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:	**The 2005 and 2007 Retrenchees Kimberley Mine Trust**
TEL NO:	**0538320029 (Roelien)**
CEL NO:	**083 434 7209 (Louis Modise)**
FAX NO:	**086 5107120**
POSTAL ADDRESS:	**PO Box 110823; Hadisonpark; 8306**
PHYSICAL ADDRESS:	**4 Mullin Street; Hadisonpark; Kimberley; 8306**

FILE REFERENCE NUMBER SAMRAD: **(NC) 30/5/1/2/2/10108 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

Name of the Practitioner:	**ROELINA OOSTHUIZEN**
Tel No.:	**084 208 9088**
Fax No.:	**086 510 7120**
E-mail address:	**roosthuizen950@gmail.com**

ii) 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. Please refer to attached CV.
(with evidence attached as **Appendix 2**)

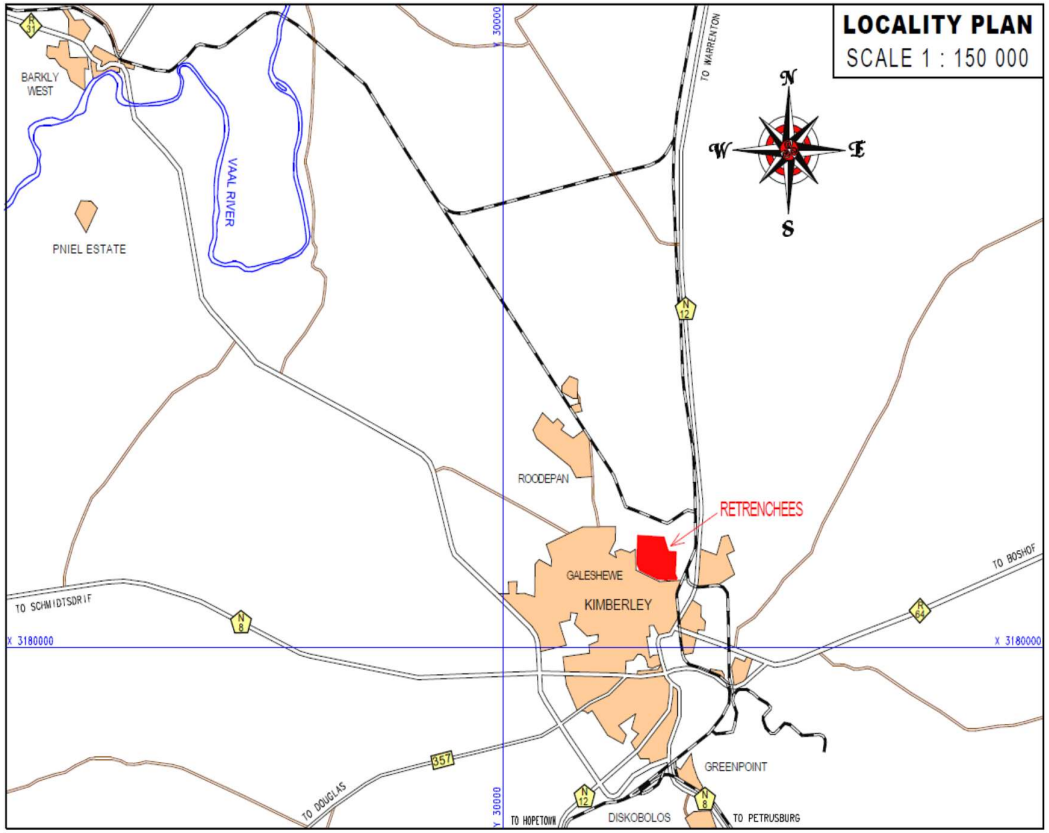
b) Description of the property

Farm Name:	**Farm No.:**	**Erf 5024**
	Farm Name:	Erf
	Portion:	Remaining Extent
	Magisterial District:	Kimberley
	Province:	Northern Cape
	Title Deed No.:	T176/1941

	Farm No.: **Erf 4812** **Farm Name:** Erf **Portion:** Remaining Extent **Magisterial District:** Kimberley **Province:** Northern Cape **Title Deed No.:** T176/1941 **Farm No.:** **Erf 4815** **Farm Name:** Erf **Portion:** 0 **Magisterial District:** Kimberley **Province:** Northern Cape **Title Deed No.:** T127/1960 **Farm No.:** **Erf 4811** **Farm Name:** Erf **Portion:** 0 **Magisterial District:** Kimberley **Province:** Northern Cape **Title Deed No.:** G6/1923
Application area (Ha)	232.7688 ha (two hundred and thirty two comma seven six eight eight hectares)
Magisterial district:	Kimberley
Distance and direction from nearest town	The Colville Tailings Deposit (CTD) is located to the north of Kimberley. The CTD is situated directly north of the Florianville neighbourhood, Northern Cape, South Africa.
21 digit Surveyor General Code for each farm portion	C03700010000502400000 C03700010000481200000 C03700010000481500000 C03700010000481100000

c) Locality map

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



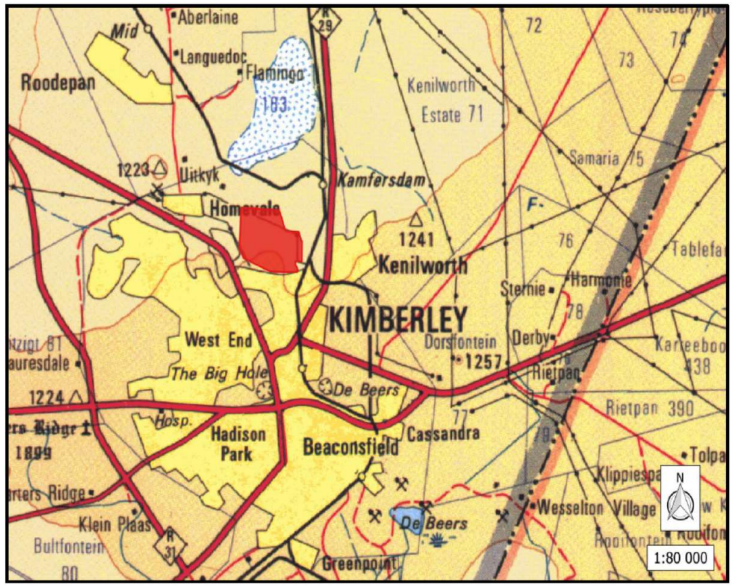


Figure 1: Locality Map 1: 150 000 and locality on 1:80000 on topographical map of Kimberley

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)

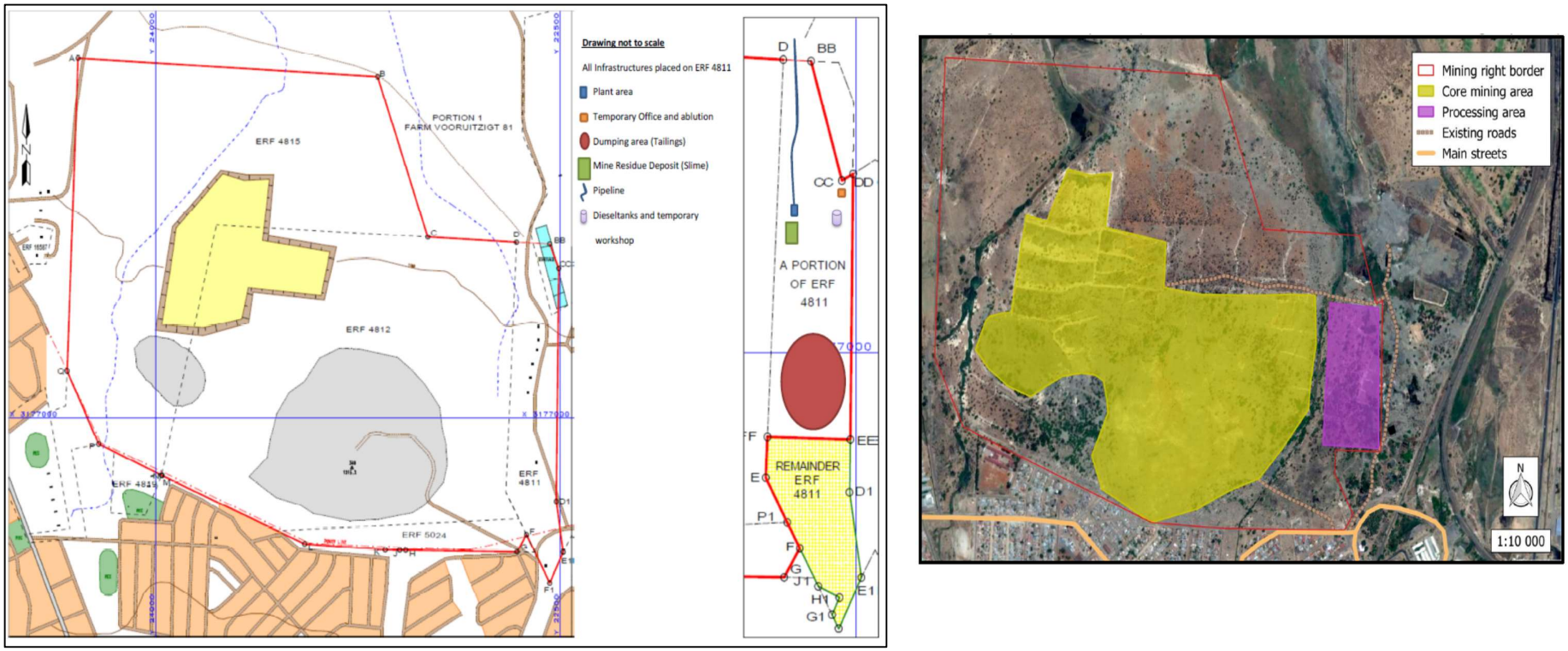


Figure 2: Infrastructure site layout plan with proposed google overlay of core mining area and processing (Dr. B Milne out of ecological report February 2017.

i) Listed and specified activities

Table 1: Listed and Specified Activities

NAME OF ACTIVITY (All activities including activities not listed) **(e.g. Excavations, blasting, stockpiles, discard dumps or dams, loading, hauling and transport, water supply dams and boreholes, accommodation, offices, ablution, stores, workshops, processing plant, storm water control, berms, roads, pipelines, power lines, conveyors, etc.…etc.…etc.…)**	**Aerial extent of the Activity Ha or m²**	**LISTED ACTIVITY Mark with an X where applicable or affected**	**APPLICABLE LISTING NOTICE (*GNR 544, GNR 545 or GNR 546)/NOT LISTED***
Activity 17 of the National Environmental Management Act 107 of 1998 **("NEMA") Listing Notice 2** 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 ("**MPRDA**"), including associated infrastructure, structures and earthworks, directly related to the extraction of a mineral resource, including activities for which an exemption has been issued in terms of section 106 of the MPRDA.	232.7688ha on Erf 4811, 4815, 4812, 5024 ("**Collville Area**"). In terms of the agreement concluded between De Beers Consolidated Mines Proprietary Limited ("**DBCM**") and The 2005 and 2007 Retrenchees – Kimberley Mines Trust (the "**Retrenchees**" or about 22 July 2016 (the "**Agreement**") the CTD on Erf 4815, 4812, 5024 must be cleared within five years. Erf 4811 will be used for all processing and dumping operations.	X	GNR 984
Activity 21 of NEMA Listing Notice 2 Any activity including the operation of that activity associated with the primary **processing of a mineral resource** including winning, reduction, extraction, classifying, concentrating, crushing, screening and washing but excluding the smelting, beneficiation, refining, calcining or gasification of the mineral resource in which case activity 6 in this Notice applies.	**[12.7418ha]** on Erf 4811. Erf 4811 will be used for all processing and dumping operations.	X	GNR 984
Activity 24(ii) of NEMA Listing Notice 1 The development of haul roads 15m wide with no reserve	±20 000m² on the Colville Area.	X	GNR983
Activity 56(ii) of NEMA Listing Notice 1 The continuous lengthening (and rehabilitation) of haul roads	±20 000m² on the Colville Area.	X	GNR983

15m wide with no reserve			
Activity 15 of NEMA Listing Notice 2 The clearance of an area of more than 20 ha of indigenous vegetation	A total of 40 hectares will be physically disturbed were the CTD will be removed from Erf 4815, 4812, 5024 and re-processed and dumped on Erf 4811. (In terms of the Agreement Erf 4815, 4812, 5024 must be cleared within five years. Erf 4811 will be used for all processing and dumping operations.)	X	GNR984
Activity 14 of NEMA Listing Notice 1 The development of infrastructure for the storage and handling of dangerous goods (fuel) in containers with a combined capacity of 80m³ or more but not exceeding 500m³.	±80m³ on Erf 4811.	X	GNR 983
Activity 6 of Listing Notice 2 The development of or changes to facilities or infrastructure for any process or activity which requires a permit or licence in terms of national or provincial legislation governing the generation or release of emissions, pollution or effluent.	On Erf 4811. Extent to be confirmed . This is required for the Return Water Dam.	X	GNR984
Activity 9 of Category A under the National Environmental Management: Waste Act 59 of 2008	The disposal of inert waste to Erf 4811 in excess of 25 tons but not exceeding 25 000 tons, excluding the disposal of such waste for the purposes of levelling and building which has been authorised by or under other legislation.	Waste Act	GNR 633
Activity 15 of Category A under the National Environmental Management: Waste Act 59 of 2008 The continuous establishment and reclamation of temporary stockpiles resulting from activities which require a mining right.	±500m² **[12.7418ha]** on Erf 4811.	Waste Act	GNR 633
OTHER ACTIVITIES (Associated infrastructure not considered to be listed activities) Temporary Workshop Facilities Storage Facilities	 ±300m² ±3000m²	Not listed	 NOT LISTED

Concrete Bund walls and diesel Depots	±250m²		
Ablution Facilities	±25m²		
Topsoil Stockpiles	±500m²		
Overburden Stockpiles	±500m²		

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)

- Mining and Processing Method:

The tailings will be loaded with an excavator on to dump trucks for conveyance to the Processing Plant. At the Processing Plant the run of mine tailings will be fed onto a grizzly for screening out oversize material. The tailings will be processed through a screening and crushing section for delivery to a 75 tph DMS plant. Concentrate from the DMS plant will be processed through an X-Ray/Sortex plant to extract the diamonds. (In terms of the Agreement the Erf 4815, Erf 4812, Erf 5024 must be cleared within five years. Erf 4811 will be used for all processing and dumping operations.)

There will be 31 employees including the security personnel.

According to the Resource Statement done by De Beers there is a total of 878 040 tons of tailings available for treatment at an average grade of 8.6 carats/100 tons.

- Production Rates:

Rate of Production 187 000 tons per year and 17 000 tons per month
Est. payable reserve ration 100%
Efficiency factor 95%

This Calculates to an operation of 5 years at the same production rate every month. (MWP, 2016).

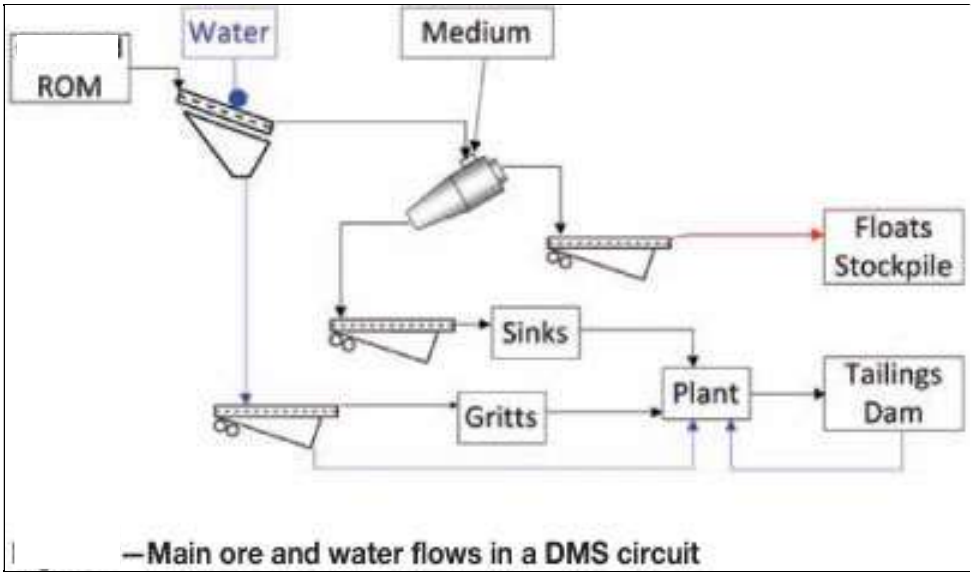


Figure 3: Conceptual schematic flow diagram of the plant.

e) Policy and Legislative Context

Applicable Legislation and Guidelines used to compile the report (a description of the policy and legislative context within which the development is proposed including an identification of all legislation, policies, plans, guidelines, spatial tools, municipal development planning frameworks and instruments that are applicable to this activity and are to be considered in the assessment process.)	Reference where applied	HOW DOES THIS DEVELOPMENT COMPLY WITH AND RESPOND TO THE POLICY AND LEGISLATIVE CONTEXT (E.g In terms of the National Water Act:-Water Use License has/has not been applied for).
Conservation of Agricultural Resources Act (Act 43 of 1983) and Regulations (CARA)	- 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) 30/5/1/2/2/10108 MR). - 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) - 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	- Control measures are to be implemented upon the approval of the EMPR.

	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. Commencement of Threatened or Protected Species Regulations 2007 : 1 June 2007 GNR 150/GG 29657/23-02-2007	- A permit application regarding protected plant species need to be lodged with DENC if any protected species is encountered. In terms of the specialist study no species were encountered. - Control measures are to be implemented upon the approval of the EMPR.

	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 Africa"s natural biodiversity and its landscapes and seascapes.	- Chapter 2 lists all protected areas.	- Not applicable. The mining operation does not fall within any protected area.
National Environmental	- Chapter 4: Waste management activities	- To be implemented upon the

Management: Waste Management Act (Act 59 of 2008)	- 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) - Regulations GN R633 published on 24 July 2015 in terms of NEM: WA (Amendments to the waste management activities list published under GN921)	approval of the EMPR.
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 need 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	- Control measures are to be implemented upon the approval of the EMPR.

	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. - 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;	- A water use application is in the final stages of preparation and will be lodged with Department of Water and Sanitation (DWS). - Control measures are to be implemented upon the approval of the EMPR.

	(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)) - 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.

Northern Cape Nature Conservation Act (Act 9 of 2009)	- Addresses protected species in the Northern Cape and the permit application process related thereto.	- A permit application regarding provincially protected plant species as well as for large-scale harvesting of indigenous flora need to be lodged with DENC if necessary. - 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.
Northern Cape Planning and Development Act (Act 7 of 1998)	- To control planning and development	- To be implemented upon the approval of the EMPR.
Spatial Planning and Land Use Management (Act 16 of 2013 (SPLUMA) and regulations	- To provide a framework for spatial planning and land use management in the Republic; - To specify the relationship between the spatial planning and the land use management, amongst others - Regulations GN R239 published on 23 March 2015 in terms of SPLUMA	- To be implemented upon the approval of the EMPR.
Subdivision of Agricultural Land Act, 70 of 1970 and regulations	- Regulations GN R373 published on 9 March 1979 in terms of Subdivision of Agricultural Land	- To take note.

Basic Conditions of Employment Act (Act 3 of 1997)) as amended	- To regulate employment aspects	- To be implemented upon the approval of the EMPR
Community Development (Act 3 of 1966)	- To promote community development	- To be implemented upon the approval of the EMPR
Development Facilitation (Act 67 of 1995) and regulations	- To provide for planning and development	- To take note.
Development Facilitation (GN24, PG329, 24/07/1998)	- Regulations re Northern Cape LDO's	- To take note.
Development Facilitation (GNR1, GG20775, 07/01/2000)	- Regulations re application rules S26, S46, S59	- To take note.
Development Facilitation (GN732, GG14765, 30/04/2004)	- Determines amount, see S7(b)(ii)	- To take note.
Land Survey Act (Act 8 of 1997)) and regulations, more specifically GN R1130	- 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
Municipal Ordinance, 20/1974	- To control pollution, sewers etc.	- To be implemented upon approval of the EMPR
Municipal Ordinance, PN955, 29/08/1975	- Nature conservation Regulations	- To be implemented upon approval of the EMPR
Cape Land Use Planning Ordinance, 15/85	- To control land use planning	- To take note.
Cape Land Use Planning Ordinance, PN1050, 05/12/1988	- Land use planning Regulations	- To take note.

f) Need and desirability of the proposed activities

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

De Beers Consolidated Mines was the holder of a Mining Right which included the Colville dumps which were executed on behalf of the Minister of Mineral Resources ("Minister") and De Beers.

The Retrenchees and DBCM have resolved that according to the Section 102 application this Colville Dump area will be excluded from the Mining Right of De Beers and the Retrenchees will do an application for a Mining Right.

This Mining Right application by THE 2005 AND 2007 RETRENCHEES-KIMBERLEY MINES TRUST is as a result of the Agreement. De Beers Consolidated Mines agreed to sell to the retrenches the Colville tailings resource for 1 Rand. The operation that will be conducted on the Colville Tailings Dump will be for the benefit of the 1 800 Retrenchees. (In terms of the Agreement Erf 4815, Erf 4812, Erf 5024 must be cleared within five years. Erf 4811 will be used for all processing and dumping operations.)

The Colville application area consists of 3 areas of which on two areas Area A and Area B, where upon course kimberlite tailings resource containing a high proportion of processed kimberlite from historical underground mining at Kimberley Mine has been deposited. This Tailings Mineral Resource represents the residue from the re-treatment of the older Colville washing plant tailings. On area A & B the tailings will be excavated and loaded onto trucks for processing.

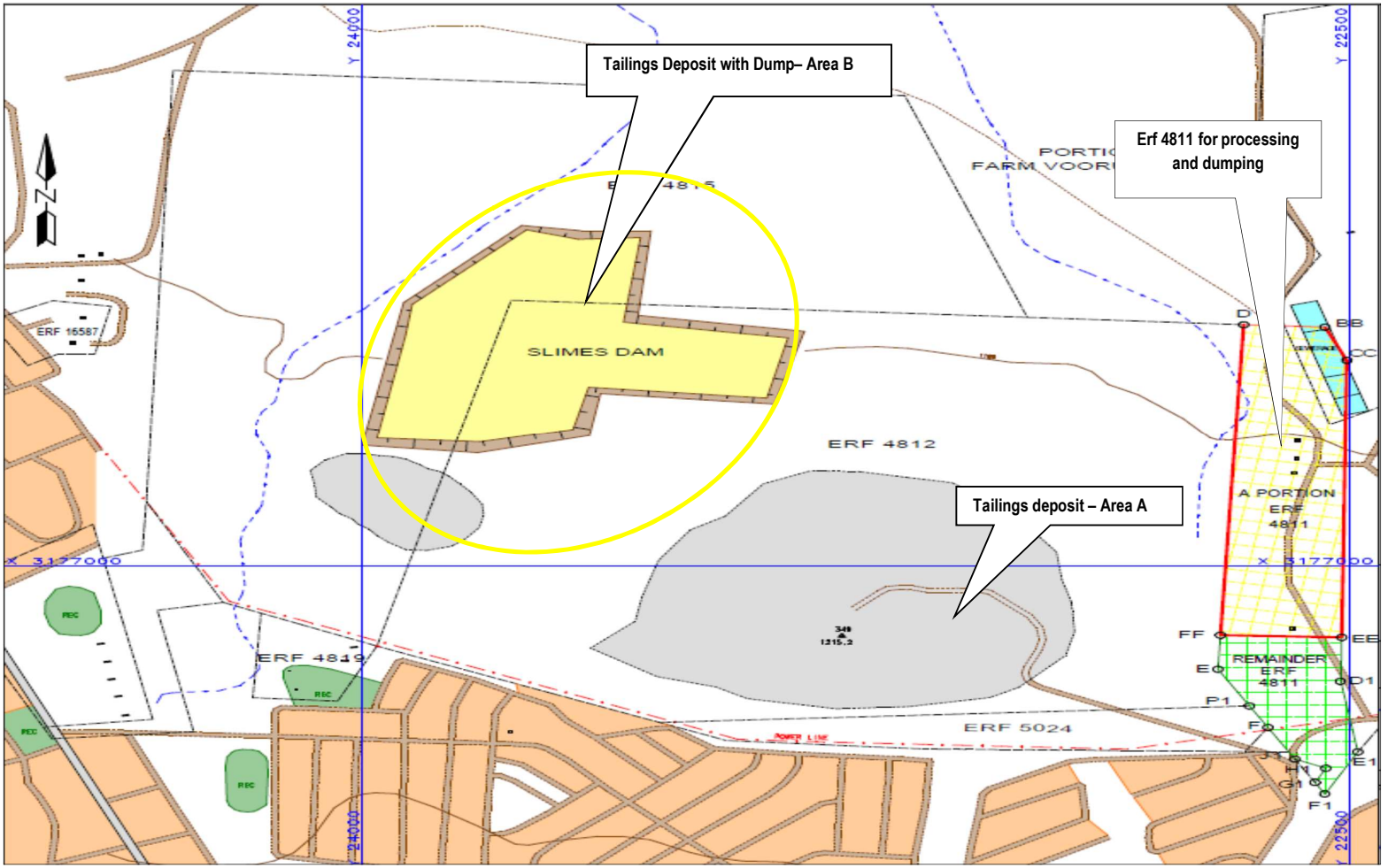


Figure 4: Mine Areas for processing

The land currently can be classified as wilderness area as the total area was left un-rehabilitated with dumps, heaps and small excavations evident all over the entire application area. Currently a lot of illegal mining activities of small scale miners are taking place. There was also building rubble and domestic waste dumped in places.

