low sensitivity for Heritage but a high sensitivity for both areas in terms of Palaeontology.

The necessary specialist studies were done and is included into the EIA/EMP documents. If the mining 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.

MAP OF RELATIVE ARCHAEOLOGICAL AND CULTURAL HERITAGE THEME SENSITIVITY

Very High sensitivity	High sensitivity	Medium sensitivity	Low sensitivity
			X

Sensitivity Features:

Sensitivity	Feature(s)
Low	Low sensitivity

MAP OF RELATIVE PALEONTOLOGY THEME SENSITIVITY

Very High sensitivity	High sensitivity	Medium sensitivity	Low sensitivity
	X		

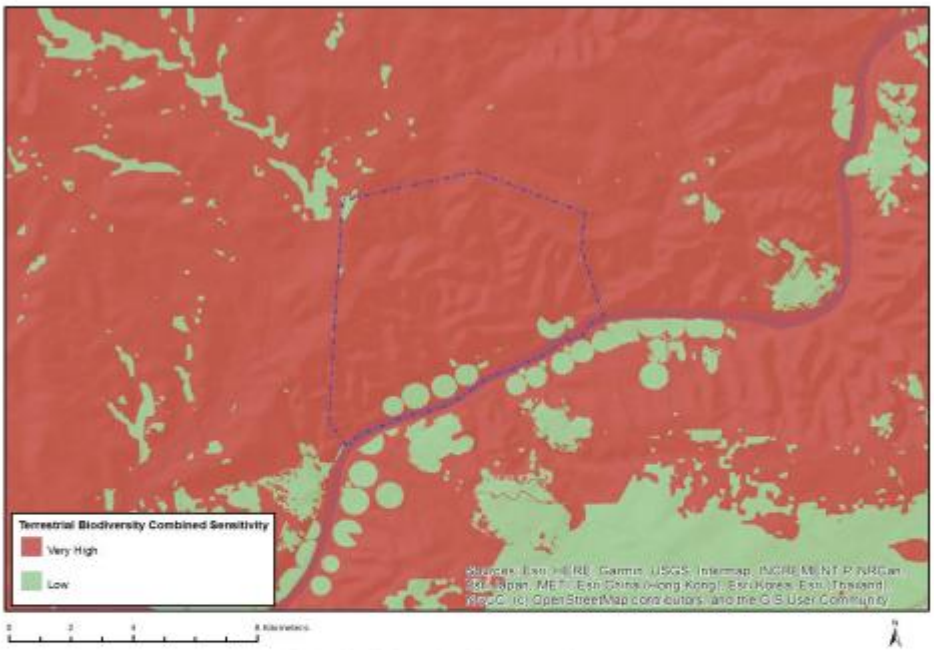
Sensitivity Features:

Sensitivity	Feature(s)
High	Features with a High paleontological sensitivity
Medium	Features with a Medium paleontological sensitivity

Biodiversity

In terms of the screening tool that had been done for the mining right application the application area falls into Critical Biodiversity Area 1 and 2 as well as ecological support areas. The necessary specialist studies was done and are included into the EIA EMP.

MAP OF RELATIVE TERRESTRIAL BIODIVERSITY THEME SENSITIVITY



Very High sensitivity	High sensitivity	Medium sensitivity	Low sensitivity
X			

Sensitivity Features:

Sensitivity	Feature(s)
Low	Low Sensitivity
Very High	Critical Biodiversity Area 1
Very High	Critical Biodiversity Area 2
Very High	Ecological Support Area

Figure 9. Final site layout plan in terms of the screening tool for Terrestrial Biodiversity

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.

Description of the consultation process: -

The consultation process as described by NEMA for Environmental Authorisation was followed and is still in process. The following steps were already taken:

- Notification letters were sent to all interested and/or affected parties on the 12 April 2022. Attached to each of these letters was a Draft Scoping report, containing information relating to the proposed project for comments.
- A newspaper advert was be placed in the DFA local newspaper on 29 April 2022.
- Notices were placed at the entrances to the farms and along the fence line and in the library in Douglas.

Proof of notification and consultation is attached as Appendix 3. The consultation process is still in process.

On 11 October 2022 the EIA / EMP Report was sent by registered post to identified persons with a cover letter. Letters was also sent to various neighbouring people with adjacent farms or further away. All Government Departments identified were also notified by registered letters with the EIA / EMP Report attached. The EIA EMP document was also placed on the Wadala Website for easy access.

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 Appendix 3 (Table 3)

iv) 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:

All information is taken out of the Independent Statement of diamond resources and exploration targets done in January 2019 by Mr. Stephen H. le Roux on At Last, De Bad and Lanyon Vale projects.

Geological Setting

Alluvial geology of the Kimberley area1:
The erosion of diamondiferous kimberlites liberates diamonds onto the land surface, for redistribution by streams and rivers. The processes that lead to the deposition and concentration of diamonds in river sediments are obviously of direct importance in the formation of economic alluvial diamond deposits.

The South African alluvial deposits are distributed in a southwest-trending belt that stretches from the Limpopo River to the Namaqualand coast. The major deposits are concentrated along the Vaal and Orange River valleys and some tributaries of the Vaal River. The deposits invariably consist of gravel resting on Precambrian bedrock.

This bedrock contains trap sites for diamonds in the form of scour channels, potholes, gulleys and plunge pools, and in all cases, its competence and irregularity are sufficient to trap coarse debris that, in turn, act to entrain diamonds. The bedrock comprises a wide variety of rock types, including granite, gneiss, lava, dolomite, tillite, shale and quartzite, and cross-cutting dykes perpendicular to the fluvial channels and paleochannels are important in the development of trap sites.

The diamonds were originally derived from kimberlites on the Kalahari Craton, mostly within South Africa and transported by rivers to their placer sites. Many of these placers were subsequently reworked during the Cenozoic and redeposited as younger placers in downstream locations as depicted in the schematic illustration below (figure 10).

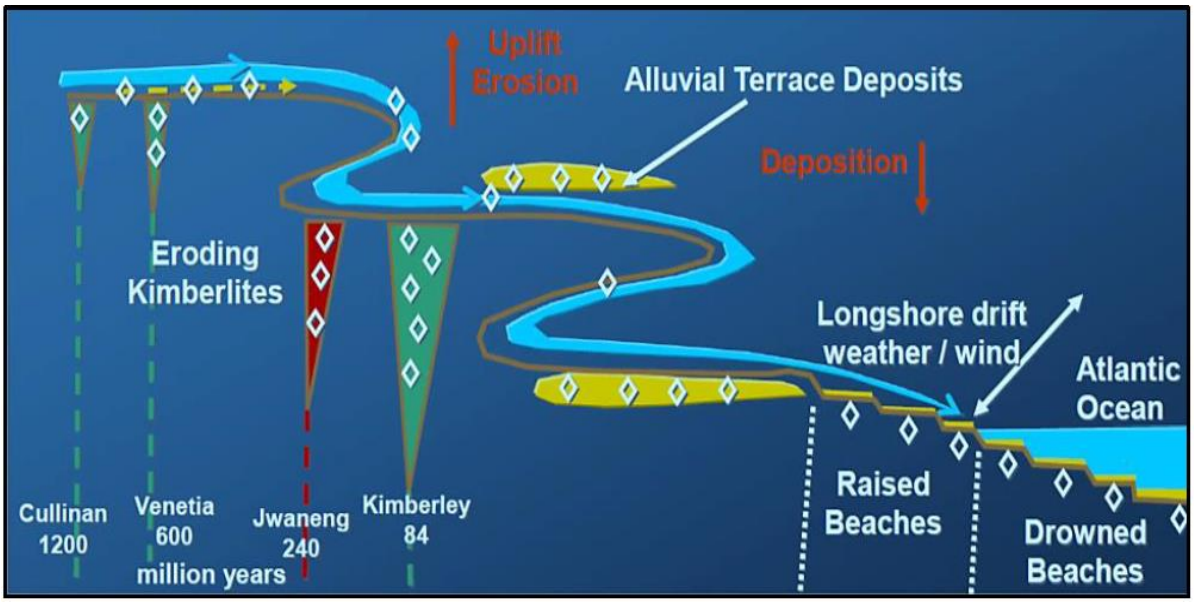


Figure 10. Origin of Alluvial Diamond Deposits.

The age of the alluvial placers ranges from Late Cretaceous to Quaternary with depositional peaks coinciding with fluvial phases during the Late Cretaceous, Miocene and Plio-Pleistocene. These ages post-date the emplacement of all the diamondiferous kimberlites on the Kalahari Craton from which the diamonds were derived.

Deposits of Miocene, Pliocene and Pleistocene age occur along the Vaal River valley between Christiana and Douglas and along the Orange River valley between Hopetown and Prieska. These deposits are located at elevations between present river level and 120m above present river levels. The diamonds were probably transported from kimberlites located near Kroonstad, Welkom, Theunissen, Boshof, Koffiefontein, and in northern Lesotho via former drainage courses of the Vals, Vet, Riet and Orange Rivers and a so-called Kimberley River that tapped the Boshof kimberlites prior to being captured by the Modder River during the Pliocene.

Studies of the Lower Vaal, Harts and Middle Orange River (MOR) alluvial deposits show that there are five broad phases of prominent alluvial deposit development in these areas reflected by several deposit types.

Cretaceous aged Nooitgedacht-Droogeveldt Terraces are considered to be the oldest alluvial deposits and they occur between 80 - 120 meters above the modem Vaal River S-W of Barkly West. These deposits probably conform in age to the initial period of late-Cretaceous uplift which triggered a period of accelerated river incision and simultaneous erosion and lowering of the land surfaces, accompanied by the supply of detritus, including diamonds.

Miocene-age Holpan and Klipdam Channel deposits occur at approximately 60 meters above the Vaal River. Younger terraces include the Pliocene-age Proksch Koppie and Wedburg Terraces, which occur at 30 - 45 and 20 - 30 meters respectively.

Pliocene - Holocene deposits or the youngest terraces, which include the current Vaal River channel, occur between 0 - 20 meters and are collectively referred to as the Rietputs and Riverton Terraces.

Younger deposits, through a process of progressive weathering, deflation and winnowing of the above deposits, 'secondary' deposits known as Rooikoppies developed over large areas of the landscape. Typically, these deposits are found to be broadly associated with older terraces and buried channels, these readily accessible deflation deposits were extensively mined by the old timers and Diggers. In many cases the presence of Rooikoppie deposits was useful in respect of highlighting the presence of older buried deposits.

Hundreds of thousands of carats and numerous large stones have been produced from these terraces at various projects with grades varying between 0.1 and 2.0 cpht.

Geology of the Lower Vaal and Middle Orange River Deposits

Prior to the Karoo period, the (pre-Karoo) Vaal River cut a network of channels closely approximating the present floodplain. These channels were then utilized by the subsequent glaciers and were finally filled with Dwyka tillites and shales (at ±250 million years). The post-Karoo Vaal River, subsequently, incised into these formations and deposited gravels and large quantities of fine sediments.

The geological settings of the diamondiferous gravel deposits vary from thick remnant palaeo-river terraces and channels of late Cretaceous age through to young surface deflation or Rooikoppie deposits of 0.5 – 1.0 meters thick.

Through geological time, erosion and deflation of the very extensive primary gravel deposits lead to the formation of extensive lag deposits or Rooikoppie which in places were particularly rich. These deposits are generally associated with underlying primary gravels but mass weathering, material creep and movement of the heavier lag deposits down slopes has resulted in deposits which may be far more extensive than the underlying primary deposits.

Rooikoppie gravels have been extensively dug by the old-time diggers in the past, using unsophisticated mining and diamond recovery techniques. Highly fractured Ventersdorp lavas or Dwyka tillites underlie the Rooikoppie gravels. Iron has stained the entire assemblage, giving it a reddish colour and hence the
name Rooikoppie.

Magmatic intrusions are in the form of Karoo-aged dolerite sills and dykes and Cretaceous-aged kimberlites.

In the Lower Vaal and MOR area dry periods lead to the precipitation of an extensive hard calcrete horizon which effectively defines the "interface" between the surface Rooikoppies and lower primary gravel deposits in many areas.

The calcrete prevented old time diggers from mining below the Rooikoppies and consequently large areas of primary gravel are being mined in areas such as the MOR by drilling, blasting and stripping the hard 1-to-2-meter calcrete layer and mining and processing the underlying preserved primary alluvial gravels.

Property Geology and Geological Model – Lanyon Vale

Alluvial diamondiferous gravels are found in the area as remnants of ancient terrace deposits occurring at different elevations above the floor of the present Orange River. Terrace elevations in the MOR area vary from a few metres to about 110m above the floor of the current river position.

These terraces are represented by a set of 'stepped terraces' showing the strongest preservation at the following heights above the present Orange River:

- 0 - 20m: low level terrace;
- 30 - 60m: intermediate terrace;
- 75 - 105m: high level terrace.

The terraces can display all the typical braided stream features such as channels, point bars and sandbanks and comprise a sedimentary package of:

- Rooikoppie (0.5 - 3m)
- Calcrete capping (1 - 3m)
- Intermediate, sandy gravel (1 - 5m)
- Coarse basal gravels (1 - 5m)

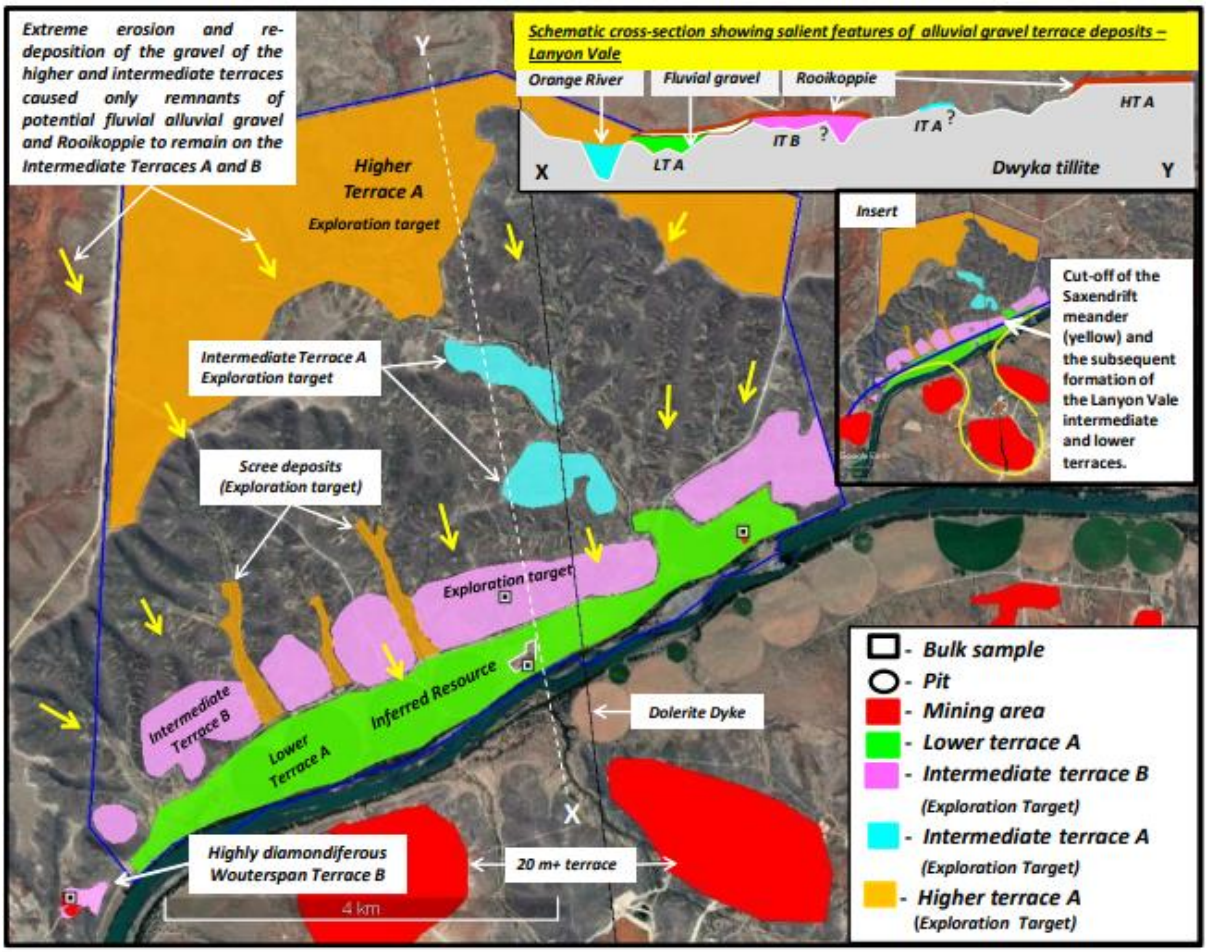


Figure 11. Satellite image showing Alluvial Diamond Deposits and Inferred Resources on Lanyon Vale.

The erosion and reworking of the intermediate terraces at Lanyon Vale caused only remnants of potential fluvial alluvial gravel and overlying Rooikoppie gravels to remain on these terraces. The highly diamondiferous and well-known Wouterspan B terrace are situated adjacent and on the same level as the intermediate B terraces at Lanyon Vale, which makes the vastly underexplored intermediate B terrace on Lanyon Vale, a highly prospective target to pursue.

Historic bulk sampling on the Wouterspan B terrace deliver grades between 0.4 – 0.6 cpht with average stone sizes bigger than 2.0 ct/stone.

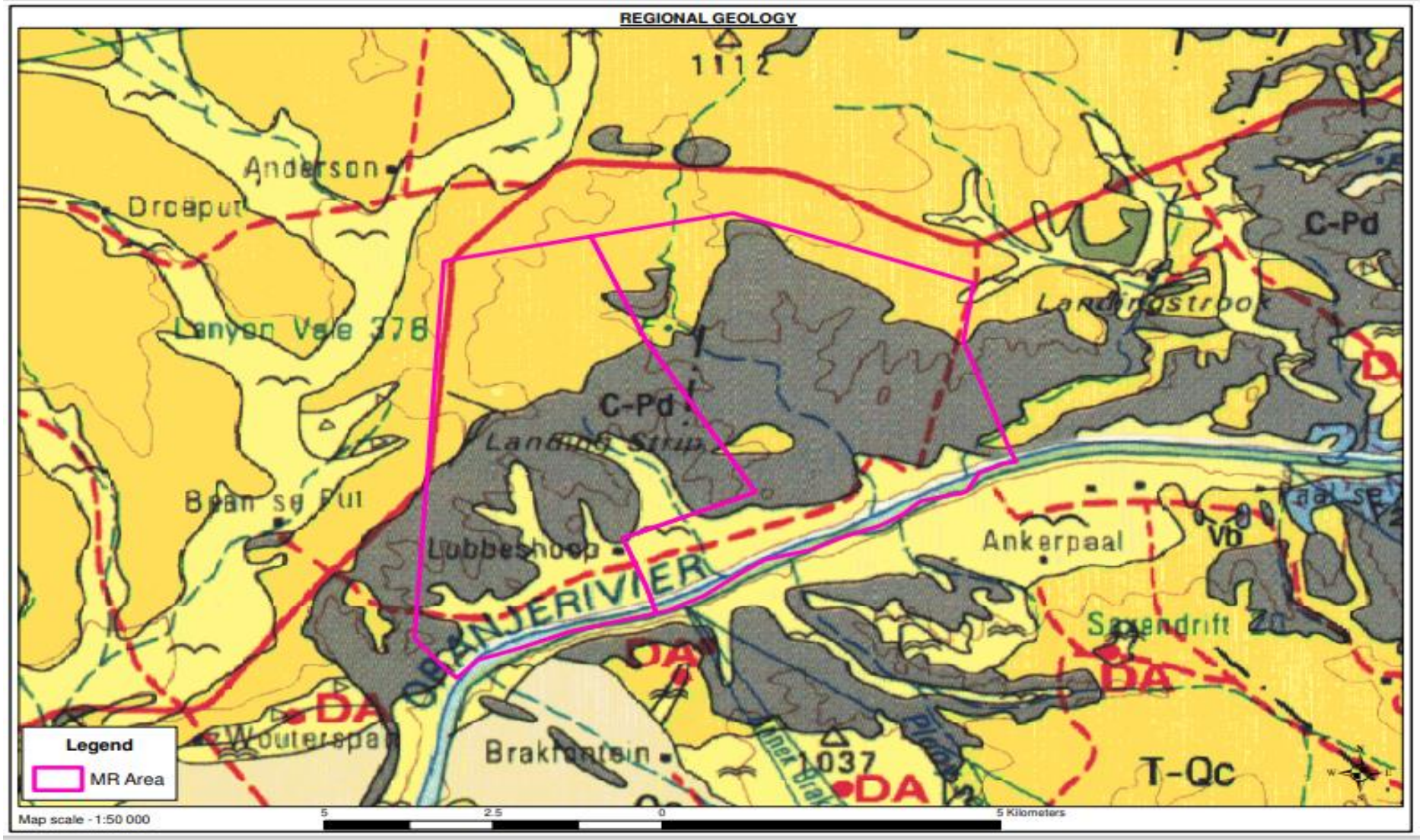


Figure 12. Geological maps of Lanyon Vale

(1) *CLIMATE:*

Darius van Rensburg from DPR Ecologists and Environmental Services has been appointed by Renaissance Resources to provide a Desktop Ecological and Wetland assessment in June 2018 for alluvial diamond mining prospecting on Portions 15 and 23 of the farm Lanyon Vale 376 near Douglas, and to determine the possible impact of prospecting on the application area Climate was described and included in this report.

The region has an approximate mean annual rainfall of 260mm per annum which occurs largely as thunderstorms between October and April with a mean annual evaporation of 200–300 mm/annum This is considered a relatively low rainfall and causes the area to form part of the more arid parts of South Africa. The occurrence of wetlands are therefore not common, however, due to the proximity to the Orange River the area adjacent to the river contains a high number of watercourses and several wetlands associated with the marginal zone of the Orange River. The surface water runoff in the area is restricted to very high rainfall events that results in an estimated mean annual runoff (MAR) for the area between 0-2.5 mm. The mean maximum and minimum temperatures of the region are 39˚C and -2.3˚C.

(2) *TOPOGRAPHY:*

Darius van Rensburg from DPR Ecologists and Environmental Services has been appointed by Renaissance Resources to provide a Desktop Ecological and Wetland assessment in June 2018 for alluvial diamond mining prospecting on Portions 15 and 23 of the farm Lanyon Vale 376 near Douglas, and to determine the possible impact of prospecting on the application area Topography was described and included in this report.

It is clear that the study area contains a highly varied topography. From aerial images and contours of the study area it is likely that the northern portion is dominated by an undulating plateau with numerous watercourses bisecting it (Map 1). The south eastern portion of the site descends from the plateau into a very uneven terrain dominated by hills bisected by a high number of watercourses (Map 1). The elevation decreases steadily along this uneven rocky terrain toward the Orange River which forms the southern border of the site. Along the river a wide and extensive floodplain is present and also contains the centre-pivot irrigation previously mentioned. The topography is natural and no visible modification is present. Altitude in the study area varies from 1066 m to 944 m along the Orange River. This also indicates the highly variable topography. This variable topography contributes to the high number of watercourses in the study area and will undoubtedly also increase the habitat and species diversity considerably.

The southern portion of the property along the Orange River has been transformed as a result of agriculture farming and there is a farmstead along the southern section of the farm. A large number of small drainage channels and rivers draining into the Orange River bisects the property. (figure 13).