Resource Statement

Over a period of time, several aspects of work have been undertaken at the Colville Tailings Diamond Resource. The resource was first ratified through the Mineral Resource Classification Committee on 16 August 2005. A further refinement to the Colville Retreat component in 2006 resulted in a new ratified scorecard for this component on 06 November 2006.

The outcomes of these estimates have resulted in the current declarations, as per the official 2010 resource and reserve statement, after tonnage reductions due to further sampling at the Colville Retreat Tailings Resource have been applied.

The current Colville Tailings Diamond Resource Statement is thus officially declared as follows:

Resource Component	Tonnes	Grade	Carats
Colville Outer	263 649	2.34	6 169
Colville Centre	24 390	26.85	6 549
Colville Retreat	590 129	8.6	50 751
Total	**878 168**	**7.23**	**63 469**

- Need and desirability

  There are two market types for diamonds namely jewellery and industrial.

  The diamond industry is an international trade and one that involves a number of processes between the mining and extraction of the rough product through to the polished diamond jewellery of the retail sector. A competitive market for diamonds exists internationally and locally and these reserves constitute an economically viable resource with the potential of earning foreign currency and supplying work opportunities in an area of great unemployment.

  Summary of product consumers

  The diamond industry is an international trade and one that involves a number of processes between the mining and extraction of the rough product through to the polished diamond jewellery of the retail sector. Commonly referred to as the pipeline put simply this consists of the mining wholesale dealing, manufacturing, polished wholesale, jewellery manufacturing and the retail sector. Increasingly such segmentation according to process for these pipeline is becoming more blurred as downstream and upstream movements take

place. World rough diamond production is estimated to be some $8 billion per annum of which South Africa is the fourth biggest producing country.

Summary of customer specifications and details of any proposed beneficiation of the products

The Colville Tailings Diamond Resource diamond production is ideally suited for the jewellery marked. It is hoped that at least some of the diamond production will be cut and polished locally.

Summary of infrastructure requirements such as roads, rail, electricity and water

The city of Kimberley is the capital of the Northern Cape Province, South Africa and can be reached via a tarred road. Kimberley can be described as the diamond capital of South Africa with a history of diamond mining since the discovery of diamonds in 1871 that led to the creation of the Big Hole. Today, a large number of diamond mines are operational in the area, including the Finch Diamond Mine of De Beers.

Infrastructure in the area is very 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. It must however be noted that the water supply to the activities will be sourced from the nearby Kamfersdam free of charge from the Sol Plaatjie Municipality. The only cost will be the pumping cost. (In terms of the commercial agreement the Erven (Erf 4815, Erf 4812, Erf 5024) must be cleared within five years. Erf 4811 will be used for all processing and dumping operations that have been secured from the Municipality.)

Summary of other information applied that may influence price, e.g. exchange rate, duties, tariff barriers, etc.

a) Exchange rate – direct influence on revenue as the product price is determined in US dollars
b) Fluctuations in diamond market demand and supply may also influence prices in the market.

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 Colville Dump is an existing historical mine that is known from the 1930's to the surrounding community and the State. The mining site with specific reference to the tailings deposit area needs urgent rehabilitation and is an area that lends itself to criminal activities and illegal dumping.

- The reclamation of the Colville Dump should be seen as a positive move whereby a pollution source will be removed, the impact on land use and land capability been mitigated.
- Although the Colville Dump reclamation project is going to take 5 years to complete. This could only be from a socio-economic point of view a positive development with the regard to impacts on adjacent residents and value of Erven. The geology has already been destroyed as part of the historically dump and underground mining operations. The result of processing of the original Kimberlite material was the generation of tailings deposit that are being found on the mining site.
- During the next 5 years the existing tailings deposit are going to be totally reclaimed up to the original soil footprint surface and the tailings material loaded and hauled to an Processing Facility. The whole reclamation project should be seen as a rehabilitation exercise that will mean that the tailings deposit footprint areas are being rehabilitated and a big pollution source is being removed from the Kimberley area.
- The un-rehabilitated site will have the chance to be rehabilitated and to be ready for a beneficial use to the surrounding Community.

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:

Farm Name		Title Deed	In Extent
Farm No.:	**Erf 5024**	T176/1941	148.4680ha
Farm Name:	Erf		
Portion:	Remaining		
Magisterial District:	Kimberley		
Province:	Northern Cape		
Farm No.:	**Erf 4812**	T176/1941	140.1951
Farm Name:	Erf		Morgen
Portion:	Remaining		
Magisterial District:	Kimberley		
Province:	Northern Cape		
Farm No.:	**Erf 4815**	T127/1960	140.1951
Farm Name:	Erf		Morgen

Portion: Magisterial District: Province: Farm No.: Farm Name: Portion: Magisterial District: Province:	0 Kimberley Northern Cape **Erf 4811** Erf 0 Kimberley Northern Cape	G6/1923	16.1386Ha
		Total application area.	232.7688 ha

The property on which the Mining Right was granted 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 has been mined in the past. Mining in the early 1900's has disturbed the area, with open mining pits, access roads and dumps found throughout.

The city of Kimberley is the capital of the Northern Cape Province, South Africa and can be reached via a tarred road. Kimberley can be described as the diamond capital of South Africa with a history of diamond mining since the discovery of diamonds in 1871 that led to the creation of the Big Hole. Today, a large number of diamond mines are operational in the area, including the Finch Diamond Mine of De Beers.

Infrastructure in the area is very 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. It must however be noted that the water supply to the activities will be sourced from the nearby Kamfersdam free of charge from the Sol Plaatjie Municipality. The only cost will be the pumping cost. (In terms of the commercial agreement the Erven (Erf 4815, Erf 4812, Erf 5024) must be cleared within five years. Erf 4811 will be used for all processing and dumping operations that has been secured from the Municipality.) (MWP, 2016).

Alternatives considered:-

As the agreement for the Colville dumps on the Mining Right has been applied for over the said area, it would not be viable to consider an alternative site for the Environmental Management Programme of the Mining Right.

Therefore there are no alternatives to the area.

(b) The type of activity to be undertaken:

Opencast Mining activities reclamation for Diamonds in Kimberlite tailings.

Alternatives considered:-

The only alternative land use is for the extension of the municipal housing areas; however the applicant's main economic activity is mining and for this reason does not favour any other alternative land use.

Further, since a mining right has been granted over the area, the option of amending the mining area or the type of activity is neither available nor considerable.

(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 neighbourhood, access roads, proximity to the areas earmarked for mining as well as limited additional impact on the environmental (non-perrennial drainage lines and wind direction), heritage resources and discussions with the home owners closest.

The following infrastructure will be established and will be associated with the mining operation:

- Processing Plant: 2 X 16 feet
- 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 (Colville dump): Opencast mining to reclaim kimberlite tailings dumps.
- Processing plant:
- 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 20 meters. The width of the road is based on an operating width of the haul trucks of 5 meters. Best practice and the guideline from the DMR is to allow for 4 x Operating width of haul truck, in this case 20 meters wide roads. The current access road is deemed adequate for a service road into the mine.

- Salvage yard (Storage and laydown area).
- Security Gate and guard house at access control point.
- Product Stockpile area.
- Waste disposal site

The operation will establish a dedicated, fenced waste disposal site with a concrete floor and bund wall. The following types of waste will be disposed of in this area:

- Small amounts of low level hazardous waste in suitable receptacles;
- Domestic waste;
- Industrial waste.
- Temporary Workshop Facilities and Wash bay.
- Water distribution Pipeline.
- Water tank : It is anticipated that the operation will establish 1 x 10 000 litre water tanks with purifiers for potable water.

Alternatives considered:-

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

In terms of water use alternatives; the operation is not located near any perennial rivers but are within Kimberley and can make use of Municipal alternatives as the best water source for the operation. 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 ESKOM power, Municipal power or generators. 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 tailings will be loaded with an excavator on to dump trucks for conveyance to the Processing Plant. At the Processing Plant the run of mine tailings will be fed onto a grizzly for screening out oversize material.

Technology

The tailings will be processed through a screening and crushing section for delivery to a 75 tph DMS plant. Concentrate from the DMS plant will be processed through an X-Ray/Sortex plant to extract the diamonds. (In terms of the Agreement the Erf 4815, Erf 4812, Erf 5024 must be cleared within five years. Erf 4811 will be used for all processing and dumping operations.)

Alternatives considered:-

The planned mining activities include the re-processing of kimberlitic tailings. 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 diamonds in tailings.

(e) The operational aspects of the activity:

The tailings will be loaded with an excavator on to dump trucks for conveyance to the Processing Plant. At the Processing Plant the run of mine tailings will be fed onto a grizzly for screening out oversize material. The tailings will be processed through a screening and crushing section for delivery to a 75 tph DMS plant. Concentrate from the DMS plant will be processed through an X-Ray/Sortex plant to extract the diamonds. (In terms of the Agreement the Erf 4815, Erf 4812, Erf 5024 must be cleared within five years. Erf 4811 will be used for all processing and dumping operations. The expected lifespan of the mine is 5 years.

Mining activities will primarily make use of existing roads created by previous mining activities, but additional roads will most likely be created. A crushing and screening plant will also be erected on site.

Alternatives considered:-

The conventional opencast reclamation of Kimberlite material load-haul-mining method has been proven to be 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 diamonds in Kimberlite.

(f) The option of not implementing the activity:

Potential land use includes grazing, housing development and mining. The majority of the area is classified to have low potential for grazing land and no suitability for crop yield. Therefore, mining activities are believed to be the most economically beneficial option for the area. Whether the diamond mining operation continues or not, the other (illegal) mining operations will most likely persist.

The Retrenchees Mining project aims to uplift the Trust and all the persons that must benefit out of the Trust and who have been retrenched by De Beers in 2005 and 2007. If the operation does not continue it would hold back any potential employment for the region and the families who are likely to benefit from the positive employment opportunities. Simultaneously, it may have a stagnant effect on the economy of South Africa and the diamond industry as a whole. Substantial tax benefits to the State and Local Government will also be inhibited.

Mining forms an integrated part of the social and economic growth of South Africa and more specifically the Northern Cape Province.

Socio-Economy

The operation will make provision for 31 job opportunities. This will be lost if the project does not proceed. Substantial tax benefits to the State and Local Government will also be lost.

Biodiversity

The majority of the relevant area is covered by old tailings deposits with no vegetation and very little natural vegetation remaining on the periphery of the stockpiles. The remaining minority of the property that is situated northern side of the application area remained natural veld to some extent.

The vegetation cover of the area is pure grassveld, comprising of Kalahari Thornveld invaded by karoo veldt types.

Currently vegetation cover is sparse with bare areas open on the tailings on most of the area. Grass cover area scattered with mostly pioneer species evident. Trees are scattered all over the disturbed area of which most of them will be classified as alien species according to CARA regulations. No endangered trees like Acacia erioloba were identified or noticed.

The mobility and in many cases the adaptability of many bird species has meant that they more than any other vertebrate group have taken advantage of many of the changes we have brought about in the environment.

As this site was severely disturbed for the past 30 years and the fact that this area is adjacent to a residential area has cause that all wildlife has probably immigrated to adjacent undisturbed.

Heritage and Cultural Resources

The Colville Dump is an existing historical mine that is known from the 1930's to the surrounding community and the State. The mine consists of various mine infrastructures that is in a poor state and is a definite pollution source. The mining site with specific reference to the tailings deposit area needs urgent rehabilitation.

The reclamation of the TD facility should be seen as a positive move whereby a pollution source will be removed, the impact on land use and land capability been mitigated.

Although the TD reclamation project is going to take 5 years to complete. This could be from a socio-economic point of view a positive development with regard to impacts on adjacent residents and value of Erven.

Recommendations are made to protect historically significant remains of buildings which are likely to be affected by the proposed development. The project may go ahead subject to the precautions stated above. If heritage resources were to be found during the mining phase, the procedure is approach the relevant heritage authorities (SAHRA and/or the Provincial Heritage Resources Authority).(HIA report by Edward Matenga, January 2017)

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.

- Notification letters were sent to all interested and/or affected parties on the 26th September 2016. Attached to each of these letters was a Background Information Document (BID), containing information relating to proposed project.
- A newspaper advert was placed in the DFA (Diamond Fields Advertiser) local newspaper on the 27th September 2016.
- A notice was placed at the entrance to the site.
- Notices was also placed at all the small spaza shops in the area.
- Flyers were put on all the fences and post boxes at the houses surrounding the application area.

- A Scoping Report were compiled and submitted to the DMR on the SAMRAD online system on 12 October 2016 and in hard copy on 25 October 2016.
- The Scoping Report was made available at the Kimberley Library. A register was also left for parties to note down any comments or concerns after they have viewed the document. No person completed the register. The document was missing when the consultant wanted to collect it from the Library.
- The Scoping Report were also made available on disk to all Government Departments and letters were sent to all registered parties to make them aware that the Scoping Report is available at the Library should they wish to peruse the document.
- Notices were placed on 31 January 2017 for a Public meeting to take place on 16 February 2017 at all the small spaza shops in the area as well as at the site.
- The Meeting took place on 16 February 2017 and the Scoping Report was also made available at the meeting for any parties to peruse the document.
- The minutes of the meeting and the attendance register is attached as part of Appendix A.
- The Scoping Report was also made available at the Colville Library after the Public Meeting and a request.
- The EIA EMP Report were also made available on disk to all Government Departments and letters were sent to all registered parties to make them aware that the EIA EMP Report is available at the Library should they wish to peruse the document.
- The EIA EMP was also loaded onto the SAHRA on-line system and made submitted on 24 March 2017.

Consultation process:

Proof of consultation (attendance registers, minutes of meetings and response forms) is attached as Annexure 'A'. 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)

Table 5: Consultation with I&Aps

Interested and Affected Parties List the names of persons consulted in this column, and Mark with an X where those who must be consulted were in fact consulted		Date Comments Received	Issues Raised	EAPs response to issues as mandated by the applicant	Section and paragraph reference in this report where the issues and or response were incorporated
AFFECTED PARTIES					
Landowner/s	**X**				
Sol Plaatje Municipality P.O. Box 5030 Kimberley 8300	X Scoping report with registered mail on disc on 27 October 2016 EIA/EMP report with registered mail on disc on 24 March 2017		No comments – consultation still in process.	N/A	Letter from Sol Plaatje referred to as the Retrenchees has obtained permission for the Water use and the use of ERF 4811. Refer to : i)Details of the development footprint alternatives considered f)Need and desirability of the proposed activities
Lawful occupier/s of the land					
There are no lawful occupiers.				N/A	N/A
Landowners or lawful occupiers on adjacent properties	**X**				
Florianville Community	X Flyers		A large number of the Community attended the public meeting on 22 February 2017.	N/A	N/A
Municipal Councillor	**X**				
Municipality	**X**				
Sol Plaatje Municipality P.O. Box 5030 Kimberley 8300	X Scoping report with registered mail on disc on 27 October 2016 EIA/EMP report with registered mail on disc on 24 March 2017		No comments – consultation still in process.	N/A	N/A
Organs of State (Responsible for infrastructure that may be affected Roads Department, Eskom, Telkom, DWS					
SANRAL	X		No comments – consultation still in	N/A	N/A

P.O. Box 415 Pretoria 0001	Scoping report with registered mail on disc on 27 October 2016 EIA/EMP report with registered mail on disc on 24 March 2017		process.		
Department of Agriculture, Forestry & Fisheries Directorate: Forestry Management P.O. Box 2782 Upington 8800	X Scoping report with registered mail on disc on 27 October 2016 EIA/EMP report with registered mail on disc on 24 March 2017		No comments – consultation still in process.	N/A	N/A
Department of Environment and Nature Conservation Private Bag X6102 Kimberley 8300	X Scoping report with registered mail on disc on 27 October 2016 EIA/EMP report with registered mail on disc on 24 March 2017				
Dept. of Agriculture, Land Reform & Rural Development Private Bag X5108 Kimberley 8300	X Scoping report with registered mail on disc on 27 October 2016 EIA/EMP report with registered mail on disc on 24 March 2017		No comments – consultation still in process.	N/A	N/A
ESKOM Holdings SOC Limited Northern Cape Operating Unit: Land Development P.O. Box 606 Kimberley 8300	X Scoping report mailed on 27 October 2016 EIA/EMP report	04 October 2016	Encroaching onto the servitude area. Impact on the HV lines and safety	The comments were acknowledged	(b) Description of Current Land Use. -Existing Structures

	with registered mail on disc on 24 March 2017				
Department of Water & Sanitation Private Bag X6101 Kimberley 8300	X Scoping report with registered mail on disc on 27 October 2016 EIA/EMP report with registered mail on disc on 24 March 2017		No comments – consultation still in process.	N/A	N/A
National Dept. of Public Works P.O. Box 1931 Kimberley 8300	X Scoping report with registered mail on disc on 27 October 2016 EIA/EMP report with registered mail on disc on 24 March 2017		No comments – consultation still in process.	N/A	N/A
SAHRA P.O. Box 4637 Cape Town 8000	X Scoping report with registered mail on disc on 27 October 2016 and Loaded onto SAHRA on-line system 26 October 2016. Loaded onto SAHRA on-line sytem on 24 March 2017 and made submitted.		No comments – consultation still in process.	N/A	N/A
National Dept. of Public Works Private Bag X5002 Kimberley	X Scoping report with registered		No comments – consultation still in process.	N/A	N/A

8300	mail on disc on 27 October 2016 EIA/EMP report with registered mail on disc on 24 March 2017				
Communities					
Florianville Community	X Flyers		No comments – consultation still in process.	N/A	N/A
Dept. Land Affairs					
No land claim					
Traditional Leaders					
No Traditional Leaders					
Dept. Environmental Affairs					
Dept. of Environment & Nature Conservation Private Bag X6102 Kimberley 8300	X EIA/EMP report with registered mail on disc on 24 March 2017		No comments – consultation still in process.	N/A	N/A
Other Competent Authorities affected					
OTHER AFFECTED PARTIES					
INTERESTED PARTIES					
De Beers Kimberley Mines P.O. Box 155 Kimberley 8300	X	Letter with BID was returned by the Post Office as unclaimed on 1 November 2016	No comments – consultation still in process.	N/A	N/A
Action Aid Christopher Rutledge Christopher.Rutledge@ actionaid.org	Respond to advert in DFA	E-mail received on 17 October 2016	Registered as an interested and affected party and would like to receive the EIA	An e-mail was send with registration forms and the BID document. The group were also notified that the Scoping Report is available at the Kimberley Library	No issues were raised apart from the request to be registered as an interested and affected party.
Gerald Mcentee 11 Oriental Street Colville Kimberley Cell : 0620909314 Community	Attend public meeting 22 February 2017		Job Creation and Community involvement		
Alfred Norman	Attend public meeting 22		To start a business		

52 Apsilon Street Colville Kimberley Cell: 0718187331 Community	February 2017		We want to create employment in our community		
Riaan Kuyani 12 Protea Street Colville Kimberley Cell: 0839262793 Riaankuyani86@gmail.com Ebenezer Centre of Hope and Burning Leaves FC	Attend public meeting 22 February 2017		Sports Development and Community Building Poor development of infrastructure in our community, Lack of job opportunities. High number of substandard ……..Conservation and Rehabilitation of our area by previous miners.		
Martin Kuyani 12 Protea Street Colville Kimberley Elderly	Attend public meeting 22 February 2017		Job creation and there is a lack of development in the area.		
Georginia Koopman 42 Protea Street Colville Kimberley Community	Attend public meeting 22 February 2017		No comment		
Anna Sandt 2 Oriental Street Colville Kimberley Cell: 0746094184 Community	Attend public meeting 22 February 2017		Cash in the trust We want to include the youth to decide for their future		
Desiree Sandt 2 Oriental street Colville Kimberley Community	Attend public meeting 22 February 2017		Cash For business of the youth.		
Henry Sandt 2 Oriental street Colville Kimberley	Attend public meeting 22 February 2017		Cash in the Trust To fight crime and substance abuse.		

Community					
Dorothy Huyster 83 St Paul's Street Colville Kimberley Cell 0748630120 Community	Attend public meeting 22 February 2017		For business To start a crèche in the community		
IF Wax 5 Oriental street Colville Kimberley Cell 0837606146 Community	Attend public meeting 22 February 2017		For business in the community To up-lift the youth in the community		
Brendon Bawa 5 Oriental street Colville Kimberley Cell 0641020044 Community	Attend public meeting 22 February 2017		Cash For Skills Development		
Dl Wax 5 Oriental street Colville Kimberley Cell 0837606146 Community	Attend public meeting 22 February 2017		Cash For business Establishment		
Sarie Nel 5 Oriental street Colville Kimberley Cell 0837606146 Community	Attend public meeting 22 February 2017		Cash For business Establishment		
Valerie Mcentee 11 Oriental Street Colville Kimberley 053 8741974 Community	Attend public meeting 22 February 2017		For Job Creation		
Wayne Harris 11 Gamma Street Colville Kimberley Cell 0765751848	Attend public meeting 22 February 2017		For Job Creation Community business		

Community					
BJ Kock 2 Beta Street Colville Kimberley Cell 0786530219 Community	Attend public meeting 22 February 2017		Cash for businesses We want to combat crime in our community through job creation		
DR Vister 1 Oriental Street Colville Kimberley Community	Attend public meeting 22 February 2017		Cash in Trust account We want to create jobs to improve the youths quality of life		
NB Norman 52 Apsilon Street Colville Kimberley Cell 0718187331 Community	Attend public meeting 22 February 2017		Cash in trust For the better of our communities		
Ruben Pillay 3 Oriental Street Colville Kimberley Cell 081012426 Community	Attend public meeting 22 February 2017		Cash in Trust account We want to create jobs to improve the youths quality of life		
Andries Vister 1 Oriental Street Colville Kimberley Cell 0622186821 Community	Attend public meeting 22 February 2017		Cash in Trust account We want to create jobs to improve the youths quality of life		
Lena Vister 1 Oriental Street Colville Kimberley Cell 0622186821 Community	Attend public meeting 22 February 2017		Crèche for working peoples children		
Nadine Kujanje 52 Delta Street Colville Kimberley Cell 0842339113 Community	Attend public meeting 22 February 2017		Cash in trust To open businesses		
Diego Harris	Attend public meeting 22		Open business for our inheritance		

11 Gamma Street Colville Kimberley Cell 0609383342 Community	February 2017		Long term solutions		
HelgaRooi 21 Gamma Street Colville Kimberley Cell 0742525166 Community	Attend public meeting 22 February 2017		Cash in trust to create jobs We want to teach our children the skill for dress making.		
Fatilla Rooi 11 Gamma Street Colville Kimberley Cell 0818864896 Community	Attend public meeting 22 February 2017		To Create jobs We want to create skills		
Matthew Tony Smith 35 Barbara Street Colville Kimberley Community	Attend public meeting 22 February 2017		To start business in community Colville		
Aldean Wilson 27 Omega Street Colville Kimberley Cell 0604546582 Community	Attend public meeting 22 February 2017		Cash in trust for business. To empower our youth in skills training.		
Nadine Fredericks 40 St. Pauls Road Colville Kimberley Cell 0784215819 Community	Attend public meeting 22 February 2017		Skills development to open business		
Joan Fredericks 40 St Pauls Road Colville Kimberley Cell 0784215874 Community	Attend public meeting 22 February 2017		Skills development to open business		
Wilbur Harris 11 Gamma Street Colville Kimberley Cell 0734000730 Community	Attend Public meeting 22 February 2017		Youth empowerment		
Denise Williams	Attend Public meeting 22		To created jobs		

56 Delta Street Colville Kimberley Cell Community	February 2017		For the better of our lives in skills training		
Mervin Charles Pillay 3 Oriental Street Colville Kimberley Cell 0786342880 Community (Elderly)	Attend Public meeting 22 February 2017		Cash in trust To establish business for job creation and skills training amongst the youth for the better of their lives to curb crime and substance abuse.		

* Note: The contents of this table have been recorded up to 24 March 2017 as the process of public participation is an ongoing process.

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)

- ***GEOLOGY:***

The Colville Retreat Tailing Mineral Resource (CRTMR) is a coarse residue kimberlite tailings resource containing a high proportion of processed kimberlite from the historical underground mining at Kimberley Mine. This TMR represents the residue from the re-treatment of the older Colville washing plant tailings. It is viewed as a single global deposit and no attempt has been made to subdivide the TMR into zones. No detailed knowledge of the plant processes or of the detailed location of the original kimberlite is known.

The geology has already been destroyed as part of the historically underground and dump operations. The result of processing of the original Kimberlite material was the generation of tailings deposit that are being found on the mining site.

During the next 5 years the existing tailings deposit are going to be totally reclaimed up to the original soil footprint surface and the slimes material loaded and hauled to and existing plant. The whole Tailings Dump reclamation project should be seen as a rehabilitation exercise that will mean that the Tailings Dump footprint areas are being rehabilitated and a big pollution source is being.

Planned, systematic and thorough mechanical reclamation of the mineral resource should take place. As reclamation progresses it should be indicated on a plan. All processing will take place on ERF 4811.Geological Model

Grade Model

No evidence of historic sampling of the CRTMR could be found and as a result a grab sampling campaign was

initiated as part of the KREP programme in August 2006, with the intention of obtaining a low confidence global trade estimate. The sampling process and results are documented in the relevant KREP Report (Jonker 2006).

A total of 8 grab samples was taken, dispersed evenly through the sloping sides of the CRTMR. The individual sample support size was adequate at approximately 100t. A total of 847t of material was bulk-sampled, the wet sample tonnage has been calculated using a belt weightometer at the KMSP where the samples were treated. A sub-sample of each sample was taken, weighed wet and then dried in an oven and weighed dry. A factor was calculated to convert the wet sample tons to dry sample tons. A total of 80.47 carats (1613 stones) were recovered during the sampling programme. The amended sample results (Fill Export data) are included in Table 1; it should be noted that they are quoted at as strict +3 sieve (1.15mm) bottom cut-off and results are given for X-Ray recovery only (applicable to the CTP process) and for X-Ray plus Grease Belt Recovery.

(In terms of the commercial agreement the Erven (Erf 4815, Erf 4812, Erf 5024) must be cleared within five years. Erf 4811 will be used for all processing and dumping operations.) (Mining Works Programme, 2016).

Table 1: Grab Sample Results for the Colville Retreat TMR

Grab Sample Number	Wet Tonnage	Moisture Factor	Dry Tonnage	Carats (x-ray)	Carats (x-ray + Grease Belt)	Comments
KM_CRD_GR001	115	0.9102	104.67	7.68	7.82	Moisture not measured, use average
KM_CRD_GR002	108	0.9167	99.00	6.90	7.97	
KM_CRD_GR003	120	0.9102	109.22	10.29	10.88	Moisture not measured, use average
KM_CRD_GR004	108	0.9300	100.44	10.79	12.36	
KM_CRD_GR005	98	0.9102	89.20	8.72	9.17	Moisture not measured, use average
KM_CRD_GR006	92	0.8876	81.66	9.44	10.29	
KM_CRD_GR007	92	0.9102	83.74	5.90	6.79	Moisture not measured, use average
KM_CRD_GR008	114	0.9063	103.32	6.58	6.93	
	847		**771.26**	**66.30**	**72.21**	

In terms of the global estimate required, the samples were considered to be spatially representative of the entire deposit and a decision was taken to estimate the grade of the CRTMR in cpht from total sample carats divided by total dry sample tons. A +3 sieve grade of 8.60cpht was calculated for the CRTMR based on X-Ray recovery results only. Should grease belt recovery be included in the plant process this grade will increase to 9.36cpht! (Mining Works Programme, 2016).

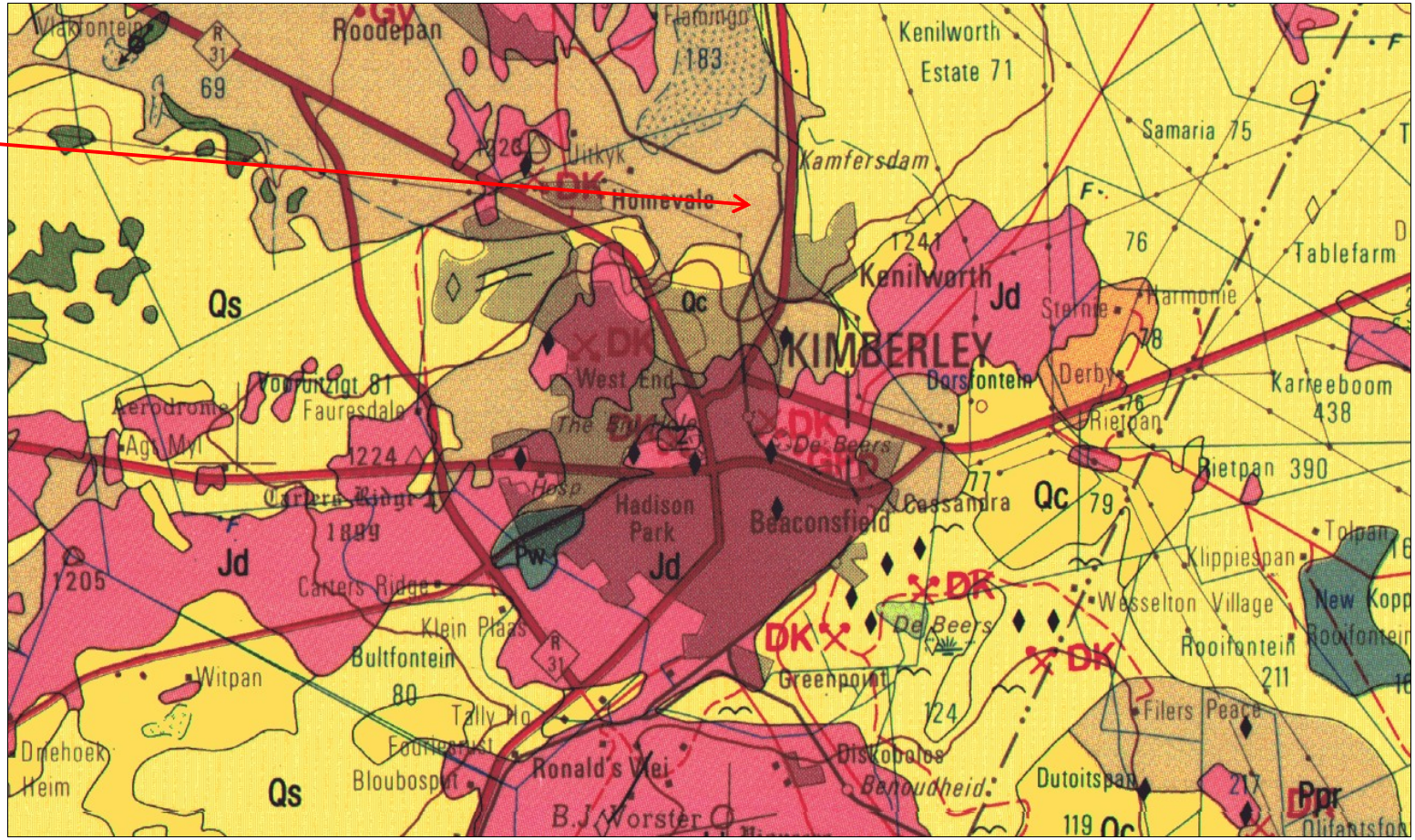


Figure 5: Extraction of Geological Map Kimberley 2824 1:250 000

- ***CLIMATE:***

Regional Climate:-
The Northern Cape is classified as a semi-dessert and is known to have summer rains with high temperatures in the Summer (as high as 38°C to 40°C) and cold Winters (temperatures ranging from -4°C to -6°C). The sun shines approximately 80% during Summer and approximately 70% during the Winter.

Average Annual Rainfall:-

	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec	Total
Ave rainfall (mm)	77	69	67	40	17	6	5	10	19	38	55	60	**463**
Ave rain days/month	6.5	5.7	6.2	4	1.6	0.9	0.8	1	1.6	3.5	5.2	5.9	**43**

Rainfall Intensity:-
Most of the rainfalls occur during thunderstorms in the Summer months as well as during cloud bursts where maximum rainfalls were measured of up to 112.5mm at a downpour of approximately 60 minutes.

Average Maximum and Minimum Temperatures:
The average maximum temperature measured during the Summer is 30.9°C and the minimum during the Winter months is 3.4°C.

Average Monthly Wind Direction and Speed:-
The prevailing wind direction in the area is mainly from the north to north-westerly with the strongest winds from the west-southwest to north-northwest that occurs between August and December. October and November month are common for high wind speeds of up to 4.85 metres per second.

Average Monthly Evaporation:-
It is estimated that the average annual evaporation rate is approximately 2365mm which indicates the dry climate conditions in this area.

Presence of Extreme Climatic Conditions:-

Hail:	October to March
Frost:	May to September
Strong Winds:	Occasional strong winds occur but not often
Droughts:	Normal for a dessert area – approximately 6 out of 10 years

- ***TOPOGRAPHY:***

The area is generally flat, characterised by plains with open low hills or ridges. Two drainage lines cut through the property in a south to north direction. The elevation ranges between 1 200 m.a.s.l. in the south to 1 176 m.a.s.l. in the north. The terrain is indicated by a very gentle slope of 2 % from south to north.(Ecological report by Dr. B Milne, 2017)

The mechanical reclamation of the Colville Dump facility up to the original soil footprint surface. This means that if all the tailings material is being removed, the site could be returned to its original topographical form and level.

Other than limited topsoil, in direct vicinity of the access roads, contractor office site, storage sites that are temporary storage until such topsoil stockpiles are being used during rehabilitation.

Access to all active mining areas should be controlled. The necessary warning signs should be put in place. All Colville Dump reclamation activities should be restricted to the fenced-off area.

- **VISUAL**

The Colville Tailings Dump reclamation operation will be visible from the Florianville residential area and industrial area of Kimberley.

The mechanical tailing reclamation operation will take 5 years to complete. After 5 years no tailings deposit will be visible anymore. The Colville Tailings Dump footprint areas will be rehabilitated and will blend in with the surrounding landscape.

- ***SOILS:***

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

The Scope of Study

The specific terms of reference for the study include the following:

- conduct a desktop study and field investigation in order to identify and describe different ecological habitats and provide an inventory of communities/species/taxa and associated species of conservation concern within the environment that may be affected by the proposed activity;
- identify the relative ecological sensitivity of the project area;
- produce an assessment report that:
  - indicates identified habitats and fauna and flora species and their ecological sensitivity,
  - determines the potential impacts of the project on the ecological integrity,
  - provides mitigation measures and recommendations to limit project impacts.
  - indicate ecological responsibilities pertaining to relevant conservation legislation.

This ecological assessment report attached as Annexure C describes the ecological characteristics of the proposed mining area, identifies the source of impacts from mining operation, and assesses the impacts, as well as the residual impacts after closure.

The Soils of the study area have been described by Dr. Milne as the terrain on site is closely associated with the Ae45 land type (Figure 7 below). Here, deep (> 300 mm) red-yellow apedal, freely drained, red soils, with a high base status are found. According to the Southern African Agricultural Geo-referenced Information System, the soils associated with this land type have low to moderate water erosion hazard, while the sandy soils are susceptible to wind erosion (Dr. B Milne, 2017).

To conclude, Dr. Milne stated that it is clear that the destruction of the within the mining area is inevitable. The significance of the impacts will be affected by the success of the mitigation measures implemented and the rehabilitation programme for the mining area.

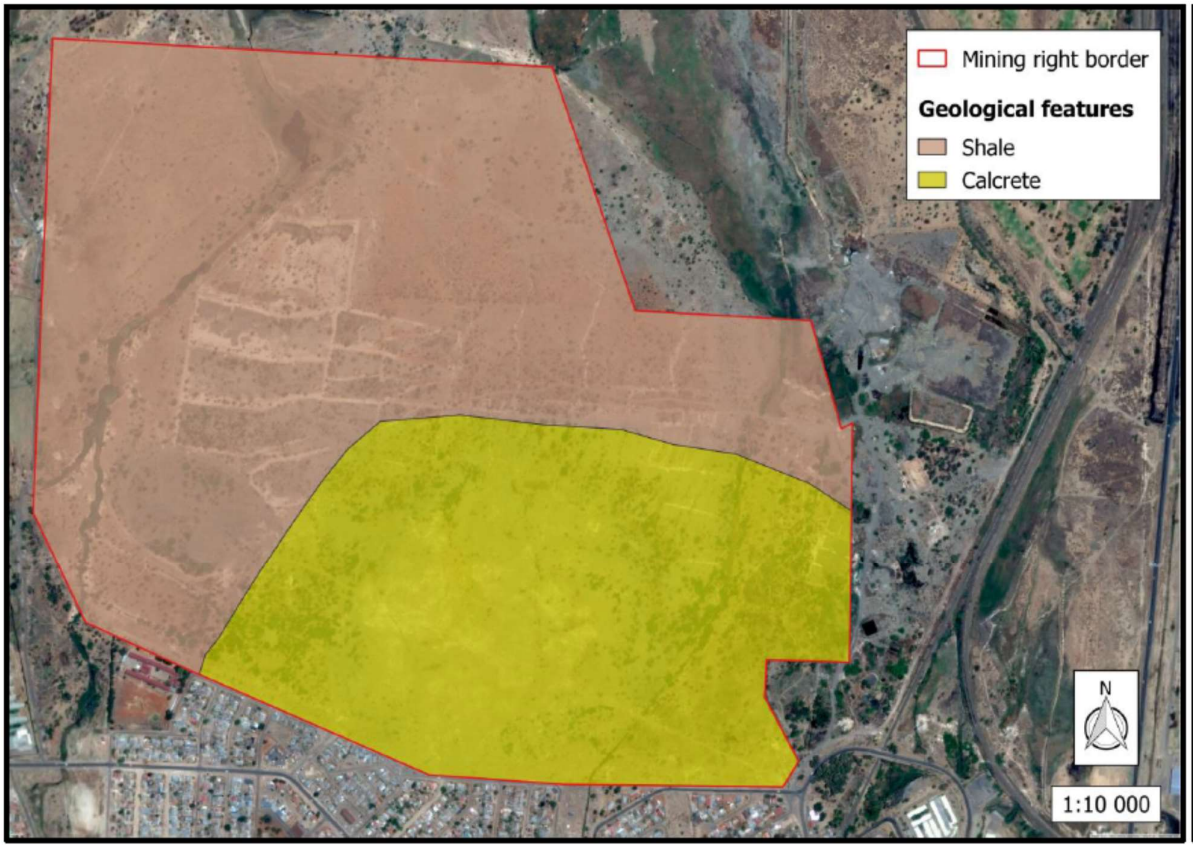


Figure 6: The distribution of geological features in the study area. (Map by Dr. B Milne, 2017).

Figure 7: Land type associated with the study area. (Map by Dr. B Milne, 2017)

- ***LAND CAPABILITY AND LAND USE:***

  Existing loss of land capability to support any other use of the property due to the Kimberlite tailings that had been stockpiled on the property since the 1930's.

  The area (occupied by the existing Tailings Deposit) (141 ha) where the reclamation operations will focus, is and had

been alienated for any other form of land use. No other activity is currently possible other than mining.

Once the tailings (TD) are being totally reclaimed and the footprint areas properly being rehabilitated, some vegetation cover will be established. This will allow for some beneficial use of the property after some time.

- ***SURFACE WATER AND DRAINAGE:***

The Colville Dump area falls within the Lower Vaal water management area which is located in the quaternary catchment region C91E, Lower Vaal Catchment of the DWS. The Vaal River lies further to the north and the Modder River further south of the study area.

Kimberley Mines forms part of a local endoreic area adjacent and to the north of the Modder River system. This local endoreic area stretches ±25km west to Kimberley to ±30km east of Kimberley and a north-south width of 7 – 10km. Due to its flat topography about zero runoff from this local drainage region contributes to the Modder River running ±10km south of the site.

No other watercourses or drainage lines are present in the study area. No natural watercourses traverse the Kimberley Mines mining area, and thus it was necessary for a number of storm water furrows/channels to be constructed in the past to allow interception of runoff thereby allowing drainage of the region and containment of water for re-use. These furrows traverse the study area and discharge towards Kamfersdam. Two of these storm water furrows running through the application area.

The Kamfersdam is situated 1.2km north of the application area and will all drainage drain towards this area.

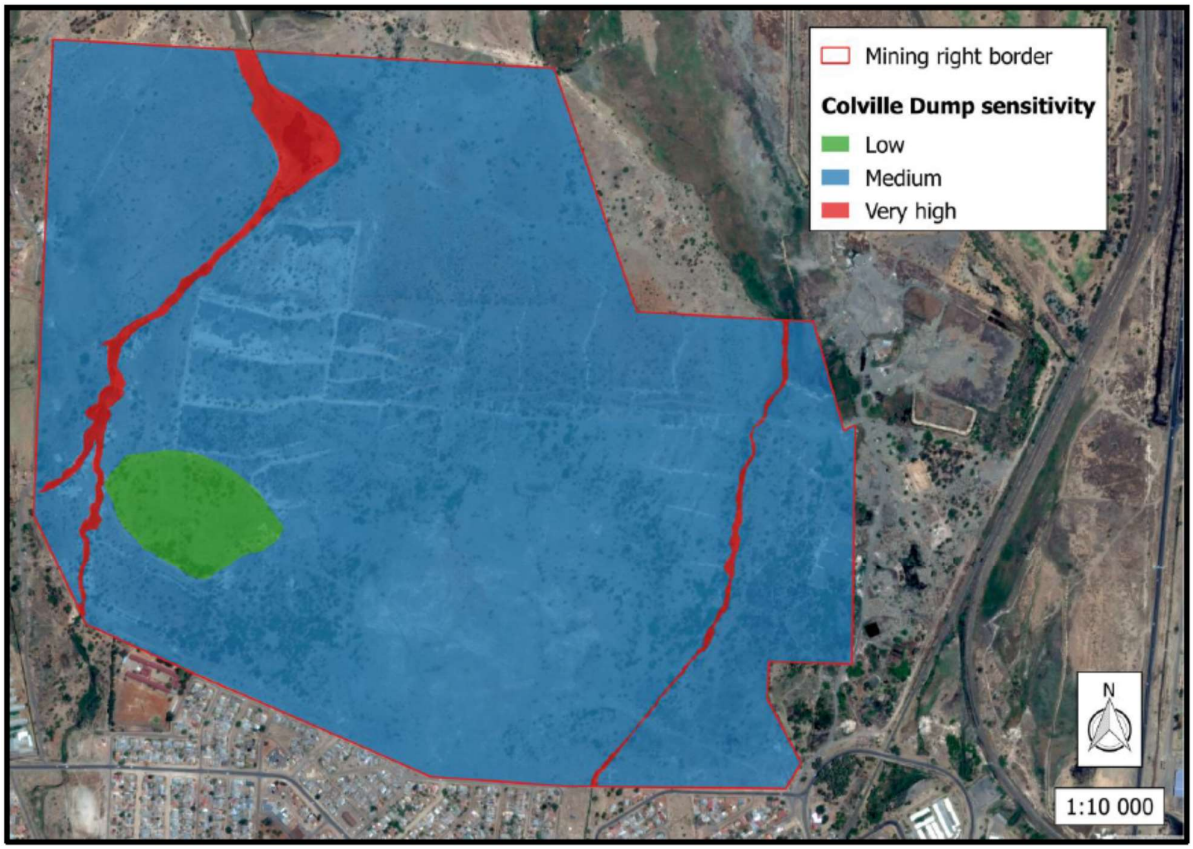


Figure 8: A sensitivity map of the Colville Dump mining area indicating the two drainage channels towards Kamfersdam to the north. (Map by Dr. B Milne, 2017)

GROUND WATER:

The Colville dumps is an existing historical mine that is known from the 1930's to the surrounding community and the State. The mine consists of various kimberlite tailings dumps that is in a poor state.

The reclamation of the Colville Tailings Dump facility should be seen as a positive move, the impact on land use and land capability been mitigated.

Although the Colville Tailings Dump reclamation project is going to take 5 years to complete. This could only be from a socio-economic impact point of view a positive development with the regard to impacts on adjacent residents and value of Erven.

- **AIR QUALITY:**

Currently there are big areas of the tailing deposit that is bare with no vegetation on which particles can be blown by wind. Dust can thus be currently a nuisance to the residential area.

The mining area where the loading of tailings will take place will at this stage not be closer than 100m to the houses, with additional permission.

No other sources of particulate or gaseous emissions other than the dust generated from tailings and gravel roads are expected to have an influence on the background air quality status of this region. The main sources of dust emission contributions will be wind-blown dust from vehicles travelling on gravel roads and the mining (excavating) of tailings facilities. From the wind-blown dust sources, the tailings dumps will be the main source of emissions and mitigation concerns. Wind-blown dust typically impacts down-wind from the direction where the highest velocity winds occur.

The trucks involved in the transport would potentially be an insignificant source of re-suspension of soil on the gravel roads and the vehicle entrained dust will be bounded near the road where it is generated from. Regardless fall-out dust buckets will be placed strategic points along the gravel road. These buckets would be used to assess the dust fall-out from the trucks travelling along the gravel roads (source) and mitigation strategies would be implemented if guideline values for the dust fall-out monitoring programme require so.

No impact of tailings dust is anticipated beyond the 500 meter guideline and therefore most fall-out dust buckets for managing and mitigating fall-out dust would be placed 500 meters from the tailings facility in the predominant wind directions. Extensive dust monitoring would be done at selected sites with potential significant environmental and health impacts and mitigation of mining methods and activities pertaining to tailings source would be managed accordingly.

A complain register for surrounding home owners and the community will be kept on site and the management of dust would be guided by these additionally comments of public.

NOISE

Noise will be generated during the mechanically tailings reclamation operation (excavating, stockpiling and loading and transportation). Noise will be a nuisance factor.

The Colville Tailings Dump reclamation operation is located on an existing mining site, known as the Colville mine, but had not been in operation for a long time. Recently only illegal activities have taken place.

Residential area is located on the southern boundary (100m away). The impact would be of more importance regarding the direct worker environment that should adhere to the requirements in terms of the Mine Health and Safety Act. Loading will take place during day time hours.

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

- ***NATURAL VEGETATION:***

Dr Elizabeth (Betsie) Milne has been appointed by Wadala Mining to provide an ecological study in order to highlight the ecological characteristics of the proposed mining area, and to determine the possible impact of mining on the diversity and ecological status of the area.

The Scope of Study

The specific terms of reference for the study include the following:

- conduct a desktop study and field investigation in order to identify and describe different ecological habitats and provide an inventory of communities/species/taxa and associated species of conservation concern within the environment that may be affected by the proposed activity;
- identify the relative ecological sensitivity of the project area;
- produce an assessment report that:
  - indicates identified habitats and fauna and flora species and their ecological sensitivity,
  - determines the potential impacts of the project on the ecological integrity,
  - provides mitigation measures and recommendations to limit project impacts.

- indicate ecological responsibilities pertaining to relevant conservation legislation.

This ecological report is attached as Annexure C describes the ecological characteristics of the proposed mining area, identifies the source of impacts from mining operation, and assesses the impacts, as well as the residual impacts after closure.

A desktop study and field investigation was performed by Dr. Betsie Milne to obtain ecological information for the proposed area and identify the ecological characteristics and sensitivity of the site. The majority of the study area falls within the Savanna Biome (Mucina and Rutherford 2006). According to the vegetation map of Mucina and Rutherford (2012), two broad-scale vegetation units are present on site (Figure 9). Vaalbos Rocky Shrubland is found to the northern parts of the study area, while the remaining southern section is classified as Kimberley Thornveld. However, this vegetation map does not reflect the true character of the site, because it has not been mapped at a very fine scale and the site has been transformed by activities associated with mining and urban development.

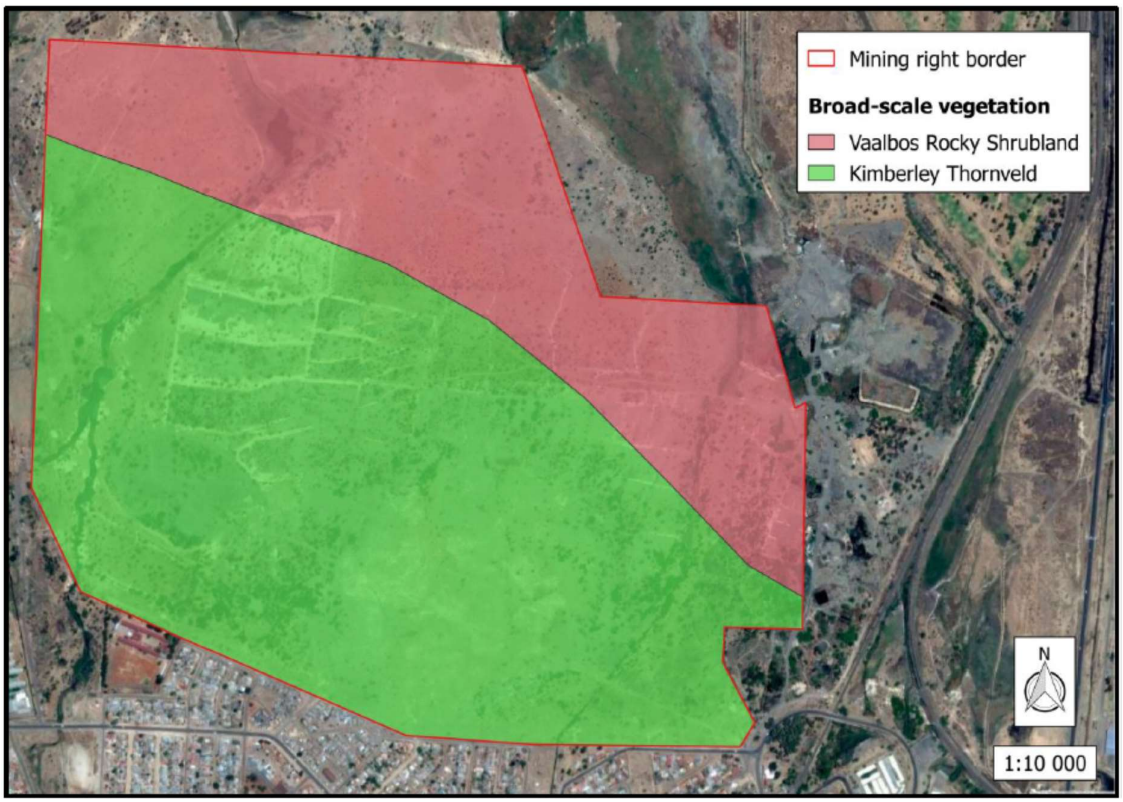


Figure 9: The distribution of four broad-scale vegetation units (Mucina et al. 2005) that is present in the study area. (Dr. Betsie Milne, February 2017).