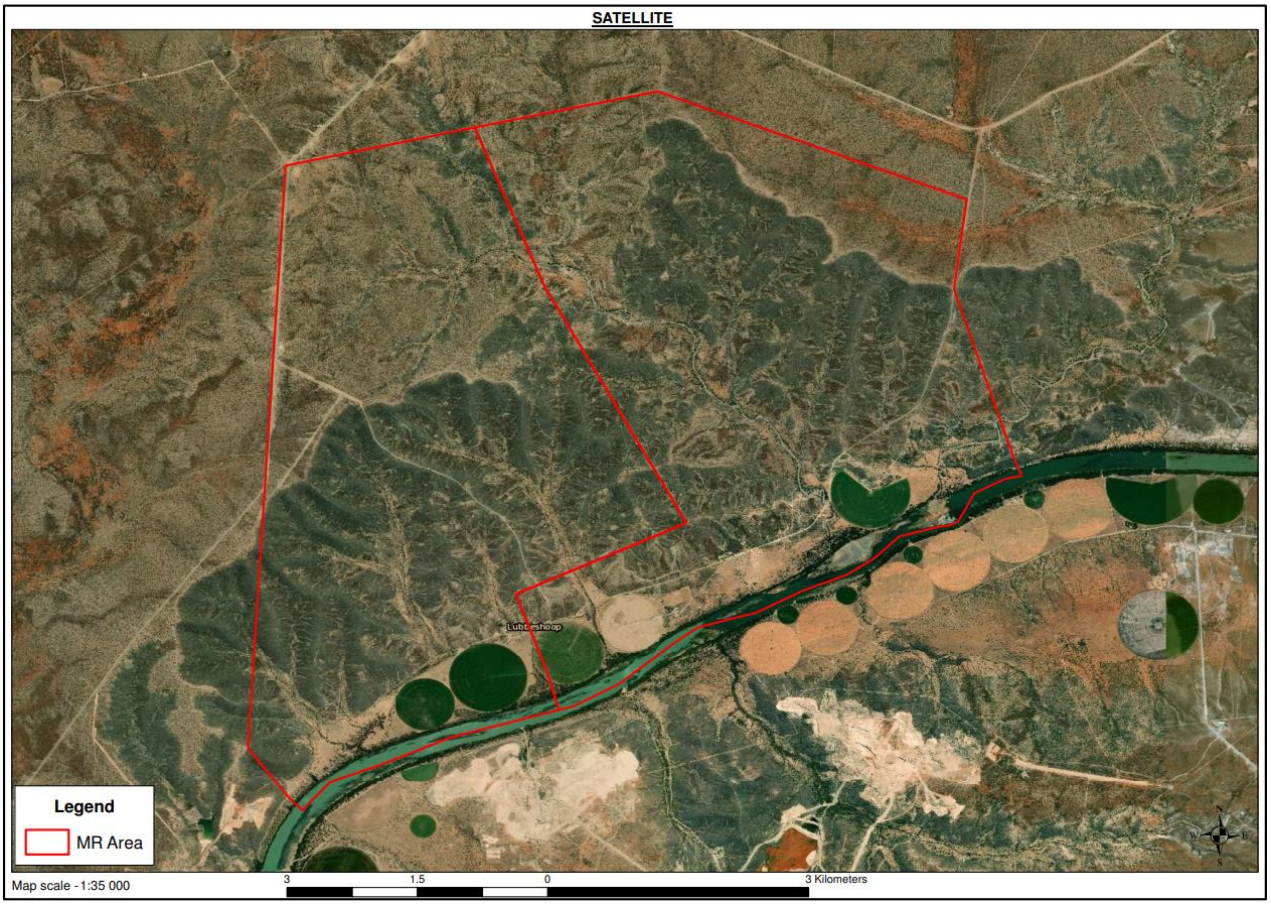


Figure 13. Satellite image of Application area on Lanyon Vale

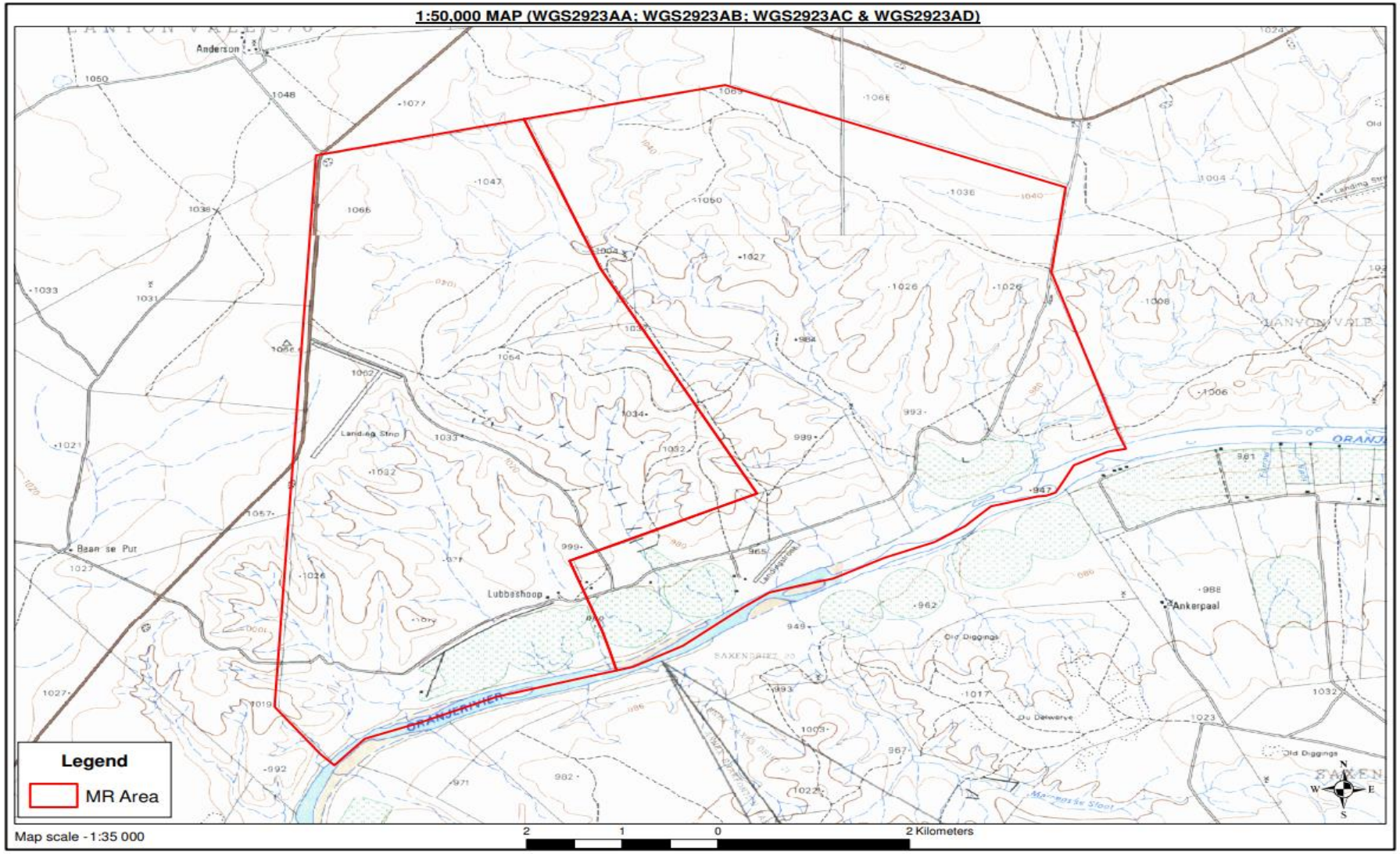


Figure 14. Topographical Map of Lanyon Vale 1:50 000 application area indicated by RED line.

(3) ***SOILS:***

Dr. Betsie Milne from Bocia Ecological Consulting Pty Ltd has been appointed by Renaissance Resources to provide an Ecological Assessment Report in October 2022 for alluvial diamond mining on Lanyon Vale, Hay near Douglas, and to determine the possible impact of mining on the application area soil was described and included in this report.

Land types found on the property include Ag115, Fc565 and Ia124 (Figure 15). The calcrete terraces, represented by the Ag115 land type, are characterised by red-yellow 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.

Figure 15. The distribution of land types in the study area.

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 are most susceptible to water erosion during flooding events. Deep erosional features were observed along drainage network on the alluvium, during the field survey.

(4) *LAND CAPABILITY AND LAND USE:*

Dr. Betsie Milne from Bocia Ecological Consulting Pty Ltd has been appointed by Renaissance Resources to provide an Ecological Assessment Report in October 2022 for alluvial diamond mining on Lanyon Vale, Hay near Douglas, and to determine the possible impact of mining on the application area land capability and land use was described and included in this report.

Pre-mining Land Capability

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.

Land Use Prior to Mining

Apart from the proposed mining activities, the mining right application area is mainly used for agriculture. Crop irrigation is practised along the river, while the remaining areas are utilised as natural pastures for livestock grazing.

Historical Agricultural Activities and evidence of Abuse

Several surface disturbances and old diggings are evident and numerous earth berms have been constructed across the drainage network.

Existing Structures

Existing infrastructure include a homestead, farm building and roads .

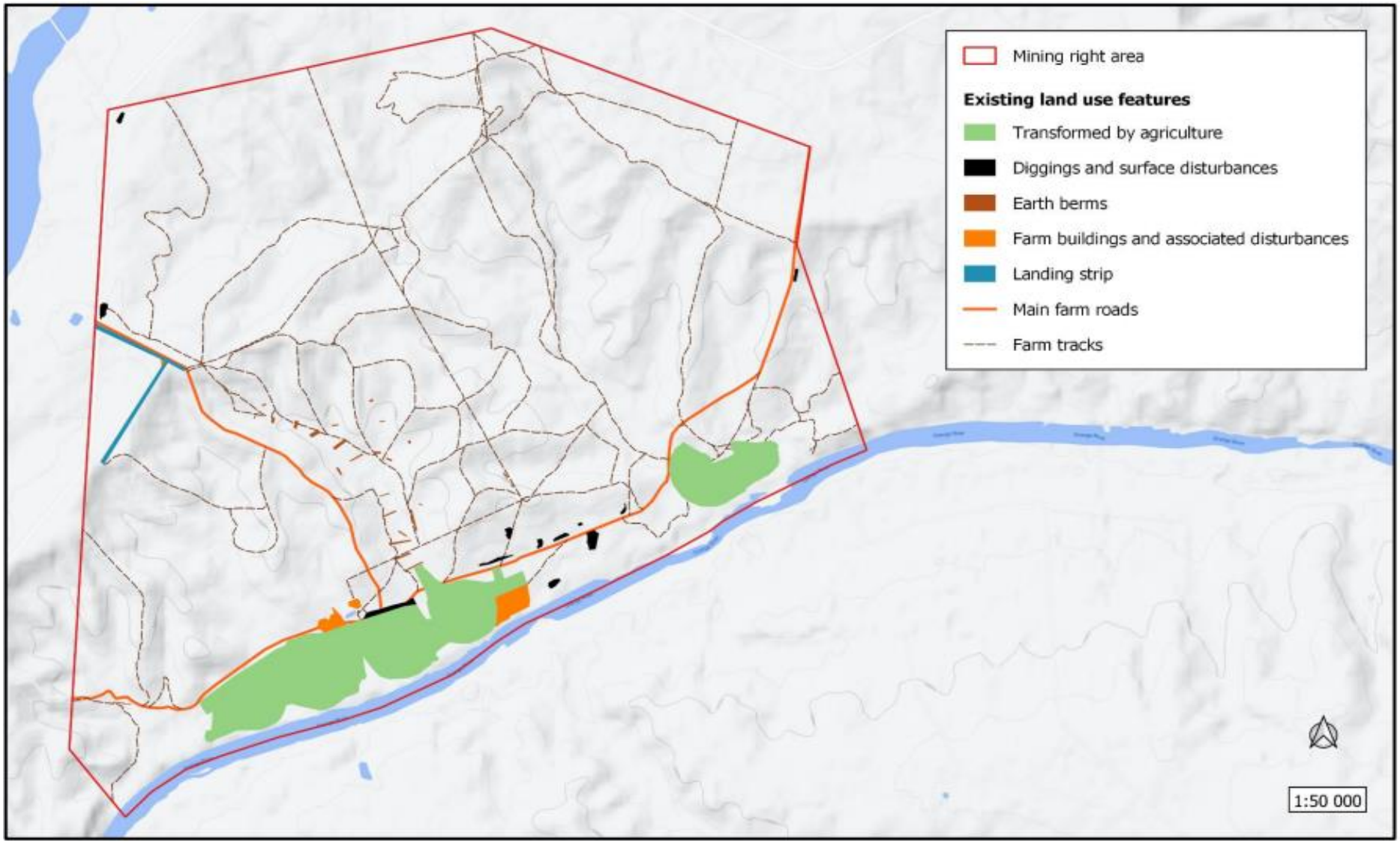


Figure 16. Evidence of existing infrastructure and past disturbance in the study area.

(5) *NATURAL FAUNA:*

Dr. Betsie Milne from Bocia Ecological Consulting Pty Ltd has been appointed by Renaissance Resources to provide an Ecological Assessment Report in October 2022 for alluvial diamond mining on Lanyon Vale , Hay near Douglas, and to determine the possible impact of mining on the application area Fauna was described and included in this report.

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 Lanyon Vale 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. Virtually all mammals of the study area are protected; either according to Schedule 1, 2 or 3 of NCNCA.

Aardvark has a high probability to occur on site, especially in the deep sandy alluvium. 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 mining 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.

The Brown Hyaena has a low potential to be found on site mainly since farm fences are restricting their occurrences across their natural distribution range. The Dent's Horseshoe Bat also has a low chance to be found on site due to their preference for savanna habitat. The Littledale's whistling rat is also not expected to occur on site based on their restricted distribution.

Apart from these special species of conservation concern, Yellow Mongoose, Ground squirrel, Kudu and Steenbok were recorded on site. Vervet Monkey is a problem animal (Schedule 4) also recorded on site, and other problem animals with a high likelihood to occur on site include Black-backed Jackal and Caracal.

Reptiles

The Lanyon Vale 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. No natural permanent water occurs on site that represents suitable habitat for water-dependent species, but the ephemeral pans and drainage lines will be very 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. The Raucous Toad and Southern Pygmy Toad are endemic to South Africa and occur in a variety of terrestrial habitats for most of the time. However, they use various temporary waterbodies containing rainwater to breed, including pans, pools, roadsides, farm dams and even quarries, and could therefore also 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.

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 or protected fish.

Seven fish species are expected to be found in the Orange River, 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 Vaal-orange 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. 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:

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 are expected to 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.

NATURAL FLORA:

Dr. Betsie Milne from Bocia Ecological Consulting Pty Ltd has been appointed by Renaissance Resources to provide an Ecological Assessment Report in October 2022 for alluvial diamond mining on Lanyon Vale, Hay near Douglas, and to determine the possible impact of mining on the application area Flora was described and included in this report.

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.

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.

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 six distinct units, which are described below. These descriptions include unique characteristics and the dominant species found in each unit.

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

This community occurs on the calcrete plateau in the north of the study area. The vegetation is presented as shrubland with tall shrubs scattered in a short grassy matrix, intermixed with dwarf shrubs. Rocky, calcareous soil covers ± 20 - 30 % 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 Rhigozum obovatum, R. trichotomum, Cadaba aphylla, Searsia tridactyla, S. burchellii, Ehretia rigida and Nymania capensis. The dwarf shrub layer, dominated by Pentzia incana and Roepera lichtensteiniana, is more diverse and also includes Oedera humilis, Felicia fascicularis, Peliostomum origanoides, Aptosimum spinescens, Barleria rigida, Asparagus suaveolens, Lycium cinereum, Pteronia mucronata, Lasiosiphon polycephalus, Sericocoma avolans, Blepharis mitrata, Pegolettia retrofracta, Thesium lineatum, Plinthus karooicus, Aizoon secundum, A. schellenbergii and Salsola sp.

The grass layer is predominantly short and dominated by Enneapogon desvauxii, but other grasses include Cenchrus ciliaris, Aristida adscensionis, Eragrostis echinochloidea, Stipagrostis obtusa, S. uniplumis, S. ciliata and Fingerhuthia africana.

Herbs include Geigeria ornativa, Lasiopogon muscoides and the succulent Aloe hereroensis var. hereroensis.

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

This community covers the central parts of the study area, where it occurs on the rocky slopes of the tillite ridges, with many calcrete intrusions. Rocks constitute 20 – 30% 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 Searsia tridactyla, Boscia albitrunca, Nymania capensis, Rhigozum obovatum and Ehretia rigida. The diverse dwarf shrub layer includes Eriocephalus decussatus, Euryops dregeanus, Justicia incana, Fagonia isotricha var. isotricha, Tetraena microcarpa, Roepera lichtensteiniana, Aizoon asbestinum, A. secundum, Pteronia glauca, P. mucronata, Felicia fascicularis, Barleria rigida, Aptosimum spinescens, Peliostomum origanoides, Pentzia incana, Lasiosiphon polycephalus, Lycium cinereum, Asparagus suaveolens and Oedera humilis.

The grass layer is dominated by Aristida junciformis, but the low growing Enneapogon desvauxii is also common. Other common tall grass species include Stipagrostis ciliata, Fingerhuthia africana, Eragrostis annulata, Aristida adscensionis and Cenchrus ciliaris.

Herbs include Senecio consanguineus, Barleria lichtensteiniana, Aptosimum indivisum, Dicoma capensis, Oxalis lawsonii, Limeum aethiopicum, Geigeria ornativa, the bulb Ornithoglossum dinteri and the succulent Aloe claviflora.

iii) Riparian woodlands

This community lines the banks of the Orange River as well as the numerous drainage channels across the study area. The tree community transition from Vachellia karroo dominated woodland in the south to Olea europaea dominated woodland along the upper reaches of the drainage lines. In some areas, the woodland along the Orange River has been severely degraded and replaced by reed beds, dominated by Phragmites australis with shrubs and alien forbs along the fringes.

Apart from the dominant V. karroo, Searsia pendulina, Eucalyptus camaldulensis and Salix mucronata are also common in the canopy along the river. Lycium hirsutum and Asparagus retrofractus form almost impenetrable layers in the understory, while the floor is dominated by weeds, especially Bidens bipinnata, but also Argemone ochroleuca, Sisymbrium capense, Senecio consanguineus, Urtica urens and Datura ferox. Along the drainage lines, O. europaea co-occurs with Tarchonanthus camphoratus, Searsia burchellii, Senegalia mellifera, Boscia albitrunca and Ziziphus mucronata subsp. mucronata. The grasses Fingerhuthia africana and Cenchrus ciliaris are common here.

iv) Salsola - Stipagrostis ciliata open shrubland on deep alluvium

This community occurs in the south of the study area on deep, consolidated alluvium. It represents remnant patches in between those areas already transformed by agriculture but is also associated with the broader channels in the lower reaches of the drainage network. It has been subject to severe degradation, with sparse vegetation cover and numerous erosional features.

The vegetation is presented as open shrubland, dominated by low shrubs, but with Senegalia mellifera scattered across the community. Salsola sp. dominates the low shrub layer, but other common species include Lycium cinereum, Peliostomum origanoides, P. leucorrhizum, Aptosimum spinescens, Aizoon schellenbergii, A. secundum, Melolobium candicans, Lasiosiphon polycephalus and Plinthus karooicus. The grassy matrix is dominated by Stipagrostis ciliata, but Stipagrostis obtusa, Aristida congesta subsp. congesta and Enneapogon cenchroides are also common. Herbs include Lotononis laxa, Dicoma capensis, Sesamum triphyllum, Laggera decurrens and the invasive Xanthium spinosum.

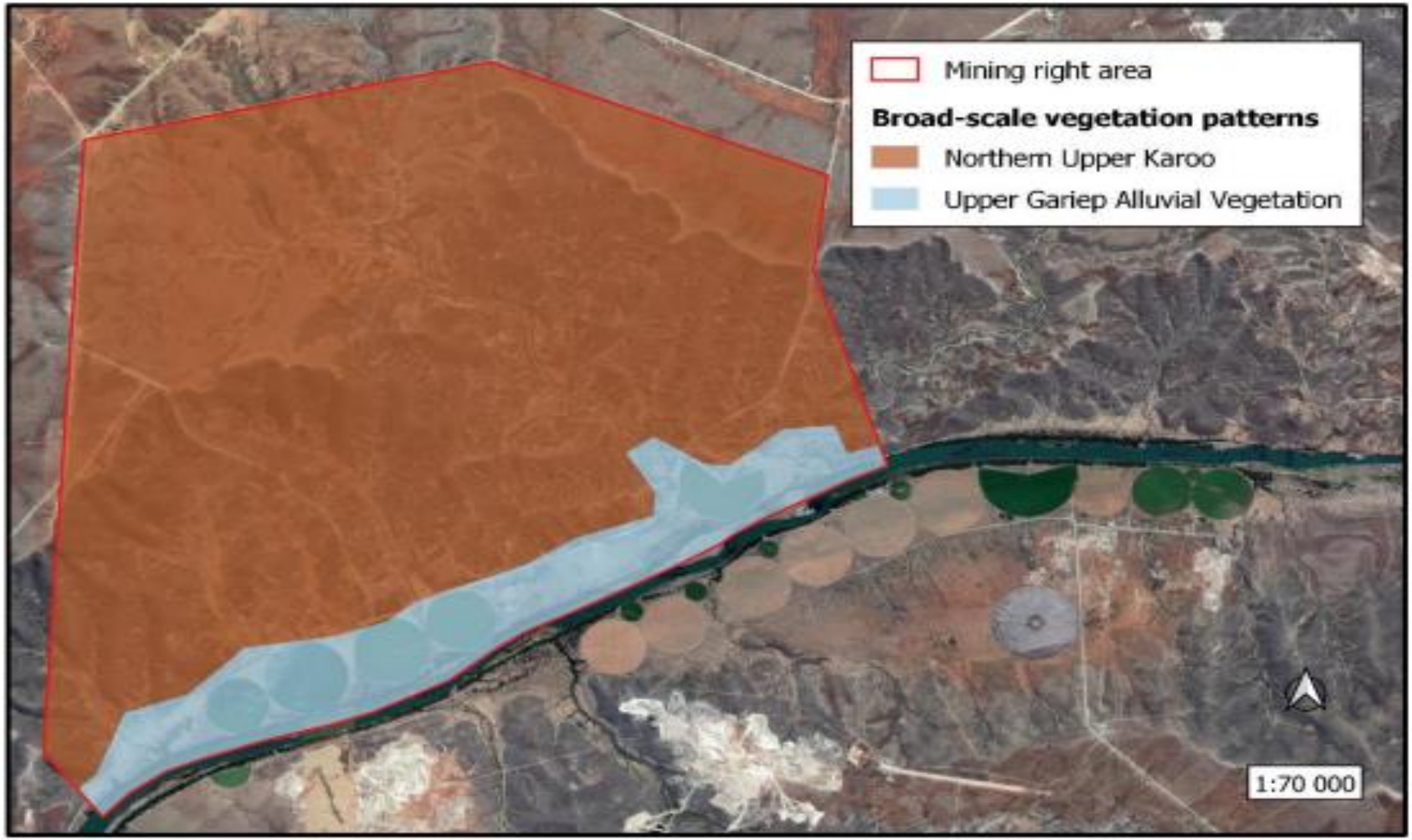


Figure 17. The broad-scale vegetation units (Mucina and Rutherford 2012) present in the study area.

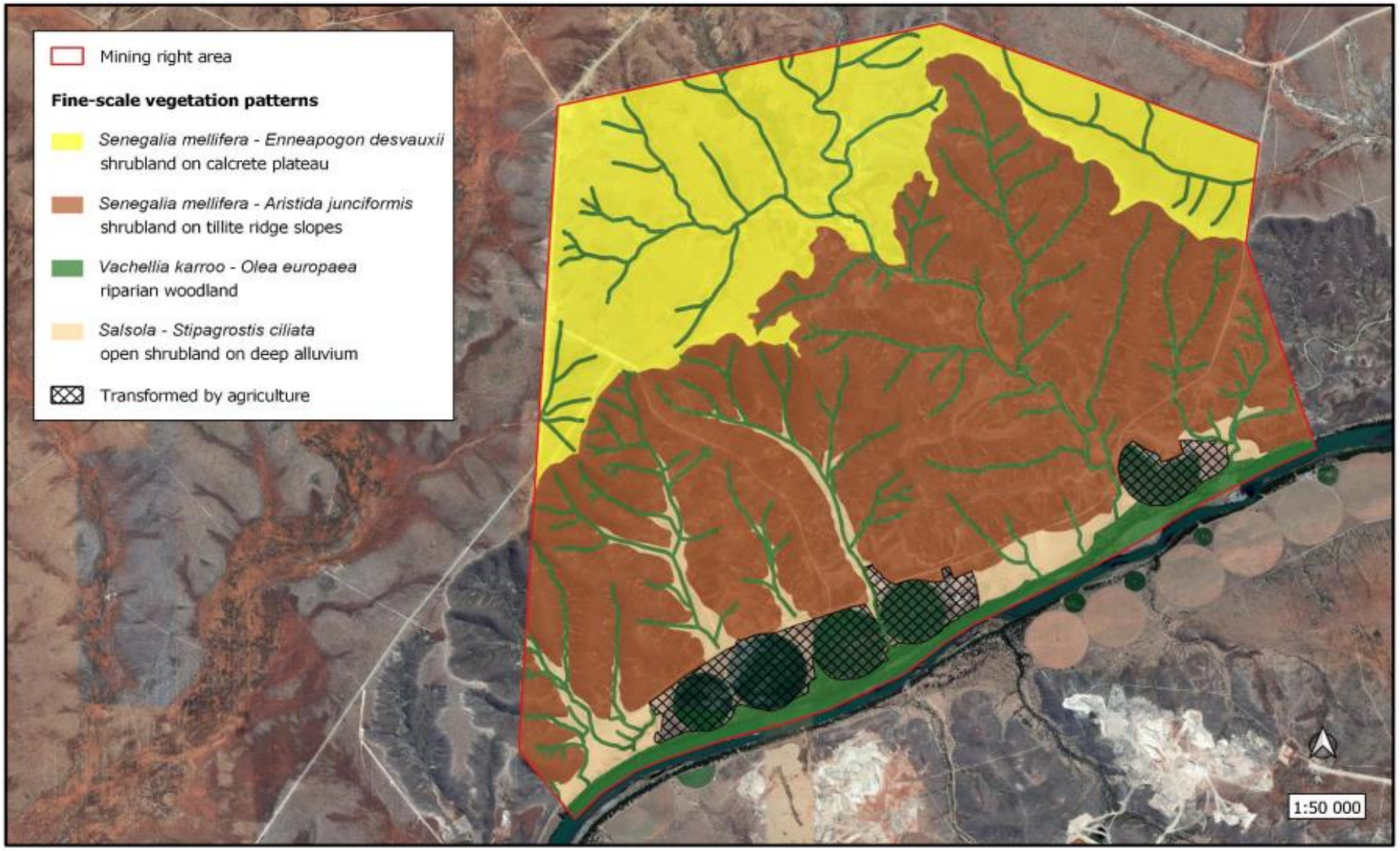


Figure 18. The distribution of fine-scale plant communities in the study area

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)) was not recorded during the survey, but they typically occur on the rocky shrublands in the region. It 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. 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. Salsola sp. was common in the open shrubland on alluvium, but its identity could not be determined.

Species protected in terms of the National Forest Act include Boscia in the upper reaches of the site as well as in the shrublands on calcrete and tillite. On the calcrete plateau it occurred at moderate densities of ± 2 - 3 individuals per hectare, represented by the entire population size range, i.e. saplings (70 cm (d) x 50 cm (h)), young shrubs (1.5 (d) x 1 m (h)), stunted shrubs (1 m (d) x 30 cm (h)) and adult trees (3 m (d) x 2 – 2.5 m (h)). The same is true for the population on the ridge slopes, but here they occurred at lower densities of ± 1 individual per hectare. Larger trees of 2 - 3 m in height x 3 - 5 m in diameter were recorded along the banks of the drainage lines.

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. Of these, the two Aloe species and Nymania capensis were recorded in the shrublands on calcrete plateau and tillite ridge slopes, while Oxalis lawsonii was recorded on the ridge slopes. Large Olea europaea subsp. africana trees were found along the banks of the drainage channels at high densities.

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.

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 4.

Table 4. Declared indicators of bush encroachment in the Northern Cape recorded in the study area.