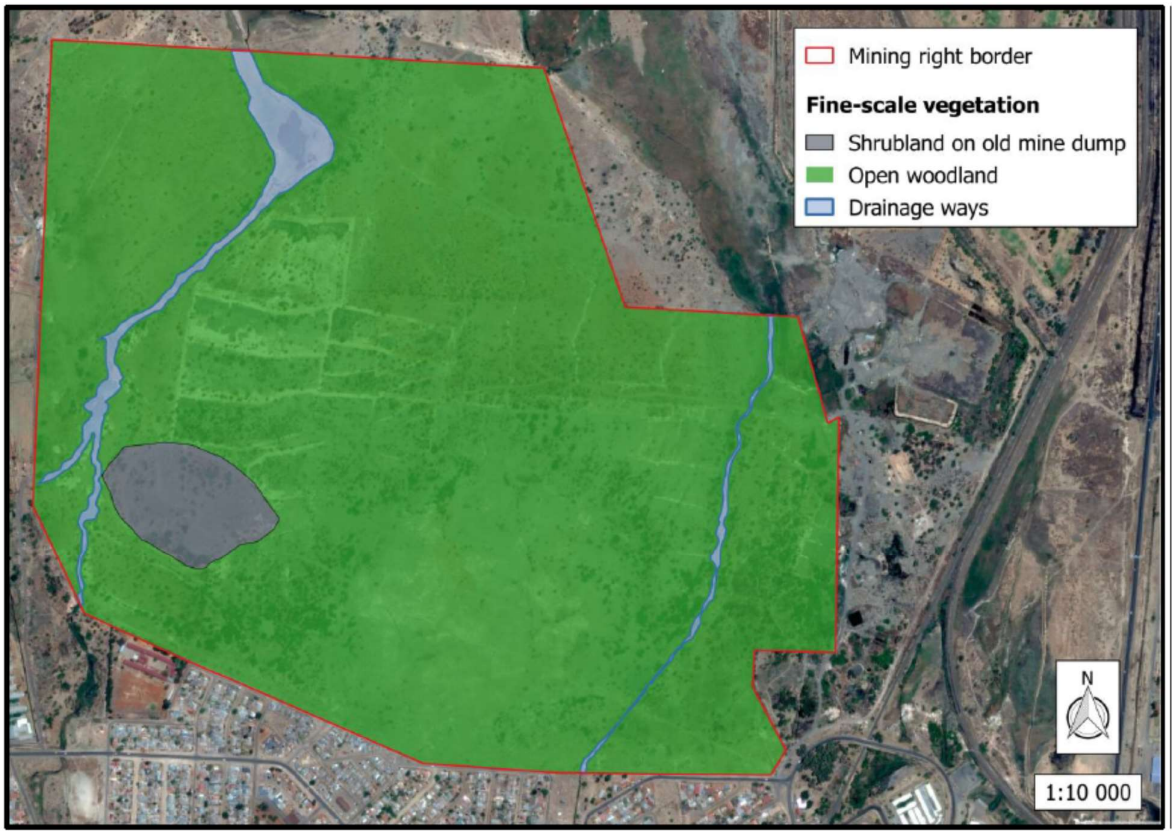


Figure 10: The distribution of fine-scale vegetation units in the study area. (Dr. Betsie Milne, February 2017)

Conclusion

The vegetation units found within the study area are classified as least threatened. No fine-scale conservation planning has been conducted for the area and it is not known to host exceptional biodiversity. Furthermore, the study area does not fall within a National Protected Areas Expansion Strategy Focus Area.

The proposed mining site falls within an urban development zone and has also not been identified as important for long-term maintenance of broad-scale ecological processes within the Sol Plaatje Municipality (Kotze et al. 2009). The mining operation itself is not expected to cause severe habitat transformation through the reclamation of the Colville Dump, and due to the high degree of transformation through previous mining activities on site it is not expected to contribute to severe cumulative habitat loss or the disruption of the broad-scale landscape connectivity in the region. However, it is advisable that the mining activities are restricted to the earmarked area as indicated in Figure 2 (Google map by Dr. B Milne).

- **NATURAL FAUNA:**

Dr Elizabeth (Betsie) Milne has been appointed by Wadala Mining to provide an ecological assessment in order to highlight the ecological characteristics of the proposed mining area, and to determine the possible impact of mining on the diversity and ecological status of the area attached as Annexure C.

The Scope of Study

The specific terms of reference for the study include the following:

- conduct a desktop study and field investigation in order to identify and describe different ecological habitats and provide an inventory of communities/species/taxa and associated species of conservation concern within the environment that may be affected by the proposed activity;
- identify the relative ecological sensitivity of the project area;
- produce an assessment report that:
  - indicates identified habitats and fauna and flora species and their ecological sensitivity,
  - determines the potential impacts of the project on the ecological integrity,
  - provides mitigation measures and recommendations to limit project impacts.
  - indicate ecological responsibilities pertaining to relevant conservation legislation.

  This ecological report is attached as Annexure C describes the ecological characteristics of the proposed mining area, identifies the source of impacts from mining operation, and assesses the impacts, as well as the residual impacts after closure.

Mammals

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 or specially protected 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.

Only a few distinct habitats are found in the study area and the site is surrounded by residential and industrial areas. Therefore, the proposed mining site is not likely to host a diverse mammal community. As many as 50 terrestrial mammals and nine bat species have been recorded in the region (see Appendix 2 of Ecological study as Annexure C), of which Yellow Mongoose were encountered during the site visit.
Nine listed terrestrial mammal species and four listed bat species potentially occur in the area (Table 6). The African Straw-coloured Fruit-bat and Geoffroy's Horseshoe Bat have a high chance of occurring on site, given their wide habitat tolerances. The Dent's Horseshoe Bat, Darling's Horseshoe Bat and Bushveld Gerbil have a moderate potential of occurring on site.

Although their habitat preference is similar to what is found on site, the natural vegetation is already transformed to a large extent. The Sclater's Golden Mole, Ground Pangolin, Lesser Dwarf Shrew, South African Hedgehog, Black-footed cat, Brown Hyena, African Striped Weasel and Honey Badger all have a low potential of occurring on site due to the proximity of the site to residential and industrial development. Many of these are rather skittish and therefore they will most likely not occur here.

Virtually all mammals of the study area are protected; either according to Schedule 1, 2 or 3 of NCNCA (see Appendix 2 of Ecological Study as Annexure C). Those that are specially protected, and not yet mentioned as listed, include Aardvark, Aardwolf, African Wild Cat, Cape Fox and Striped Polecat. These all have a low potential to occur on site due the proximity to residential areas. Problem animals (Schedule 4) include Black-backed Jackal, Vervet Monkey, Chacma Baboon and Caracal, of which Vervet Monkey is most likely to occur on site.

The core mining activities are associated with the Dump and the Woodlands in the east of the property. Listed mammals that are most likely to be impacted in the form of species- and/or habitat loss resulting from the mining activities include bats and small mammal species that are associated with these habitats.

Reptiles
The Colville Dump lies within the distribution range of at least 55 reptile species (see Appendix 2 of Ecological Study as Annexure C), of which none are of international or national conservation concern. Three species are endemic to South Africa, i.e. Homopus femoralis (Greater Padloper), Pachydactylus mariquensis (Common Banded Gecko) and Agama aculeata distanti (Eastern Ground Agama) and most area are protected either according to Schedule 1, 2 or 3 of

NCNCA, except for agamas, geckos and skinks (see Appendix 2 of Ecological Study Annexure C). Specially protected species include Karusasaurus polyzonus (Southern Karusa Lizard) and Chamaeleo dilepis dilepis (Namaqua Chamaeleon).
The habitat diversity for reptiles in the study area is not high, and the Woodland community is considered to be the most important habitat for reptiles at the site. It is however not foreseen that the mining activities will cause significant habitat loss for the local reptile population. In general, impacts by the proposed mining operations on reptiles are likely to be low.

Amphibians
Fifteen amphibian species are known from the region (Appendix 2 of Ecological Study Annexure C). Low amphibian diversity is normal for an arid area, but is likely to increase within the drainage ways and grassy matrix of the Woodland community where water collects. As a result, higher amphibian diversity is most likely to be found in these habitats.
Pyxicephalus adspersus (Giant Bull Frog) is the amphibian species of conservation concern that potentially occur in the study area. It is listed as Near Threatened in terms of the Red Data Book of Frogs and is protected according to Schedule 1 of the NCNCA. All other amphibians of the study area are protected according to Schedule 2 of NCNCA (see Appendix 2 of Ecological Study Annexure C). Impacts on amphibians are likely to be high if the drainage ways or those wet areas in the grassy matrix of the Woodland community are to be destroyed.

Avifauna
The study site does not fall within any of the Important Bird Areas (IBA) defined by Birdlife South Africa, but lies adjacent to Kamfers Dam (Figure 11) and near Dronfield (2 km) and Benfontein (13 km) as depicted on Figure 11.

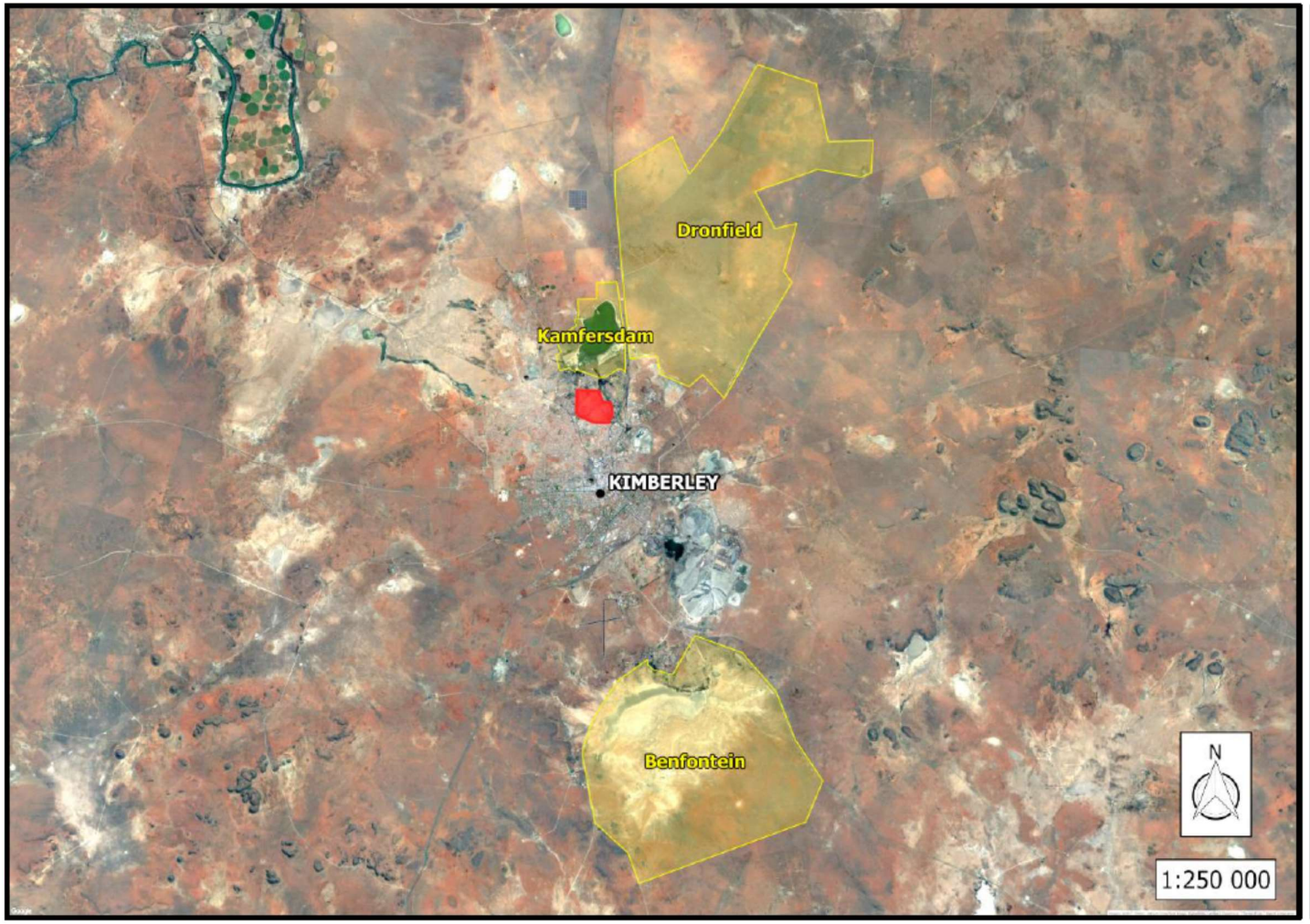


Figure 11: Colville dump (indicated in red) lies in the vicinity of three important Bird Areas (BirdLifeSA 2015), i.e. Kamfersdam and the Dronfield-and Benfontein Nature Reserves (indicated in yellow) Map by Dr. B Milne

Kamfersdam is an endorheic pan that has been transformed into a permanent wetland over the past decade due to an increase in sewage effluent inflow. Hence, it has become an important habitat for birds, especially the Greater- and Lesser Flamingos. The dam supports the largest permanent population of Lesser Flamingos in southern Africa. The most significant threats to Kamfersdam are poor water quality, flooding and expansion of urban development, while threats to the bird population include illegal hunting of water birds and the collisions and mortality of flamingos and other water birds caused by power lines and the electrical transmission lines along the railway.
Dronfield supports large numbers of breeding White-backed Vulture, which comprises 41 % of the breeding pairs in the Kimberley region. These birds forage over wide areas and a pair was encountered soaring over the study area during the site visit. The use of poisons in farming areas to combat mammalian predators still poses a threat to scavenging raptors, and hundreds of vultures can be killed in a single poisoning incident. Collisions with transmission power lines and electrocutions on reticulation and distribution power lines also pose an ongoing threat to vultures and other trigger species.

Benfontein is a Nature Reserve owned by De Beers Consolidated Mines since 1891 and there has been significant investment by research groups over the years. The farm supports small numbers of breeding White-backed Vulture, Blue Crane and Blue Korhaan. The farm also holds several biome-restricted assemblage species and congregatory species, including Lesser Flamingo. More than 1 700 water birds are present during years of high rainfall on the ephemeral Benfontein Pan, and 65 water bird species have been recorded on the pan. There are presently few threats to this IBA as it is being well conserved. The invasive mesquite Prosopis glandulosa, currently present in the north-eastern section and spreading along the N8 on the eastern boundary, could become a significant threat if not controlled. Collisions with the power line transecting the eastern side of Benfontein are a threat to the White-backed Vultures and large terrestrial birds such as Blue Crane and Ludwig's Bustard. Anglo American has recently bought De Beers and this change of ownership may lead to a change in land use or the sale of the property.

A total number of 299 bird species have been recorded from the region and all of these species are protected either according to Schedule 1, 2 or 3 of NCNCA (see Appendix 2 of the Ecological Report as Annexure C). Twenty-five listed bird species are known from the region, all of which are classified as Vulnerable, Near Threatened or Endangered (Table 7 in the Ecological Report as

Annexure C). Although none of these species were observed to reside on site, they are expected to potentially occur on site either by occasionally passing over the area or by frequently foraging in the various habitats.

In general, bird species of the study area are likely to experience the most disturbances among all fauna as a result of the Colville Dump mining activities. During the site visit it became evident that the lush herbaceous vegetation, abundance of trees and densely populated reed beds host rich bird diversity and are important for breeding, nesting and foraging. The most significant impacts are expected to be in the form of habitat destruction. This will especially impact the Woodland community and drainage way in the east of the property.
Apart from general disturbances and habitat loss, other potential impacts would come from electrocution and collisions with power lines and the accidental or intentional killing of birds. Not all species are vulnerable to powerlines, but flamingos, bustards and storks are highly vulnerable to collisions, while many of the raptors, including vultures, are susceptible to electrocution and collision. Monitoring during the mining operation would be vital in order to ensure no or low impact.

Three plant communities were identified on site of which all are included in the core mining areas. The drainage ways, woodland community and the dump are considered to be of very high, medium and low sensitivity, respectively. The most profound impacts are expected to be related to the destruction of trees and herbaceous vegetation associated with the woodland habitat, especially in terms of habitat loss for the rich bird population found here. Furthermore, the large extent of declared weeds currently found on site is a cause of concern, but the mining operation could contribute significantly to future land use and ecological integrity if these species are irradicated and controlled during the life of the operation. Any disturbances to the drainage ways is also expected to, in turn, cause cumulative fragmentation of important ecological corridors in the area and impair the hydrological regime.

No species of conservation concern were encountered during the survey. However, due to limited access to the site and the lush herbaceous cover it is possible that these species could have been overlooked. Numerous species, especially bulbs are known from the region and therefore could potentially occur on site. The mining operation will result in the large-scale clearance of indigenous vegetation. A permit application regarding protected flora as well as the harvesting of indigenous vegetation need to be lodged with the Northern Cape Department of Environment and Nature Conservation prior to any clearance of vegetation.

No nationally protected trees were found on site, but it is possible for small individuals of V. erioloba to occur among the trees of the woodland community. It is advisable that the affected areas are scanned, prior to any invasive activities and that a licence application regarding protected trees should be lodged with Department of Agriculture, Forestry and Fisheries prior to any potential disturbances to these trees.

To conclude, it is clear that the destruction of the natural habitat, especially for the bird population, within the study area is inevitable. The significance of the impacts will be affected by the success of the mitigation measures implemented and the rehabilitation programme for the mining area. The majority of the site was subjected to previous mining activities which transformed the natural habitat and therefore additional impacts by the Colville Dump operation in these areas are not expected to cause major degradation of ecological integrity. In my opinion the proposed activities can continue in these areas. However, authorisation should be granted on condition that the applicant commits to the adherence of effective avoidance, management, mitigation and rehabilitation measures.

- **SOCIO-ECONOMIC STRUCTURE OF THE REGION:**

(a) *Population Density, Growth and Location:-*

According to the 2011 Census, the population of Kimberley was 96,977, while the townships Galeshewe and Roodepan had populations of 107,920 and 20,263 respectively. This gives the urban area a total population of 225,160. Of this population, 63.1% identified themselves as “Black African”, 26.8% as “Coloured”, 8.0% as “White” and 1.2% as “Indian or Asian”. 43.2% of the population spoke Afrikaans as their first language, 35.8% spoke Setswana, 8.7% spoke English, 6.0% spoke isiXhosa and 2.7% spoke Sesotho.

Kimberley is the capital of the Northern Cape Province. It is located approximately 110km east of the confluence of the Vaal and Orange Rivers. The city has considerable historical significance due to its diamond mining past.

The Sol Plaatjie Local Municipality comprises of a large urban node in the form of Kimberley, and villages and farms. Kimberley is the administrative centre of the municipality. The economic activities consist of retailers, industries as well as mining and farming.

The SPLM accommodates approximately 247 000 people and is also a major contributor to the economy of the Province accounting for 28.9% and 82.1% of provincial and District GDP in 2009 respectively, Sol Plaatjie LM certainly is encumbered with ensuring that the Province as a whole reaches its accelerated growth objectives.

Table 1: Sol Plaatjie Municipality: Population by Population Group

Persons	2001	1996	Change over 5 years		Annual ave % change	% Composition 2001
			Number	percent		
African	109,714	105,838	3,876	4%	0.7%	54%
Coloured	63,918	63,655	263	0%	0.1%	32%
Indian	1,612	1,809	-197	-11%	-2.3%	1%
White	26,220	29,587	-3,367	-11%	-2.4%	13%
Total Population	**201,484**	**204,263**	**-2.799**	**-1%**	**-0.3%**	**100%**

Gender	People	Percentage
Female	49 550	51.09%
Male	47 427	48.91%

Population Group	People	Percentage
Black African	40 218	41.47%
Coloured	35 590	36.70%
White	17 841	18.40%
Indian or Asian	2 226	2.30%
Other	1 102	1.14%

First Language	People	Percentage
Afrikaans	52 161	55.48%
Setswana	17 621	18.74%
English	14 626	15.56%
isiXhosa	4 328	4.60%
Sesotho	2 174	2.31%
isiZulu	901	0.96%
Other	836	0.89%
isiNdebele	418	0.44%
Sign Language	301	0.32%

Sepedi	275	0.29%
Tshivenda	175	0.19%
Xitsonga	153	0.16%
SiSwati	57	0.06%
Not Applicable	2 952	

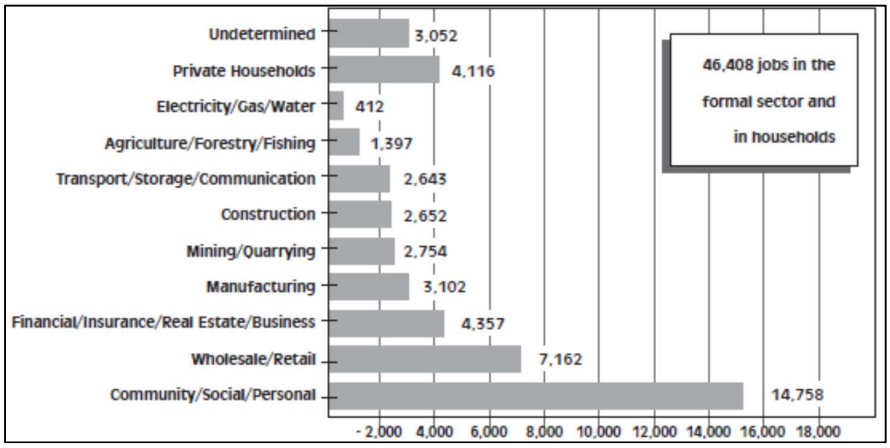
(b) *Major Economic Activities and Sources of Employment:-*

The population of Sol Plaatjie shows a declining trend – in common with the Northern Cape Province as a whole. One third of the employed citizens in Sol Plaatjie work for the public sector. The number of economically active people barely grew between 1996 and 2001. However, the number of people with employment decreased, with the result that the rate of unemployment increased markedly, from 34% to 42%.

Persons	2001	1996	2001	1996	Change over 5 years	
			Percent	Percent	Number	Percent
Employed	46,412	51,643	58.5%	65.7%	-5.231	-10%
Unemployed	32,928	26,979	41.5%	34.3%	5,949	22%
Total Labour Force	79,340	78,622	100.0%	100.0%	718	1%
Not Economically Active	54,218	49,889			4,329	9%
Population 15 – 65	133,558	128,511			5,047	4%
Total Population	**201,484**	**204,263**			**-2,799**	**-1%**

In the past, the local economy of Sol Plaatjie was heavily dependent on the De Beers Diamond Mines in and near SPM. In addition, the military maintained large bases of men and equipment in and around the region. However, since the major mines, have downscaled and closed over the last 15 years and the military establishments have shrunk since 1994, the local economy has changed without diversifying. The public secotr is the single largest source of employment, as the city is home to the regional and head offices of three spheres of government. The figure below illustrates that in 2001 the majority of the population were employed in the service sector.

Diagram 1: Employment pattern in Sol Plaatjie, 2001 Census Data



Other major employment areas are retail distribution and services. Tourism is a useful contributor to the economy, but it is not large enough to be defined as a driver of the economy in its own right. Employment in the manufacturing sector has experienced slow decline between 2000 and 2003.

Since the manufacturing sector is slowly losing the limited critical mass that it had, it no longer provides a viable economic sector for SPM on which to focus over the longer term within the ambit of a city development strategy. With regard to other economic sectors, the following picture emerges:

- Mining is in closure mode within the city;
- Construction depends on government decisions;
- Retail is a driver of the local economy as the trading centre for the region;
- Tourism is a supporter of economic growth, but will rely on improved human capital;
- Transport depends on major state infrastructural investment in road and rail upgrading.

Table 2: Positive and negative forces in the economy

	Positive	Negative
Main Forces	**Drivers of the economy** Government (Provincial, District & Local) Retail and service economy for the city and the region	**Underminers of the economy** Decline of the mining and manufacturing sectors Growing strength of Mangaung as the principal urban centre in the region
Important Supplements	**Boosters** The Diamond Hub Project The Urban Renewal Projects	**Obstacles / Barriers** Deteriorating state of the N12
	Complementers	**Caps**

	Tourism and tourism development Blue Train Appropriate improvers of the retail and recreation environment	Capacity of the SPM as an institution to drive the strategic agenda Poor state of maintenance on municipal services Infrastructure supporting economic activity Loss of municipal tax revenue through decline of CBD
	Supporters De Beers "Big Hole" redevelopment – conference centre, hotel, museum Education institutions	**Diversions** Decentralised shopping malls
	Sustainers The N23 in its present poor state	
	Defenders Social grants	
Alternatives	**Rescuers** The new prison and mental facility Regional health facilities The N12 upgraded The military Relocation of a national department to Sol Plaatjie	

(c) *Estimated Unemployment:-*

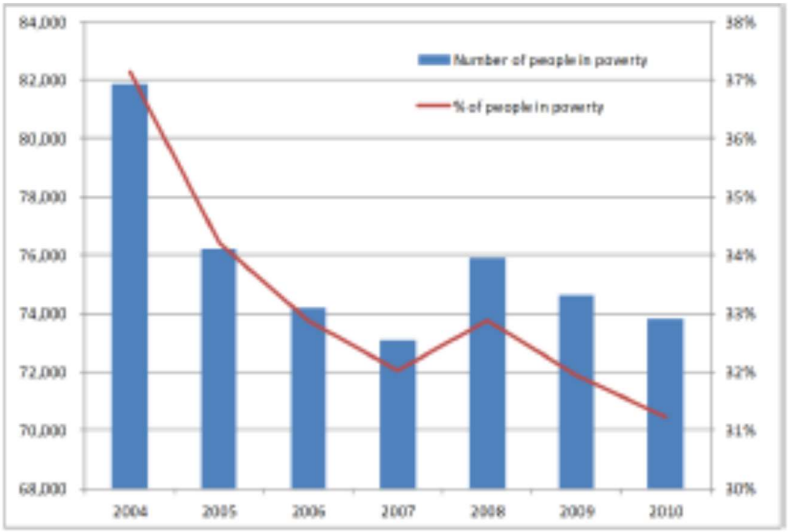
The education level of persons in the area where only 10% have post-matric and 90% matric or less with an unemployment rate of 33% which is mainly in the category of persons with matric or less, a need exist for innovative ways to diversify the economy. The main job creating sectors are the primary and secondary sectors which employ the most unskilled workers.

Table 3: Labour Market and Education Statistics 2011 compared to 2001

Labour Market				Education (aged 20+)					
Unemployment Rate (official)		Youth Unemployment Rate (official) 15 – 34 years		No Schooling		Matric		Higher Education	
2001	2011	2001	2011	2001	2011	2001	2011	2001	2011
41,3%	**31,9%**	51,5%	**41,7%**	11,3%	**7,1%**	21,9%	**29,2%**	8,7%	**10,4%**

Linked to the unemployment rate the chart below indicates the people living in poverty in the Sol Plaatjie Municipality.

Chart 1: Number and percentage of people livening in poverty, Sol Plaatjie Local Municipality 2004 – 2010



According to the chart above the number of people living in poverty decreased dramatically to 31,2%. This is well below the national average of 39,9% as well as the provincial and district averages of 43,4% and 39,1% respectively. The NDP's target is to reduce the number of people living in poverty to 39% by 2030.

(d) *Housing Demand and Availability:-*

Table 4: Access to Household Services (higher level) 2011 compared to 2001

Level of Service	2001 %	2011 %
Piped water inside dwelling	51,2	61,9
Flush toilet connected to sewer	83,4	82,8
Electricity for lighting	82,4	84,9
Weekly refuse removal	90,8	84,3

SPM was able to provide more households with a higher standard of service in terms of water and electricity during the period 2001 to 2011 which was however not the case with sanitation and refuse removal. In the case of sanitation the main reason is that until 2009/10 SPM's bulk sewer treatment works ran out of capacity which led to a moratorium on development as new development – also housing development – could not be connected to the sewer network. The capacity problems have since been resolved and the moratorium has been lifted and enough capacity has been created

for the next 20 years. Refuse removal also lagged behind mainly due to the increase of informal settlements – which is not accessible to deliver a waste removal service. This is still the case today.

The infrastructure diamond below depicts the four household infrastructure measures on a single diamond shaped chart. The larger the diamond, the better serviced the area is in terms of refuse removal, electricity, water and sanitation access. The dotted blue line shows the national average as a means of comparison, the light dotted blue line is the provincial comparison, whilst the green line shows the SPM's measure. The dotted blue line falls inside the green line indicating that SPM is performing better than the national and provincial average.

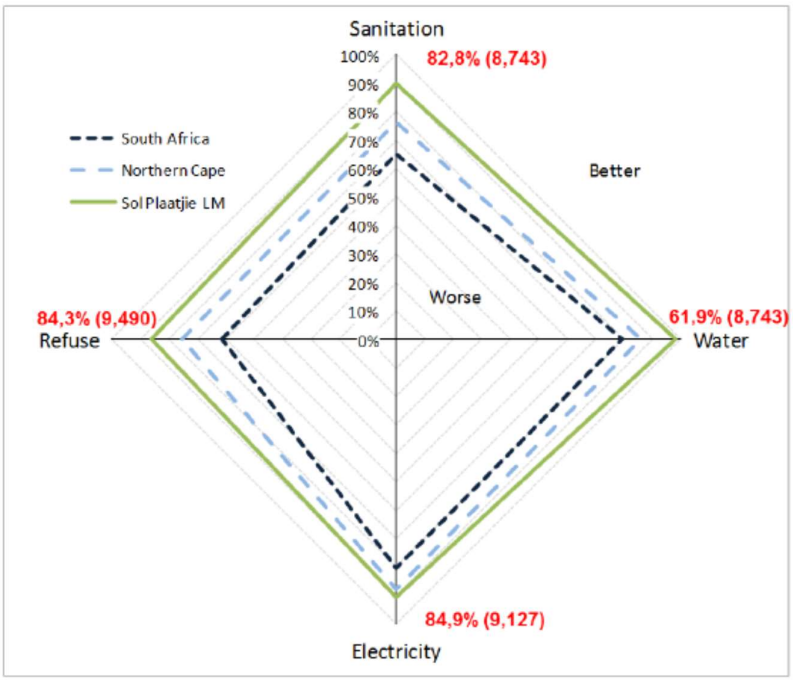


Figure 5: SPM Infrastructure Diamond: Basic Services: 2011

Although SPM does well in providing services to its communities the tables below indicate the backlogs and needs that still exist in terms of service delivery.

The table below indicate the number of informal settlements in SPM as well as the stage of development in each informal settlement.

Table 5: No. and Status of Informal Settlements

Description	No. of Areas	H/H
Planning not commenced	9	5 172

Planning in process	11	2 167
Planning completed – await registration	5	1 526
Install services	2	996
Housing	1	3 500
TOTAL	**28**	**13 361**

Table 6 below indicates the present backlogs/need for basic household services according to Census 2011, the provision of services since the 2012/2013 financial year as well as the planned provision for the financial year 2014/2015. It also include the growth of informal households since the 2011 Census and the survey done through the NUSP process.

Table 6: Basic Household Services Backlog and Need 2011

Service	Backlog Census 2011	Provision up to 30 Jun 2014	2014/2015 Targets	TOTAL	Balance	PLUS Growth 2011 to 2013
New Houses (subsidised)	7 846	1 293	375	1 668	6 178	11 693
New Erven Planned and Surveyed	7 846	1 163	1 272	2 435	5 411	10 927
Houses connected to water	8 743	2 521	892	3 413	5 330	10 846
Houses connected to sanitation	9 343	3 552	892	4 444	4 899	10 415
Houses connected to electricity	9 127	2 335	214	2 549	6 578	12 094
Houses provided with waste removal	9 490	2 000	600	2 600	6 890	12 406
Roads Rehabilitation/ Paving	297km	25,7km	2,5km	31,7km	265,3km	-

(e) *Social Infrastructure:-*

The city of Kimberley have formal instructure such as schools, university, hospitals, sport- and recreation facilities and shops.

(f) *Water Supply:-*

Water is available to almost 50% of the population in the Northern Cape in the form of water piped to their dwelling. The next most used source of water supply is piped water on-site or in yards, which is available to around 33% of the population.

Surface water from the Riet-, Vaal- and Orange River is the major source of water in the region, although some smaller communities

are totally dependent on groundwater for supply.

- ***ARCHAEOLOGICAL***

A Heritage Impact Assessment (HIA) was carried out in terms of Section 38 of the National Heritage Resources Act (No 25 of 1999) to locate sites of heritage significance and assess potential adverse impacts of the proposed mining right for the Kimberley Mines Trust in an area in Kimberley called the 2005 and 2007 Retrenchees. The report is culmination of fieldwork conducted in November 2016.
Six sites were recorded. A colour scheme is used to rank the magnitude of perceived impacts and risk of the proposed development. Appropriate interventions and mitigation strategies are also proposed.

	Ranking	Explanation	No of Sites
1	High	National and Provincial heritage sites (Section 7 of NHRA). All burials including those protected under Section 36 of NHRA. They must be protected.	0
2	Medium A	Substantial archaeological deposits, buildings protected under Section 34 of NHRA. Footprint of early modern mining. These may be protected at the recommendations of a heritage expert.	3
3	Medium B	Sites exhibiting archaeological characteristics of the area, but do not warrant further action after they have been documented.	0
4	Low	Heritage sites deemed of less importance. Decisions on mitigation will be made by a heritage expert including options for destruction with or without salvage.	4
		TOTAL	7

The following is a list of the sites and the risk ranking:

SITE	LATITUDE	LONGITUDE	DESCRIPTION
S1	28°42'22.3"S	24°46'12.5"E	Mine plant components
S2a	28°42'36.80"S	24°46'6.90"E	Foundation remains of building, eucalyptus
S2b	28°27'36.8"S	24°46'09.6"E	Foundation remains of building, eucalyptus
S3	28°42'38.36"S	24°45'52.98"E	Kimberlite discard
S4	28°42'38.00"S	24°45'51.10"E	Exposures of industrial/household waste
S5	28°42'31.21"S	24°45'24.59"E	Ramp for offloading material onto screens
S6	28°42'25.54"S	24°45'17.20"E	Tailing - 2nd mining phase

General Observations

The existing landscape at the Retrenchees represents the cumulative impact of three mining phases spanning nearly 150 years.

(i) The first phase is identified with the early "Rush" which has been described in Sections 3.4 and 4.5. The foundation remains of buildings which were seen and recorded during the survey are likely to date back to this period from the 1870s.

(ii) The second phase is defined by the introduction of new advanced methods of separating the diamond from the Kimberlite rock. With the information to hand it has not been possible to pinpoint the time of the transition in the last century. This necessitated reworking of tailings and further opencast operations in the area, until 2005-2007 when De Beers closed the mine.

(iii) De Beers had expressed intention to hand over the land for development for public good. However soon after closure unlicensed operations started setting in the third phase (from around 2007) which has continued to the present. Many small holes have been opened with the screening for the mineral done on site. The operators can be seen working as individuals or in groups. Because of the unregulated nature of the operations the area has become a crime hotspot. Dumping of household and industrial waste in the south-eastern part of the property indicates lack of environmental monitoring. Both these activities have combined to accelerate degradation and to create a social landscape which stokes crime.

(i) The foundation remains of buildings which appear to date to the first mining phase (S2a and S2b). The sites are 30m apart, with 7 mature eucalyptus standing in the same area, are worth retaining and incorporating into the landscape of the proposed mine offices.

(ii) The broken plant components (S1): A local museum may be approached to assess their value as relics of the mining history of Kimberley. Since it was apparent that they have been deposited there recently, their present provenance is not important and preservation in situ is therefore not necessary.

(iii) The mixture of household and industrial waste exposed by the holes of recent unlicensed miners indicate a disturbed provenance as a result of the first two mining events (S4). However this might be of interest to students of industrial and historical archaeology. Relevant departments in local museums and universities may be approached to run test pits if they are interested.

(iv) Part of the relict ramp and concrete floor at the bottom (S6) may be preserved in part or as whole as representing the mineral screening process during the second mining phase.

Recommendation and Conclusions

Recommendations are made to protect historically significant remains of buildings which are likely to be affected by the proposed development.

The project may go ahead subject to the precautions stated above. If heritage resources were to be found during the mining phase, the procedure is approach the relevant heritage authorities (SAHRA and/or the Provincial Heritage Resources Authority). (HIA by Dr. Edward Matenga, 2017 Annexure B)

(b) Description of the current land uses

Currently, the major land uses in the area are urban and industrial development. Most of the site has been transformed, but according to the Southern African Agricultural Geo-referenced Information System, the land capability of the remaining natural areas is non-arable with moderate potential grazing land. The grazing capacity is between 9 and 13 ha/AU, with the agricultural region being demarcated for cattle farming. The site is categorised to have no suitability for crop yield.

The site was subject to mining since the 1930s and suffered major loss of land capability due to the Kimberlite tailings that had been stockpiled on the property since then. Currently, illegal mining by small-scale miners are taking place as well as illegal dumping of domestic waste.

(1) Land Use before Mining:

The Colville Tailing is an existing historical mine that is known form the 1930's to the surrounding community and the State. The area (occupied by the existing Tailings Deposit) (141 ha) where the reclamation operations will focus, is and had not been alienated for any other form of land use. No other activity is currently possible other than mining.

(2) Evidence of Disturbance:-

Surface areas possibly disturbed is only restricted to the existing mining area. The majority of the surface area is already disturbed by existing mining activities (opencast pits, tailings deposits, waste dumps, access roads, etc.). The surface drainage as such is already disturbed as the result of previous mining activities (opencast mining and the resultant tailings deposit facility and dumps, etc.).

(3) Existing Structures:-

The Colville Tailings Deposit area is an existing mine are with existing mine infrastructure such as tailings deposits, tailings dumps, open excavations, access roads, Eskom power line, etc. All 100m safety borders from infrastructure will be kept.

(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)

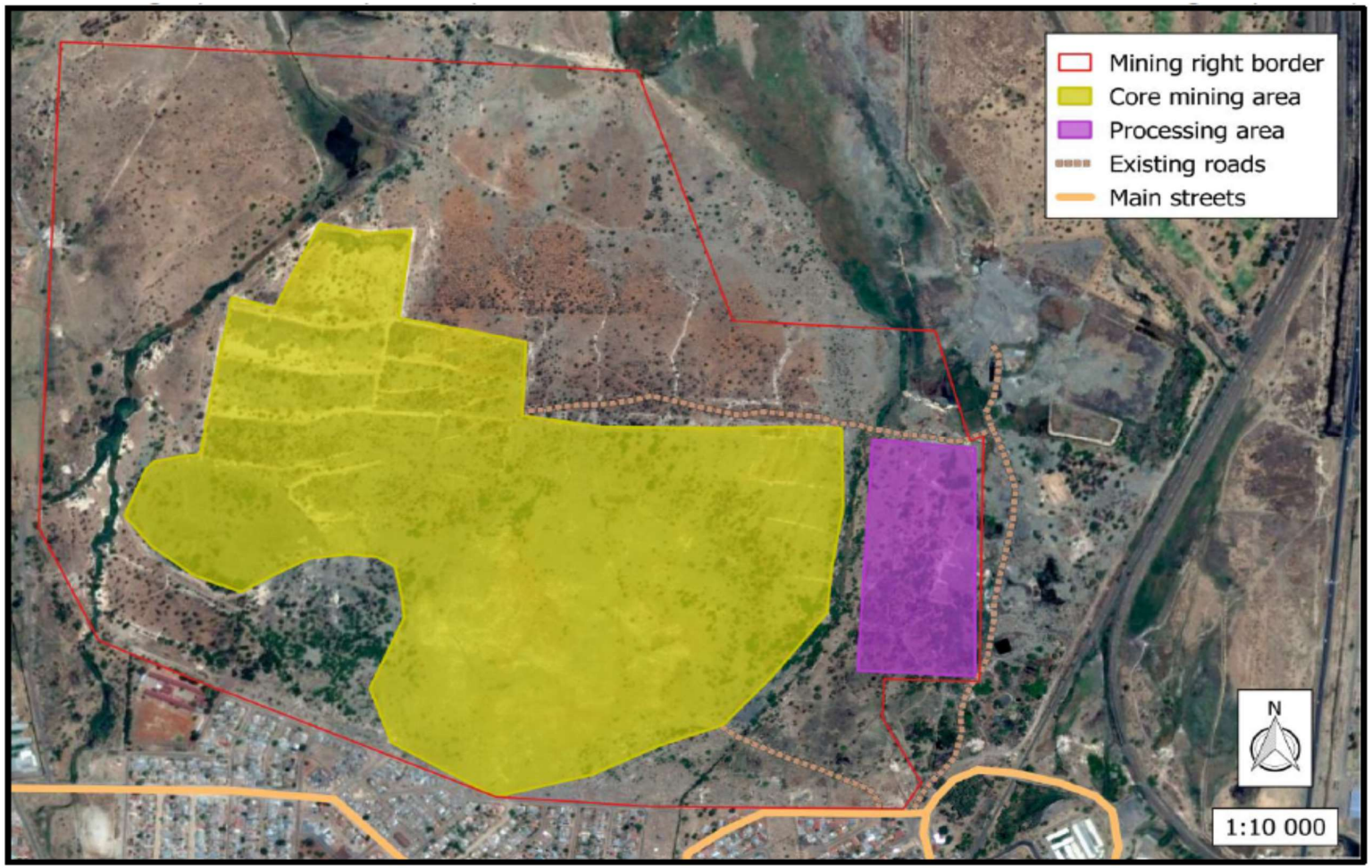


Figure 12: Environmental and current land use map

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

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

Environmental Factor	Nature of Impact	Significance	Probability	Duration	Consequence Extent	Management / mitigation
PHYSICAL						
Geology and Mineral Resource	Sterilisation of mineral resources	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	• Reclamation of all dumps continuously, if possible and does not influence mining and safety requirements. • Employ effective rehabilitation strategies to restore surface topography of dumps and plant site. • Stabilise the mine residue deposits (Tailings dump). • All temporary infrastructures should be demolished during closure.
Soils	Soil Erosion Construction of infrastructure; topsoil removal; potential runoff.	Low-Medium	High	Construction and Operational	Low Local	• At no point may plant cover be removed within the no-development zones. • All attempts must be made to avoid exposure of dispersive soils.

						• Re-establishment of plant cover on disturbed areas must take place as soon as possible, once activities in the area have ceased. • Ground exposure should be minimised in terms of the surface area and duration, wherever possible. • The soil that is stockpiled during construction should be stock-piled in layers and protected by berms to prevent erosion. • All stockpiles must be kept as small as possible, with gentle slopes (18 degrees) in order to avoid excessive erosional induced losses. • Stockpiled soil material are to be stored and bermed on the higher lying areas of the footprint area and not in any storm water run-off channels or any other areas where it is likely to cause erosion, or where water would naturally accumulate. • Stockpiles susceptible to wind erosion are to be covered during windy periods. • Audits must be carried out at regular intervals to identify

						areas where erosion is occurring. • Appropriate remedial action, including the rehabilitation of the eroded areas, must occur. • Rehabilitation of the erosion channels and gullies. • Dust suppression must take place. • 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.
	Nature of Impact	Significance	Probability	Duration	Consequence Extent	Management / mitigation
	Loss of soil fertility During the removal of topsoil; stockpiling.	Low-Medium	High	Construction	Low Local	• 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 in order to ensure that the quality of the topsoil is not impaired. • Topsoil stockpiles must be kept separate from sub-soils. • The topsoil should be replaced as soon as

						possible onto the cleared areas, thereby allowing for the re-growth of the seed bank contained within the topsoil.
	Nature of Impact	Significance	Probability	Duration	Consequence Extent	Management / mitigation
	Soil pollution Spillage of hazardous material; runoff.	Medium	Medium	Construction and Operational	Low Local	• 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.
Land Capability	Loss of land capability through topsoil removal, disturbances and loss of fertility.	Very Low	Possible	Short term	Minimal Local	Employ appropriate rehabilitation strategies to restore land capability.
Land use	Loss of land use due to poor	Very low	Possible	Short term	Minimal Local	Carefully plan the placement of infrastructure and employ

	placement of surface infrastructure and ineffective rehabilitation					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	• Ground works and stripping of vegetation resulting in a changed land profile. • Runoff from stockpiled soil and vegetation may contain high levels of silt. • Transport of	Medium to Low	Possible	Construction	Low Local	Water Quality deterioration: change in water quality is caused by a change in natural conditions and/or an enhancement of pollution from sources. Dirty storm water trenches should be inspected regularly (once before the rainy season and after each occurrence of a storm) to clean the trench from excess soil particles to prevent

	construction materials to and from site. Significant levels of dust may emanate from the use of heavy construction vehicles which in turn will impact on runoff water quality. • Materials used during construction may impact negatively on the runoff water quality.					overtopping of the channel wall during a sudden storm which will result in mixing of the dirty and clean water systems. Mitigation measures (or safety precautions) that are taken in order to eliminate any risk the project area could have on the natural, cultural and social environment of the concerned area and that must be implemented during the different phases i.e. construction, operational and post closure to minimize the impacts are as follows: • Only environmental friendly materials must be used during the construction phase to minimize pollution of surface water runoff and/or underground water resources. • Pipe leakages should be minimized. • Proper clean and dirty water separation techniques must be used to ensure uncontaminated water returning to the environment. • Non mining waste i.e. grease, lubricants, paints, flammable liquids, garbage, historical machinery and other
	• Spillages that may occur on access and haul roads may impact negatively on surface water quality. This issue is dealt with in the EMP. • A high potential of soil erosion exists due to an	High	Possible	Operational	Low to Moderate Local	

	increased percentage of bare surfaces.					combustible materials generated during activities should be placed and stored in a controlled manner in a proper designed area. • The topography of rehabilitation disturbed areas must be rehabilitated in such a manner that the rehabilitated area blends in naturally with the surrounding natural area. This will reduce soil erosion and improve natural re-vegetation.
	• Possible leaching of polluted soil through infiltration and runoff resulting in surface water pollution. • Removal of vegetation could lead to erosion and sediment transportation. • Significant dust levels will emanate from the use of heavy construction vehicles.	Moderate to High	Possible	Closure	Low Local	
Environmental Factor	Nature of Impact	Significance	Probability	Duration	Consequence Extent	Management
Indigenous Flora	**Loss of and disturbance to indigenous vegetation** Construction of roads, plant site, as well as other	Low	Definite	Construction and operational	Low to Medium Local	• Minimise the footprint of transformation. • Encourage proper rehabilitation of mined areas. • Encourage the growth of natural plant species. • Ensure measures for the adherence to the speed limit.

	necessary infrastructure; placement of stockpiles; and the clearing of vegetation for mining, materials storage and topsoil stockpiles; vehicular movement.					
	Loss of flora with conservation concern Removal of listed or protected plant species; during Construction of roads, plant site, as well as other necessary infrastructure; the placement of stockpiles; and clearing of vegetation for mining.	Low	Definite	Construction and Operational	Low to Medium Local	• Footprint areas of the mining activities must be scanned for Red Listed and protected plant species prior to mining. • It is recommended that these plants are identified and marked prior to mining. • These plants should, where possible, be incorporated into the design layout and left in situ. • However, if threatened of destruction by mining, these plants should be removed (with the relevant permits from DAFF and DENC) and relocated if possible. • All those working on site must be educated about the conservation importance of the fauna and flora occurring on site.
	Proliferation of alien vegetation	Medium-High	High	Construction and Operational	Low Regional	• Minimise the footprint of transformation.

	Clearing of vegetation; mining activities					• Encourage proper rehabilitation of mined areas. • Encourage the growth of natural plant species. • Mechanical methods (hand pulling) of control to be implemented extensively. • Annual follow-up operations to be implemented.
	Encouragement of bush encroachment Clearing of vegetation; disturbance through mining activities.	Low-Medium	Medium	Construction and Operational	Low Local	• Minimise the footprint of transformation. • Encourage proper rehabilitation of mined areas. • Encourage the growth of natural plant species. • Mechanical methods (hand pulling) of control to be implemented extensively. • Annual follow-up operations to be implemented.
Fauna	**Loss, damage and fragmentation of natural habitats** Clearance of vegetation; mining activities	Medium-High	Medium	Construction and Operational	Low-Medium Local	• 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). No construction personnel or vehicles may leave the demarcated area except those authorised to do so.
	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	Medium	Construction and Operational	Low Local	• 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 extent of the proposed mine should be demarcated on site layout plans, and no construction personnel or vehicles may leave the demarcated area except those authorised to do so. Those areas surrounding the mine site that are not part of the demarcated development area should be considered as a no go zone for employees, machinery or even visitors. • The 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.
Air Quality	Sources of atmospheric 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.	Low	Certain	Decommissioning	Low Local	Effective soil management; identification of the required 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 and at the abutting residential areas	Medium	Possible	Pre- Construction and Construction	Low Local	Equipment and/or machinery which will be used must comply with the manufacturers specifications on acceptable noise levels Topsoil stripping should be limited to daytime only.
	Civil construction activities Noise increase at the boundary of the mine footprint and at the abutting residential areas.	Medium	Possible	Pre- Construction and Construction	Low Local	Equipment and/or machinery which will be used must comply with the manufacturers specifications on acceptable noise levels Civil construction activities 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 manufacturers specifications on acceptable noise levels Construction of internal roads should be limited to daytime only.
	Construction of the overland conveyer 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 manufacturers specifications on acceptable noise levels
	Assembly of crusher and plant equipment 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 manufacturers specifications on acceptable noise levels Assembly of mine foot print activities should be limited to daytime only. Noise survey to be carried out to monitor the noise levels during these activities.
	Building activities 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 manufacturers specifications on acceptable noise levels Building activities at the mine foot print and along the conveyer belt should be limited to daytime only.

	Hauling of building material to and from the specific areas. Noise increase at the boundary of the mine footprint and at the abutting residential areas.	Medium	Possible	Pre- Construction and Construction	Low Local	Equipment and/or machinery which will be used must comply with the manufacturers specifications on acceptable noise levels Hauling of material should be limited to daytime only. Noise survey to be carried out to monitor the noise levels during these activities.
	Construction of the Mine Residue dump, soil stock pile and material stock pile. 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 manufacturers 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. Noise increase at the boundary of the mine footprint.	Medium	Possible	Operational	Low Local	Equipment and/or machinery which will be used must comply with the manufacturers specifications on acceptable noise levels Topsoil stripping should be limited to daytime only.
	Diesel emergency generators Noise increase at the boundary of the mine footprint.	Medium	Possible	Operational to closure	Low Local	Equipment and/or machinery which will be used must comply with the manufacturers specifications on acceptable noise levels Noise survey to be carried out to

						monitor the noise levels during these activities.
	Additional traffic to and from the mine	Medium	Possible	Operational to closure	Low Local	Equipment and/or machinery which will be used must comply with the manufacturers specifications on acceptable noise levels Noise survey to be carried out to monitor the noise levels during these activities.
	Mining activities at the dump	Medium	Possible	Operational to closure	Low Local	Equipment and/or machinery which will be used must comply with the manufacturers specifications on acceptable noise levels Noise survey to be carried out to monitor the noise levels during these activities.
	Maintenance activities at the different sites.	Medium	Possible	Operational to closure	Low Local	Equipment and/or machinery which will be used must comply with the manufacturers 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 Noise increase at the boundary of the mine footprint and at the residents living close.	Medium	Possible	Decommissioning	Low Local	Equipment and/or machinery which will be used must comply with the manufacturers specifications on acceptable noise levels Backfill of mine footprint area activities should be limited to daytime only.