Scientific name	Common name
Grewia flava	Velvet Raisin
Rhigozum trichotomum	Three – thorn Rhigozum
Senegalia mellifera	Black Thorn
Tarchonanthus camphoratus	Camphor Bush
Vachellia karroo	Sweet Thorn

(6) *SURFACE WATER AND WETLANDS*

Dr. Betsie Milne from Bocia Ecological Consulting Pty Ltd has been appointed by Renaissance Resources to provide an Ecological Assessment Report in October 2022 for alluvial diamond mining on Lanyon Vale, Hay near Douglas, and to determine the possible impact of mining on the application area surface water was described and included in this report.

The Lanyon Vale study area falls within the Boegoeberg quaternary catchment D71C of the Lower Orange Water Management Area (Figure 19). This quaternary catchment has been allocated a Present Ecological State (PES) of 'Moderately Modified' (C) by Smook et al. (2002) and information regarding its mean annual rainfall, evaporation potential and runoff is provided in Table 5.

Table 5. Catchment characteristics for the Boegoeberg quaternary catchment in which the study area falls, 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)
D71C	1 592	250	2 350	4.75

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 6. Most of these wetlands have been moderately to severely modified.

The Orange River, with its associated wetlands and riparian zone, lines the mining right border in the south and an extensive network of drainage lines occur on site (Figure 19).

Table 6. 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

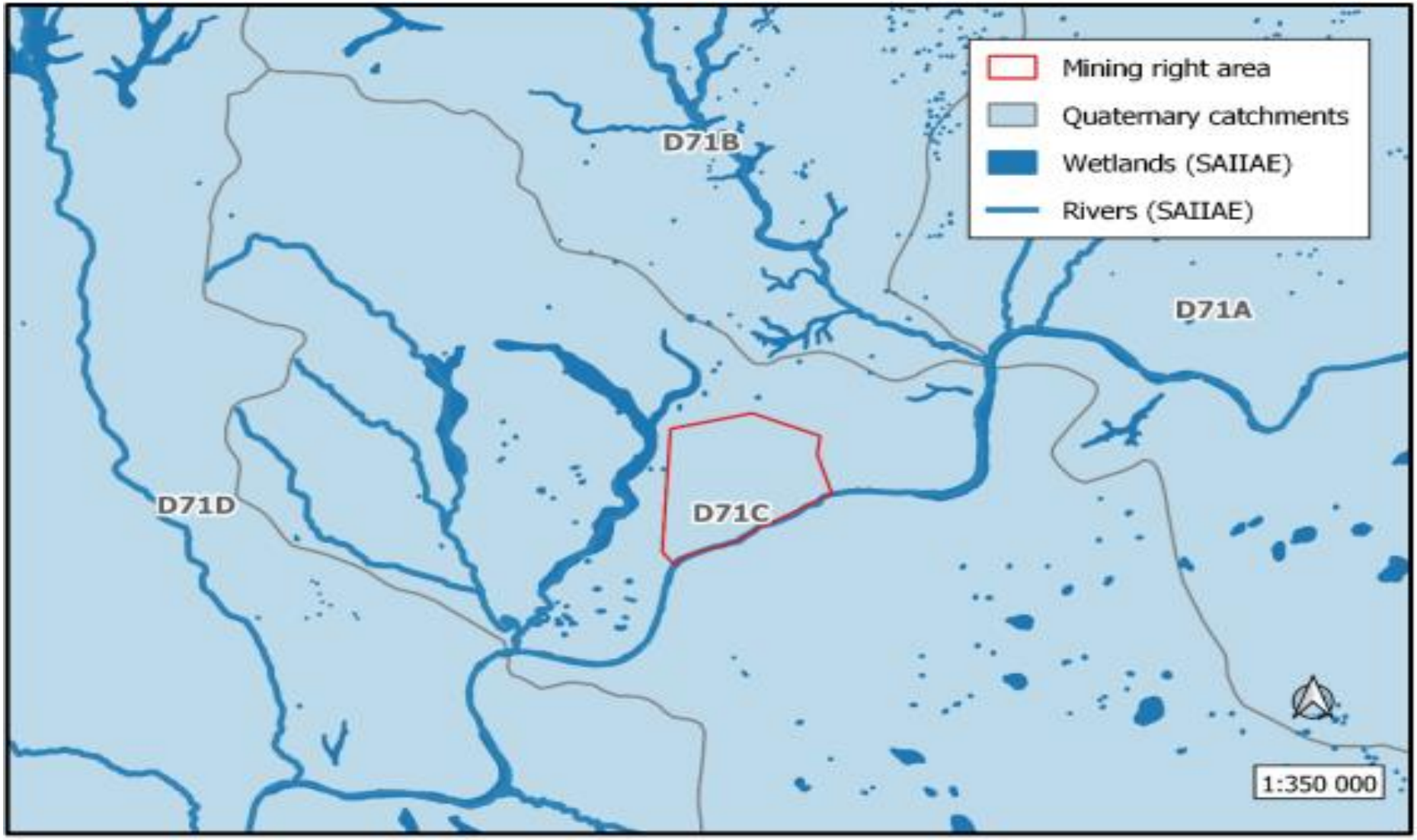


Figure 19. The locality of the proposed mining area in relation to the Boegoeberg quaternary catchment of the Lower Orange Water Management Area.

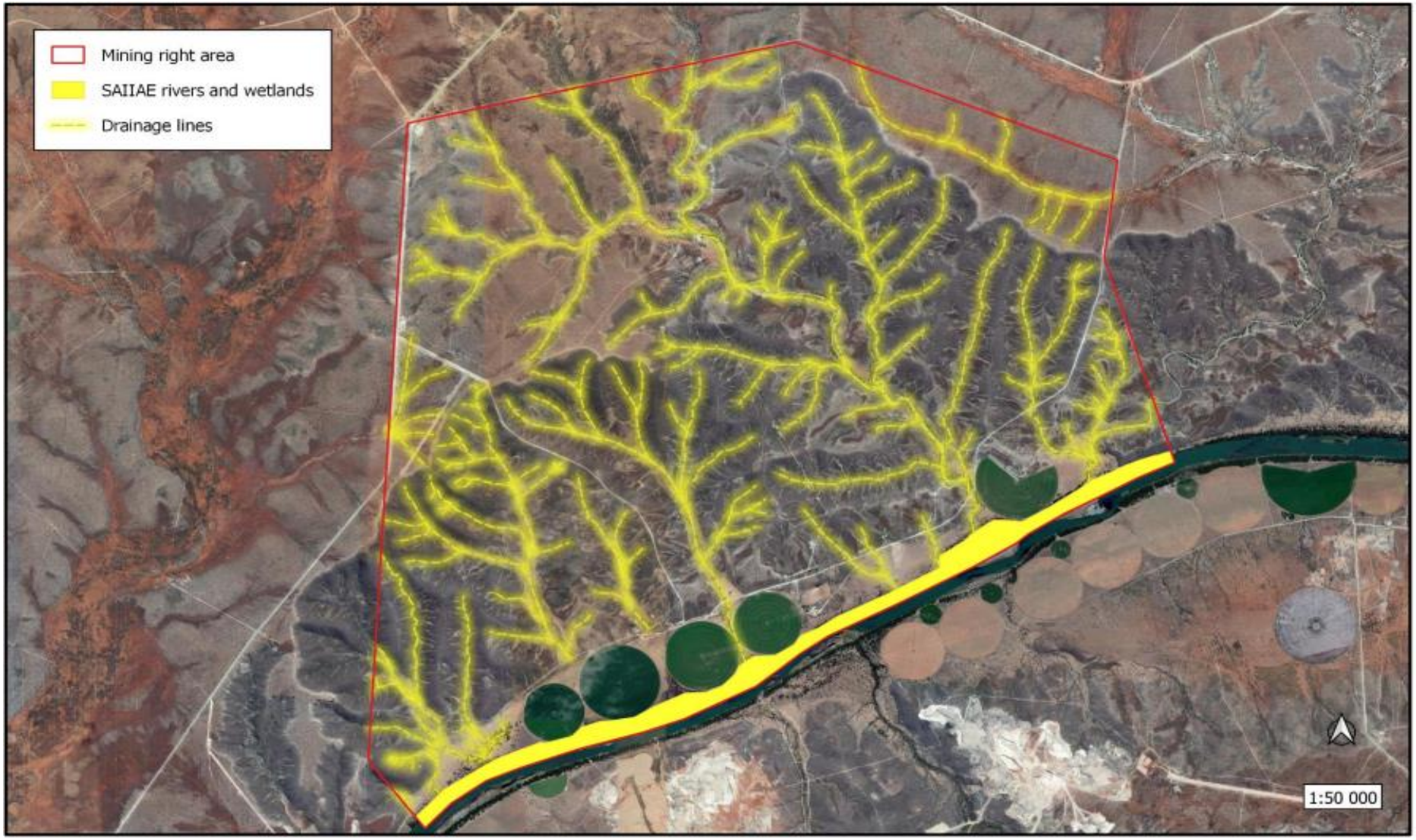


Figure 20. The location of SAIIAE wetlands and drainage lines on the proposed mining right area

(7) ***GROUND WATER:***

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

Ground –Water Zone
It is not anticipated that ground water plays a significant role in the study area. The river is the primary source of water for most activities.
The area between Douglas and Prieska is criss-crossed by dolerite dykes which could act as barriers to water seepage from mine sites. These thin impersistent dykes in the proposed mine area will not affect ground–water movement significantly. The depth of the boreholes as indicated in 1.10 precludes ground water being an important factor in the area.

Operation Demand
Processed water
The processed water and mine residue deposits will form part of a closed dirty water system and will not be allowed back into the Orange River. Water for mining operations will be sourced from the Orange River.

(8) ***CULTURAL AND HERITAGE RESOURCES:***

Dr. Edward Matenga from (AHSA) Archaeological and Heritage Services Africa Pty Ltd has been appointed by Renaissance Resources to provide an Heritage Impact Assessment Report for alluvial diamond mining on Lanyon Vale, Hay near Douglas, and to determine the possible impact of mining on the application area.

This Heritage Impact Assessment (HIA) report has been prepared in support of a Mining Right Application on Portion 23 (a Portion of Portion 15) of the Farm Lanyon Vale 376 near Douglas in the Siyancuma Local Municipality, Northern Cape. A ground survey was undertaken on 16 August and 21 September 2022 to assess the heritage sensitivity of the property, and potential adverse impacts of the proposed activities were evaluated.

The heritage sensitivity of the property is summarised as follows:

The Stone Age

Stone Age material is widely distributed on the plains, ridges, and valleys on the property. Eleven (11) occurrences were recorded in this instance. The Stone Age material comprises scrapers, blades, cores, and flakes typologically dating to the Middle Stone Age/Late Stone Age period. The single occurrences of a cleaver and hand-axe may represent a transitional period from the Early Stone Age to the Middle Stone Age. The scattered distribution pattern seems to indicate general hunter-gatherer activity in the area over time. None of the sites were found to warrant further action.

The Early Iron Age
No material dating to the Iron Age was found.
The Later Iron Age
No material dating to the Later Iron Age was found.

Burial grounds
A burial ground was known and recorded on the farm with ±30 cairn burials arranged in two rows. The deceased were farm workers. A servitude of 100 m radius must be reserved as per the statutory regulations. Two circular stone features of diameter c. 160 cm were also recorded. They possibly mark graves. As a precaution, these features must be protected with a 100 m servitude. Otherwise, they must be investigated by a qualified archaeologist for a permit to be issued for their disposal.

Figure 21. A burial ground (LNV02) and circular stone features that may be graves (LNV04 & LNV05)

Conclusion and recommendations
The Mining 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
Prof Marion Bamford, of the University of the Witwatersrand, sub-contracted by Archaeological and Heritage Services Africa (Pty) Ltd,

Pretoria, South Africa has been appointed by Renaissance Resources to provide a Palaeontological Impact Assessment Report for alluvial diamond mining on Lanyon Vale, Hay near Douglas, and to determine the possible impact of mining on the application area.

A Palaeontological Impact Assessment was requested for the proposed Mining Right Application by Renaissance Resources (Pty) Ltd on the Remaining Extent of Portion 15 (Lubbeshoop) of the Farm Lanyon Vale 376 and Portion 23 (a portion of Portion 15) of Farm Lanyon Vale 376. The site is southwest of Douglas in the Hay Administrative District, Northern Cape Province. The extent of the area is 4248.9 Ha.

To comply with the regulations of the South African Heritage Resources Agency (SAHRA) in terms of Section 38(8) of the National Heritage Resources Act, 1999 (Act No. 25 of 1999) (NHRA), a site visit (Phase 2) Palaeontological Impact Assessment (PIA) was completed for the proposed development.

The proposed site lies on the highly fossiliferous Quaternary Calcretes and the moderately fossiliferous Quaternary alluvium and Dwyka Group. 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 miners, contractor, environmental officer or other designated responsible person once excavations, drilling or mining activities have commenced. Since the impact will be low, as far as the palaeontology is concerned, the project should be authorised.

Palaeontological context

The palaeontological sensitivity of the area under consideration is presented in Figure 22. 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 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 22. SAHRIS palaeosensitivity map for the site for the proposed Lanyon Vale 376 MRA 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).

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 FOSSILS in the Dwyka Group tillites, 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 do contain 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 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 ad cobble layers are not fossiliferous. Nonetheless, a Fossil Chance Find Protocol should be added to the EMPr. If fossils are found by the miners, 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.

Chance Find Protocol

Monitoring Programme for Palaeontology – to commence once the excavations / drilling / mining activities begin.

1. The following procedure is only required if fossils are seen on the surface and when drilling/excavations/mining commence.
2. When excavations begin the rocks and must be given a cursory inspection by the environmental officer or designated person. Any fossiliferous material (plants, insects, bone, invertebrates) should be put aside in a suitably protected place. This way the project activities will not be interrupted.
3. Photographs of similar fossils must be provided to the developer to assist in recognizing the fossil plants, vertebrates, invertebrates or trace fossils in the shales and mudstones. This information will be built into the EMP's training and awareness plan and procedures.
4. Photographs of the putative fossils can be sent to the palaeontologist for a preliminary assessment.
5. If there is any possible fossil material found by the developer/environmental officer/miners then the qualified palaeontologist sub-contracted for this project, should visit the site to inspect the selected material and check the dumps where feasible.
6. Fossil plants or vertebrates that are considered to be of good quality or scientific interest by the palaeontologist must be removed, catalogued and housed in a suitable institution where they can be made available for further study. Before the fossils are removed from the site a SAHRA permit must be obtained. Annual reports must be submitted to SAHRA as required by the relevant permits.
7. If no good fossil material is recovered then no site inspections by the palaeontologist will be necessary. A final report by the palaeontologist must be sent to SAHRA once the project has been completed and only if there are fossils.
8. If no fossils are found and the excavations have finished then no further monitoring is required.

(9) ***AIR QUALITY:***

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 mining activtiy.

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 opencast mining process, the loading of gravels onto the transport trucks, the dumping of gravels over each sites primary screen or feeder bins as well as from the movement of trucks and vehicles on

the mining 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.

(10) *Noise:*

Noise on site will come from the large vehicles (tip trucks, front-end loaders, back actors), from the working pans.

There are numerous mining operations on both sides of the proposed mining operation as well as across the Orange River. Although these operations do generate noise the overall impact can be described as negligible.

(11) *VISUAL ASPECTS:*

The mining area is visible from the other side of the Orange river and to the neighbour to the west of the mining area. There are no residential areas within the surrounding area. The mine is not located on any tourist route and will not be visible to the average tourist.

(12) *CRITICAL BIODIVERSITY AREAS AND BROAD-SCALE PROCESSES:*

Dr. Betsie Milne from Bocia Ecological Consulting Pty Ltd has been appointed by Renaissance Resources to provide an Ecological Assessment Report in October 2022 for Lanyon Vale 376, Hay near Douglas, and to determine the possible impact of mining on the application area Critical biodiversity areas and broad-scale processes was described and included in this report.

The proposed mining site falls within critical biodiversity areas (Figure 23), 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 encompassthe drainage catchment, are classified as Critical Biodiversity Area Two (Figure 24). 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 (Figure 24), 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 (Figure 25). 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.
According to the screening tool, the Lanyon Vale study area is of very high sensitivity based on the Terrestrial Biodiversity Theme. This sensitivity is a direct function of the Critical Biodiversity Areas according to the Northern Cape Critical Biodiversity Areas Map. The study area 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). The site is however of low sensitivity based on the Plant Species- and Aquatic Biodiversity Themes.

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.

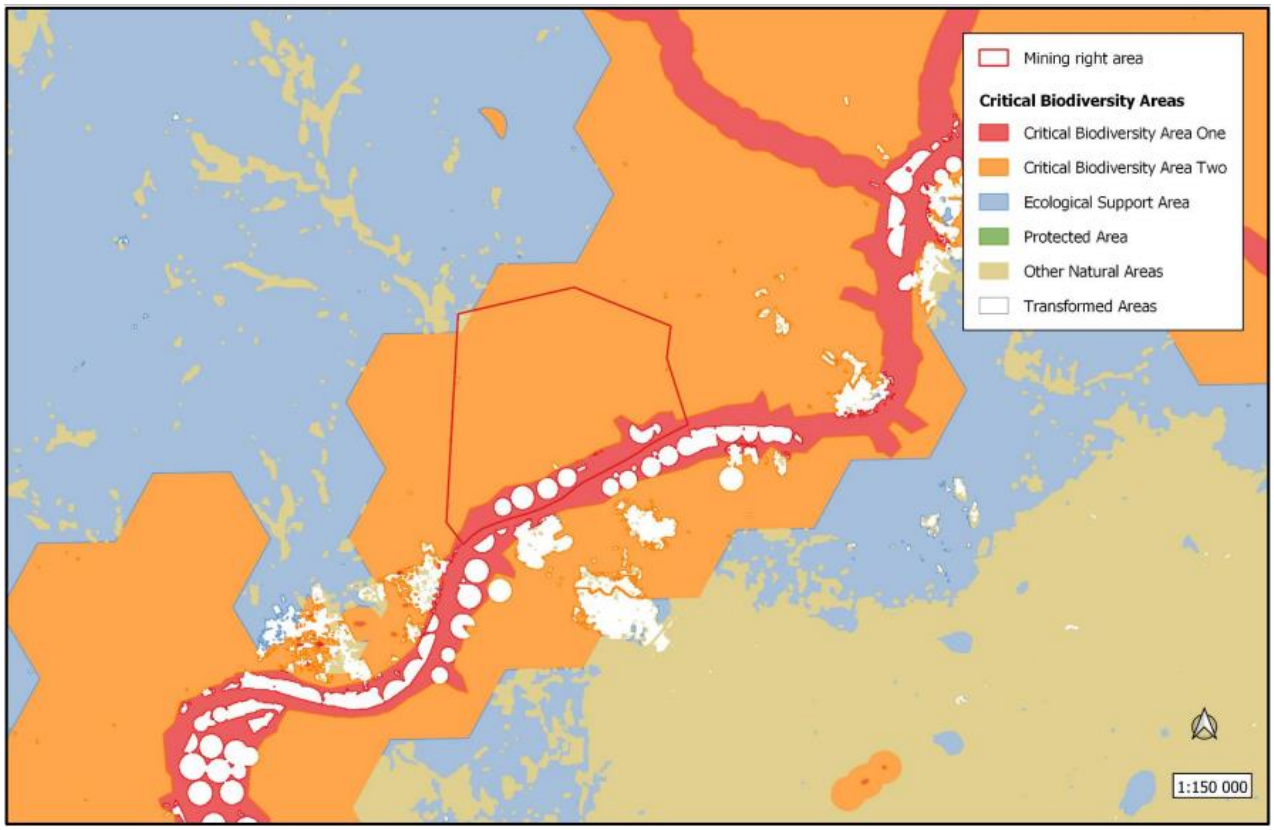


Figure 23. The study area in relation to the Northern Cape Critical Biodiversity Areas.

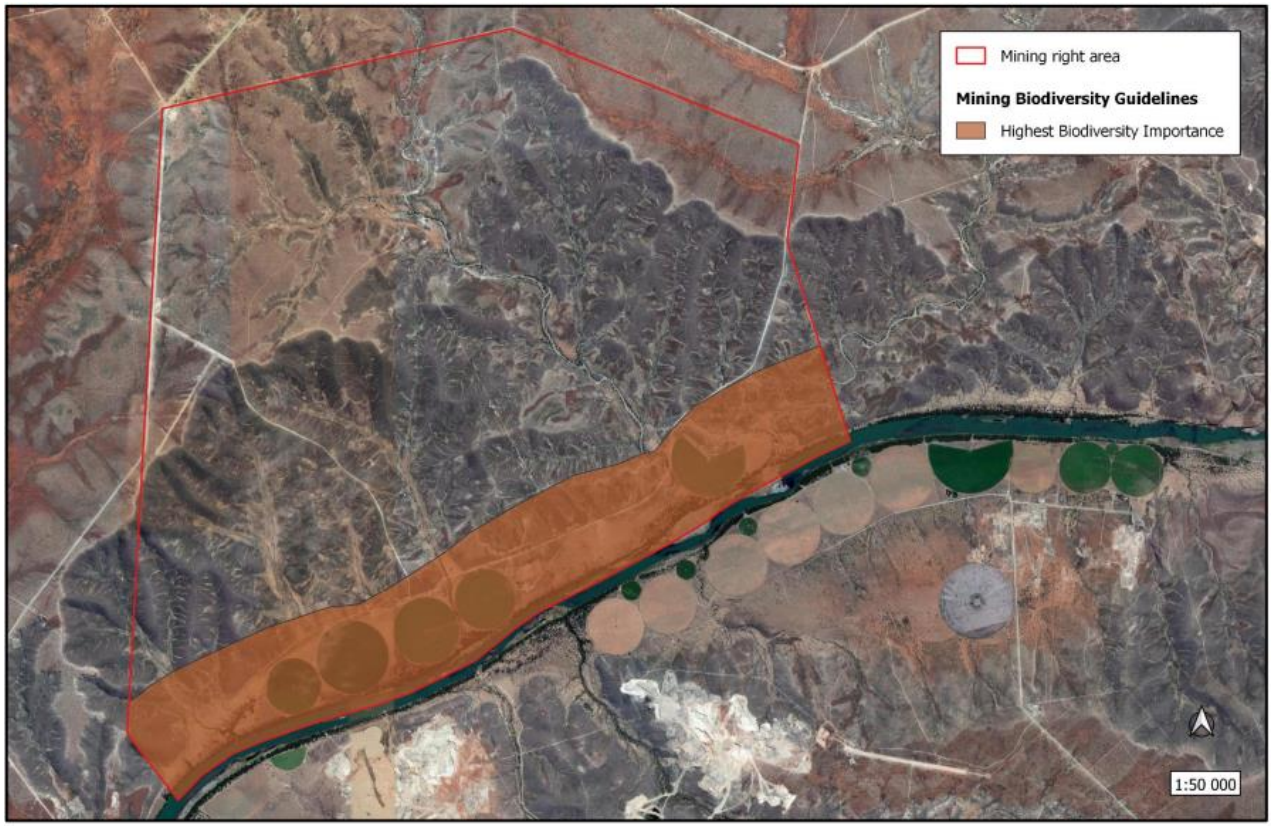


Figure 24. The study area in relation to the Mining and Biodiversity Guidelines.

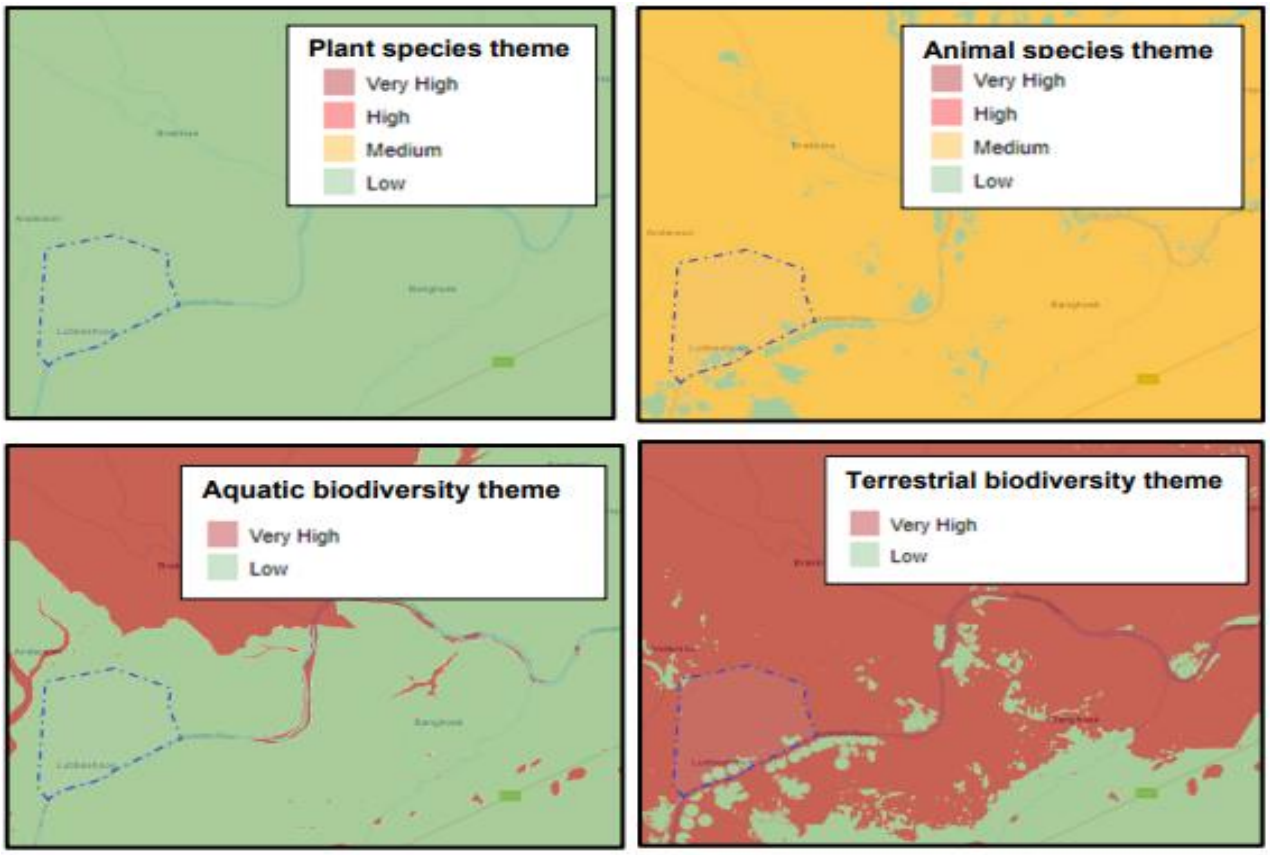


Figure 25. Environmental sensitivities in the study area, according to the National Web based Environmental Screening Tool.

The study area also borders the southern boundary of the Griqualand West Centre (GWC) of Endemism core (Frisby et al. 2019) (Figure 26). 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 (Figure 27), 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.

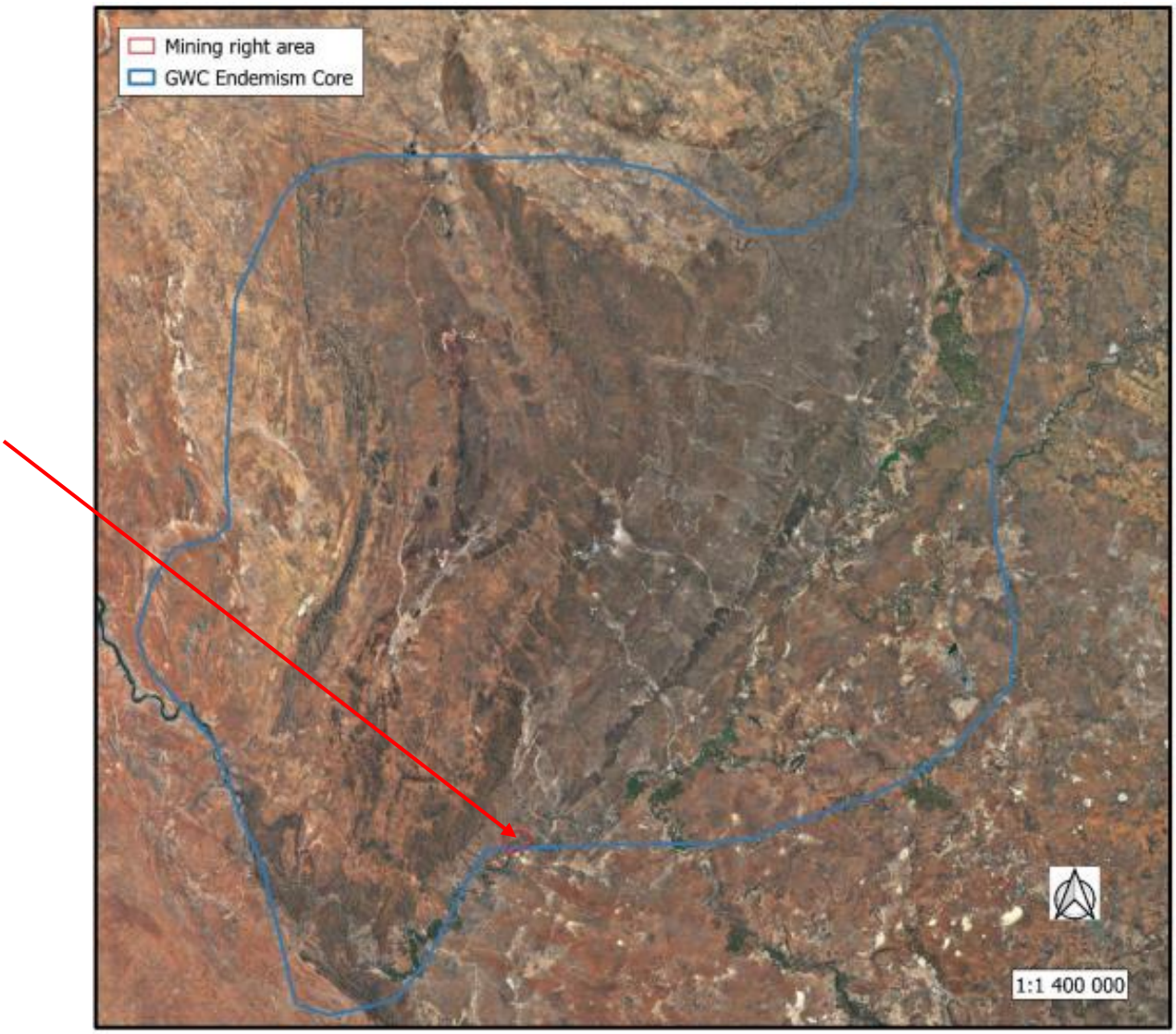


Figure 26. Lanyon Vale in relation to the Griqualand West Centre of Endemism (Frisby et al. 2019).

Figure 27. The extent of transformation through mining and agriculture along the Orange River.

(13) ***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 in Douglas at the confluence and are used to irrigate the many agricultural farming activities in and around Douglas.

Figure 28. Locality Map of 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.

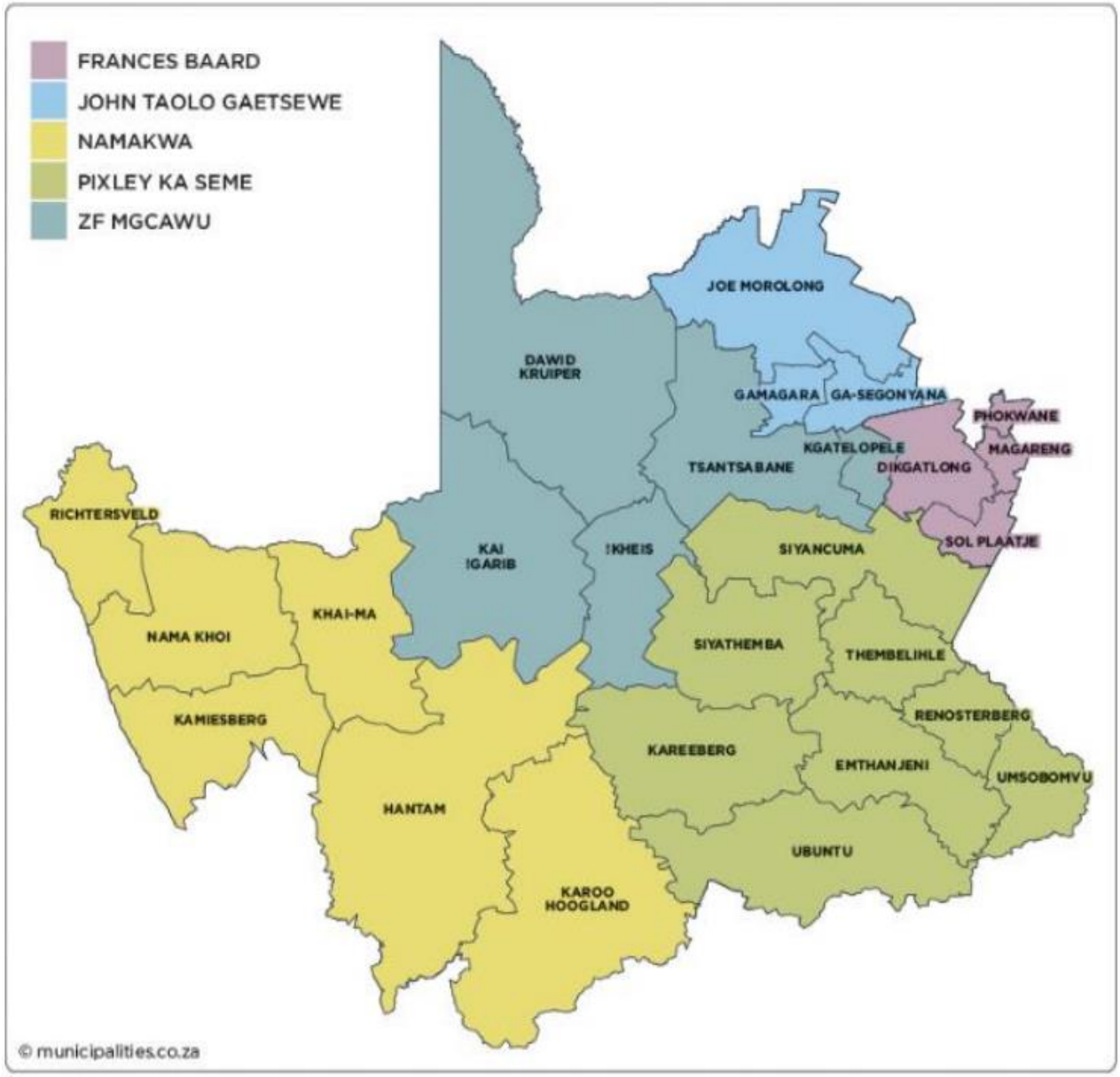


Figure 29. Map of District Municipalities in the Northern Cape. Source: Google Maps (2020)

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.

The local area (Siyancuma) has a small to medium population density and labour is sourced from the surrounding towns of Prieska and Douglas. Fuel and basic supplies can be obtained at Douglas or Prieska and the property has land and mobile telephone connectivity.

The following information is found in the Integrated Development Plan (IDP) 2020 – 2021 of the Siyancuma Municipality.

The Siyancuma Local Municipality hosts the confluence of the Vaal and the Orange River. It comprises in the main of the three towns, that is, Campbell, Douglas and Griekwastad and has densely populated rural settlements called Smitchdrift and Bucklands. The municipal area is richly endowed with precious and semi-precious stones, that is, diamonds and tiger's eye. Beneficiation of tiger's eye is on the high impact project identified in the District Growth and Development Strategy. The Municipality has a great tourism potential.

The Siyancuma Local Municipality is characterised by incorporating the confluence of South Africa's largest rivers, the Orange and Vaal Rivers, with rich mineral deposits (diamonds, tiger's eye, zinc, lead and copper). The municipality has relatively high levels of basic services, partially integrated society, medical facilities in Douglas and Griekwastad, one of the biggest correctional services in the province and is the neighbour to Kimberley, the provincial and legislative capital of the province. It still has major inequalities to overcome and in common with the rest of the country, a skew and sluggish economy to transform and speed up. The themes of this IDP are increasing economic growth, improving community self-reliance, achieving service excellence and sustainability led by strengthened leadership and good governance and a common approach between stakeholders.

Population	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 depict the population figures of the five District Municipalities as in 2011 and 2016:

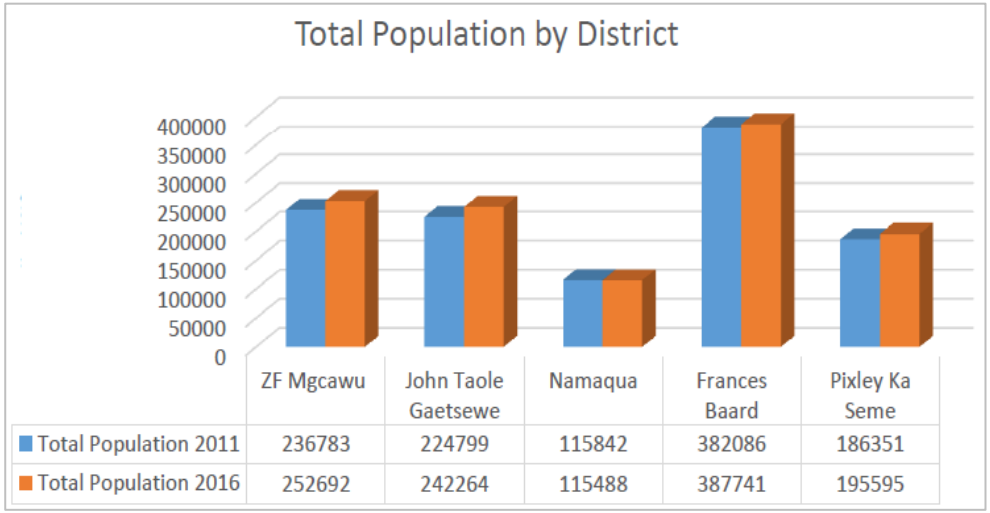


Figure 30. Total Population by District (Source: StatsSA (2011) & StatsSA Community Survey (2016))

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).

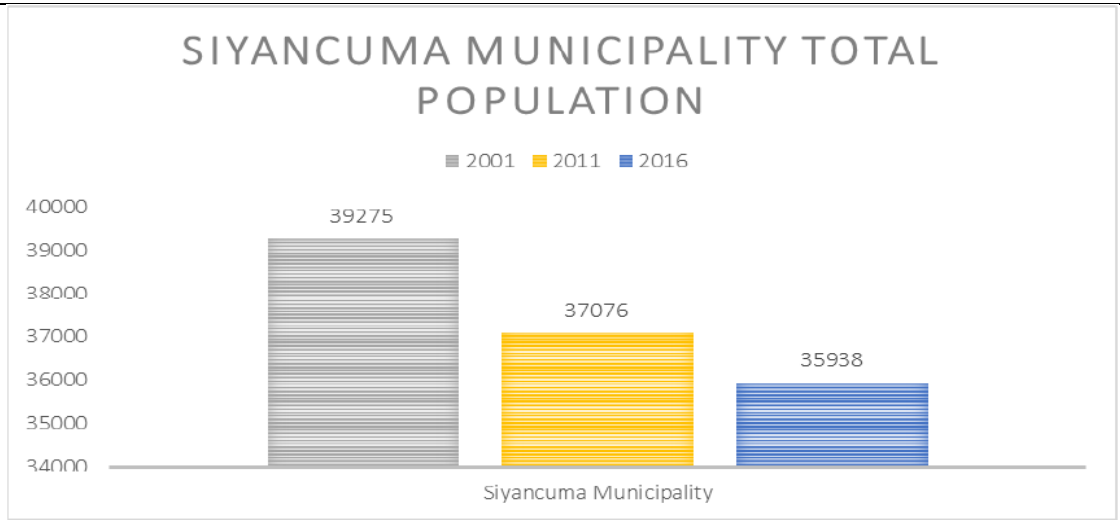


Figure 31. Siyancuma Municipality total population (Source: (2001), StatsSA (2011) & StatsSA Community Survey (2016)).

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.

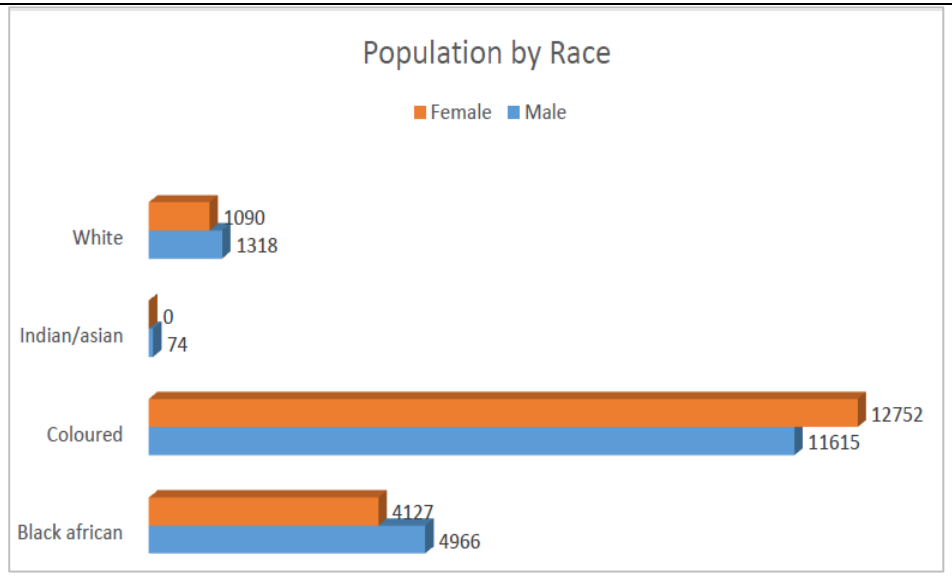
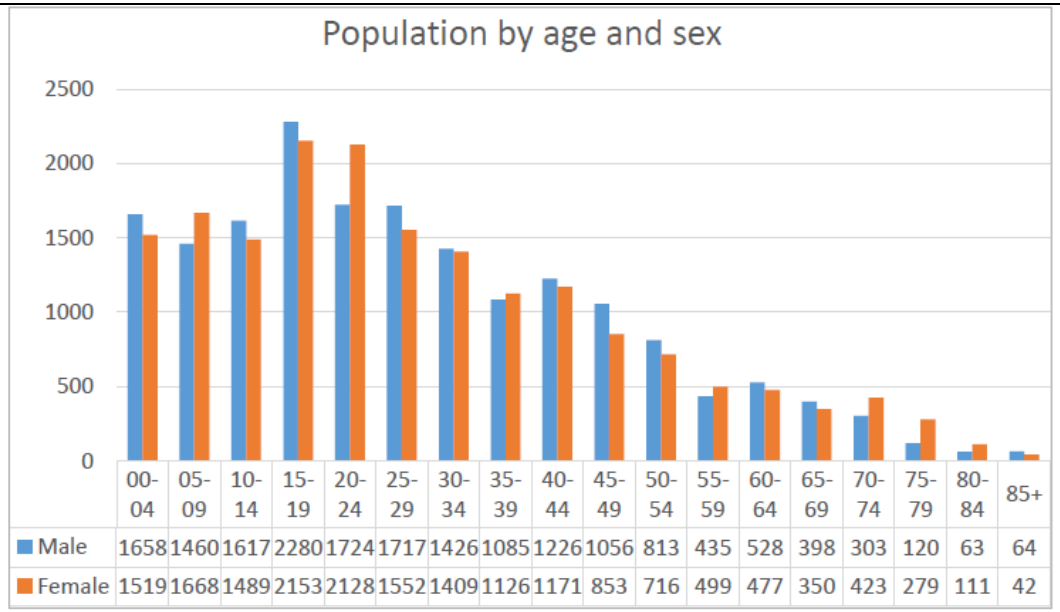


Figure 32. Population by race and gender (Source: StatsSA Community Survey (2016)).

Age & Gender Composition	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 %



	00-04	05-09	10-14	15-19	20-24	25-29	30-34	35-39	40-44	45-49	50-54	55-59	60-64	65-69	70-74	75-79	80-84	85+
Male	1658	1460	1617	2280	1724	1717	1426	1085	1226	1056	813	435	528	398	303	120	63	64
Female	1519	1668	1489	2153	2128	1552	1409	1126	1171	853	716	499	477	350	423	279	111	42

Figure 33. Population by age and gender.

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.

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

Table 7: Municipal Health Centres (Source: Siyancuma Municipality (2020))

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

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.

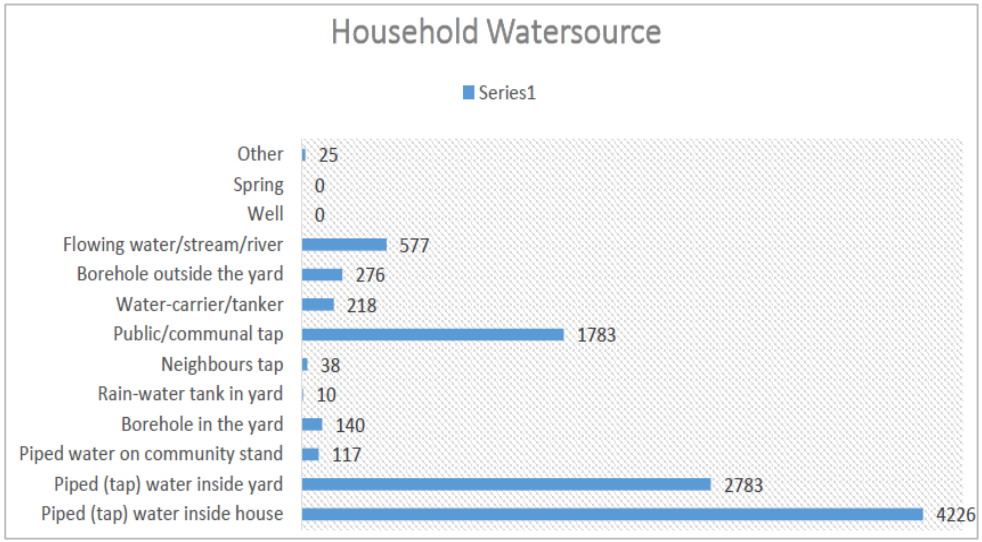
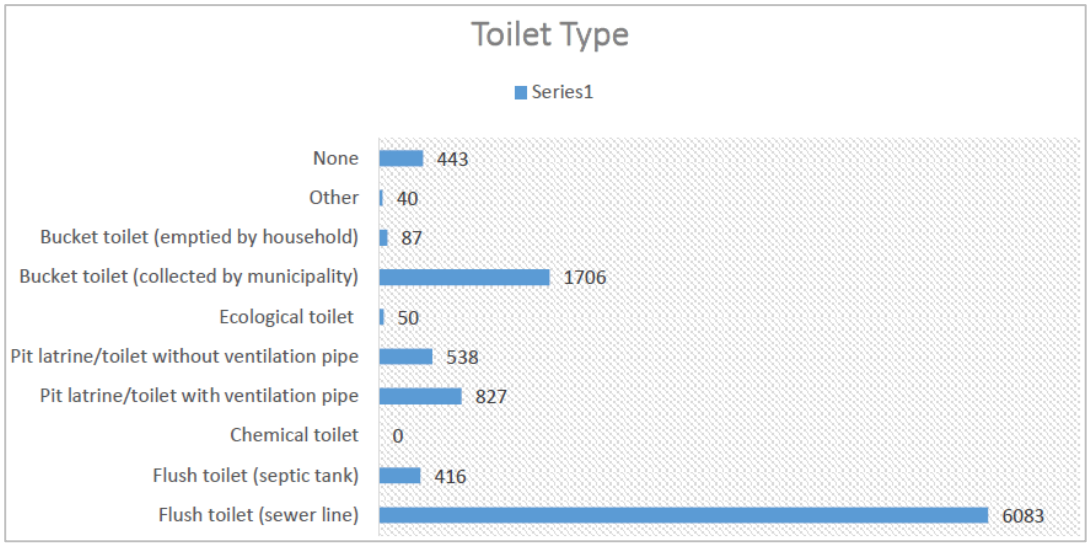
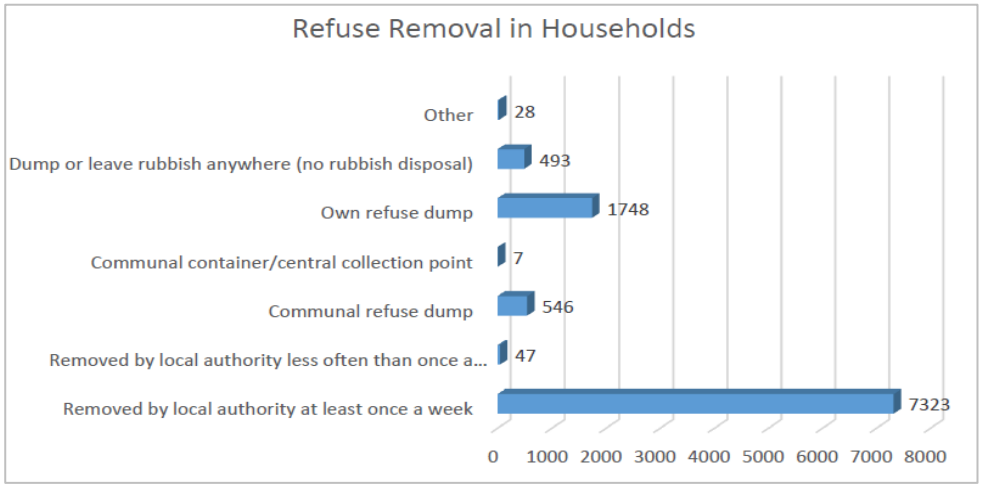


Figure 34. Household Water sources (Source: StatsSA Community Survey (2016)).

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 ad 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" 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.  **Figure 35.** Toilet Type (Source: StatsSA Community Survey (2016)).
Refuse Removal	The graph below 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.  **Figure 36.** Refuse removal (Source: StatsSA Community Survey (2016))
Electricity	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, e.g., 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.

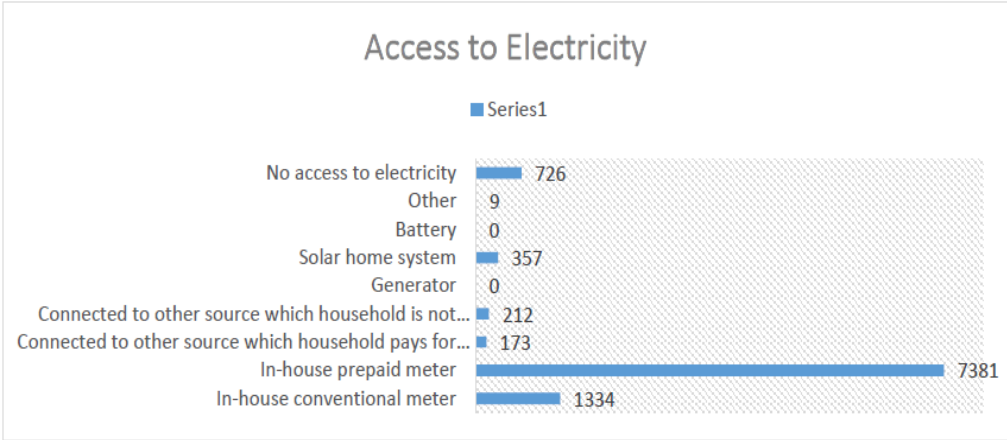


Figure 37. Access to Electricity (Source: StatsSA Community Survey (2016))

Housing

1. Household Dynamics

The table below indicates that the number of households in the Siyancuma Municipality have increased by 613 number of households from 2011 to 2016. It can also be seen that the number of formal dwellings have increased along with the number of houses being owned by their residents.