	Planting of grass and vegetation at the rehabilitated areas	Medium	Possible	Decommissioning	Low Local	Equipment and/or machinery which will be used must comply with the manufacturers specifications on acceptable noise levels Planting of grass and/or vegetation should be limited to daytime only
	Removal of infra-structure	Medium	Possible	Decommissioning	Low Local	Equipment and/or machinery which will be used must comply with the manufacturers specifications on acceptable noise levels Removal of infrastructure should be limited to daytime only. Noise survey to be carried out to monitor the noise levels during these activities.
Visual impacts	Potential visual impact on R64	Medium Regional	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 and will become a feature of the area.
	Potential Visual Impact on the surrounding land users/ residents	Medium Regional	Highly Likely	Construction, Operation and Decommissioning	Medium Local Site	The design of the proposed mining development will determine the visual impact.
	Potential visual impact of the proposed development on the	Medium Regional	Highly Likely	Construction, Operation and Decommissioning	Medium Local Site	The design of the proposed mining development will determine the visual impact.

	commercial activities located within 1 km.					
	Potential visual impact of the proposed development on the Sense of Place	Medium Regional	Highly Likely	Construction, Operational and Decommissioning	Medium Local Site	Design of the proposed development can ensure that the development forms part of the area and is aesthetically pleasing.
	Potential visual impact of the proposed development on the construction phase of the surrounding land users in close proximity	Medium Regional	Highly Likely	Construction	Low Local Site	Wetting of exposed areas should be undertaken as required to prevent dust pollution having a negative visual impact. • Ensure that the design fits into the surrounding environment and it is aesthetically pleasing; • 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
	Potential visual impact of the proposed development on the operational phase of the surrounding land users in close proximity.	Medium Regional	Highly likely	Operational	Medium Local Site	Wetting of exposed areas should be undertaken as required to prevent dust pollution having a negative visual impact. • Ensure that the design fits into the surrounding environment and it is aesthetically pleasing. • Ensure that all infrastructure and the site and general surroundings are maintained in a neat and appealing way; • Rehabilitation of disturbed areas and re-establishment of vegetation;
Traffic	Potential negative impacts on traffic safety and deterioration of the existing road networks.	Low	Low likelihood	Decommissioning	Low Local	Utilise existing access roads, where applicable; implement measures that ensure adherence to traffic rules.
Heritage resources	The Deterioration of sites of cultural and heritage importance.	Medium to Low	Certain	Construction, Operational	Low	The heritage and cultural resources (e.g. ruins, historic structures, etc.) must be protected and preserved by the delineation of a no go zone.

						Should any further resources be disturbed, exposed or uncovered during site preparations, these should immediately be reported to an accredited archaeologist. Burial remains should not be disturbed or removed until inspected by an archaeologist.
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 the Retrenchees. Alternatively, the existing Sol Plaatje 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 of local construction workers during the construction phase to enable them to be employable during the operational phase would not stop the influx of outsiders, but could attempt to minimise the number of "new" outsiders coming to the area in search of employment. • 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.
	Inflow of Temporary workers	Low Negative	Highly Probable	Start up and Construction	Low Negative Local	• Construction workers falling within the semi-skilled to unskilled category should be sourced from the local population where possible to avoid possible conflict arising between locals and the outside workforce, but

						also to limit the need for accommodation facilities. • Construction activities should be kept to normal working hours e.g. from 7 am until 5 pm during weekdays. • Construction schedules and activities should be clearly communicated to the local municipality and nearby residents. • Security on-site should be active prior to the construction period. • The construction site should be properly managed to avoid any littering and possible environmental pollution. Water and sanitation facilities should be up to standard. • Information distributed as part of the existing HIV/Aids awareness campaigns undertaken in the area should again be focused on and communicated to the local workforce. • Unrealistic employment expectations should not be created. • The development of informal vending "stations" where

						food and small goods are sold should be properly managed, to avoid littering, safety risks and possible environmental pollution.
	Influx of Jobseekers	Low Negative	Highly probable	Start-up and Construction	Low Negative Local	• Maximise the use of local labour where possible by developing a strategy to involve local labour in the construction process. • The development, publication and widespread dissemination of a recruitment policy could serve to encourage local employment and reduce the potential influx of jobseekers to the area. • The communication strategy should ensure that unrealistic employment expectations are not created.
	Community and Institutional Activities Local Economic Contribution	Medium Positive	Probable	Start-up and Construction	Medium Positive Regional	• The Retrenchees should develop a database of local companies, including credible SMMEs that could qualify as potential service providers prior to the initiation of the tender process, to enable these local companies and SMMEs to be involved with the tender process. In this

						regard The Retrenchees should liaise with local stakeholders, as well as with representatives of the SPM. • Even if local companies and SMMEs would be considered during the construction phase of the project, the tender process should be based on competitive business principles and the quality of services to be rendered to ensure adherence to standards and to maximise overall welfare.
	Conflicts between Local Residents and Newcomers Impact on Social Networks	Low Negative	Probable	Start-up and Construction	Low Negative Local	• Unrealistic job expectations should be restrained through a transparent communication process. • The appointment of locals and the inflow of temporary workers should still be managed with due cognisance of the sensitivities at hand and the process of introducing foreigners should be pro-actively managed. • As far as possible, the movement of construction workers should be confined to the work site to avoid any potential for impact from this

						variable in proximate residential areas. • Specify the conduct of contract workers in worker related management plans and employment contracts. • Consult with local structures and SPM on employment matters. • Do not house construction workers on site, but ensure sufficient and proper accommodation facilities. • Ensure sufficient safety and security measures on site
	Individual and Family Level Impacts Impact on nearby residential properties.	Low Negative	Low probability	Start-up and Construction	Low Negative Local	• Effective management of the mining activities to avoid any environmental pollution focusing on water, waste and sanitation infrastructure and services, and limiting any increase in noise levels. • Dust pollution should be kept to a minimum • Strict security measures should be put in place. Security personnel should be on site on a permanent basis. • The active mining area should be fenced to avoid unauthorised entry by animals onto the mining area
	Impact on daily	Low	Probable	Start-up and	Low Negative	• Dust suppression methods

	living and movement patterns	Negative		Construction	Local	should be strictly implemented if and where required • All construction vehicles should be in a good condition and adhere to the road worthy standards • Dust creation should be kept to the minimum by adhering to the speed limits on the gravel road • The construction of additional access roads should be limited. • Speeding of construction vehicles must be strictly monitored. • Upgrading of the entrance and turn-off to the mining area from the R64 might be required. • Further negotiations with the Northern Cape Department of Roads and Public Works should be entered into if upgrading is required.
	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
	Community Infrastructure Needs Impact on Infrastructure and Services	Low Negative	Highly probable	Construction	Low Negative Local	• Maximise the employment of locals where possible • Maintenance of the roads frequently used by construction traffic e.g. R64 should be discussed and negotiated with the Northern Cape Department of Roads and Public Works
	Heritage Features	Low Negative	Highly probable	Construction	Low Negative Local	• Any heritage features (e.g. buildings and/or artefacts) on site must be protected and monitored • Should it be necessary, such heritage features should be assessed and be recorded by an accredited Heritage Impact Specialist or archaeologist
	Intrusion Impacts Visual Impact and Sense of Place	Low Negative	Probable	Construction	Low Negative Local	• The construction site should be kept litter free • Site rehabilitation on certain sections of the site should occur as soon as the construction process allows • The recommendations made by the Visual Impact Assessment should be

						adhered to.
	Noise Impact	Low Negative	Probable	Construction	Low Negative Local	• The mitigation measures of the Noise Impact Assessment should be implemented • Construction vehicles should be in a good working order • Construction activities should be kept to normal working hours e.g. 7 am until 5 pm during weekdays
	Population Impacts Employment Opportunities and skills inequities	Medium Positive	Probable	Operational	High Positive Regional	• The development of skills and the creation of opportunities to obtain experience through the start-up and construction phase are of critical importance to ensure that the semi-skilled and unskilled positions can be filled from individuals (especially the youth) from the core communities (SPM area) as well as the wider district. • Job creation and training remains critical as there is still a high unemployment rate within the local communities even with all the mining activities undertaken in the area. The reason being that the local community members do not have the necessary skills to

						be easily employable. Training should thus be focused on mining related skills. • The general practice would be that if a mining company is not able to appoint a local person with the necessary skills, they would employ an "outsider". • A recruitment policy should be adopted to enhance positive employment impacts, limit in-migration of outside jobseekers and mitigate the potential impact of residual in-migration. • The Retrenchees should clearly communicate their anticipated employment figures and job categories to the communities. • Employees should be properly informed of the skills development programmes of The Retrenchees and how they can be involved in these programmes. • Should retrenchments be necessary, adequate measures should be put in place to assist the affected employees to find alternative

						forms of employment. • Possible steps to be taken with regards to retrenchments should be clearly communicated to all employees, and the SPM.
	Community and Institutional Activities Local Economic Contribution	Medium Positive	Probable	Operational	High Positive Regional	• Focused programmes aimed at building SMME links to the mine could supplement the indirect economic benefits to the local communities. • The mine should adopt a Procurement Plan whereby they aim to provide SMME's with the opportunity to become involved in the procurement of capital goods, consumables and services. This Plan should be implemented in conjunction with the local municipality and local development programmes in the surrounding communities. These programmes could focus on providing support and technical advice to entrepreneurs and/or SMMEs to enable them to supply goods and materials for operations at the future mine

	Capacity Building and Skills Training	Medium Positive	Probable	Operational	High Positive Regional	• A community skills database audit could be undertaken. Alternatively the existing Sol Plaatje Labour Desk could be used to determine which skills are available and which employees should undergo further training and skills development. • The findings of the community skills database should determine and contribute to the specific type and level of training interventions to be provided during the operational life of the mine. • Training and career path plans must be focused on mining related skills. Progress in this regard should be monitored on an annual basis. • In-house training through learnerships to fill the hard-to-fill vacancies would be crucial for long term capacity building and skills development within the core and affected communities • Sectors for portable skills training should also be identified in consultation with the SPM to ensure the

						transfer of applicable skills relevant at the time of downscaling. • Women should also benefit from the skills training programmes.
	Social Development and social services support	Medium Positive	Probable	Operational	High Positive Regional	• Involvement in upliftment programmes should be done according to the priority needs and projects identified as part of the SPM IDP, as well as in consultation with other stakeholders such as the local community representatives, traditional leaderships and youth organisations. • Focus involvement on the existing LED programmes and/or existing community development projects undertaken in the area. • Community development projects initiated by The Retrenchees should avoid benefiting only a selected few but should follow a broad based approach, still taking budget constraints into consideration.
	Conflicts between local residents and newcomers	Low Negative	Probable	Operational	Low Negative Local	• Maximise the employment of locals as far as possible • Make use of credible SMME's for the provision of

	Impact on social networks					goods and services • Embark on regular communication efforts towards the community with regards to the mine's involvement in the communities. This could be done through an established forum
	Individual and Family level impacts Impacts on daily living and movement patterns and family activities	Low Negative	Highly Probable	Operational	Low Negative Local	• Maximise the employment of local labour to limit the negative impacts on the infrastructure and services within the area • The applicant should enter into discussions with the local municipality to indicate their employment profile in order to determine the need for housing and the additional pressure it would place on the existing infrastructure and services. • Maintenance of the roads frequently used by mining related traffic e.g. R64 should be discussed and negotiated with the Northern Cape Department of Roads and Public Works. • Speed limits on the local roads surrounding the mining site should be enforced.

						• Speeding of mine related vehicles must be strictly monitored • Due to the traffic volumes on the R64 it is imperative that the entrance to the mine should be upgraded and be kept up to standard to accommodate the traffic load and traffic patterns. • Monitoring of possible impacts on water quality and quantity, as well as the possible impacts of dust pollution should be undertaken.
	Impact on Sol Plaatje Local Municipality	Low Positive	Probable	Operational	Low Positive Regional	• Assist the SPM with the diversification of the local economy • Emphasise the use of local service providers (BEE) and focus on the development of LED programmes • Institute a joint municipal coordinating and implementing committee to support the municipalities' local economic and social develop needs and requirements, where feasible • Ensure that mine employees do have access to proper housing facilities
	Health and safety	Low	Highly	Operational	Low Negative	• The general health of

	risks	Negative	Probable		Local	employees should be monitoring on an on-going basis • EMP Guidelines should be strictly adhered to and international best practice should be sought
	Community Infrastructure Needs Impact on Infrastructure	Low Negative	Probable	Operational	Low Negative Local	• The establishment of a bus transport service for employees would limit negative impacts on the road network and traffic volumes.
	Intrusion Impacts Visual Impact and Sense of Place	Low Negative	Highly Probable	Operational	Low Negative Local	• Recommendations and mitigation measures as part of the EMP should be strictly implemented. • Mining areas should be rehabilitated as soon as the Mining Works Programme allows
	Noise Impact	Low Negative	Probable	Operational	Low Negative Local	• Recommendations and mitigation measures proposed by the Noise Impact Assessment should be strictly implemented • Noise generating activities should be kept to normal working hours (e.g. 7 am until 5 pm) where possible
	Socio-Economic Possible social	Low Negative	Highly probable	Decommissioning	Low Negative Local	• Downscaling of production should be undertaken over a period of time. • Downscaling and

	impacts to be experienced during decommissioning (closure of the mine) could include the following: Job losses due to mine closure; Decline in the sustainability of the local economy as a result of the loss of employment, household income and capital investments; Reduced economic activities within the area with subsequent negative impacts on smaller businesses; A decline in the local economy would also have a direct impact on the financial status of the affected local municipalities; Negative impact on the revenue base of the local municipalities; Population changes					retrenchment of contractor and permanent staff should be done over a period of time. • Rehabilitation of all mining and mining related areas should be undertaken. • A closure plan must be developed and a closure quantum must be included in the Environmental Management Programme Report

	and out-migration of people from the area; Negative impact on the social fabric and social networks; A new class of jobseekers targeting other mines in the area; Decrease in the quality of life of the surrounding communities due to the discontinuation of social development support and local economic development programmes; Possible relocation of families; Skilled workers moving out of the area in search of employment elsewhere; Negative impact on infrastructure development and maintenance; A change in community					

	infrastructure; Disruptions and nuisance factors associated with the actual decommissioning such as noise, visual and traffic related impacts; Increased safety risks associated with the decommissioning of the infrastructure; Possible negative impact on the crime levels due to increased unemployment rate; Remnants of possible environmental impacts; and Remaining visual impact as a result of mining.					
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
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 (Colville dump):** Opencast mining/ reclamation of Colville dumps.
6	**Salvage yard (Storage and laydown area).**
7	**Security Gate and guard house at access control point.**
8	**Product Stockpile area.**
9	**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.
10	**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 20 meters. The width of the road is based on an operating width of the haul trucks of 5 meters. Best practice and the guideline from the DMR is to allow for 4 x Operating width of haul truck, in this case 20 meters wide roads. The current access road is deemed adequate for a service road into the mine.
11	**Temporary Workshop Facilities and Wash bay.**
12	**Water distribution Pipeline.**

13	**Water tank :** It is anticipated that the operation will establish 1 x 10 000 litre water tanks with purifiers for potable water.

The criteria used to assess the significance of the impacts are shown in the table 7 below/overleaf. 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 significance 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 8: Significance of impacts is defined as follows.

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

Significance of impacts is defined as follows:

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

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

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

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

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

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

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

Table 9: Explanation of PROBABILITY of impact occurrence

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

Table 10: 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 **Postmasburg area**
4	Regional/District **Regional**	Direct and Indirect impacts affecting environmental elements within District **(ZF-Mgcawu District)**
5	**Provincial**	Direct and Indirect impacts affecting environmental elements in the **Northern Cape Province**

Table 11: 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 12: 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 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. The infrastructure and stockpiles/dumps will alter the topography by adding features to the landscape. Removal of dumps will unearth the current 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 removing of dumps, 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 the area has been converted due to the dumping of the kimberlite material with proper rehabilitation the land capabilities and land use potential can be restored.

Groundwater could be 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 (drainage lines) 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.

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.

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.

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.

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: Very low

Mitigation measures

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

Topography

Level of risk: Low

Mitigation measures

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

Soil erosion

Level of risk: Low

Mitigation measures

- At no point may plant cover be removed within the no-development zones;
- All attempts must be made to avoid exposure of dispersive soils;
- Re-establishment of plant cover on disturbed areas must take place as soon as possible, once activities in the area have ceased;
- Ground exposure should be minimised in terms of the surface area and duration, wherever possible;
- The mining operation must co-ordinate different activities in order to optimise the utilisation of the reclamation of dumps and thereby prevent repeated and unnecessary dumping;
- The soil that is stockpiled during construction should be stock-piled in layers and protected by berms to prevent erosion;
- All stockpiles must be kept as small as possible, with gentle slopes (18 degrees) in order to avoid excessive erosional induced losses;
- Stockpiled soil material are to be stored and bermed on the higher lying areas of the footprint area and not in any storm water run-off channels or any other areas where it is likely to cause erosion, or where water would naturally accumulate;
- Stockpiles susceptible to wind erosion are to be covered during windy periods;
- Audits must be carried out at regular intervals to identify areas where erosion is occurring;
- Appropriate remedial action, including the rehabilitation of eroded areas, must occur;
- Rehabilitation of the erosion channels and gullies;
- The mining operation should avoid land with steep slopes;
- Dust suppression should take place;

- 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;
- 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 in order to ensure that the quality of the topsoil is not impaired;
- Topsoil stockpiles must be kept separate from sub-soils;
- The topsoil should be replaced as soon as possible on to the backfilled areas, thereby allowing for the re-growth of the seed bank contained within the topsoil;
- 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.

Soil pollution

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.

Land capability and land use

Level of risk: Low

Mitigation measures

- Ensure that optimal use is made of the available land through consultation with land owner and proper planning of mining activities.
- Employ effective rehabilitation strategies to restore land capability and land use potential of the Erven.
- All activities to be restricted within the demarcated areas.

Ground water

Level of risk: Low

Mitigation measures

- Training and awareness
  - Make all employees aware of water conservation/water demand management, water pollution avoidance and minimization measures reporting procedure and registry of incidents.
  - Train all employees to reduce water consumption.
  - Make one (1) individual person at a management level responsible for the management of the overall mine water balance. Train departmental heads in the managing of water balance, water pollution and water conservation within their sectors.
  - Train all employees in the implementation of standard operating procedures (SOP's) (e.g. hydrocarbon management, sewerage plant management, monitoring and record keeping).
- Minimise and manage the loss in water resource
- Allow for a safe working environment
- Reduce Waste Material Oxidation Potential
  - Stockpile areas should be cleared as quickly as possible;
  - Continuous monitoring of runoff water quality.

Surface water

Level of risk: Low - Medium

Mitigation measures

- Sufficient care must be taken when handling hazardous materials to prevent pollution.
- If servicing and washing of the vehicles occur on site, there must be specific areas constructed for these activities, which must have concrete foundations, bunding as well as oil traps to contain any spillages.
- A walled concrete platform, dedicated store with adequate flooring or bermed area and ventilation must be used to accommodate chemicals such as fuels, oils, paints, herbicide and insecticides.
- Oil residue shall be treated with oil absorbent and this material removed to an approved waste site.
- Spill kits must be easily accessible and workers must undergo induction regarding the use thereof.
- At all times care should be taken not to contaminate surface water resources.
- Provide bins for staff at appropriate locations, particularly where food is consumed.
- The mining site should be cleaned daily and litter removed.
- Conduct ongoing staff awareness programmes in order to reinforce the need to avoid littering, which can contribute to surface water pollution.
- Only environmental friendly materials must be used during the construction phase to minimize pollution of surface water runoff and/or underground water resources.
- Pipe leakages should be minimized.
- Proper clean and dirty water separation techniques must be used to ensure uncontaminated water returning to the environment.

- Non mining waste i.e. grease, lubricants, paints, flammable liquids, garbage, historical machinery and other combustible materials generated during activities should be placed and stored in a controlled manner in a proper designed area.
- The topography of rehabilitation disturbed areas must be rehabilitated in such a manner that the rehabilitated area blends in naturally with the surrounding natural area. This will reduce soil erosion and improve natural re-vegetation.

Indigenous flora

Level of risk: Low to medium

Mitigation measures

- Footprint areas of the mining activities must be scanned for Red Listed and protected plant species prior to mining;
- It is recommended that these plants are identified and marked prior to mining.
- These plants should where possible, be incorporated into the design layout and left in situ.
- However if threatened of destruction by mining these plants should be removed (with the relevant permits from DAFF and DENC) and relocated if possible.
- All those working on site must be educated about the conservation importance of the fauna and flora occurring on site.
- Minimise the footprint of transformation
- Encourage proper rehabilitation of mined areas
- Encourage the growth of natural plant species (diverse selection of natural plant species).
- Mechanical methods (hand-pulling) of control to be implemented extensively.
- Annual follow-up operations to be implemented.
- Ensure measures for the adherence to speed limit.
- Maintenance of firebreaks;
- No trees felled for firewood;

Alien invasive plants

Level of risk: Low

Mitigation measures

- Minimise the footprint of transformation.
- Encourage proper rehabilitation of mined areas.
- Encourage the growth of natural plant species.
- Mechanical methods (hand-pulling) of control to be implemented extensively.
- Annual follow-up operations to be implemented.

Fauna

Level of risk: Low

Mitigation measures

- 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). No construction personnel or vehicles may leave the demarcated area except those authorized to do so. Those areas surrounding the mine site that are not part of the demarcated development area should be considered as a no go zone for employees, machinery or even visitors.
- 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

Habitat

Level of risk: Low

Mitigation measures

- 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). No construction personnel or vehicles may leave the demarcated area except those authorised to do so.

Air quality

Level of risk: Low-Medium

Mitigation measures

- Vegetation must be removed when soil stripping is required only. These areas should be limited to include those areas required for 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;
    - Reclamation of dumps and rehabilitation of disturbed areas; and

Noise and vibration

Level of risk: Medium

Mitigation measures

- Machinery with low noise levels which complies with the manufacturer's specifications to be used.
- Construction activities to take place during daytime period only.
- Noise monitoring on a quarterly basis.
- Vehicles to comply with manufacturers' specifications and any activity which will exceed 90.0dBA to be done during daytime only.
- Emergency generators to be placed in such a manner that it is away from any residential area.
- 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.
- The siren when conveyor, hauling vehicles area reversing and/or any other mine vehicle to be replaced with a vibrating type siren if it is approved by the Department of Labour.
- Haul roads to be levelled on a regular basis to avoid the formation of potholes.
- 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.
- Actively manage the process and noise and vibration impact assessment to determine compliance to the noise regulations and/or vibration standards. The levels to be evaluated in terms of the baseline noise levels.

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 tailings dumps 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.
- Ensure that the design fits into the surrounding environment and it is aesthetically pleasing.
- 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: Medium

Mitigation measures

- The heritage and cultural resources (e.g. ruins, historic structures, etc.) must be protected and preserved by the delineation of a no go zone.
- Should any further 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-Medium

Mitigation measures

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

- Implement the mitigation measures as proposed in this report.
- As job creation is one of the most pressing socio-economic needs in the local community, through the development of The Retrenchees should focus on SMME development and related local job creation, whilst considering the limitations of the available local skills.
- The Retrenchees should assist their employees to find suitable housing in the towns surrounding the mining area to limit additional impacts on the provision of services and infrastructure by the SPM.
- Assistance in terms of skills development for those that would be employed during the start-up and construction phases of the project, as well as for permanent employees during the operational phase of the project would be necessary. Education is critical to sustain the socio-economic development of the community members living in the area. Continued support for training and capacity building thus remain important.
- Possible SMME links to the mine should be pursued to maximise local business benefits;
- The establishment of a management and monitoring committee to deal with increased social pressure on the local area, as well as increased pressure on the infrastructure and services provision is recommended. Such a committee should not only consist of representatives of The Retrenchees, but all the mining companies operating in the area together with representatives from the Sol Plaatje Local Municipality.
- The development and execution of the Social and Labour Plan should be done in consultation with the Sol Plaatje Local Municipality.
- The Retrenchees should communicate and present their involvement in the community (goodwill, social responsibility, capacity building programmes, skills development, general development support and so forth) to obtain community support.
- Ensuring continued contact and communication between the Retrenchees Mine, the Sol Plaatje Local Municipality, and local community leaders, as well as nearby landowners is critical, especially during the start-up and construction phase, but should also continue for the life of mine.

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 tailings resources has been deposited in this area due to historical mining activities during the 1930's. There is therefore no other alternative with regard to the overall operation footprint.

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 (Colville Kimberlite tailing dump).

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 pans	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; Installing suitable mufflers on engine exhausts and compressor components; Installing acoustic enclosures for equipment causing radiating noise; Installing vibration isolation for mechanical equipment; Re-locate noise sources to areas which are less noise sensitive, to take	Medium

					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.	
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	Very Low
Clean & Dirty water systems:	Surface disturbance Soil contamination Surface water contamination	Soil Surface Water	Construction Commissioning Operational Decommissioning Closure	Low	It will be necessary to divert storm water around dumps areas by construction of a temporary gravel cut-off berm that will prevent surface run-off into the drainage areas. Reclaimed dumps, 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. The defined waterway as indicated has to be protected with a 100m buffer zone and should be preserved as a natural storm water drainage channel. The ecological function of this channel is to collect storm water (sheet flow) during rain events from the area before	Low

					it flows into Kamfersdam downstream. Maintenance of trenches Monitoring and maintenance of oil traps in relevant areas. Drip trays used. Immediately clean hydrocarbon spill. 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 of 100 m 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. Special care needs to be taken during the construction phase to prevent surface storm water rich in sediments and other pollutants from entering the natural drainage systems / wetlands. Effluents and waste should be recycling and re-use as far as possible.	
Fuel Storage facility (Diesel	Groundwater contamination	Soil Groundwater Surface water	Construction Commissioning Operational	Medium	Maintenance of Diesel tanks and bund walls. Oil traps	Low

tanks)	Removal and disturbance of vegetation cover and natural habitat of fauna Soil contamination Surface disturbance		Decommissioning Closure		Drip tray at re-fuelling point. Refuelling must take place in well demarcated areas and over suitable drip trays to prevent soil pollution. Spill kits to clean up accidental spills from earthmoving machinery must be well-marked and available on site. Workers must undergo induction to ensure that they are prepared for rapid clean-up procedures. All facilities where dangerous materials are stored must be contained in a bund wall. Vehicles and machinery should be regularly serviced and maintained.	
Mining Area (Colville dumps).	Dust Noise Removal and disturbance of vegetation cover and natural habitat of fauna Soil contamination Surface disturbance Surface water contamination	Air quality Fauna Flora Groundwater Noise and vibration Soil Surface Water Topography Safety	Commissioning Operational Decommissioning Closure	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; Installing silencers for fans; Installing suitable mufflers on engine exhausts and compressor components; Installing acoustic enclosures for equipment causing radiating noise; Installing vibration isolation for mechanical equipment;	Low

					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 of 100 m 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. Special care needs to be taken during the construction phase to prevent surface storm water rich in sediments and other pollutants from entering the natural drainage systems / wetlands. Effluents and waste should be recycling and re-use as far as possible. The extent of the mining area should be demarcated on site layout plans (preferably on disturbed areas or those identified with low conservation importance). No construction personnel or vehicles may leave the demarcated area except those	

					authorized to do so. Those areas surrounding the mine site that are not part of the demarcated development area should be considered as a no go zone for employees, machinery or even visitors. 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; and The defined waterway as indicated has to be protected with a 100m buffer zone and should be preserved as a natural storm water drainage channel. The ecological function of this channel is to collect storm water (sheet flow) during rain events from the upper reaches before it flows into Kamfersdam.	
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
Security Gate and guard house at access control point	Dust Noise Removal and disturbance of vegetation cover and	Air Quality Fauna Flora Soil	Construction Commissioning Operational Decommissioning Closure	Medium	Access control Maintenance of boom gates and entrance Dust control and monitoring Noise control and monitoring Immediately clean hydrocarbon spill	Low

	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; Installing silencers for fans; Installing suitable mufflers on engine exhausts and compressor components; Installing acoustic enclosures for equipment causing radiating noise; Installing vibration isolation for mechanical equipment; 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.	
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	Medium	Dust Control and monitoring Noise control and monitoring Drip trays Storm water run-off control Immediately clean hydrocarbon spills Rip disturbed areas to allow re-growth of vegetation cover Noise control Well maintained equipment Selecting equipment with lower sound power levels; Installing silencers for fans; Installing suitable mufflers on engine exhausts and compressor components; Installing acoustic enclosures for equipment causing radiating noise; Installing vibration isolation for	Low

					mechanical equipment; 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	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 Surface disturbance	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; Installing silencers for fans; Installing suitable mufflers on engine exhausts and compressor components; Installing acoustic enclosures for equipment causing radiating noise; Installing vibration isolation for mechanical equipment;	Low

					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.	
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: 1 X 10 000 litre water tanks and purifiers for	Surface disturbance	Fauna Flora Surface Water	Construction Commissioning Operational Decommissioning Closure	Medium	Maintain water tanks and structures	Low

potable water.						

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
Ecological Assessment Report by Dr. B Milne February 2017 **Annexure C**	Three plant communities were identified on site of which all are included in the core mining areas. The drainage ways, woodland community and the dump are considered to be of very high, medium and low sensitivity, respectively. The most profound impacts are expected to be related to the destruction of trees and herbaceous vegetation associated with the woodland habitat, especially in terms of habitat loss for the rich bird population found here. Furthermore, the large extent of declared weeds currently found on site is a cause of concern, but the mining operation could contribute significantly to future land use and ecological integrity if these species are eradicated and controlled during the life of the operation. Any disturbances to the drainage ways is also expected to, in turn, cause cumulative fragmentation of important ecological corridors in the area and impair the hydrological regime. No species of conservation concern were encountered during the survey. However, due to limited access to the site and the lush herbaceous cover it is possible that these species could have been overlooked. Numerous species, especially bulbs are known from the region and therefore could potentially occur on site. The mining operation will result in the large-scale clearance of indigenous vegetation. A permit application regarding protected flora as well as the harvesting of indigenous vegetation need to be lodged with the Northern Cape Department of Environment and Nature Conservation prior to any clearance of vegetation. No nationally protected trees were found on site, but it is possible for small individuals of V. erioloba to occur among the trees of the woodland community. It is advisable that the affected areas are scanned, prior to any invasive activities and that a licence application regarding protected trees should be lodged with Department of Agriculture, Forestry and Fisheries prior to any potential disturbances to these trees. To conclude, it is clear that the destruction of the natural habitat, especially for the bird population, within the study area is inevitable. The significance of the impacts will be affected by the success of the	X	Contained in the mitigation measures and EMPR

	mitigation measures implemented and the rehabilitation programme for the mining area. The majority of the site was subjected to previous mining activities which transformed the natural habitat and therefore additional impacts by the Colville Dump operation in these areas are not expected to cause major degradation of ecological integrity. In my opinion the proposed activities can continue in these areas. However, authorisation should be granted on condition that the applicant commits to the adherence of effective avoidance, management, mitigation and rehabilitation measures.		
PHASE 1 HERITAGE IMPACT ASSESSMENT REQUESTED IN TERMS OF SECTION 38 OF THE NATIONAL HERITAGE RESOURCES ACT NO 25/1999 FOR MINING RIGHTS AT THE 2005 AND 2007 RETRENCHEES – KIMBERLEY MINES TRUST, KIMBERLEY, NORTHERN CAPE PROVINCE Prepared by Edward Matenga (MPhil, Archaeology; PhD Archaeology &Heritage, Uppsala/Sweden) January 2017 **Annexure B**	Recommendations are made to protect historically significant remains of buildings which are likely to be affected by the proposed development. The project may go ahead subject to the precautions stated above. If heritage resources were to be found during the mining phase, the procedure is approach the relevant heritage authorities (SAHRA and/or the Provincial Heritage Resources Authority).	X	Contained in the mitigation measures and EMPR

Attach copies of the Specialist Reports as appendices (All studies attached as Annexures from A – C)

k) Environmental impact statement

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

- The Processing plant may have a medium impact on air quality, fauna, flora, noise, soil and surface water after mitigation.
- The Ablution facilities will have a very low impact on groundwater and soil in case of an emergency spill after mitigation.
- The Clean & Dirty water systems may have a low impact on groundwater, soil and surface water after mitigation.
- The Fuel Storage facility (Diesel tanks) may have a low impact on groundwater, soil, and surface water after mitigation.
- The Mining Area (Colville dump) may have a medium impact on air quality fauna, flora, noise, soil, surface water and topography after mitigation.
- The Salvage yard (Storage and laydown area) may have a low impact on fauna, flora, groundwater, soil and surface water after mitigation.
- The Security Gate and guard house at access control point may have a low impact on air quality, fauna, flora and soil after mitigation.
- The Product Stockpile area may have a low impact on air quality, fauna, flora, noise, soil and surface water after mitigation.
- The waste disposal site (domestic and industrial waste) may have a low impact on groundwater, soil, and surface water after mitigation.
- The Roads (both access and haulage road on the mine site) may have a low impact on air quality, fauna, flora, noise, soil and surface water after mitigation.
- The Workshop and Wash bay may have a low impact on groundwater, soil and surface water after mitigation.
- The Water distribution Pipeline may have a low impact on fauna, flora, and surface water after mitigation.
- The Water tanks may have a low impact on fauna, flora, and surface water after mitigation.

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

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

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

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

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

In general, the environmental impacts associated to the mining operation are rather negative, while the social impacts are more beneficial. Impacts on vegetation are likely to be most profound, because the mining operation will constitute large-scale clearance of indigenous vegetation and most likely also the removal of protected species if any are encountered. The specialist study indicated no protected species. Soil erosion and surface water deterioration are likely to be possible important impacts if appropriate management strategies are not practised.

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

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

(ii) Final Site Map;

Provide a map at an appropriate scale which superimposes the proposed overall activity and its associated structures and infrastructure on the environmental sensitivities of the preferred site indicated any areas that should be avoided, including buffers. Attach as **Appendix (Figure 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. The sensitive areas include the non-perennial drainage lines (waterways) and ruins.

The defined waterway as indicated has to be protected with a 100m buffer zone and should be preserved as a natural storm water drainage channel. The ecological function of this channel is to collect storm water (sheet flow) during rain events from the area before it flows into Kamfersdam.

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

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;

Please see Final Site Map below.

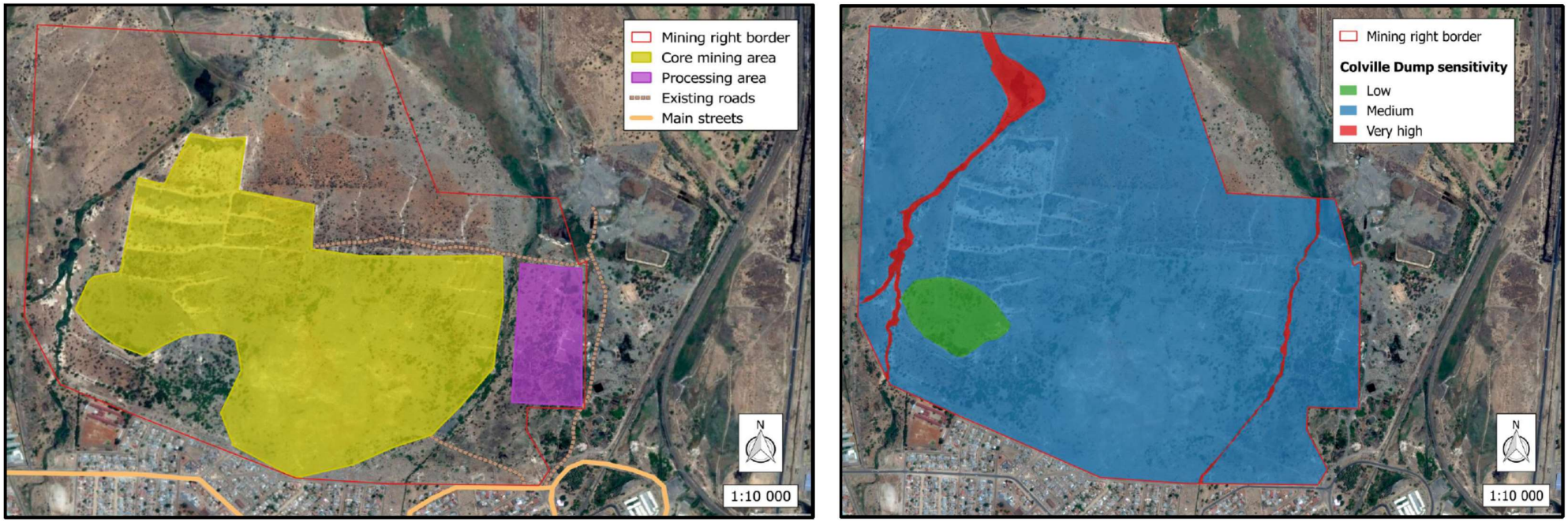


Figure 13: Final Site Surface layout map with sensitivity map on the right side (Dr. B Milne, Ecological report).

(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 residential living and (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 31 jobs and will also add to the increased economic activity and the area surrounding the erven.

Older dumps, 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 stockpiles/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 reclamation of dumps, 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 (drainage lines) 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, activities on the

residential areas 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 Colville 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;
- Support to the Local Municipality in respect of service delivery and infrastructure development/maintenance through the implementation of the Social and Labour Plan of the Retrenchees;
- Economic and revenue contribution to the local municipal area, as well as the Frances Baard District and adjacent municipalities;
- The involvement of The Retrenchees with regards to training and capacity building of its employees and subsequent improvement of the livelihoods of the employees' families, as well as its efforts in sustaining the socio-economic development of the communities in close proximity to the operation;
- The involvement of The Retrenchees 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 Retrenchees 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 worke 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 being 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.
- 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.
- Buffer zones must be placed around all non-perennial drainage lines in which no mining may take place.

Topography

- All reclaimed dumps 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
- Reclaimed dumps must be subject to progressive controlled dumping 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 Retrenchees 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.
- The non-perennial stream is classified as a water system according to GN704 and is a natural storm water accumulation stream. No water system shall be mined before an authorization is obtained from DWS. This water system will however not be mined.
- Rehabilitation of disturbed areas during the 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 locality of this Mining area is based on the old existing Mining area, mined since the 1930's and much of the area has been previously disturbed. The footprints of most infrastructures were chosen to utilize old disturbance and minimize new footprints. There is therefore no other alternative with regard to the overall operation footprint.

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. The property was already under a Mining right held by De Beers.

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 reclamation of diamonds in dumps (i.e. dump workings) is the only economic viable method currently being used by the diamonds fraternity. There is no alternative mining method for the mining of diamonds in kimberlite dumps.

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 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 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. 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 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 guarantee 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 streams which may be impacted by the mining activity are non-perennial. Monitoring takes place by collecting surface water samples during the rainy season at a frequency of once a month if possible.

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 depressions. This should be done by the monitoring of all areas until a closure certificate has been issued.

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

Maintenance (Aftercare):

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

After-effects Following Closure:

Acid Mine Drainage: No potential for bad quality leachate or acid mine drainage development is associated with diamond mine closure.
Long Term Impact on Ground Water: No after effect on the groundwater yield or quality is expected.

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

q) Period for which the Environmental Authorisation is required

5 years. Thus the period required is for the Life of Mine of the Mining Right.

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 2005 AND 2007 RETRENCHEES-KIMBERLEY MINES TRUST Mine site as it stands currently (risking premature rehabilitation) is estimated to be R1 763 284.00 according to the DMR calculations.

No.	Description	Unit	A	B	C	D	E=A*B*C*D
			Quantity	Master	Multiplicatio	Weighting	Amount
1	Dismantling of processing plant and related structures (including overland conveyors and powerlines)	m3	1200	12.99	1	1	15588
					1	1	
2 (A)	Demolition of steel buildings and structures	m2	3300	180.92	1	1	597036
2(B)	Demolition of reinforced concrete buildings and structures	m2	250	266.61	1	1	66652.5
3	Rehabilitation of access roads	m2	10000	2	1	1	20000
4 (A)	Demolition and rehabilitation of electrified railway lines	m	0	314.22	1	1	0
4 (A)	Demolition and rehabilitation of non-electrified railway lines	m	0	171.39	1	1	0
5	Demolition of housing and/or administration facilities	m2	250	361.83	1	1	90457.5
6	Opencast rehabilitation including final voids and ramps	ha	0	184152.88	0.52	1	0
7	Sealing of shafts adits and inclines	m3	0	97.12	1	1	0
8 (A)	Rehabilitation of overburden and spoils	ha		126450.38	1	1	0
8 (B)	Rehabilitation of processing waste deposits and evaporation ponds (non-polluting potential)	ha	0.25	157491.66	1	1	39372.915
					1		
8 (C)	Rehabilitation of processing waste deposits and evaporation ponds (polluting potential)	ha	0	457430.43	1	1	0
					1	1	
9	Rehabilitation of subsided areas	ha	0	105883.15	1	1	0
10	General surface rehabilitation	ha	5	100170.03	1	1	500850.15
11	River diversions	ha	0	100170.03	1	1	0
12	Fencing	m	0	114.26	1	1	0
13	Water management	ha	0	38087.46	1	1	0
14	2 to 3 years of maintenance and aftercare	ha	0	13330.61	1	1	0
15 (A)	Specialist study	Sum	0		1	1	0
15 (B)	Specialist study	Sum	0		1	1	0
					Sub Total 1		1329957.065
1	Preliminary and General		79797.4239		weighting factor 2		83787.2951
					1.05		
2	Contingencies		132995.7065				132995.7065
					Subtotal 2		1546740.07
					VAT (14%)		216543.61
					Grand Total		1763284

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 Retrenchees 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)

A Heritage Impact Assessment (HIA) was carried out in terms of Section 38 of the National Heritage Resources Act (No 25 of 1999) to locate sites of heritage significance and assess potential adverse impacts of the proposed mining right for the Kimberley Mines Trust in an area in Kimberley called the 2005 and 2007 Retrenchees. The report is culmination of fieldwork conducted in November 2016.

Six sites were recorded. A colour scheme is used to rank the magnitude of perceived impacts and risk of the proposed development. Appropriate interventions and mitigation strategies are also proposed.

	Ranking	Explanation	No of Sites
1	High	National and Provincial heritage sites (Section 7 of NHRA). All burials including those protected under Section 36 of NHRA. They must be protected.	0
2	Medium A	Substantial archaeological deposits, buildings protected under Section 34 of NHRA. Footprint of early modern mining. These may be protected at the recommendations of a heritage expert.	3
3	Medium B	Sites exhibiting archaeological characteristics of the area, but do not warrant further action after they have been documented.	0
4	Low	Heritage sites deemed of less importance. Decisions on mitigation will be made by a heritage expert including options for destruction with or without salvage.	4
		TOTAL	7

The following is a list of the sites and the risk ranking:

SITE	LATITUDE	LONGITUDE	DESCRIPTION
S1	28°42'22.3"S	24°46'12.5"E	Mine plant components
S2a	28°42'36.80"S	24°46'6.90"E	Foundation remains of building, eucalyptus
S2b	28°27'36.8"S	24°46'09.6"E	Foundation remains of building, eucalyptus
S3	28°42'38.36"S	24°45'52.98"E	Kimberlite discard
S4	28°42'38.00"S	24°45'51.10"E	Exposures of industrial/household waste
S5	28°42'31.21"S	24°45'24.59"E	Ramp for offloading material onto screens
S6	28°42'25.54"S	24°45'17.20"E	Tailing - 2nd mining phase

General Observations

The existing landscape at the Retrenchees represents the cumulative impact of three mining phases spanning nearly 150 years.

(i) The first phase is identified with the early “Rush” which has been described in Sections 3.4 and 4.5. The foundation remains of buildings which were seen and recorded during the survey are likely to date back to this period from the 1870s.

(ii) The second phase is defined by the introduction of new advanced methods of separating the diamond from the Kimberlite rock. With the information to hand it has not been possible to pinpoint the time of the transition in the last century. This necessitated reworking of tailings and further opencast operations in the area, until 2005-2007 when De Beers closed the mine.

(iii) De Beers had expressed intention to hand over the land for development for public good.[4] However soon after closure unlicensed operations started setting in the third phase (from around 2007) which has continued to the present. Many small holes have been opened with the screening for the mineral done on site. The operators can be seen working as individuals or in groups. Because of the unregulated nature of the operations the area has become a crime hotspot. Dumping of household and industrial waste in the south-eastern part of the property indicates lack of environmental monitoring. Both these activities have combined to accelerate degradation and to create a social landscape which stokes crime.

(i) The foundation remains of buildings which appear to date to the first mining phase (S2a and S2b). The sites are 30m apart, with 7 mature eucalyptus standing in the same area, are worth retaining and incorporating into the landscape of the proposed mine offices.

(ii) The broken plant components (S1): A local museum may be approached to assess their value as relics of the mining history of Kimberley. Since it was apparent that they have been deposited there recently, their present provenance is not important and preservation in situ is therefore not necessary.

(iii) The mixture of household and industrial waste exposed by the holes of recent unlicensed miners indicate a disturbed provenance as a result of the first two mining events (S4). However this might be of interest to students of industrial and historical archaeology. Relevant departments in local museums and universities may be approached to run test pits if they are interested.

(iv) Part of the relict ramp and concrete floor at the bottom (S6) may be preserved in part or as whole as representing the mineral screening process during the second mining phase.

Recommendation and Conclusions

Recommendations are made to protect historically significant remains of buildings which are likely to be affected by the proposed development.

[4] Luke Mason, Pers. Comm. November 2016.

The project may go ahead subject to the precautions stated above. If heritage resources were to be found during the mining phase, the procedure is approach the relevant heritage authorities (SAHRA and/or the Provincial Heritage Resources Authority).

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.

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)

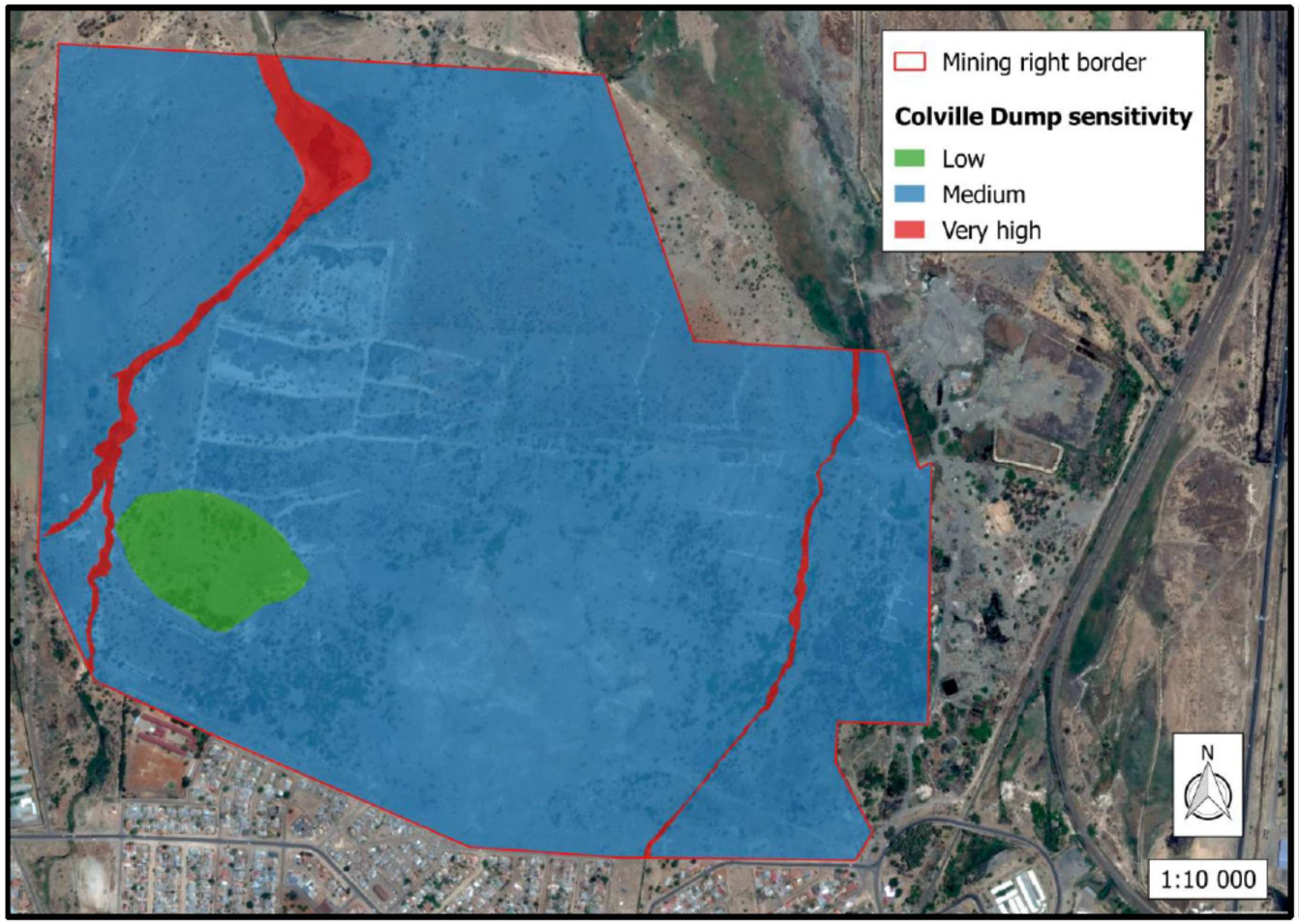


Figure 14: A sensitivity map for the proposed mining area.

d) Description of impact management objectives including management statements

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

The main closure objectives of the Company's planned 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**

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

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

Management principles pertaining to Mine Residue dump include:

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

Maintenance

The necessary agreements and arrangement will be made by the Retrenchees 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, the Retrenchees 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 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:

- The Retrenchees 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.
- The Retrenchees 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 and the management of downscaling as contained in the SLP.

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 is won't be a need for this, as based on the specialist reports.

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 on Erf 4811, and doing controlled dumping on Erf 4811 as part of the rehabilitation process.

It must however be noted that the water supply to the activities will be sourced from the nearby Kamfersdam free of charge from the Sol Plaatjie Municipality. The only cost will be the pumping cost.

The processing plant (diamond pans) 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 nearby Kamfersdam free of charge from the Sol Plaatjie Municipality. The only cost will be the pumping cost. (In terms of the commercial agreement the Erven (Erf 4815, Erf 4812, Erf 5024) must be cleared within five years. Erf 4811 will be used for all processing and dumping operations that have been secured from the Municipality.)

viii) Has a water use licence been applied for?