Table 8: Household Dynamics (Source: StatsSA Community Survey (2016) and StatsSA (2011))

	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 %

2. Household Services

From the table below it can be seen that the services provided to households within the Siyancuma Municipality have improved. More households indicated that they have flush toilets, refuse removal, piped water (inside dwellings) and electricity in 2016 than in 2011.

Table 9: Household services (Source: StatsSA Community Survey (2016) and StatsSA (2011))

	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 %

3. Housing Backlogs

From the figure below it can be seen that the total housing backlogs amount up to 3345 houses with the greatest backlog being in the town Breipaal (1051 houses) followed by Bongani (836 houses) and Schmidtsdrift (700 houses).

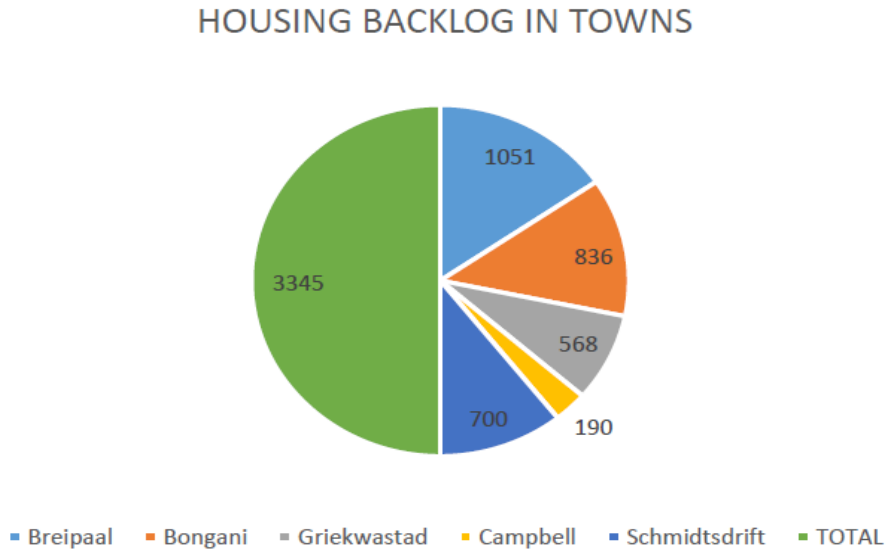


Figure 38. Housing Backlog in towns (Source: Siyancuma Local Municipality (2020)).

Education

1. Level of Education:
The statistics below 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.

Table 10: Level of education (age +20) (Source: StatSA Community Survey (2016) and StatsSA (2011))

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

2. 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.

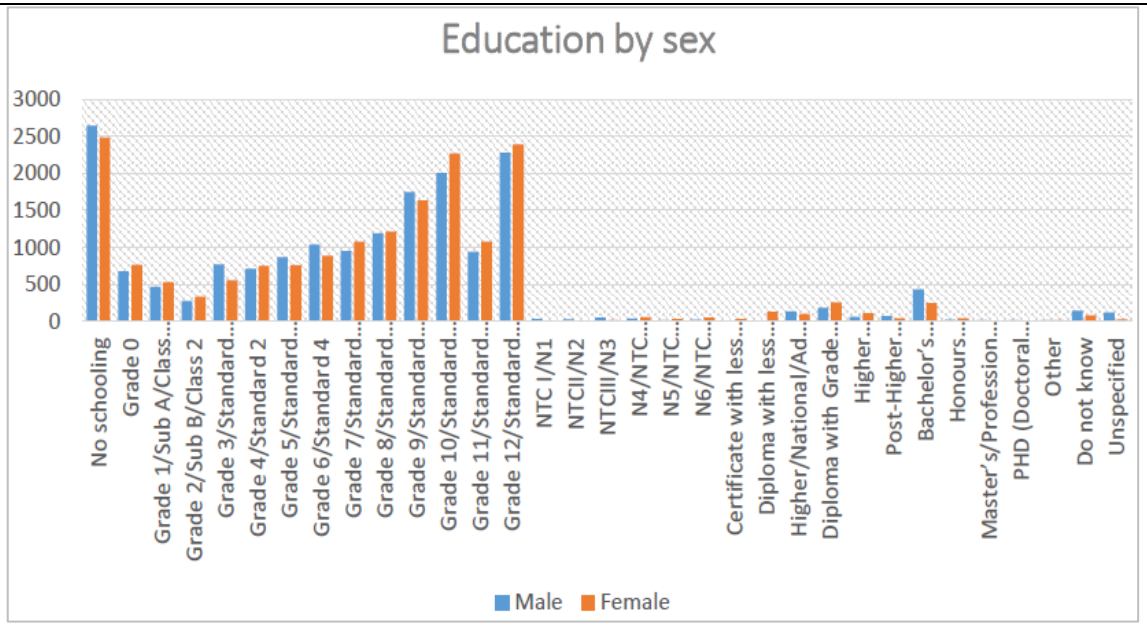


Figure 39. Education by gender.

(14) *SENSITIVE LANDSCAPES:*

Site sensitivity

The ecological sensitivity map for Lanyon Vale is illustrated in Figure 40. The Orange River and drainage lines, along with their riparian buffers, are of very high sensitivity due to their vital ecological and hydrological functionality and significance. All watercourses are unique habitats protected in terms of the National Water Act (Act No 36 of 1998). These highly sensitive areas should be considered as no-go areas.

The shrublands on the plateau, ridge slopes and alluvium are all of high sensitivity. Healthy populations of the nationally protected tree, Boscia albitrunca, occur widespread across the plateau and ridge slopes and these units also provide ideal habitat for the listed Ludwig's Bustard. The open shrubland on alluvium, although degraded through anthropogenic activities, fall within the local catchments of the drainage lines and the Orange River. The substrate is highly prone to erosion and runoff losses, which poses secondary risks to the watercourses through sedimentation. These areas are not regarded as no-go areas, but activities should proceed with caution as it may not be possible to mitigate all impacts.

Areas transformed by agriculture are of low sensitivity. These are transformed habitats where there is likely to be a negligible impact on ecological processes and biodiversity. Most types of activities can proceed within these areas with little ecological impact.

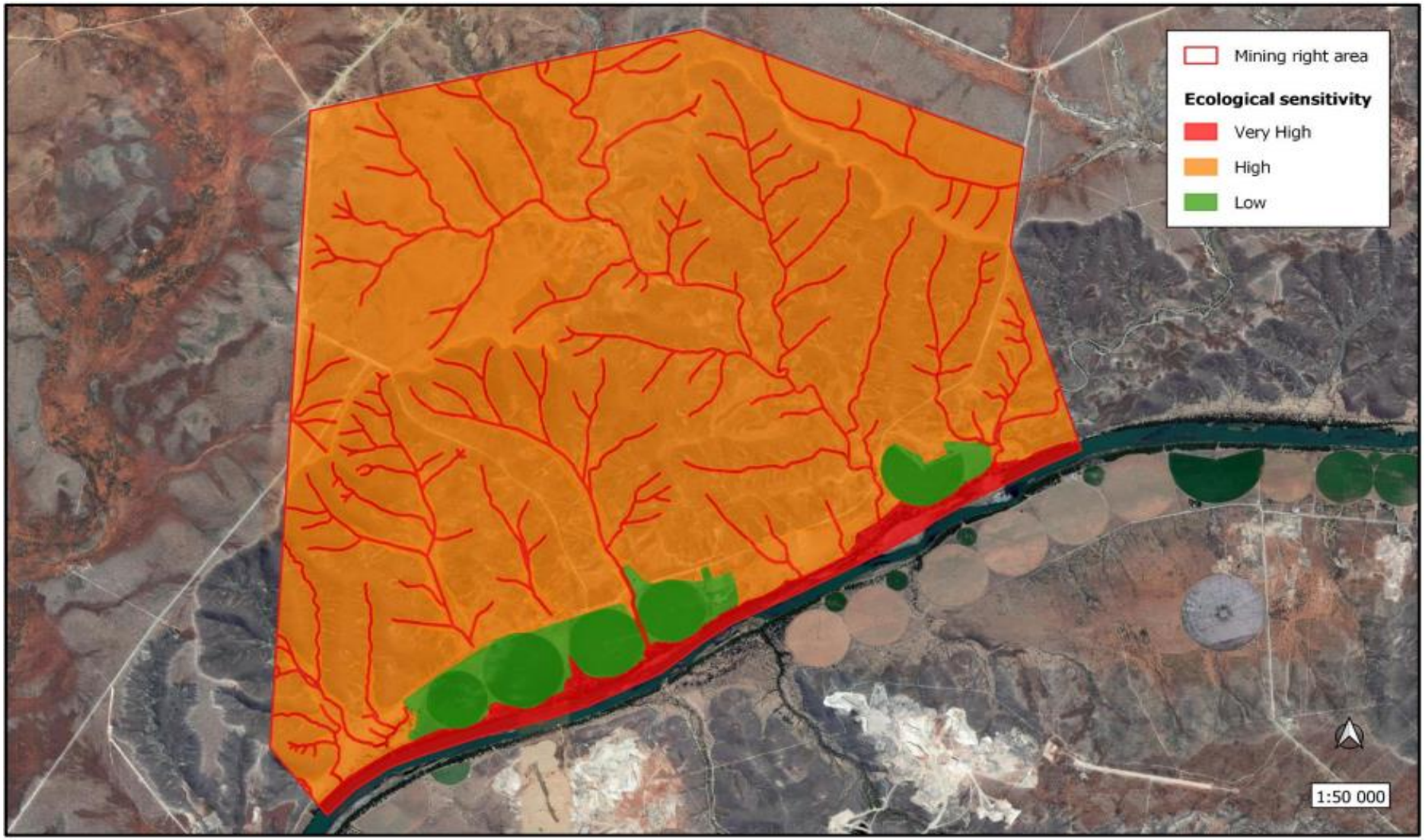


Figure 40. A sensitivity map for the Lanyon Vale mining area

(b) Description of the current land uses

Dr. Betsie Milne from Bocia Ecological Consulting Pty Ltd has been appointed by Renaissance Resources to provide an Ecological Assessment Report in October 2022 for alluvial diamond mining on Lanyon Vale 376, Hay near Douglas, and to determine the possible impact of mining on the application area Land capability and Land Use was described and included in this report.

Pre-mining Land Capability

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.

Land Use Prior to Mining

Apart from the proposed mining activities, the mining right application area is mainly used for agriculture. Crop irrigation is practised along the river, while the remaining areas are utilised as natural pastures for livestock grazing.

Historical Agricultural Activities and evidence of Abuse

Several surface disturbances and old diggings are evident and numerous earth berms have been constructed across the drainage network.

Existing Structures

Existing infrastructure include a homestead, farm building 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 mining methodology discussion, as well as in section g as part of the mine 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)

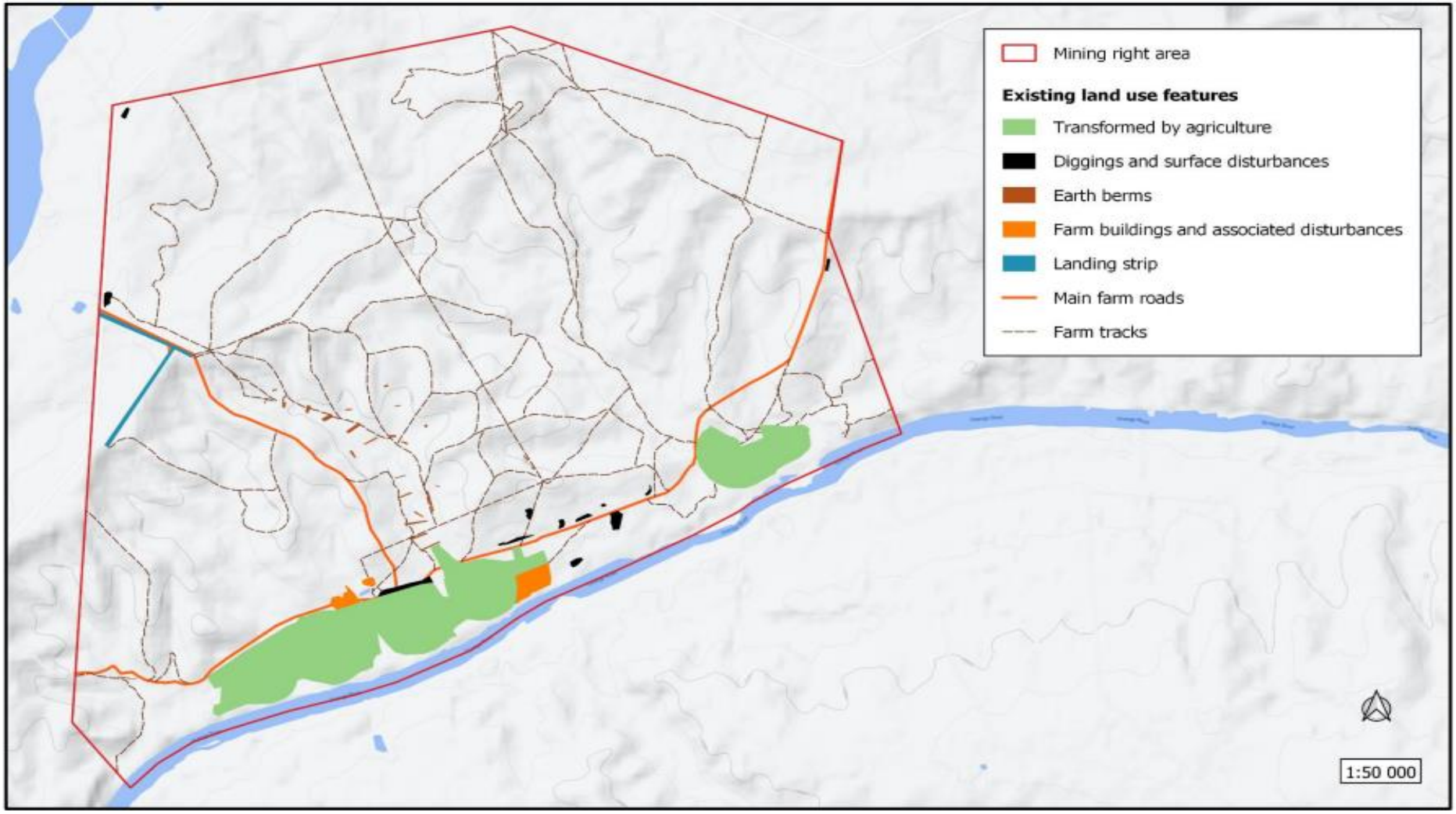


Figure 41. Environmental and current land use map with previous distubances evident

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	Very low	Highly unlikely	Operational and Decommissioning	insignificant Local	Ensure that optimal use is made of the available mineral resource.
Topography	Changes to surface topography Development of infrastructure; and residue deposits.	Medium	High	Construction and Operational	Low Local	• Mining of all alluvial gravels continuously, if possible and does not influence mining and safety requirements. • Employ effective rehabilitation strategies to restore surface topography of excavations, dumps 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 the excavation of minerals,	Low-Medium	Possible, frequently	Decommissioning	Low Local	• Bare ground exposure should be minimised at all times in terms of the surface area and duration. • Re-establishment of plant cover on disturbed areas must take place as soon as possible,

	construction of infrastructure and roads, stockpiling, natural events. Vegetation will be stripped for construction of new roads and mining 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.					once activities in the area have ceased. • No new roads, infrastructure or mining 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 mining 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
	Loss of soil fertility During clearing of an area for the	Medium - High	Certain for life of operation	Residual	Medium-High On-Site	• Topsoil needs to be removed and stored separately during mining and the construction of

	excavation of minerals, construction of infrastructure and roads, stockpiling. 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 mining activities, loss of soil fertility can also occur through soil compaction by dump loads as well as heavy machinery and vehicles.					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.
	Nature of Impact	Significance	Probability	Duration	Consequence Extent	Management / mitigation
	Alteration of soil character and quality During clearing of an area for the excavation of minerals, construction of infrastructure and roads, stockpiling, oil and petrochemical spills. Topsoil contains living organisms and seed banks that provide ecological resilience against disturbances, and any disturbances to	Medium - High	Certain for life of operation	Residual	Low-Medium On-site	• Topsoil needs to be removed and stored separately during mining 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 %.

	the intact soil profile will change its ability to sustain natural ecological functioning. Vehicles and mining equipment may potentially leak hazardous fluids on the soil surface, which will cause soil pollution. Apart from the direct disturbances caused by the mining activities, soil compaction by dump loads as well as heavy machinery and vehicles will causes a decrease in large pores, and subsequently the water infiltration rate into soil.					• 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 procedures. • 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 removal, disturbances and loss of fertility.	Very Low	Possible	Residual	Minimal Local	Employ appropriate rehabilitation strategies to restore land capability.
Land use	Loss of land use due to poor placement of surface infrastructure and ineffective rehabilitation	Very low	Possible	Residual	Minimal Local	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 Hydrocarbon spills from construction vehicles and fuel storage areas may contaminate the groundwater resource locally	Medium	Possible	Construction	Low Local	Staff at Workshop areas, yellow metal laydown zones and fuel storage areas should be sufficiently trained in hydrocarbon spill response. Each area where hydrocarbons are stored or likely to spill should be equipped with sufficient spill response kits and personnel, contaminated soil should be disposed of correctly at a suitable location.
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 mining activities there is a possibility that the watercourses on site (Orange River and drainage lines) might be altered or indirectly affected. This includes direct mining within the watercourses as well as development of	Medium to High	Possible, infrequent	Permanent	Low-Medium Regional	• All activities associated with the mining 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 mining 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.

	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 have downstream effects.					• 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. Vegetation will be stripped in preparation for the mining areas and associated infrastructure.	Low-Medium	Possible, infrequent	Residual	Low Regional	• 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 mining areas should be developed over watercourses.

	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 pans to be filled with silt from mining 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.					• 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 mining 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	**Loss of and disturbance to indigenous vegetation** During clearing of an area for the	Low to medium	Certain for life of operation	Residual	Low to Medium On site	• Implement best practise principles to minimise the footprint of transformation, by keeping to existing roads and earmarked areas where possible.

	excavation of minerals, construction of infrastructure and roads, stockpiling. The Lanyon Vale mining 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 mining activities generate lots of dust which can reduce the growth success and seed dispersal of many small plant species in the adjacent pristine areas.					• 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 flora species	Medium High	Certain for life of operation	Residual	Low to Medium On site	• The footprint areas of the mining activities must be scanned for Red Listed and protected plant species prior to any destructive activities by

	Removal of plant species of conservation concern during clearing of an area for 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. There are a few plant species of conservation concern present on the Lanyon Vale Mining Right area as discussed in this report. Many of the species are found in the core mining area and therefore it is likely that the mining operation will impact					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 mining 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.

	on their population dynamics. The most significant concern is the loss of Boscia albitrunca recruits. Saplings are rarely visible during clearance operations and therefore the younger populations often get wiped out. Furthermore, any illegal harvesting of these and other plants for whatever reason by staff, contractors or secondary land users could have devastating effects on the population of these species.					• 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. The environmental induction should occur in the appropriate languages for the workers who may require translation. Environmental induction prior to commencing with work on site. The environmental induction should occur in the appropriate languages for the workers who may require translation. • All those working on site must be educated about the conservation importance of the fauna and flora occurring on site. • Employ regulatory measures to ensure that no illegal harvesting takes place.

	Introduction or spread of alien species During clearing of an area for the excavation of minerals, construction of infrastructure and roads, stockpiling, improper rehabilitation practises. Several invasive species occur on site, especially in the transformed habitats, which clearly indicates the effect of improper rehabilitation practises. Any anthropogenic disturbances to natural vegetation, especially the clearance of large areas of land, provide the opportunity	Low Medium-	Possible, frequently	Residual	Very Low Local	• 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 need to be implemented to ensure effective eradication. • Encourage proper rehabilitation of disturbed areas through soil restoration and reseeding of indigenous plant species.

	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 mining site, because they spread easily to neighbouring habitats where they outcompete indigenous species. These alien 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 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.					
	Encouragement of bush encroachment During clearing of an area for the excavation of minerals, construction of infrastructure and roads, stockpiling, improper rehabilitation practises. The extent of bush encroaching species on site is high, especially regarding the densities of Senegalia mellifera.	Low	Possible, infrequently	Residual	Very Low On site	• Mechanical methods of control should be implemented pro-actively when encroaching species form dense stands. • Regular follow-up monitoring of encroached control areas need to be implemented to ensure effective eradication. • Encourage proper rehabilitation of disturbed areas through soil restoration and reseeding of indigenous plant species.

	Bush encroachment is a natural 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 proper mitigation, the impacts can be substantially reduced. In fact, the proposed mining 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.					
Fauna	**Loss, damage and fragmentation of natural habitats** During clearing of an area for the excavation of minerals, construction of infrastructure and roads, stockpiling.	Medium-High	Certain for life of operation	Residual	Low-Medium Regional	• All activities associated with the mining 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,

	Fragmentation of habitats typically leads to the loss of 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-					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 mining should take place in the pans or in the ephemeral drainage channels. • 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 habitats.

	populations occurring within the region. Pockets of fragmented natural habitats hinder the growth and development of populations. The mining 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.					
	Disturbance, displacement and killing of fauna Vegetation clearing; increase in noise and vibration; human and vehicular movement on site resulting from mining activities.	Low-Medium	Certain for life of operation	Decommissioning	Low Local	• Careful planning of the operation is needed to avoid the destruction of pristine habitats and minimise the overall disturbance footprint. • The extent of the mining activities should be demarcated on site layout plans, and no personnel or vehicles may leave the demarcated area except if authorised to do so. Areas

	The transformation of natural habitats will result in the loss of micro habitats, affecting individual 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,					surrounding the earmarked site that are not part of the demarcated area should be considered as a no-go zone. • No mining should take place in the drainage lines or river and no new roads should be created across these watercourses. 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. • If any of the protected wildlife species are directly threatened by habitat destruction or displacement during the mining 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

	vultures and owls will negatively affect their local populations.					conservation importance of the fauna occurring on site. • 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 a maximum speed limit of 40 km/h as well as driving mindfully on site to lower the risk of animals being killed on the roads or elsewhere in the mining area.
Cumulative Compromise of Broadscale Ecological Processes	**Clearing of vegetation and disturbance during the construction of roads and mining activities; alterations to watercourse habitat characteristics.** Transformation of intact habitat on a cumulative basis would contribute to the fragmentation of the landscape and would potentially	Medium-high	Certain for life of operation	Residual	Low-Medium Regional	• 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 mining should take place in them. If this is unavoidable, a water use license to alter the beds and banks of each earmarked

	disrupt the connectivity of the landscape for fauna and flora and impair their ability to respond to environmental fluctuations. The habitats on site are vulnerable to cumulative disturbances, due to the vast extent of transformation through mining and agriculture in the region. 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.					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 occur, 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.
Air Quality	Sources of atmospheric	Low	Certain	Decommissioning	Low Local	Effective soil management; identification of the required

	emission associated with the mining operation are likely to include fugitive dust from materials handling operations, wind erosion of stockpiles, and vehicle entrainment of road dust.					control efficiencies in order to maintain dust generation within acceptable levels.
SOCIAL SURROUNDINGS						
Environmental Factor	Nature of Impact	Significance	Probability	Duration	Consequence Extent	Management
Noise Impacts	Clearing of footprint areas, stripping of stockpiling of topsoil Noise increase at the boundary of the mine footprint	Medium	Possible	Pre- Construction and Construction	Low Local	Equipment and/or machinery which will be used must comply with the manufacturer's specifications on acceptable noise levels Topsoil stripping should be limited to daytime only.
	Construction of internal Roads	Medium	Possible	Pre- Construction and Construction	Low Local	Equipment and/or machinery which will be used must comply with the manufacturer's specifications on acceptable noise levels Construction of internal roads should be limited to daytime only.
	Construction of the Mine Residue dump, soil stock pile and material stock pile.	Medium	Possible	Pre- Construction and Construction	Low Local	Equipment and/or machinery which will be used must comply with the manufacturer's specifications on acceptable noise levels

						Noise survey to be carried out to monitor the noise levels during these activities.
	Clearing of new open cast mining areas, stripping and stockpiling of topsoil.	Medium	Possible	Operational	Low Local	Equipment and/or machinery which will be used must comply with the manufacturer's specifications on acceptable noise levels. Topsoil stripping should be limited to daytime only.
	Diesel generators	Medium	Possible	Operational to closure	Low Local	Equipment and/or machinery which will be used must comply with the manufacturer's specifications on acceptable noise levels. Noise survey to be carried out to monitor the noise levels during these activities.
	Mining activities	Medium	Possible	Operational to closure	Low Local	Equipment and/or machinery which will be used must comply with the manufacturer's specifications on acceptable noise levels Noise survey to be carried out to monitor the noise levels during these activities.
	Maintenance activities at the site.	Medium	Possible	Operational to closure	Low Local	Equipment and/or machinery which will be used must comply with the manufacturer's specifications on acceptable noise levels

						Noise survey to be carried out to monitor the noise levels during these activities.
	Back fill of mine footprint area	Medium	Possible	Decommissioning	Low Local	Equipment and/or machinery which will be used must comply with the manufacturer's specifications on acceptable noise levels. Backfill of mine footprint area activities should be limited to daytime only.
Visual impacts	Potential visual impact	Medium	Certain	Construction, Operation and Decommissioning	Low Local Site	The design of the proposed mining development will determine the visual impact. As the visual impact would be low, Correct design will ensure that the development will fit into the surrounding area.
Traffic	Potential negative impacts on traffic safety and deterioration of the existing road networks.	Low	Low likelihood	Decommissioning	Low Local	Utilise existing access roads, where applicable; implement measures that ensure adherence to traffic rules.
Environmental Factor	Nature of Impact	Significance	Probability	Duration	Consequence Extent	Management
Socio-Economic	**Population Impacts** Employment Opportunities and skills Inequities	Medium Positive	Probable	Start-up and Construction	Medium Positive Local	• A community skills audit should be undertaken by Renaissance Resources. Alternatively, the existing Labour Desk could be used to determine which skills are locally available and which

						employees could come into consideration for employment. • Training of potential future employees, contract workers and/or community members should focus on mining 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 preferred training and skills development method. • Training courses should be accredited and certificates obtained should be acceptable by other related industries. • Guidance concerning legal requirements to which locals should adhere to, to make them employable, such as the standard construction industry requirements should also be attended to.
	Safety and Security Risks	Low Negative	Highly Probable	Construction	Low Negative Local	• A Fire/Emergency Management Plan should be developed and implemented

						at the outset of the construction phase. • Open fires for cooking and related purposes should not be allowed on site. • Appropriate firefighting equipment should be on site and construction workers should be appropriately trained for fire fighting • The construction area should be fenced or access to the area should be controlled to avoid animals or people entering the area without authorisation. • The construction sites should be clearly marked and "danger" and "no entry" signs should be erected. • Speed limits on the local roads surrounding the construction sites should be enforced. • Speeding of construction vehicles must be strictly monitored • Local procurement and job creation should receive preference.
	Health Impacts	Low Negative	Highly probable	Construction	Low Negative Local	• Maximise the employment of locals where possible

						• First aid supplies should be available at various points at the construction site • Continue and extend the current HIV/AIDS awareness and support programmes, with specific focus on those in and nearby the construction site • The general health of construction workers should be monitored on an on-going basis
Interested and Affected Parties	Loss of trust and a good standing relationship between the IAP's and the mining company.	Low to medium	Possible	Construction, Operational and Decommissioning	Low Local	Ensure continuous and transparent communication with IAP's

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** pans with conveyers and recovery
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 operation will establish stormwater control berms and trenches to separate clean and dirty water on the mine 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	**Mining Area:** Opencast mining to mine for alluvial diamonds.
6	**Salvage yard (Storage and laydown area).**
7	**Product Stockpile area.**
8	**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: o Small amounts of low-level hazardous waste in suitable receptacles; o Domestic waste; o Industrial waste.
9	**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 mining operation will create an additional 2 - 4 km of roads, with a width of 6 meters.
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 consequence of the impacts are shown in the **table 11** below. The limits were defined in relation to mining 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 Consequence of the impacts was calculated by using the following formula:

(Severity + Extent + Duration) x 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 11. Consequence of impacts is defined as follows.

CONSEQUENCE				
Colour Code	**Consequence rating**	**Rating**	**Negative Impact**	**Positive Impact**
	Very low	3 -16	Acceptable/Not serious	Marginally Positive
	Low	17 - 22	Acceptable/Not serious	Marginally Positive
	Low- Medium	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

Consequence 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.

Low Medium 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 made the following evaluation, criteria need to be described.

Table 12. Criteria used to assess the **SIGNIFICANCE** of impacts

Weight	Severity	Spatial scope (Extent)	Duration

5	Disastrous	Trans boundary effects	Permanent
4	Catastrophic / Major	National / Severe environmental damage	Residual
3	High / Critical / Serious	Regional effect	Decommissioning
2	Medium / slightly harmful	Immediate surroundings / local / outside mine fence	Life of Operation
1	Minimal/potentially harmful	Slight permit deviation / on-site	Short term / construction (6 months – 1 year)
0	Insignificant/ non harmful	Activity specific / No effect / Controlled	Immediate (0 – 6 months)

Table 13. Explanation of **PROBABILITY** of impact occurrence

Weight number		1	2	3	4	5
Frequency						
Probability	Frequency of impact	Highly unlikely	Rare	Low likelihood	Probable / Possible	Certain
		Practically impossible	Conceivable but very unlikely	Only remotely possible	Unusual but possible	Definite
	Frequency of activity	Annually or less	6 months/ temporarily	Infrequent	Frequently	Life of Operation

Table 14. 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 **Pixley Ka Seme District**
5	**Provincial**	Direct and Indirect impacts affecting environmental elements in the **Northern Cape Province**

Table 15. 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 16. 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 mine, there is a possibility of sterilisation of the mineral reserves and resources due to improper placement of infrastructure. The infrastructure and slimes dam will alter the topography by adding features to the landscape. Topsoil removal and alluvial mining will unearth the natural topography. The construction of infrastructure and various facilities in the mining area can also result in loss of soil due to erosion. Vegetation where present will be stripped in preparation for placement of infrastructure and loading, 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 a number of years, 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 operation of the mine, 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 mining, 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 mining 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 mining 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 mining activities destroy natural vegetation, invasive plants can increase due to their opportunistic nature in disturbed areas. If invasive plants establish in disturbed areas, it may cause an impact beyond the boundaries of the mining 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 mining 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 mining 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 mine 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 mining 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 mining 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 mining 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 mine 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 mine, and that the economy will not decline to its original level prior to the development of this project. This is because the mine 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 mine closure in advance, but it is acceptable to assume that the mine closure will have a negative impact on the local and regional economy with a high probability of occurrence, a Low severity and a Low 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 mining of alluvial gravels should be well planned and all infrastructure positions should be selected with the main aim of avoiding sterilization of future resources.

Topography

Level of risk: Low

Mitigation measures

- Mining of alluvial gravels continuously, if possible, otherwise when they become available;
- Employ effective rehabilitation strategies to restore surface topography of and controlled backfilling at excavations and plant site;
- Stabilise the mine residue deposit;
- 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 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 mining 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 mining operation should be carried out to identify areas where erosion is occurring; followed by appropriate remedial actions.

Soil pollution

Level of risk: Medium High

Mitigation measures

- Topsoil needs to be removed and stored separately during mining 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- 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 procedures.
- 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 mining 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: Medium

Mitigation measures

- Ensure that optimal use is made of the available land through consultation with land owner and proper planning of mining activities.
- Surface agreement to be signed with land owners.
- Employ effective rehabilitation strategies to restore land capability and land use potential of the area.
- All activities to be restricted within the demarcated areas.
- Ensure that land which is not used during construction is made available for grazing.

Ground water

Level of risk: Low

Mitigation measures

- 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.

Surface water

Alteration destruction of watercourses

Level of risk: Medium-High

Mitigation measures

- All activities associated with the mining 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 mining 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 mining areas should be developed over watercourses.
- Disturbances during the rainy season should be monitored and controlled.

Indigenous flora

Loss of indigenous vegetation

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.
- 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.

Indigenous flora

Loss of Red data and/or protected floral species

Level of risk: Medium-High

Mitigation measures

- The footprint areas of the mining 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 mining 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. The environmental induction should occur in the appropriate languages for the workers who may require translation.
- 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.

Indigenous flora

Introduction or spread of alien species

Level of risk: Low to 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 reseeding of indigenous plant species.

Indigenous flora

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 reseeding of indigenous plant species.

Fauna

Habitat fragmentation

Level of risk: Medium-High

Mitigation measures

- All activities associated with the mining 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 mining 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 mining 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 that are not part of the demarcated area should be considered as a no-go zone.
- No mining should take place in the drainage lines or river and no new roads should be created across these watercourses. 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.

- If any of the protected wildlife species are directly threatened by habitat destruction or displacement during the mining 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 the risk of animals being killed on the roads or elsewhere in the mining area.

Broad-scale ecological processes

Level of risk: Medium-High

Mitigation measures

- 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 mining 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.

Air quality

Level of risk: Low

Mitigation measures

- Vegetation must be removed when soil stripping is required only. These areas should be limited to include those areas required for mining 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 open areas are exposed should be restricted. Mining should not be delayed after vegetation has been cleared and topsoil removed.
- Dust suppression methods should, where logistically possible, must be implemented at all areas that may / are exposed for long periods of time.
- For all mining activities management should undertake to implement health measures in terms of personal dust exposure, for all its employees:
    - Speed limits;
    - Spraying of surfaces with water;
    - Mining of alluvial gravels and rehabilitation of disturbed areas; and

Noise and vibration

Level of risk: Low

Mitigation measures

- Machinery with low noise levels which complies with the manufacturer's specifications to be used.
- Restrict construction and mining activities to take place during daytime period only unless agreements obtained to do 24hr operations.
- Vehicles to comply with manufacturers' specifications and any activity which will exceed 90.0dBA to be done during daytime only.
- Systematic maintenance of all forms of equipment, training of personnel to adhere to operational procedures that reduce the occurrence and magnitude of individual noisy events.
- Generators to be placed in such a manner that it is not a nuisance for any other parties.
- Noise monitoring to be done along the mine footprint and noise sources within the mine boundary on a monthly basis after which the frequency can change to a quarterly basis.
- Actively manage the process and the noise management plan must be used to ensure compliance to the noise regulations and/or standards. The levels to be evaluated in terms of the baseline noise levels.
- Standardised noise measurements should be carried out on individual equipment at the delivery to site to construct a reference data-base and regular checks carried out to ensure that equipment is not deteriorating and to detect increases which could lead to increase in the noise impact over time and increased complaints.

Visual impacts

Level of risk: Low -Medium

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:

- Primary measures that will be implemented should mainly be measures that minimise the visual impact by softening the visibility of the mining activities, by "blending" with the surrounding areas. Such measures will include rehabilitation of the disturbed area, such as the excavations by re-vegetation of the area and using an aesthetically pleasing design for the proposed development.

During the construction phase the following mitigation measures should be implemented to minimise the visual impact.

- Reduce the construction period through careful planning and productive implementation of resources.
- Restrict the activities and movement of construction workers and vehicles to the immediate construction site and existing access roads.
- 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.
- Reduce and control construction dust emitting activities through the use of approved dust suppression techniques; and
- Restrict construction 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

- Implement measures that ensure the adherence to traffic rules.

Heritage resources

Level of risk: Low

Mitigation measures

- The heritage and cultural resources (e.g. stone age sites and Mining Heritage etc.) must be protected and preserved by the delineation of a no go zone.
- Stone tools should be avoided where possible and fresh exposure should be recorded before destruction. All stone tool artefacts should be recorded, mapped and collected before destruction.
- Should any further heritage or cultural resources be disturbed, exposed or uncovered during site preparations, these should immediately be reported to an accredited archaeologist.

Socio-economic

Level of risk: Low

Mitigation measures

- 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 mining 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

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 mining 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 mining operation was considered, as the alluvial gravels have been deposited in this area. There is therefore no other alternative with

regard to the overall operation footprint. The applicant is the holder of an existing Prospecting Right on the same area.

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

Not applicable. There is no alternative development location for the site as this is the area with the 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)

Not applicable. There is no alternative development location for the site and therefore the initial site locality is considered to be the final site locality. The impact assessment provided in section g(v) is therefore sufficient and the process undertaken to identify impacts is the same as in section g(vi).

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, Decommissioning, 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	SIGNIFICANCE IF MITIGATION
Processing Plant: 2 X 16 feet pan	Dust Noise Removal and disturbance of vegetation cover and natural habitat of fauna Soil contamination Surface disturbance	Air Quality Fauna Flora Noise Soil Surface water Safety	Construction Commissioning Operational Decommissioning Closure	Medium	Access control Maintenance of processing plant Dust control and monitoring Noise and vibration 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; Re-locate noise sources to areas which are less noise sensitive, to take advantage of distance and natural shielding; Develop a mechanism to record and respond to complaints.	Medium

Ablution Facilities Chemical Toilets	Soil contamination Possible Groundwater contamination	Soil Groundwater	Construction Commissioning Operational Decommissioning Closure	Low	Maintenance of sewage facilities on a regular basis. Removal of container plants 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 excavations and dumps areas by construction of a temporary gravel cut-off berm that will prevent surface run-off into the drainage areas. Excavations for Alluvial gravel, where and when applicable, should be rehabilitated concurrently as mining progresses. 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. Immediately clean hydrocarbon spill.	Low

					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. Maintain a buffer zone around the streams. Note that these buffer zones are essential to ensure healthy functioning and maintenance of wetland. Minimizing – unavoidable impacts shall be minimized by taking appropriate and practicable measures such as transplanting important plant specimens, 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.	
Fuel Storage facility (Diesel tanks)	Groundwater contamination Removal and disturbance of vegetation cover and natural habitat of fauna Soil contamination	Soil Groundwater Surface water	Construction Commissioning Operational Decommissioning Closure	Medium	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.	Low

	Surface disturbance				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.	
Mining Area	Dust Noise Removal and disturbance of vegetation cover and natural habitat of fauna Accelerated erosion of areas adjacent to workings that have been de-vegetated leads to increased suspended sediment loads in nearby streams and rivers. Wind-blown dusts from unprotected tailings and waste rock dumps	Air quality Fauna Flora Groundwater Noise and vibration Soil Surface Water Topography Safety	Commissioning Operational Decommissioning Closure	Medium	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 MRD stability control and monitoring Erosion control Noise control Well maintained equipment Selecting equipment with lower sound power levels; Re-locate noise sources to areas which are less noise sensitive, to take advantage of distance and natural shielding; Develop a mechanism to record and respond to complaints.	Low

	enter aquatic environment. Soil contamination Surface disturbance Surface water contamination				Maintain a buffer zone around the streams. Note that these buffer zones are essential to ensure healthy functioning and maintenance of wetland. Minimizing – unavoidable impacts shall be minimized by taking appropriate and practicable measures such as transplanting important plant specimens, 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. 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. 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. The environmental induction should occur in the appropriate languages for the workers who may require translation. 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. Careful consideration is required when planning the placement for stockpiling topsoil and the creation of access routes in order to minimise the overall mining footprint. The footprint areas of the mining activities must be scanned for Red Listed and protected plant species prior to mining Snares & traps removed and destroyed Implementation of a suitable management action plan during the operation of the proposed diamond mine, based on analysis of bi-annual	

					water quality and biological monitoring data collected at sites upstream and downstream of all activities; Prevention of exotic vegetation encroachment; Prevent further siltation within the river segment as well as downstream of activities; Unnecessary destruction of marginal and instream habitat should always be avoided during operations.	
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	Medium	Access Control Maintenance of fence Storm water run-off control Immediately clean hydrocarbon spill	Low
Product Stockpile area	Dust Noise Removal and disturbance of	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	Low

	vegetation cover and natural habitat of fauna Surface disturbance				Rip disturbed areas to allow re-growth of vegetation cover Noise control Well maintained equipment Selecting equipment with lower sound power levels; Re-locate noise sources to areas which are less noise sensitive, to take advantage of distance and natural shielding; 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	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 mine site):	Dust Groundwater contamination Noise Removal and disturbance of vegetation cover and natural habitat of fauna Soil contamination	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 Well maintained equipment Selecting equipment with lower sound power levels;	Low-Medium

	Surface disturbance				Re-locate noise sources to areas which are less noise sensitive, to take advantage of distance and natural shielding; 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 bay	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 Pipeline	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:	Surface disturbance	Fauna Flora	Construction Commissioning	Medium	Maintain water tanks and structures	Low

1 X 10 000 litre water tanks and purifiers for potable water.		Surface Water	Operational Decommissioning Closure			

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 HTAT 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
Appendix 4 **Heritage Impact Assessment for a Mining Right Application on Portion 23 (a Portion of Portion 15) of the Farm Lanyon Vale 376 near Douglas in the Siyancuma Local Municipality, Northern Cape** **Prepared by Edward Matenga (PhD Archaeology & Heritage, MPhil, Archaeology; Uppsala/Sweden)** **October 2022**	**CONCLUSION AND RECOMMENDATIONS** The Mining 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.	X	
Appendix 5 Palaeontological Impact Assessment for the proposed diamond prospecting Rights Application on portions of Farm Lanyon Vale 376, southwest of Douglas, Northern Cape Province **06 October 2022**	**Executive Summary** A Palaeontological Impact Assessment was requested for the proposed Mining Right Application by Renaissance Resources (Pty) Ltd on the Remaining Extent of Portion 15 (Lubbeshoop) of the Farm Lanyon Vale 376 and Portion 23 (a portion of Portion 15) of Farm Lanyon Vale 376. The site is southwest of Douglas in the Hay Administrative District, Northern Cape Province. The extent of the area is 4248.9 Ha.	X	

Prof Marion Bamford **Palaeobotanist** **P Bag 652, WITS 2050** **Johannesburg, South Africa** **Marion.bamford@wits.ac.za**	To comply with the regulations of the South African Heritage Resources Agency (SAHRA) in terms of Section 38(8) of the National Heritage Resources Act, 1999 (Act No. 25 of 1999) (NHRA), a site visit (Phase 2) Palaeontological Impact Assessment (PIA) was completed for the proposed development. The proposed site lies on the highly fossiliferous Quaternary Calcretes and the moderately fossiliferous Quaternary alluvium and Dwyka Group. 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 miners, contractor, environmental officer or other designated responsible person once excavations, drilling or mining activities have commenced. Since the impact will be low, as far as the palaeontology is concerned, the project should be authorised. **Recommendation** Based on the fossil record for guidance but confirmed by the site visit and walk through there are NO FOSSILS of 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 ad cobble layers are not fossiliferous. Nonetheless, a Fossil Chance Find Protocol should be added to the EMPr. If fossils are found by the miners, 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.		
Appendix 6 Ecological Assessment Report in application for Environmental Authorisation related to a Mining Right Application ((NC) 30/5/1/3/2/10202 MR) that was lodged with the Department of Mineral Resources **October 2022** **Dr. Betsie Milne from Boscia Ecological Consulting Services**	**CONCLUSION, RECOMMENDATIONS AND OPINION REGARDING AUTHORISATION** Four habitats were identified on site, of which the Orange River, drainage lines and their riparian buffer zones are the most sensitive to mining. The shrublands on the calcrete plateau and tillite ridge slopes host a widespread occurrence of Boscia albitrunca and is considered to be of high sensitivity. Furthermore, the substrate of the open shrubland on alluvium poses high runoff and sedimentation risks to the adjacent watercourses and is therefore also considered to be of high sensitivity. The most profound impacts expected to be related to the proposed mining 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	X	

	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 during mining operations, but the significance of the impacts will ultimately be affected by the success of the mitigation measures implemented during the mining 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.		

Attach copies of the Specialist Reports as appendices (All studies attached as Appendix 4 – 6)

k) Environmental impact statement

(i) Summary of the key findings of the environmental impact assessment;

The site proposed for mining operations has been rated as being acceptable for the development. However, this is subject to the Orange River and associated floodplains being excluded from mining activities and that comprehensive rehabilitation is implemented.

Topsoil contains living organisms and seed banks that provide ecological resilience against disturbances, and any disturbances to the intact soil profile will change its ability to sustain natural ecological functioning. Vehicles and mining equipment may potentially leak hazardous fluids on the soil surface, which will cause soil pollution. Apart from the direct disturbances caused by the mining activities, soil compaction by dump loads as well as heavy machinery and vehicles will causes a decrease in large pores, and subsequently the water infiltration rate into soil.

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 mining activities, loss of soil fertility can also occur through soil compaction by dump loads as well as heavy machinery and vehicles.

Vegetation will be stripped for construction of new roads and mining 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.

The Lanyon Vale mining activities is expected to destroy some natural vegetation. It is expected that the ecological functioning and biodiversity will take many years to fully recover. Vehicle traffic and mining activities generate lots of dust which can reduce the growth success and seed dispersal of many small plant species in the adjacent pristine areas.

Four habitats were identified on site, of which the Orange River, drainage lines and their riparian buffer zones are the most sensitive to mining. The shrublands on the calcrete plateau and tillite ridge slopes host a widespread occurrence of Boscia albitrunca and is considered to be of high sensitivity. Furthermore, the substrate of the open shrubland on alluvium poses high runoff and sedimentation risks to the adjacent watercourses and is therefore also considered to be of high sensitivity.

The most profound impacts expected to be related to the proposed mining 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 during mining operations, but the significance of the impacts will ultimately be affected by the success of the mitigation measures implemented during the mining 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.

Several invasive species occur on site, especially in the transformed habitats, which clearly indicates the effect of improper rehabilitation practises. Any anthropogenic disturbances to natural vegetation, especially the clearance of large areas of land, provide the opportunity 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 mining site, because they spread easily to neighbouring habitats where they outcompete indigenous species. These alien 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 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 extent of bush encroaching species on site is high, especially regarding the densities of Senegalia mellifera. Bush encroachment is a natural phenomenon characterised by the excessive expansion of certain shrub species at the expense of other plant species. While general clearing of the area and mining activities destroy natural vegetation, bush encroaching plants can increase due to their aggressive nature in disturbed areas. If encroaching plants establish in disturbed areas, it may lower the potential for future land use and decrease biodiversity. With proper mitigation, the impacts can be substantially reduced. In fact, the proposed mining activities is expected to reduce the extent of these shrubs significantly, as seen in the transformed shrubland on calcrete terraces, where past mining activities have cleared S. mellifera. By clearing these large stands of shrubs and subsequently effectively rehabilitating the cleared areas, it can benefit biodiversity.

Fragmentation of habitats typically leads to the loss of 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 pans and the ephemeral drainage channels. Fragmentation of habitats usually results in a subsequent loss of genetic variability between meta-populations occurring within the study site. Pockets of fragmented natural habitats hinder the growth and development of populations. However, the mining activities is expected to result in the loss of connectivity and fragmentation of natural habitats on a local scale.

The transformation of natural habitats will result in the loss of micro habitats, affecting individual 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.

During mining activities there is a possibility that the watercourses on site (i.e. drainage lines) might be altered or indirectly affected. This includes direct mining 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 have downstream effects.

Vegetation will be stripped in preparation for the mining 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 pans to be filled with silt from mining 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.

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 shrubland on calcrete terraces are the most vulnerable habitats on site in terms of cumulative disturbances, due to the vast extent of disturbances to these habitats in the region. The fragmentation of these habitats through loss of specialised species due to habitat alterations 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.

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.

The destruction of the natural plant species and habitats is inevitable during mining operations, but the significance of the impacts will ultimately be affected by the success of the mitigation measures implemented during the mining 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.

(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 13)**

The final site map below indicates the mining right application area in which all mining will take place. Existing roads are also depicted. The associated infrastructure relating to the mining site is also indicated.

No mining operations are carried out within a horizontal distance of 100 (one hundred) metres from reserve land, buildings, roads, railways, dams, waste dumps, or any other structure whatsoever including such structures beyond the mining 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;

No construction or excavation work shall be executed within 11 metres from any Eskom power line structure, and/or within 11 metres from any stay wire.

Please see Final Site Map below.

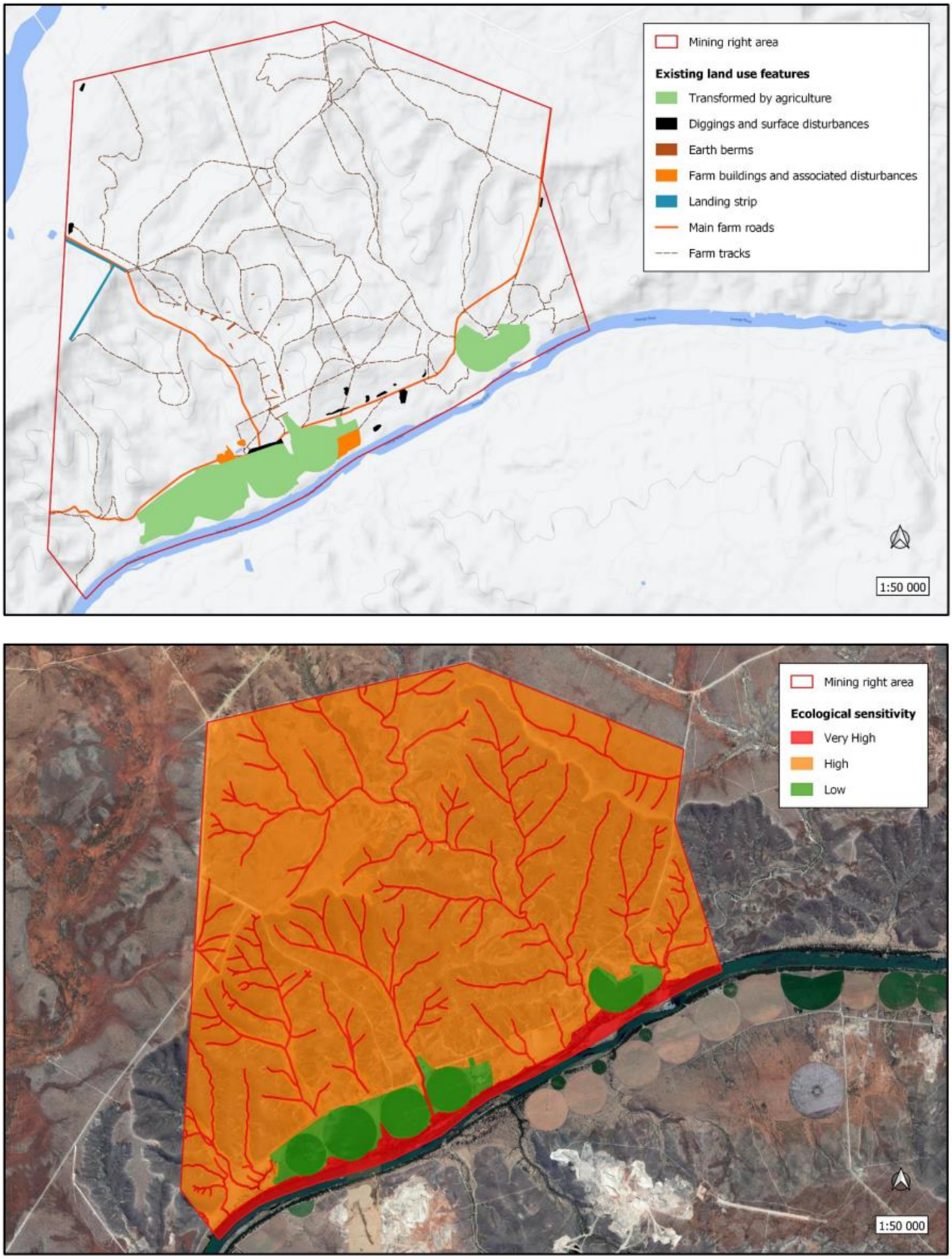


Figure 42. Final Site Surface layout map with sensitivity map.

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

As mentioned before, the specific occurrence of diamonds in the area dictates the selection of the specific mining site and there are no alternatives in terms of project location.

In terms of alternative land use, the proposed mining operation will be done in such a way that grazing will still be possible as the site will be rehabilitated in such a way that it allows the establishment of grass cover again.

The mining operation will provide 23 jobs and will also add to the increased economic activity and the area surrounding the application area.

Excavations, where and when applicable, should be rehabilitated concurrently as mining progresses. The re-vegetation of disturbed areas is important to prevent erosion and improve the rate of infiltration.

During the operational stages of the mining operation, there is a possibility of sterilisation of the mineral reserves and resources due to improper placement of infrastructure. However, the site layout plan has been developed not to place any infrastructure where resource materials could be located. The infrastructure and excavations /dumps will alter the topography by adding features to the landscape. Topsoil removal and Mine Residue Dumps will change the natural topography. The construction of infrastructure and various facilities in the mining area can also result in loss of soil due to erosion. Vegetation will be stripped in preparation for placement of infrastructure and mining of alluvial gravels, 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 cleared areas will be rehabilitated, but full restoration of soils might only occur over a number of years, 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.

There is also a possibility that equipment might leak oil, thus causing surface spillages. The hydrocarbon soil contamination will render the soil useless 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. Most of the site has a land capability for grazing, but grazing activities can still be performed in areas not earmarked for the operation, and with proper rehabilitation the land capabilities and land use potential can be restored.

Groundwater could be directly affected if any oil and fuel spillages occur during these scenarios and activities, then groundwater will be directly contaminated. Similarly, hazardous surface spillages 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. If no, or inadequate ablution facilities are available then workers might feel the need to use the veld for this purpose, which can contaminate natural resources.

Any dumping within the drainage lines will impact on the surface water environment by altering their physical characteristics. These impacts include the alteration of flow patterns, ponding and an increase in the concentration of suspended solids and sedimentation.

Mining activities on site will reduce the natural habitat for ecological systems to continue their operation. While general clearing of the area and mining activities destroy natural vegetation, invasive plants can increase due to their opportunistic nature in disturbed areas. If invasive plants establish in disturbed areas, it may cause an impact beyond the boundaries of the mining 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 mining 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 operational 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.

During the 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 operation will typically have low to moderate levels of noise, along with man-influenced sounds such

as traffic on the secondary road and very occasional air traffic. The proposed operation will add a certain amount of noise to the existing noise in the area.

The impact of site generated trips on the traffic and infrastructure of the existing roads is expected to be moderate. Furthermore, if road safety is not administered it can have a high impact on the safety of fellow road users.

The activities on site have the potential to impact upon heritage resources. Heritage sites are fixed features in the environment, occurring within specific spatial confines. Any impact upon these resources will be permanent and irreversible. Any movement of vehicles, equipment or personnel through areas containing these artefacts could result in the permanent destruction of the artefacts and loss of heritage resources.

The operation will create a number of new employment opportunities and uplift the local community. 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 could possibly impact on safety and security of local residents. During the decommissioning and at closure of the site, staff will most likely be retrenched, resulting in people being unable to find new employment for a long period of time.

Economic slump of the local towns after site closure is not considered to be an associated potential impact, because there are numerous other mining operations in the region. However, 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 operation-related businesses.

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

In terms of the Social Impact Assessment findings derived from the information available at this stage it is concluded that the likely benefits of the proposed project outweigh the potential social risks and/or threats to the local communities. However, as indicated earlier in the report, the possible impact on the infrastructure and service needs due to the inflow of an additional workforce should be addressed. It would remain the responsibility of the Local Municipality, but considering the social framework within which the mine operates, it is important for the mine to engage with the SPM in this regard to minimise any possible negative impacts. Such engagement should also contribute to meaningful contributions to the communities situated in close proximity to the mine.

It is furthermore important to ensure that any negative impacts as a result of the mining activities on the residents should be limited.

The mining 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 mining 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 adjacent municipalities;
- The involvement of Renaissance Resources with regards to training and capacity building of his 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 involvement of Renaissance Resources with regards to social development projects and support through the Integrated Development Plans (IDPs);
- The positive impact of mining activity on the regional and local economy; and
- Positive impact of extensive local procurement focus.

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

- Inconvenience and intrusion impacts during the start-up and construction phases of 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 Renaissance Resources Project would not result in permanent damaging social impacts. The socio-economic benefits associated with the mine 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.

l) 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.

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 mining operation with water.
- Speed limits of vehicles inside the mining 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.

Archaeology:

- All operators of equipment should be made aware of the possibility of the occurrence of sub-surface heritage features and the following procedures should they be encountered:
    - All construction in the immediate vicinity (50m radius of the site) should cease.
    - The heritage practitioner should be informed as soon as possible.
    - In the event of obvious human remains the SAPS should be notified.
    - Mitigation measures (such as refilling) should not be attempted.
    - The area in a 50m radius of the find should be cordoned off with hazard tape.
    - Public access should be limited.
    - No media statement should be released until such time as the heritage practitioner has had sufficient time to analyse the finds.

Fauna

- To ensure a minimum of impact to animals the following management guidelines will be followed:
    - Speed limits of vehicles inside the application area must be strictly controlled to avoid road kills.
    - Continuous controlled dumping.
    - Operational areas must be low angled as a preventative measure to ensure an escape route for animals.
    - No hunting (snares) must be allowed at the application area or in the surrounding area.
    - All mining and access roads must be fenced.

Flora

- No trees or shrubs must be felled or damaged for the purpose of obtaining firewood.

- Management must take responsibility to control declared invader or exotic species on the site. The following control methods must be used:
    - 'The plants will be uprooted, felled or cut off and can be destroyed completely.'
    - The plants will be treated with an herbicide that is registered for use in connection therewith and in accordance with the directions for the use of such an herbicide.
- Valid permits from DAFF must be obtained before any protected plant species are removed or damaged if encountered.
- Continuous controlled dumping and spreading of previously stored topsoil over the rehabilitated areas.
- All rehabilitated areas, where applicable and possible must be seeded with a vegetation seed mix adapted to reflect the local indigenous flora that was present prior to mining activities commenced if the natural succession of vegetation is unacceptably slow.
- Fires may only be allowed in facilities or equipment specially constructed for this purpose.
- The end objective of the re-vegetation program must be to achieve a stable self-sustaining habitat unit.

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 al 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.

Noise

- Working hours must be kept between sunrise and sunset as far as possible.
- As a minimum, ambient noise levels emanating from the mining 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 construction and 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 work 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.

Screening / Migration Control:

- Appropriate measures must be specifically installed and / or employed at the plant to act as screen and to reflect/reduce the noise.
- Appropriate non-metallic washers/insulation must be used with any joining of apparatus made from materials such as corrugated iron. Such apparatus must be maintained in a fixed position.

Safety

- No employees may reside on the mine site without permission from the surface owner.

- Access and haul roads must be maintained.
- Security access point to ensure monitoring of access to the site.

Soil

- In all places of development, the first 300mm of loose or weathered material found will be classified as a growth medium. The topsoil must be removed where possible, from all areas where physical disturbance of the surface will occur.
- In all areas where the above growth medium will be impacted on, it must be removed and stockpiled on a dedicated area. The maximum height of stockpiles may not exceed 2 meters.
- The growth medium/topsoil must be used during the rehabilitation of any impacted areas, after sloping in order to re-establish the same land capability.
- If any soil is contaminated during the life of the mining area, it must either be treated on site or be removed together with the contaminant and placed in acceptable containers to be removed with the industrial waste to a recognized facility or company.
- Erosion control in the form of re-vegetation and contouring of slopes must be implemented on disturbed areas in and around the site.
- Topsoil must be kept separate from overburden and may not be used for building or maintenance of access roads.
- The stored topsoil must be adequately protected from being blown away or being eroded.
- Compacted areas must be ripped to a depth of 300mm, where possible, during the continuous rehabilitation, decommissioning and closure phases of the operation in order to establish a growth medium for vegetation.
- Vehicle movement must be confined to establish roads for as far as practical in order to prevent the compaction of soils.

Surface water

- The disposal of oil, grease and related industrial waste must be transported to the stores area where it will be stored in steel containers supplied by an oil recycling contractor. All oil and grease must be removed on a regular basis from the operation by a registered approved contractor.
- All refuse and waste from the different sections must be handled according to NEMA Guidelines. Recycling of waste is encountered in all the consumer sections of the operation, where recyclable materials must be collected before dumping them in the domestic waste disposal area.
- All non-biodegradable (recyclable) refuse such as glass bottles, plastic bags and metal scrap must be stored in a container in the waste area and collected on a regular basis and disposed of at a recognized disposal facility.
- Erosion and storm water control measures must be implemented.
- An application for an integrated Water Use Licence must be submitted at the Department of Water Affairs for all actions to be performed which requires authorization in terms of water uses.
- Vehicle repairs must only take place within the maintenance area for vehicles. Repairs within open excavations must be limited to emergency break downs with drip trays.

- Re-fuelling must only take place in the re-fuelling area. If this is found not to be practical, drip trays must be used whenever re-fuelling takes place outside of this area.
- During rehabilitation the application must endeavour to reconstruct flow patterns in such a way that surface water flow is in accordance with the natural drainage of the area as far as practically possible.
- Implementation of a suitable management action plan during the operation of the proposed diamond mine, based on analysis of bi-annual water quality and biological monitoring data collected at sites upstream and downstream of all activities;
- Prevention of exotic vegetation encroachment;
- Prevent further siltation within the river segment as well as downstream of activities;
- Unnecessary destruction of marginal and in-stream habitat should always be avoided during operations.

Topography

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

Visual

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

The impact management objectives for the Renaissance Resources planned mining 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.

- Rehabilitation of disturbed areas during the mine 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 mine infrastructure, activities and facilities.
- To ensure that all traffic generated by the proposed mining 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 location of the central mining site and associated infrastructure is primarily based on proximity to the access roads, proximity to the areas earmarked for mining and limited additional impact on the environment and heritage resource.

It will therefore cause additional impacts if this infrastructure is moved and render the consideration of alternative mining sites useless.
The mining activities and methodologies associated with mining of alluvial diamonds is the only economic viable method currently being used by the diamond's fraternity. There is no alternative mining method for the mining of alluvial diamonds.

n) Aspects for inclusion as conditions of Authorisation

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

The site proposed for mining operations has been rated as being acceptable for the development. However, this is subject to the Orange River and associated floodplains being excluded from mining activities and that comprehensive rehabilitation is implemented.

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.

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

(Which relate to the assessment and mitigation measure proposed)

The study took place during late winter, which is not an optimal time of the year. The area received good summer rainfall, but most grasses and annuals were 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 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. (Dr. Betsie Milne out of the Ecological Study, October 2022).

The Mining 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. (Taken out of the HIA by Dr. Edward Matenga).

Based on the fossil record for guidance but confirmed by the site visit and walk through there are NO FOSSILS of 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 ad cobble layers are not fossiliferous. Nonetheless, a Fossil Chance Find Protocol should be added to the EMPr. If fossils are found by the miners, 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. (Taken out of the PIA assessment by Prof Marion Bamford).

The above mitigation measures are tried and tested over many years in the diamond mining 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.

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, given that the applicant also has a Prospecting Right on the application area. However, if the proposed management and mitigation measures are not properly applied or if the mining 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 mining 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 site proposed for mining operations has been rated as being acceptable for the development. However, this is subject to the Orange River and associated floodplains being excluded as far as possible from mining activities and that comprehensive rehabilitation is implemented.

Mining operations within 100 meters or within the floodplain of the river and within 500 meters of drainage channels will require authorisation from DWS.

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 will be appended to the EMPR. The Mine had to provide to the DMR, a financial rehabilitation guarantees to the amount as calculated in terms of the financial quantum Guideline and approved by the DMR.

Infrastructure areas

On completion of the mining 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 mining 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 may be impacted by the mining activity are perennial. Monitoring takes place by collecting surface water samples every quarter.

Implementation of a suitable management action plan during the operation of the proposed diamond mine, based on analysis of bi-annual water quality and biological monitoring data collected at sites upstream and downstream of all activities (taken out of the aquatic assessment report);

Long Term Stability and Safety: It should be the objective of mine management to ensure the long-term stability of all rehabilitated areas including the backfilled excavations. 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 mine 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 amended with new legislation promulgated in the new NEMA regulations NO. R. 1147 20 NOVEMBER 2015 NATIONAL ENVIRONMENTAL MANAGEMENT ACT, 1998, (ACT NO. 107 OF 1998) REGULATIONS PERTAINING TO THE FINANCIAL PROVISION FOR PROSPECTING, EXPLORATION, MINING OR PRODUCTION OPERATIONS.

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

17 years. The period applied for, being 17 years, based on the production of between 522 720 tons in year 1 ramped up in year 2 to an envisaged 1 045 440 tons per annum with a total production of 16 383 600 tons over the seventeen years. The potential for the identification for further reserve gravels may further extend the life of mine.

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 Renaissance Resources Mine site as it stands currently (risking premature rehabilitation) is estimated to be R1,103,473 according to the DMR calculations.

Table 17. Financial quantum

No.	Description	Unit	A Quantity	B Master Rate	C Multiplication factor	D Weighting factor 1	E=A*B*C*D 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
					1	1,1	
2 (A)	Demolition of steel buildings and structures	m2	0	256,63	1	1,1	0
2(B)	Demolition of reinforced concrete buildings and structures	m2	250	378,15	1	1,1	103991,25
3	Rehabilitation of access roads	m2	10000	2,1	1	1,1	23100
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	200	513,26	1	1,1	112917,2
6	Opencast rehabilitation including final voids and ramps	ha	3,5	261224,38	0,04	1,1	40228,55452
7	Sealing of shafts adits and inclines	m3	0	137,77	1	1,1	0
8 (A)	Rehabilitation of overburden and spoils	ha	0,5	179372,28	1	1,1	98654,754
8 (B)	Rehabilitation of processing waste deposits and evaporation ponds (non-polluting potential)	ha	0,3	223404,93	1	1,1	73723,6269
					1	1,1	
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	2	142093,10	1	1,1	312604,82
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	2	18909,73	1	1,1	41601,406
15 (A)	Specialist study	Sum	0			1,1	0
15 (B)	Specialist study	Sum	0			1,1	0
						Sub Total 1	825057,4114
1	Preliminary and General		49503,44469		weighting factor 2 1,05		51978,61692
2	Contingencies				82505,74114		82505,74114
						Subtotal 2	959541,77
						VAT (15%)	143931,27
						Grand Total	1103473

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 Renaissance Resources Project would not result in permanent damaging social impacts. The socio-economic benefits associated with the mine 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 from (AHSA) Archaeological and Heritage Services Africa Pty Ltd has been appointed by Renaissance Resources to provide an Heritage Impact Assessment Report for alluvial diamond mining on Lanyon Vale, Hay near Douglas, and to determine the possible impact of mining on the application area.

This Heritage Impact Assessment (HIA) report has been prepared in support of a Mining Right Application on Portion 23 (a Portion of Portion 15) of the Farm Lanyon Vale 376 near Douglas in the Siyancuma Local Municipality, Northern Cape. A ground survey was undertaken on 16 August and 21 September 2022 to assess the heritage sensitivity of the property, and potential adverse impacts of the proposed activities were evaluated.

The heritage sensitivity of the property is summarised as follows:

The Stone Age
Stone Age material is widely distributed on the plains, ridges, and valleys on the property. Eleven (11) occurrences were recorded in this instance. The Stone Age material comprises scrapers, blades, cores, and flakes typologically dating to the Middle Stone Age/Late Stone Age period. The single occurrences of a cleaver and hand-axe may represent a transitional period from the Early Stone Age to the Middle Stone Age. The scattered distribution pattern seems to indicate general hunter-gatherer activity in the area over time. None of the sites were found to warrant further action.

The Early Iron Age
No material dating to the Iron Age was found.

The Later Iron Age
No material dating to the Later Iron Age was found.

Burial grounds
A burial ground was known and recorded on the farm with ±30 cairn burials arranged in two rows. The deceased were farm workers. A servitude of 100 m radius must be reserved as per the statutory regulations. Two circular stone features of diameter c. 160 cm were also recorded. They possibly mark graves. As a precaution, these features must be protected with a 100 m servitude. Otherwise, they must be investigated by a qualified archaeologist for a permit to be issued for their disposal.

Conclusion and recommendations
The Mining 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
Prof Marion Bamford, of the University of the Witwatersrand, sub-contracted by Archaeological and Heritage Services Africa (Pty) Ltd, Pretoria, South Africa has been appointed by Renaissance Resources to provide a Palaeontological Impact Assessment Report for alluvial diamond mining on Lanyon Vale, Hay near Douglas, and to determine the possible impact of mining on the application area.

A Palaeontological Impact Assessment was requested for the proposed Mining Right Application by Renaissance Resources (Pty) Ltd on the Remaining Extent of Portion 15 (Lubbeshoop) of the Farm Lanyon Vale 376 and Portion 23 (a portion of Portion 15) of Farm Lanyon Vale 376. The site is southwest of Douglas in the Hay Administrative District, Northern Cape Province. The extent of the area is 4248.9 Ha.

To comply with the regulations of the South African Heritage Resources Agency (SAHRA) in terms of Section 38(8) of the National Heritage Resources Act, 1999 (Act No. 25 of 1999) (NHRA), a site visit (Phase 2) Palaeontological Impact Assessment (PIA) was completed for the proposed development.

The proposed site lies on the highly fossiliferous Quaternary Calcretes and the moderately fossiliferous Quaternary alluvium and Dwyka Group. 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 miners, contractor, environmental officer or other designated responsible person once excavations, drilling or mining activities have commenced. Since the impact will be low, as far as the palaeontology is concerned, the project should be authorised.

Palaeontological context

The palaeontological sensitivity of the area under consideration is presented in Figure 3. 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 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).

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).

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 FOSSILS in the Dwyka Group tillites, 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 do contain 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 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 ad cobble layers are not fossiliferous. Nonetheless, a Fossil Chance Find

Protocol should be added to the EMPr. If fossils are found by the miners, 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.

Chance Find Protocol

Monitoring Programme for Palaeontology – to commence once the excavations / drilling / mining activities begin.

1. The following procedure is only required if fossils are seen on the surface and when drilling/excavations/mining commence.
2. When excavations begin the rocks and must be given a cursory inspection by the environmental officer or designated person. Any fossiliferous material (plants, insects, bone, invertebrates) should be put aside in a suitably protected place. This way the project activities will not be interrupted.
3. Photographs of similar fossils must be provided to the developer to assist in recognizing the fossil plants, vertebrates, invertebrates or trace fossils in the shales and mudstones. This information will be built into the EMP's training and awareness plan and procedures.
4. Photographs of the putative fossils can be sent to the palaeontologist for a preliminary assessment.
5. If there is any possible fossil material found by the developer/environmental officer/miners then the qualified palaeontologist sub-contracted for this project, should visit the site to inspect the selected material and check the dumps where feasible.
6. Fossil plants or vertebrates that are considered to be of good quality or scientific interest by the palaeontologist must be removed, catalogued and housed in a suitable institution where they can be made available for further study. Before the fossils are removed from the site a SAHRA permit must be obtained. Annual reports must be submitted to SAHRA as required by the relevant permits.
7. If no good fossil material is recovered then no site inspections by the palaeontologist will be necessary. A final report by the palaeontologist must be sent to SAHRA once the project has been completed and only if there are fossils.
8. If no fossils are found and the excavations have finished then no further monitoring is required.

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 mining operation. The applicant is the holder of an existing Prospecting Right on the property.

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)

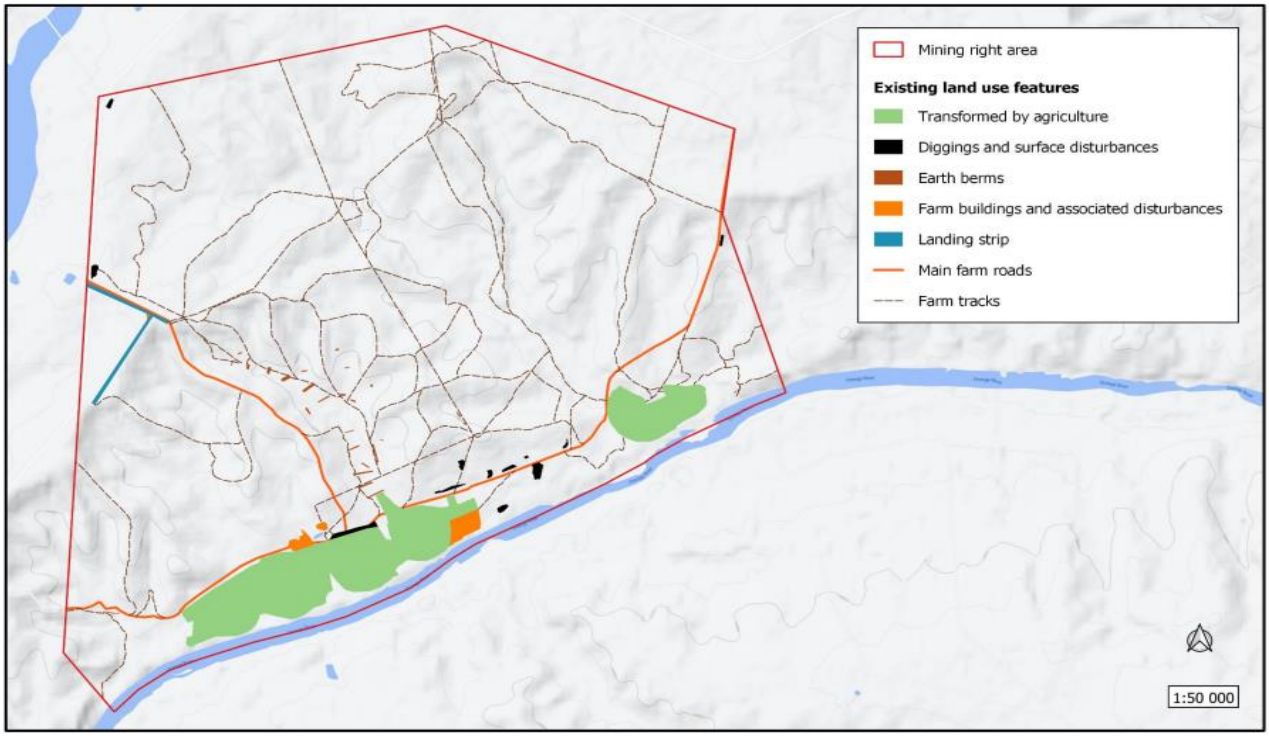
I hereby confirm that the requirement for the provision of the details and expertise of the EAP is already included in Part A as required.

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)



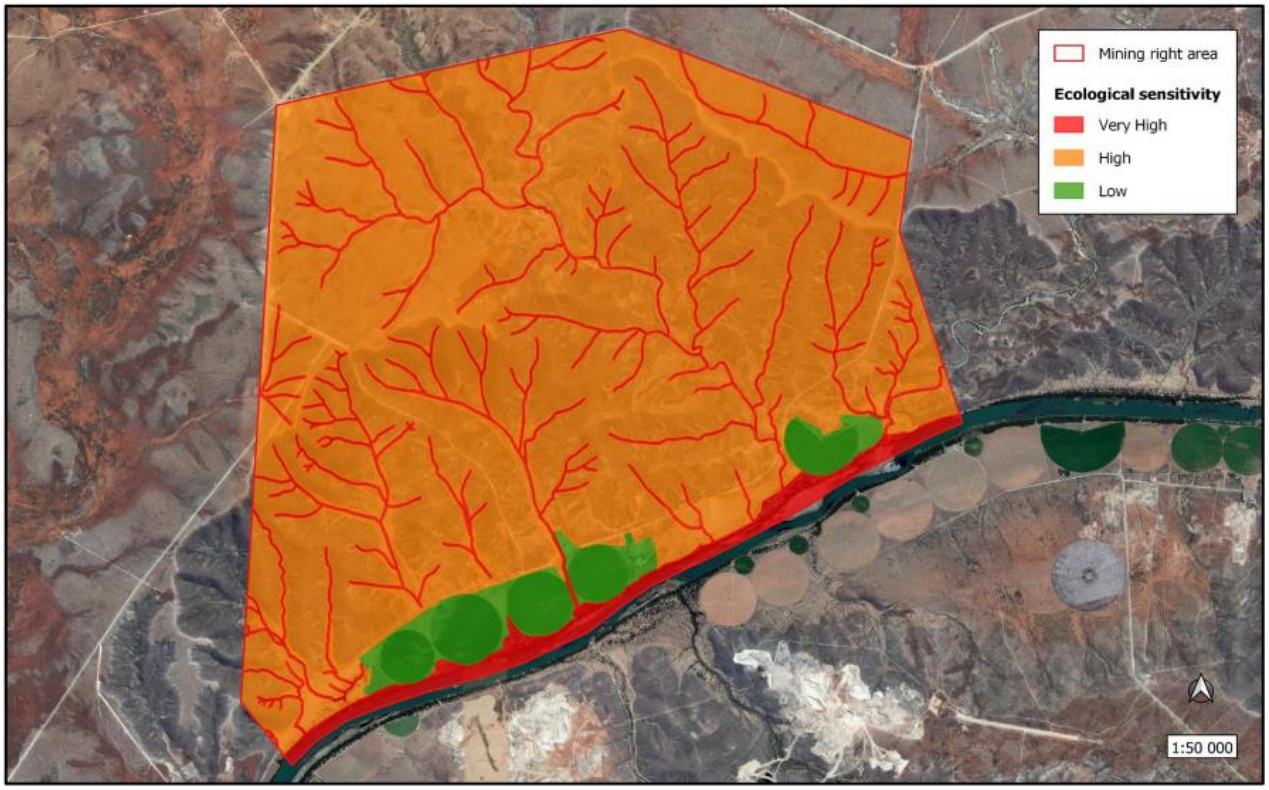


Figure 43. A sensitivity map for the proposed mining area, indicating the SITE SENSITIVITY in red taken out of the ecological study by Boscia Ecological Services.

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 planned mining 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 mining activities.
- To safeguard the safety and health of humans and animals on the site.
- To close the mining 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 mine closure is maintained until the issue of a closure certificate.
- The removal, decommissioning and disposal of all mining 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 (Porrel Dam)

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

- To ensure that the Mine Residue Dump deposit 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 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 Renaissance Resources 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 Mine 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 mine 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, Renaissance Resources will undertake the following:

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

Decommissioning and closure objectives

The key aim of 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 mine;
- 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;
- Limit the impact on staff whose positions become redundant at the time of mine closure, as addressed in the SLP;
- 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:

- Renaissance Resources will undertake a carefully planned step-wise decommissioning process.
- Closure planning will form an integral part of mine 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 mine will actively participate in regional and local planning to enhance the economic benefits of the project through development of alternative forms of income generation.
- Renaissance Resources will initiate and participate in regional planning exercises that will mitigate the impacts of closure of the mine, the local and regional economies and associated abandonment of community infrastructures surrounding the mine.
- The mine will fulfil the requirements for closure.

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 (Ecological study by Boscia Ecological Services).

The National Water Act (36 of 1998) (NWA) provides a framework to protect water resources.
According to this Act, a water resource includes a watercourse, surface water, estuary, or aquifer; whereas a water course includes:
a) a river or spring,
b) a natural channel in which water flows regularly or intermittently,
c) a wetland, lake or dam into which, or from which, water flows, and
d) any collection of water which the Minister may, by notice in the Gazette, declare to be a watercourse.

Any reference to a watercourse includes its bed and banks and a water resource does not only include the water within the system, but also the entire water cycle; i.e. evaporation, precipitation, the habitats and processes.

The purpose of this Act (Section 2) is to ensure that the nation's water resources are protected, used, developed, conserved, managed and controlled in ways which take into account amongst other factors - (g) protecting aquatic and associated ecosystems and their biological diversity and (h) reducing and preventing pollution and degradation of water resources.

No activity may take place within a watercourse unless authorised by the Department of Water and Sanitation (DWS). Any area within a wetland or riparian zone is therefore excluded from development unless authorisation is obtained from the DWS in terms of Section 21 (c) and (i).

The Lanyon Vale study area falls within the Boegoeberg quaternary catchment D71C of the Lower Orange Water Management Area. This quaternary catchment

has been allocated a Present Ecological State (PES) of 'Moderately Modified' (C) by Smook et al. (2002).

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). Most of these wetlands have been moderately to severely modified.

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

No mining will take place close to the river or in any drainage channels. No pumping of water except for taking of water from the Orange river for processing.

Four habitats were identified on site, of which the Orange River, drainage lines and their riparian buffer zones are the most sensitive to mining. The shrublands on the calcrete plateau and tillite ridge slopes host a widespread occurrence of Boscia albitrunca and is considered to be of high sensitivity. Furthermore, the substrate of the open shrubland on alluvium poses high runoff and sedimentation risks to the adjacent watercourses and is therefore also considered to be of high sensitivity.

The most profound impacts expected to be related to the proposed mining 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 during mining operations, but the significance of the impacts will ultimately be affected by the success of the mitigation measures implemented during the mining 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. (Taken out of the Ecological study done by Dr. Betsie Milne October 2022).

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 mining operations relates to dust suppression in the mining area and on the roads when hauling and transporting material to the processing plant and doing continuous backfilling as part of the rehabilitation process.

It must however be noted that the water supply to the activities will be sourced from the nearby Orange River. There will be an industrial rate applied for water used and the cost will be the pumping cost.

The processing plant (diamond pan), scrubbers and final recovery will have an impact on the cost of water used. The cost of water will have an upward trend over time as a result of the national capacity and demand situation. Water are however recycled as far as possible and redirected to the processing plants. It must however be noted that the water supply to the activities will be sourced from the Orange River.

viii) Has a water use licence been applied for?

A WULA application has been prepared and are in the final stages to be submitted. The EIA EMP is a minimum requirement for the application and therefor the application will be submitted shortly after the EIA EMP had been submitted to the competent authority. The Proof of submission will be sent onto the competent authority as soon as it is received.

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.
Processing Plant 2 X 16 feet pan	Construction Commissioning Operational Decommissioning Closure	0.5 ha Steel, concrete, electric wires	Access control Maintenance of processing plant Dust control and monitoring Noise control and monitoring Drip trays Storm water run-off control Immediately clean hydrocarbon spills		Removal of processing plant upon closure of mining right.

			Rip disturbed areas to allow re-growth of vegetation cover		
Ablution facilities Chemical toilets	Construction Commissioning Operational Decommissioning Closure	25m² or 0.0025ha	Maintenance of container Plants Removal of container plants upon closure		Removal of container plant upon closure of the Mining 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.	Maintenance of berms and trenches Oil traps used in relevant areas. Drip trays used. Immediately clean hydrocarbon spill.		Upon cessation of the individual activity (continuous rehabilitation)
Fuel Storage facility (Diesel tanks)	Construction Commissioning Operational Decommissioning Closure	250m² 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 Mining Right.
Mining Area	Commissioning Operational Decommissioning Closure	Provision is made for a maximum footprint of ±436 hectares of alluvial diamond target areas for excavations.	Proper planning of excavations Access control Dust control and monitoring Noise control and monitoring Continuous rehabilitation		Upon cessation of the individual activity (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	1000m² or 0.1 ha 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 mining right.
Waste disposal site (domestic and industrial waste):	Construction Commissioning Operational Decommissioning Closure	15m x 30m = 450m²	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 mining right.
Roads (both access and haulage road on the mine site):	Construction Commissioning Operational Decommissioning Closure	Additional mine haul road = 10 000m²	Maintenance of roads Dust control and monitoring Noise control and monitoring Speed limits Storm water run-off control Erosion control		Upon cessation of the individual activity (continuous rehabilitation) Ripping of roads upon closure of the mining right.

			Immediately clean hydrocarbon spills Rip disturbed areas to allow re-growth of vegetation cover		
Workshop and Wash bay	Construction Commissioning Operational Decommissioning Closure	300m² 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 mining right
Water distribution Pipeline	Construction Commissioning Operational Decommissioning Closure	HDPE Pipes	Maintain water pipeline and structures		Removal of pipeline upon closure of the mining right.
Water tanks:	Construction Commissioning Operational Decommissioning Closure	3m X 3m = 9m²	Maintain water tanks and structures		Removal of water tank and steel structure upon closure of the mining 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.**
Processing Plant 2 X 16 feet pan	Dust Noise Removal and disturbance of vegetation cover and natural habitat of fauna Soil contamination Surface disturbance	Air Quality Fauna Flora Noise Soil Surface water Safety	Construction Commissioning Operational Decommissioning Closure	Access control Maintenance of processing plant Dust control and monitoring Noise and vibration 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; Re-locate noise sources to areas which are less noise	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.

				sensitive, to take advantage of distance and natural shielding; Develop a mechanism to record and respond to complaints. Maintain a buffer zone around the streams. Note that these buffer zones are essential to ensure healthy functioning and maintenance of wetland. Minimizing – unavoidable impacts shall be minimized by taking appropriate and practicable measures such as transplanting important plant specimens, 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.	

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 container 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	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. Monitoring and maintenance of oil traps in relevant areas. Drip trays used. Immediately clean hydrocarbon spill. Linear infrastructure such as roads and pipelines will be inspected at least monthly to check that the associated water management	Safety ensured. Minimize potential for hydrocarbon spills to infiltrate into groundwater. Rehabilitation standards and closure objectives to be met.

				infrastructure is effective in controlling erosion. Maintain a buffer zone around the streams. Note that these buffer zones are essential to ensure healthy functioning and maintenance of wetland. Minimizing – unavoidable impacts shall be minimized by taking appropriate and practicable measures such as transplanting important plant specimens, 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.	
Fuel Storage facility (Diesel tanks)	Groundwater contamination Removal and disturbance of vegetation cover	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	Minimize potential for hydrocarbon spills to infiltrate into groundwater. Rehabilitation standards and closure objectives to be met.

	and natural habitat of fauna Soil contamination Surface disturbance			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.	
Mining Area	Dust Noise Removal and disturbance of vegetation cover and natural habitat of fauna Accelerated erosion of areas	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	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.

	adjacent to workings that have been de-vegetated leads to increased suspended sediment loads in nearby streams and rivers. Wind-blown dusts from unprotected tailings and waste rock dumps enter aquatic environment. Soil contamination Surface disturbance Surface water contamination			Dump stability control and monitoring Erosion control Noise control Well maintained equipment Selecting equipment with lower sound power levels; Develop a mechanism to record and respond to complaints. Maintain a buffer zone around the streams. Note that these buffer zones are essential to ensure healthy functioning and maintenance of wetland. Minimizing – unavoidable impacts shall be minimized by taking appropriate and practicable measures such as transplanting important plant specimens, 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. Mining activities must be planned, where possible in order to encourage (faunal dispersal) and should minimise dissection or fragmentation of any important faunal habitat type. The extent of the mining 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.	

				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. The environmental induction should occur in the appropriate languages for the workers who may require translation. 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.	

				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 mining footprint. The footprint areas of the mining activities must be scanned for Red Listed and protected plant species prior to mining; Snares & traps removed and destroyed; and Maintenance of firebreaks. It will be necessary to divert storm water around dump areas by construction of a temporary gravel cut-off berm that will prevent surface run-off into the drainage lines. 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. Implementation of a suitable management action plan during the operation of the proposed diamond mine, based on analysis of bi-annual water quality and biological monitoring data collected at sites upstream and downstream of all activities; Prevention of exotic vegetation encroachment; Prevent further siltation within the river segment as well as downstream of activities; Unnecessary destruction of marginal and in-stream habitat should always be avoided during operations.	

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.
Product 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 Well maintained equipment	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.

				Selecting equipment with lower sound power levels; Re-locate noise sources to areas which are less noise sensitive, to take advantage of distance and natural shielding; 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 mine site):	Dust Noise Removal and disturbance of vegetation cover	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	Dust levels minimized Minimize potential for hydrocarbon spills to infiltrate into groundwater Noise levels minimized

	and natural habitat of fauna Soil contamination Surface disturbance			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; Re-locate noise sources to areas which are less noise sensitive, to take advantage of distance and natural shielding; 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	Rehabilitation standards and closure objectives met. Erosion potential minimized.

				infrastructure is effective in controlling erosion.	
Workshop and Wash bay	Removal and disturbance of vegetation cover and natural habitat of fauna Soil contamination	Groundwater Soil Surface water	Construction Commissioning Operational Decommissioning Closure	Concrete floor with oil/water separator Storm water run-off control Immediately clean hydrocarbon spills	Minimize potential for hydrocarbon spills to infiltrate into groundwater Noise levels minimized Rehabilitation standards and closure objectives to be met. 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 alluvial 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)
Processing Plant: 2 X 16 feet pan	Dust Noise Removal and disturbance of vegetation cover and natural habitat of fauna Soil contamination Surface disturbance	Access control Maintenance of processing plant Dust control and monitoring Noise and vibration 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;	Removal of processing plant upon closure of mining right.	The following must be placed at the site and is applicable to all activities: • Relevant Legislation; • Acts; • Regulations • COP's • SOP's Management and staff must be trained to understand the contents of these documents and to adhere thereto.

		Re-locate noise sources to areas which are less noise sensitive, to take advantage of distance and natural shielding; 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 around the streams. Note that these buffer zones are essential to ensure healthy functioning and maintenance of wetland. Minimizing – unavoidable impacts shall be minimized by taking appropriate and practicable measures such as transplanting important plant specimens, 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.		• 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. Annual performance Assessment Reports and quantum Calculations must be done to ensure that the operation adheres to the contents of the EIA and EMPr documents.

Ablution Facilities Chemical Toilets.	Soil contamination Groundwater contamination	Maintenance of sewage facilities on a regular basis. Removal of container plants on closure	Removal of container plant upon closure of the Mining Right.	The following must be placed at the site and is applicable to all activities: • Relevant Legislation; • Acts; • Regulations • COP's • SOP's Management and staff must be trained to understand the contents of these documents and to adhere thereto. • 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. Annual performance Assessment Reports and quantum Calculations must be done to

				ensure that the operation adheres to the contents of the EIA and EMPr documents.
Clean & Dirty water systems: Berms	Surface disturbance Groundwater Contamination Soil contamination Surface water contamination	It will be necessary to divert storm water around dump areas by construction of a temporary gravel cut-off berm that will prevent surface run-off into the mining area. Excavations, where and when applicable, should be rehabilitated concurrently as mining progresses. 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. Immediately clean hydrocarbon spill.	Upon cessation of the individual activity (continuous rehabilitation) Levelling of storm water berms upon closure of Mining Right	The following must be placed at the site and is applicable to all activities: • Relevant Legislation; • Acts; • Regulations • COP's • SOP's Management and staff must be trained to understand the contents of these documents and to adhere thereto. • 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.

		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. Maintain a buffer zone around the streams. Note that these buffer zones are essential to ensure healthy functioning and maintenance of wetland. Minimizing – unavoidable impacts shall be minimized by taking appropriate and practicable measures such as transplanting important plant specimens, 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.		Annual performance Assessment Reports and quantum Calculations must be done to ensure that the operation adheres to the contents of the EIA and EMPr documents.
Fuel Storage facility (Diesel tanks)	Groundwater contamination Removal and disturbance of vegetation cover	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	Removal of diesel tanks upon closure of Mining Right.	The following must be placed at the site and is applicable to all activities: • Relevant Legislation; • Acts; • Regulations

	and natural habitat of fauna Soil contamination Surface disturbance	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.		• COP's • SOP's Management and staff must be trained to understand the contents of these documents and to adhere thereto. • 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. Annual performance Assessment Reports and quantum Calculations must be done to ensure that the operation adheres to the contents of the EIA and EMPr documents.
Mining Area.	Dust Noise	Access control Dust control and monitoring Noise and vibration control and monitoring Continuous rehabilitation	Upon cessation of the individual activity (continuous rehabilitation)	The following must be placed at the site and is applicable to all activities: • Relevant Legislation;

	Removal and disturbance of vegetation cover and natural habitat of fauna Accelerated erosion of areas adjacent to workings that have been de-vegetated leads to increased suspended sediment loads in nearby streams and rivers. Wind-blown dusts from unprotected tailings and waste rock dumps enter aquatic environment. Soil contamination Surface disturbance Surface water contamination	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; Re-locate noise sources to areas which are less noise sensitive, to take advantage of distance and natural shielding; 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 around the streams. Note that these buffer zones are essential to ensure healthy functioning and maintenance of wetland. Minimizing – unavoidable impacts shall be minimized by taking appropriate and practicable measures such as transplanting important plant specimens, confining works in		• Acts; • Regulations • COP's • SOP's Management and staff must be trained to understand the contents of these documents and to adhere thereto. • 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. Annual performance Assessment Reports and quantum Calculations must be done to ensure that the operation adheres to the contents of the EIA and EMPr documents.

		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. Mining activities must be planned, where possible in order to encourage (faunal dispersal) and should minimise dissection or fragmentation of any important faunal habitat type. The extent of the mining 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. 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. The environmental induction should occur in the appropriate languages for the workers who may require translation. 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. 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 mining footprint. The footprint areas of the mining activities must be scanned for Red Listed and		

		protected plant species prior to mining; Snares & traps removed and destroyed; and Maintenance of firebreaks. Excavations, where and when applicable, should be rehabilitated concurrently as mining progresses. 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. Implementation of a suitable management action plan during the operation of the proposed diamond mine, based on analysis of bi-annual water quality and biological monitoring data collected at sites upstream and downstream of all activities; Prevention of exotic vegetation encroachment; Prevent further siltation within the river segment as well as downstream of activities;		

Salvage yard (Storage and laydown area)	Surface Water contamination Groundwater contamination Removal and disturbance of vegetation cover and natural habitat of fauna Soil contamination Surface disturbance Surface water contamination	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 mining right.	The following must be placed at the site and is applicable to all activities: • Relevant Legislation; • Acts; • Regulations • COP's • SOP's Management and staff must be trained to understand the contents of these documents and to adhere thereto. • 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. Annual performance Assessment Reports and quantum Calculations must be done to ensure that the operation adheres

				to the contents of the EIA and EMPr documents.
Product Stockpile area	Surface Water contamination Removal and disturbance of vegetation cover and natural habitat of fauna Soil contamination Surface disturbance Surface water contamination		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; Re-locate noise sources to areas which are less noise sensitive, to take advantage of distance and natural shielding; Taking advantage during the design stage of natural topography as a noise buffer; Develop a mechanism to record and respond to complaints.	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.
Waste disposal site (domestic and industrial waste):	Groundwater contamination Surface Water contamination Contamination of soil	Storage of Waste within receptacles Storm water control Ground water monitoring 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 mining right.	The following must be placed at the site and is applicable to all activities: • Relevant Legislation; • Acts; • Regulations • COP's

	Surface water contamination			• SOP's Management and staff must be trained to understand the contents of these documents and to adhere thereto. • 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. Annual performance Assessment Reports and quantum Calculations must be done to ensure that the operation adheres to the contents of the EIA and EMPr documents.
Roads (both access and haulage road on the mine site):	Dust Surface Water contamination	Maintenance of roads Dust control and monitoring Noise control and monitoring Speed limits Storm water run-off control Erosion control	Upon cessation of the individual activity (continuous rehabilitation) Ripping of roads upon closure of the mining right.	The following must be placed at the site and is applicable to all activities: • Relevant Legislation; • Acts;

	Groundwater contamination Noise Removal and disturbance of vegetation cover and natural habitat of fauna Soil contamination Surface disturbance	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; Re-locate noise sources to areas which are less noise sensitive, to take advantage of distance and natural shielding; 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.		• Regulations • COP's • SOP's Management and staff must be trained to understand the contents of these documents and to adhere thereto. • 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. Annual performance Assessment Reports and quantum Calculations must be done to ensure that the operation adheres to the contents of the EIA and EMPr documents.
Workshop and Wash bay	Surface Water contamination	Concrete floor with oil/water separator Storm water run-off control	Removal of wash bay equipment, breaking and removal of rubble from the	The following must be placed at the site and is applicable to all activities:

	Removal and disturbance of vegetation cover and natural habitat of fauna Soil contamination	Immediately clean hydrocarbon spills	concrete floors and bund walls upon closure of mining right	• Relevant Legislation; • Acts; • Regulations • COP's • SOP's Management and staff must be trained to understand the contents of these documents and to adhere thereto. • 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. Annual performance Assessment Reports and quantum Calculations must be done to ensure that the operation adheres to the contents of the EIA and EMPr documents.

Water distribution Pipeline	Surface disturbance	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.	Removal of pipeline upon closure of the mining right.	The following must be placed at the site and is applicable to all activities: • Relevant Legislation; • Acts; • Regulations • COP's • SOP's Management and staff must be trained to understand the contents of these documents and to adhere thereto. • 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. Annual performance Assessment Reports and quantum Calculations must be done to

				ensure that the operation adheres to the contents of the EIA and EMPr documents.
Water tanks:	Surface disturbance	Maintain water tanks and structures	Removal of water tank and steel structure upon closure of the mining right.	The following must be placed at the site and is applicable to all activities: • Relevant Legislation; • Acts; • Regulations • COP's • SOP's Management and staff must be trained to understand the contents of these documents and to adhere thereto. • 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. Annual performance Assessment Reports and quantum Calculations must be done to ensure that the operation adheres to the contents of the EIA and EMPr documents.

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.

Closure:

The main closure objective of this mine is to rehabilitate the mined areas in such a way to ensure that the rehabilitated topographical landscape would blend in with the surrounding landscape, would not pose a safety hazard for human and animal, but at the same time allow a certain alternative land use. Establish a self-sustaining and stable vegetation cover in order to mitigate the visual impact, to control erosion and to create some habitat for animals. The rehabilitated environment also needs to be aesthetically acceptable according to the principle of BPEO.

Renaissance Resources will ensure that the mine site is:

- Neither a danger to public health and safety nor to animal health and safety.
- Not a source of any pollution.
- Stable (ecological and geophysical).
- Rehabilitated to the state that is suitable for the predetermined and agreed land use.
- Compatible with the surrounding biophysical environment.
- A sustainable environment.
- Aesthetically acceptable.
- Not an economic, social or environmental liability to the local community or the state now or in the future.

Renaissance Resources will ensure that the physical and chemical stability of the rehabilitated mining site will be such that risk to the environment is not increased by naturally occurring forces to the extent that such increased risk cannot be contended with by the installed measures.

Renaissance Resources will subscribe to the optimal exploitation and utilization of South Africa's mineral resources (diamonds).

Renaissance Resources will ensure that the mining site is closed efficiently and cost effectively.

Renaissance Resources will ensure that the operation is not abandoned but closed in accordance with the relevant requirements.

Renaissance Resources will ensure that the interest of all interested and affected parties will be considered.

Renaissance Resources will ensure that the all-relevant legislation regarding mine closure will be adhered to, and all relevant application procedures followed.

The management of environmental impacts:

With regard to the extension, the mitigation of all environmental impacts on all applicable aspects uses BPEO (Best practical environmental option) principles.

- Optimal utilization and maintenance of existing mine facilities in a well-planned manner.
- To take care that no new land surface, habitats of vegetation and animals are destroyed, disturbed or alienated unnecessarily.
- To contain and prevent any pollution (physical and chemical) from the mining operation within structures, facilities provided therefore.
- To ensure an effective surface run-off control system in order to deal with the separation of clean and dirty water environment.
- The sustainable and responsible utilization (re-use) of all water resources and the prevention of pollution thereof.
- The sustainable rehabilitation of the mining site (excavations, topsoil- & overburden stockpiles, rest of terrain) in order to address all environmental impacts as far as practical.

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

Mr. Thomas Lubbe is the landowner of the proposed mine site and he has been consulted as well as neighbours to the properties.

(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 mining 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 10 years after the right has been granted and all deposits mined. 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 ± 900 m^2, 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 0 m^2. 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 ± 250 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 10 000 m^2. 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 mining activities.

Demolition and rehabilitation of non-electrified railway lines

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

Demolition of housing and/or administration facilities

- There are no other housing or administration facilities associated with the mining 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 mining activities are expected to cover 3.5ha at any 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 mining activities.

Rehabilitation of overburden and spoils

- The total final overburden and spoils are estimated to amount to 2 ha and includes waste dumps as well as earth walls. Pre-planning should be conducted in order 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 mining activities.

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

- The processing waste deposits on the mining area is estimated to cover an area of ± 0.3 ha. Pre-planning should be conducted in order 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 mining 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 ± 2 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 mining activities.

Maintenance and aftercare
Maintenance and aftercare should be planned for two to three years after mine 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.
- Erosion control and monitoring of the slopes of the slime's dams;

Specialist study
A screening level risk assessment should be completed by a specialist environmental practitioner during mine closure 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 emphasise 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 mining 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.

The ultimate rehabilitation of the mining site that involves the sloping, levelling, replacement of topsoil and the seeding of an grass seed mix in areas that does not recover acceptably as agreed to by the land owner will ensure that the site could be regarded as safe for humans and

animals and will also ensure that the site is stable from an erosion point of view and also ensuring that the site could be used for grazing again.

The removal of waste material of any description from the mining area and the disposal thereof at a recognised landfill facility.

- The removal of infrastructure, equipment, plant and other items from the site.

- The ripping of compacted areas to a level of 300mm and the levelling of such areas in order to re-establish a growth medium for plants (such areas will furthermore be seeded with a vegetation seed mix adapted to reflect the local indigenous flora that was present prior to the prospecting operation, if the re-establishment of vegetation is unacceptably slow.

- The mining of alluvial diamonds and the backfilling and covering thereof with previously stored topsoil (where-after this area will also be seeded with a vegetation seed mix adapted to reflect the local indigenous flora that was present prior to the proposed operation, and seedlings protected for a period of one) if the re-establishment of vegetation is unacceptably slow.

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

The total cost to rehabilitate and mitigate the Renaissance Resources Mine site as it stands currently (risking premature rehabilitation) is estimated to be R1,103,473 according to the DMR calculations. The detailed calculation DMR quantum is presented in Table 17. The total rehabilitation costing is based on the assumption that the mining operation will do continuous concurrent rehabilitation throughout the project.

(f) Confirm that the financial provision will be provided as determined.

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

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-mining slopes are stable, free draining and no slopes have an angle in excess of 20º.	Site Manager/ Environmentalists	Monitoring will be done on an *annual basis* 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 *annual basis* 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 mining 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 *annually basis* 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 *twice a year basis* (mid-summer and mid-winter), where species diversity and vegetation cover will be investigated.

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
Noise and Vibration	To ensure that the legislated noise and ground vibration levels will be adhered to at all times. To control the incidence of unacceptable noise levels on site.	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 and that which may migrate outside the plant area.	The manager during the construction phase and the responsible person (Manager / Environmental Department) during the Operational phase of the project.	Quarterly reports on fall-out noise monitoring will be conducted as required by legislation. 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.	The Orange River are the nearest source in the vicinity of the mine. The Orange River will be monitored by collecting surface water samples quarterly.	Site Manager/Water Supply	The Orange River which may be impacted by the mining activity. Monitoring takes place by collecting surface water samples every quarter. Implementation of a suitable management action plan during the operation of the proposed diamond mine, based on analysis of bi-annual water quality and biological monitoring data collected at sites upstream and downstream of all activities (measure taken out of the aquatic study by DPR); .

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 annually 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 annually 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 annually 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 mine 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 Renaissance Resources operation should focus on the following:

- General environmental awareness
- 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

(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 Renaissance Resources project 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	Line management in the relevant area of responsibility where the incident occurred shall: • Investigate the incident and record the following information: - 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	The site managers shall: • Forward a copy of the incident form to other line managers; • Forward a copy of the incident form to the Environmental manager/ECO; • 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	The appointed environmental manager or ECO shall: • 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 Mining right must annually assess (and revise, if necessary) the total quantum of environmental liability for the operation and ensure that financial provisions are 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).

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.

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Signature of the Environmental Assessment Practitioner:

Wadala Mining and Consulting (Pty) Ltd

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Name of Company:

Date: 11 October 2022

- END –