A new WULA application has been prepared and are in the final stages to be submitted. 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.
Processsing Plant 2X 16 feet pans	Construction Commissioning Operational Decommissioning Closure	12.7418ha 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	250m² or 0.25ha	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	The surface width of the haul road is 15m. The filling layer works will consist of imported gravel layers (G6 quality), compacted in layers not exceeding 150mm thickness. The base and sub-base layer will consist of G5 quality material compacted to the Engineer's specifications. Erosion protection is provided by prescribing the installation of gabions on the upstream and downstream slopes of the filling. This area also includes the re-fuel and lubrication station, wash bay and office area. Due to the nature of	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)

		activity in this area, lining of this catchment dam is proposed. This canal will collect the dirty storm water runoff from the dumps from where the dirty water will gravitate towards the storm water collection dam. This proposed canal will also prevent clean water runoff from entering the dirty storm water system. The storage water will be used for mining activities for example dust suppression, mining process, wash bay, etc.			
Fuel Storage facility (Diesel tanks)	Construction Commissioning Operational Decommissioning Closure	3000m² 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 (Colville dump).	Commissioning Operational Decommissioning	Provision is made for a maximum footprint (at full production) of	No dumping of materials prior to approval by		Upon cessation of the individual activity (continuous rehabilitation)

	Closure	40 hectares of reclaimation of dumps at any one time.	exploration geologist; Proper planning of excavations Access control Dust control and monitoring Noise control and monitoring Continuous rehabilitation Stormwater run-off control Immediately clean hydrocarbon spill Drip trays Dump control and monitoring Erosion control		
Salvage yard (Storage and laydown area)	Construction Commissioning Operational Decommissioning Closure	5000m² or 0.5 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.
Security Gate and guard house at access control point	Construction Commissioning Operational Decommissioning Closure	2000m² or 0.2ha Concrete, bricks, steel and levelled parking area.	Access control Maintenance of boom gates and entrance Dust control and monitoring Noise control and monitoring Immediately clean hydrocarbon spill Rip disturbed areas to allow re-growth of vegetation cover		Removal and breaking down of building and boom gate upon closure of the mining right.
Product Stockpile	Commissioning	Provision is made for	Dust control and		Ripping of stockpile area

area	Operational Decommissioning Closure	a maximum footprint (at full production) of 500m² for the stockpile area at any one time.	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		upon closure of 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 = 1000m x 20m (wide) = 20 000m²	Maintenance of roads Dust control and monitoring Noise control and monitoring Speed limits Storm water run-off control Erosion control Immediately clean hydrocarbon spills Rip disturbed areas to allow re-growth of vegetation cover		Upon cessation of the individual activity (continuous rehabilitation) Ripping of roads upon closure of the mining right.
Workshop and Wash bay	Construction Commissioning Operational Decommissioning	5000m² Concrete and Steel	Concrete floor with oil/water separator Storm water run-off control		Removal of wash bay equipment, breaking and removal of rubble from the concrete floors and bund

	Closure		Immediately clean hydrocarbon spills		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 2X 16 feet pans	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; Installing silencers for fans; Installing suitable mufflers on engine exhausts and compressor components; Installing acoustic enclosures for equipment causing radiating noise; Installing vibration isolation for mechanical equipment;	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.

				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 of 100 m 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. Special care needs to be taken during the construction phase to prevent surface storm water rich in sediments and other pollutants from entering the natural	

				drainage systems / wetlands. 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 plants on closure	Minimize the potential for a chemical spill on soil, which could infiltrate to groundwater.
Clean & Dirty water systems:	Surface disturbance Groundwater Contamination Soil contamination Surface water contamination	Soil Groundwater Surface Water	Construction Commissioning Operational Decommissioning Closure	It will be necessary to divert storm water around dump areas by construction of a temporary gravel cut-off berm that will prevent surface run-off into the mining area. Older dumps, 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. The defined waterway as indicated has to be	Safety ensured. Minimize potential for hydrocarbon spills to infiltrate into groundwater. Rehabilitation standards and closure objectives to be met.

				protected with a 100m buffer zone and should be preserved as a natural storm water drainage channel. The ecological function of this channel is to collect storm water (sheet flow) during rain events from the area before it flows into Kamfersdam. Maintenance of trenches 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 infrastructure is effective in controlling erosion. Maintain a buffer zone of 100 m around the streams. Note that these buffer zones are essential to ensure healthy functioning and maintenance of wetland. 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. Special care needs to be taken during the construction phase to prevent surface storm water rich in sediments and other pollutants from entering the natural drainage systems / wetlands. Effluents and waste should be recycling and re-use as far as possible.	
Fuel Storage facility (Diesel tanks)	Groundwater contamination Removal and disturbance of vegetation cover and natural habitat of fauna Soil contamination Surface disturbance	Soil Groundwater Surface water	Construction Commissioning Operational Decommissioning Closure	Maintenance of Diesel tanks and bund walls. Oil traps Drip tray at re-fuelling point. Refuelling must take place in well demarcated areas and over suitable drip trays to prevent soil pollution. Spill kits to clean up accidental spills from earthmoving machinery must be well-marked and available on site. Workers must undergo induction to ensure that they are prepared for rapid clean-up procedures. All facilities where	Minimize potential for hydrocarbon spills to infiltrate into groundwater. Rehabilitation standards and closure objectives to be met.

				dangerous materials are stored must be contained in a bund wall. Vehicles and machinery should be regularly serviced and maintained.	
Mining Area (Colville Dump)).	Dust Noise Removal and disturbance of vegetation cover and natural habitat of fauna Soil contamination Surface disturbance Surface water contamination	Air quality Fauna Flora Groundwater Noise and vibration Soil Surface Water Topography Safety	Commissioning Operational Decommissioning Closure	Access control Dust control and monitoring Noise and vibration control and monitoring Continuous rehabilitation Storm water run-off control Immediately clean hydrocarbon spill Drip trays Dump stability control and monitoring Erosion control Noise control Well maintained equipment Selecting equipment with lower sound power levels; Installing silencers for fans; Installing suitable mufflers on engine exhausts and compressor components; Installing acoustic enclosures for equipment causing radiating noise; Installing vibration isolation for mechanical equipment; Re-locate noise sources to areas which are less noise sensitive, to take advantage of distance and natural shielding;	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.

				Taking advantage during the design stage of natural topography as a noise buffer; Develop a mechanism to record and respond to complaints. Maintain a buffer zone of 100 m around the streams. Note that these buffer zones are essential to ensure healthy 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. Special care needs to be taken during the construction phase to prevent surface storm water rich in sediments and other pollutants from entering the natural drainage systems / wetlands. 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). No construction personnel or vehicles may leave the demarcated area except those authorized to do so. Those areas surrounding the mine site that are not part of the demarcated development area should be considered as a no go zone for employees, machinery or even visitors. 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. Older dumps, 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. The defined waterway as indicated has to be protected with a 100m buffer zone and should be preserved as a natural storm water drainage	

				channel. The ecological function of this channel is to collect storm water (sheet flow) during rain events from the area before it flows into Kamfersdam.	
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.
Security Gate and guard house at access control point	Dust Noise Removal and disturbance of vegetation cover and natural habitat of fauna Surface disturbance	Air Quality Fauna Flora Soil	Construction Commissioning Operational Decommissioning Closure	Access control Maintenance of boom gates and entrance Dust control and monitoring Noise control and monitoring Immediately clean hydrocarbon spill Rip disturbed areas to allow re-growth of vegetation cover. Noise control Well maintained equipment Selecting equipment with lower sound power levels; Installing silencers for fans; Installing suitable mufflers	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.

				on engine exhausts and compressor components; Installing acoustic enclosures for equipment causing radiating noise; Installing vibration isolation for mechanical equipment; 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.	
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 Selecting equipment with lower sound power levels; Installing silencers for fans; Installing suitable mufflers on engine exhausts and	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.

				compressor components; Installing acoustic enclosures for equipment causing radiating noise; Installing vibration isolation for mechanical equipment; 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 and natural habitat of fauna Soil contamination	Air quality Fauna Flora Noise and vibration Soil Surface water	Construction Commissioning Operational Decommissioning Closure	Maintenance of roads Dust control and monitoring Noise control and monitoring Speed limits Storm water run-off control Erosion control Immediately clean hydrocarbon spills Rip disturbed areas to allow re-growth of vegetation	Dust levels minimized Minimize potential for hydrocarbon spills to infiltrate into groundwater Noise levels minimized Rehabilitation standards and closure objectives met. Erosion potential minimized.

	Surface disturbance			cover Noise control Well maintained equipment Selecting equipment with lower sound power levels; Installing silencers for fans; Installing suitable mufflers on engine exhausts and compressor components; Installing acoustic enclosures for equipment causing radiating noise; Installing vibration isolation for mechanical equipment; 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.	
Workshop and	Removal and	Groundwater	Construction	Concrete floor with oil/water	Minimize potential for

Wash bay	disturbance of vegetation cover and natural habitat of fauna Soil contamination	Soil Surface water	Commissioning Operational Decommissioning Closure	separator Storm water run-off control Immediately clean hydrocarbon spills	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 pans	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; Installing silencers for fans; Installing suitable mufflers on engine exhausts and compressor components;	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. • Environmental Awareness

		Installing acoustic enclosures for equipment causing radiating noise; Installing vibration isolation for mechanical equipment; 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 of 100 m 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. Special care needs to be taken during the construction phase to prevent surface storm water rich in sediments and other pollutants from entering the natural drainage systems / wetlands. Effluents and waste should be recycling and re-use as far as possible.		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	It will be necessary to divert storm water around dump areas by construction of a temporary gravel	Upon cessation of the individual activity (continuous rehabilitation)	The following must be placed at the site and is applicable to all

	Contamination Soil contamination Surface water contamination	cut-off berm that will prevent surface run-off into the mining area. Older dumps, 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. The defined waterway as indicated has to be protected with a 100m buffer zone and should be preserved as a natural storm water drainage channel. The ecological function of this channel is to collect storm water (sheet flow) during rain events from the area before it flows into Kamfersdam. Maintenance of trenches 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	Levelling of stormwater berms upon closure of Mining Right	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.

		check that the associated water management infrastructure is effective in controlling erosion. Maintain a buffer zone of 100 m around the streams. Note that these buffer zones are essential to ensure healthy functioning and maintenance of wetland. 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. Special care needs to be taken during the construction phase to prevent surface storm water rich in sediments and other pollutants from entering the natural drainage systems / wetlands. 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	Maintenance of Diesel tanks and bund walls. Oil traps Drip tray at re-fuelling point. Refuelling must take place in well demarcated areas and over suitable drip trays to prevent soil pollution. Spill kits to clean up accidental spills from earthmoving machinery must be well-marked and	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 • COP's • SOP's

	Surface disturbance	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.		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 (Colville Dump).	Dust Noise Removal and disturbance of vegetation cover and natural habitat of fauna Soil contamination	Access control Dust control and monitoring Noise and vibration control and monitoring Continuous rehabilitation Storm water run-off control Immediately clean hydrocarbon spill Drip trays Dump stability control and monitoring Erosion control	Upon cessation of the individual activity (continuous rehabilitation)	The following must be placed at the site and is applicable to all activities: • Relevant Legislation; • Acts; • Regulations • COP's • SOP's

	Surface disturbance Surface water contamination	Noise control Well maintained equipment Selecting equipment with lower sound power levels; Installing silencers for fans; Installing suitable mufflers on engine exhausts and compressor components; Installing acoustic enclosures for equipment causing radiating noise; Installing vibration isolation for mechanical equipment; 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 of 100 m 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. Special care needs to be taken		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.

		during the construction phase to prevent surface storm water rich in sediments and other pollutants from entering the natural drainage systems / wetlands. 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). No construction personnel or vehicles may leave the demarcated area except those authorized to do so. Those areas surrounding the mine site that are not part of the demarcated development area should be considered as a no go zone for employees, machinery or even visitors. 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 therefore be necessary to divert storm water around dump areas by construction of a berm that will prevent surface run-off into the drainage channels. Older dumps, 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. The defined waterway as indicated has to be protected with a 100m buffer zone and should be preserved as a natural storm water drainage channel. The ecological function of this channel is to collect storm water (sheet flow) during rain events from the area before it flows into Kamfersdam downstream.		
Salvage yard (Storage and laydown area)	Surface Water contamination Groundwater contamination Removal and	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;

	disturbance of vegetation cover and natural habitat of fauna Soil contamination Surface disturbance Surface water contamination			• 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.
Security Gate and guard house at access control point	Removal and disturbance of vegetation cover and natural habitat of fauna Surface disturbance	Access Control Maintenance of fence	Access control Maintenance of boom gates and entrance Dust control and monitoring Noise control and monitoring Immediately clean hydrocarbon spill Rip disturbed areas to allow re-growth of vegetation cover. Noise control Well maintained equipment Selecting equipment with lower	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.

			sound power levels; Installing silencers for fans; Installing suitable mufflers on engine exhausts and compressor components; Installing acoustic enclosures for equipment causing radiating noise; Installing vibration isolation for mechanical equipment; 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.	
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; Installing silencers for fans; Installing suitable mufflers on engine exhausts and compressor components; Installing acoustic enclosures for equipment causing radiating noise;	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.

			Installing vibration isolation for mechanical equipment; 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 Surface Water contamination Contamination of soil Surface water contamination	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 • 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 Groundwater contamination Noise Removal and disturbance of vegetation cover and natural habitat of fauna Soil contamination Surface disturbance	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; Installing silencers for fans; Installing suitable mufflers on engine exhausts and compressor components; Installing acoustic enclosures for equipment causing radiating noise; Installing vibration isolation for mechanical equipment; 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	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; • 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

		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.		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 Removal and disturbance of vegetation cover and natural habitat of fauna Soil contamination	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	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 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.

The Retrenchees 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.

The Retrenchees 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.

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

The Retrenchees will ensure that the mining site is closed efficiently and cost effectively.

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

The Retrenchees will ensure that the interest of all interested and affected parties will be considered.

The Retrenchees 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.

Socio-Economic conditions as identified in the Social and Labour Plan:

The objectives of the social and labour plan are to:

- Promote employment and advance the social and economic welfare of all South Africans;
- Contribute to the transformation of the mining industry; and
- Ensure that the holder of mining rights contribute towards the socio-economic development of the areas in which they are operating.

Historical and Cultural aspects:

The operation on the Erf was part of an existing mining Right. The mining area has been disturbed by previous mining activities.

A number of sites of cultural (archaeological and historical) heritage significance were found in the area. Some of the historical sites are related to past mining activities on Colville.

The sites are of low to high significance.

Finally, it should be noted that the subterranean presence of archaeological and/or historical sites, features or artifacts are always a distinct possibility. Care should therefore be taken during any development activities that if any of these are accidentally discovered, a qualified archaeologist be called in to investigate.

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

The Retrenchees and De Beers the surface owner have been in consultation which is still ongoing. A public meeting was conducted on the closure objectives, the agreement with De Beers stipulates that the erwen should be cleared within 5 years.

(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.

Please refer to Figure 2.

Infrastructure Areas:

On completion of the mining operation, the various surfaces, including the access road, the office area, storage areas and the screening plant site, will finally be rehabilitated as follows:-

- The MRD will be rehabilitated in situ. All remaining material on the surface will be removed to the original topsoil level. This material will then be backfilled into the depressions. 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, screening 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, which states:-
  1. *Regulation 44: When a prospecting right, mining right, retention permit or mining permit lapses, is cancelled or is abandoned or when any prospecting or mining operation comes to an end, the holder of such right or permit may not demolish or remove any building, structure or object –*
     (a) which may not be demolished or removed in terms of any other law;
     (b) which has been identified in writing by the Minister for purposes of this section; or
     (c) which is to be retained in terms of an agreement between the holder and the owner or occupier of the land, which agreement has been approved by the Minister in writing.
  2. *The provision of subsection (1) does not apply to bona fide mining equipment, which may be removed.*

Topsoil and Stockpile Deposits:

- Disposal Facilities:-
  Waste material of all description inclusive of receptacles, scrap, rubble and tyres will be removed entirely from the mining area and disposed of at a recognized landfill facility. It will not be permitted to be buried or burned on the site.
- Ongoing Seepage, Control of Rain Water:-
  Monitoring will be undertaken during the 3 year post rehabilitation aftercare and maintenance period.
- Long Term Stability and Safety:-
  It will be the objective of mine management to ensure the long term stability of all rehabilitated areas including the backfilled depressions. This will 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 planned.

Final Rehabilitation Roads:-

- After rehabilitation has been completed, all roads will be ripped or ploughed, fertilized and seeded, 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.

Maintenance (Aftercare):-

- Maintenance after closure will mainly concern 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 will be to create an acceptable post-mine environment and land-use. Therefore all agreed commitments will be implemented by Mine Management.

After-effects Following Closure:-

- Acid Mine Drainage:-
  No potential for bad quality leach ate or acid mine drainage development exists after mine closure.
- Long Term Impact on Ground Water:-
  No after effect on the groundwater yield or quality is expected as no groundwater will be used or abstracted.
- Long-term Stability of Rehabilitated Land:-
  One of the main aims of any rehabilitated ground will be to obtain a self-sustaining and stable end result. Cleaning of all tailings material concurrently and replacing of topsoil where available.

(d) Explain why it can be confirmed that the rehabilitation plan is compatible with the 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 / residential use 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 reclamation of dumps of the final waste material and the 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 2005 AND 2007 RETRENCHEES-KIMBERLEY MINES TRUST Mine site as it stands currently (risking premature rehabilitation) is estimated to be R1 763 284.00 according to the DMR calculations. The detailed calculation of additional costs is shown in Table 13 and DMR quantum is presented in Table 14. The total rehabilitation costing is based on the assumption that the old slimesdam and tailings dump is the reserve and the application is also for diamonds in kimberlite tailings dump.

Table 13. Description of the relevant 2005 AND 2007 RETRENCHEES-KIMBERLEY MINES TRUST Mine rehabilitation components as prescribed in DMR guidelines.

Rehabilitation component	DMR guideline terms	Colville Mine context
Dismantling of processing plants and related structures (including overland conveyors and powerlines)		1200m³
Demolition of steel buildings and structures		3300m²
Demolition of reinforced concrete buildings and structures	No specific terms/recommendations provided.	250m²
Rehabilitation of access roads	No specific terms/recommendations provided.	1ha a rate of R2 per m² has been used after a test was done on the grading of an 1 ha road

		surface.
Rehabilitation of processing waste deposits and evaporation ponds non-polluting potentials)		506489.93 m²(50.648ha) This is the reserve being applied for to rework and will not be calculated.
Demolition of housing and administrative facilities		250m²
Opencast rehabilitation including final voids and ramps	Some form of beneficial land use is desirable after mining. Hence, in-filling of opencast pits is advocated. However, in cases where notably less material remains on site for pit in-filling, final voids should be made safe. Costing includes sloping perimeter walls, shaping and grassing and also includes surveying and geotechnical fees.	50365.91 m² (5.036) ha This is historic excavations and will be used for backfilling and to level the Erf as per agreement with De Beers.
Rehabilitation of overburden and spoils	Overburden and spoils need to be shaped to create a stable landform. Costing includes shaping and grassing or vegetation of the overburden and spoils.	83663.95m² (8.36ha)
General surface rehabilitation	Final surface rehabilitation of areas disturbed by mining and related activities should be aligned to the selected final land use and should ensure that the surface topography is restored, runoff risk ameliorated and structures removed in order to encourage revegetation. The unit cost for general rehabilitation allows for shaping and landscaping of disturbed areas.	5ha

Table 14: Financial Quantum

No.	Description	Unit	A	B	C	D	E=A*B*C*D
			Quantity	Master	Multiplicatior	Weighting	Amount
1	Dismantling of processing plant and related structures (including overland conveyors and powerlines)	m3	1200	12.99	1	1	15588
					1	1	
2 (A)	Demolition of steel buildings and structures	m2	3300	180.92	1	1	597036
2(B)	Demolition of reinforced concrete buildings and structures	m2	250	266.61	1	1	66652.5
3	Rehabilitation of access roads	m2	10000	2	1	1	20000
4 (A)	Demolition and rehabilitation of electrified railway lines	m	0	314.22	1	1	0
4 (A)	Demolition and rehabilitation of non-electrified railway lines	m	0	171.39	1	1	0
5	Demolition of housing and/or administration facilities	m2	250	361.83	1	1	90457.5
6	Opencast rehabilitation including final voids and ramps	ha	0	184152.88	0.52	1	0
7	Sealing of shafts adits and inclines	m3	0	97.12	1	1	0
8 (A)	Rehabilitation of overburden and spoils	ha		126450.38	1	1	0
8 (B)	Rehabilitation of processing waste deposits and evaporation ponds (non-polluting potential)	ha	0.25	157491.66	1	1	39372.915
					1		
8 (C)	Rehabilitation of processing waste deposits and evaporation ponds (polluting potential)	ha	0	457430.43	1	1	0
					1	1	
9	Rehabilitation of subsided areas	ha	0	105883.15	1	1	0
10	General surface rehabilitation	ha	5	100170.03	1	1	500850.15
11	River diversions	ha	0	100170.03	1	1	0
12	Fencing	m	0	114.26	1	1	0
13	Water management	ha	0	38087.46	1	1	0
14	2 to 3 years of maintenance and aftercare	ha	0	13330.61	1	1	0
15 (A)	Specialist study	Sum	0		1	1	0
15 (B)	Specialist study	Sum	0		1	1	0
					Sub Total 1		1329957.065
1	Preliminary and General		79797.4239		weighting factor 2		83787.2951
					1.05		
2	Contingencies		132995.7065				132995.7065
					Subtotal 2		1546740.07
					VAT (14%)		216543.61
					Grand Total		**1763284**

(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	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

	invasive plant species.			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 engineer during the construction phase and the responsible person (Engineering/ Environmental Department) during the operational phase of the project. The site engineer and independent qualified environmental noise and vibration specialist.	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.	There are no sources in the vicinity of the mine. The non-perennial stream will be monitored by collecting surface water samples during the rainy season.	Site Manager/Water Supply	The streams which may be impacted by the mining activity are non-perennial. Monitoring takes place by collecting surface water samples during the rainy season at a frequency of once a month.

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

This section of the report relates to Section 33 of the GNR543 published in Government Gazette No.33306 of 18 June 2010, under Section 24(5) of the NEMA. Regulation 33(e), proposed mechanisms for monitoring compliance with and performance assessment against the environmental management programme and reporting thereon Furthermore, Regulation 55 (1) (2) of the MPRDA Regulations, R527 requires that the holder of a mining right conduct monitoring on a continuous basis.

Monitoring provides qualitative and quantitative information pertaining to the possible impacts of the development on the environment, and enables the measurement of the effectiveness of environmental management measures. The implementation of a monitoring plan is necessary to ensure compliance with the NEMA, MPRDA and NWA environmental authorisations which must be obtained before any of the proposed activities may commence. The key to the success of environmental management lies in the effective implementation of the proposed mitigation and management measures.

The monitoring programme will incorporate the following impacts and environmental components:

- Hydrological (surface water and bio-monitoring);
- Terrestrial ecology (fauna and flora); and
- Air quality (dust);

Mine environmental audits are also required to ensure that all proposed management and mitigation measures together with monitoring programmes are being implemented. These audits must be undertaken annually unless specified otherwise by the relevant authorities. This section of the report is compiled in accordance to the National Environmental Management Act, 1998 (Act No. 107 of 1998) Environmental Impact Assessment Regulation 543 of 2010, Section 31 (2) (b), and Section 33 (e), (g), (h) and (i).

Ongoing monitoring of the bio-physical and socio-economic environments will continue throughout the life of the project as per the approved EMP and the accepted monitoring programmes. The Retrenchees will monitor and assess the performance of the EMP on an ongoing basis. Monitoring of different environmental aspects/impacts takes place by means of quantitative and qualitative evaluation techniques in order to determine whether the requirements of the environmental management programme are being complied with. Monitoring is a continuous data-gathering and control procedure. It may range from routine visual inspections to in-depth investigative monitoring. All monitoring will be undertaken in terms of the approved EMP for the mine.

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 Retrenchees 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.

- An environmental, health and safety induction programme will be provided to all employees prior to commencing work, and they will sign acknowledgement of the induction.
- A daily "toolbox talk" will 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.

ENVIRONMENTAL AWARENES TRAINING PROGRAMME PROCEDURE

Natural resources are limited and not always renewable and it is the responsibility of management to ensure that all employees are trained to understand the impacts of their tasks on the environment and to reduce them wherever possible.

Environmental awareness training must be given to new employees on site and any contractors who may come onto site for a short period of time. Refresher training must be given to permanent employees on an annual basis.

The objective of this procedure is to ensure that all employees on the mine, including contractors, are competent to perform their duties, thereby eliminating negative impacts on their safety, health and the environment.

The Environmental topics to be covered in awareness training should include the following:

- **RESOURCE MANAGEMENT**
    - The importance of saving water
        1. South Africa is a water scarce country and rivers are polluted;
        2. Do not throw litter into river or water drains;
        3. Do not dispose of oils in sewers.
    - Air pollution - Climate change
        1. The use of fossil fuels is increasing the amount of greenhouse gases that are discharged to the atmosphere. Share transport or use public transport;
        2. Don't burn any rubbish, the smoke pollutes the air;
        3. Plant trees, they clean the air, provide us with oxygen and remove the greenhouse gas carbon dioxide from the air.
    - Soil conservation
        1. Keep vegetation on the surface of the land to prevent soil erosion
        2. Plant trees.

- **HAZARDOUS SUBSTANCE USE AND STORAGE**
    - Solvents, petrol, diesel, insecticides, chlorine, detergents, chemical fertilisers are harmful to the environment and to your health. Use them sparingly and do not let them get into the water systems. Containers must be disposed of to a licensed hazardous waste disposal facility;

- Hazardous substances must be stored and used correctly;
- Ensure that 16 point Material Substances Safety Data Sheets (MSDS) are available at point of store;
- Compressed gas storage requirements;
- Flammable substances store requirement.

- **INCIDENT & EMERGENCY REPORTING**

  - The company must have an emergency / incident reporting system whereby environmental incidents can be reported and actioned to mitigate and follow up on.

- **OIL / DIESEL/ PETROL SPILL CLEAN UP**

  - All employees who work with machines and vehicles must be instructed how to prevent and clean up an oil or diesel spill appropriately. Spill kits must be available on site, drip trays must be used when servicing vehicles.

- **CONSERVATION OF WATER**

  - Campaign to save water on site;
  - Clean water is expensive and potable water must be used carefully;
  - Prevent pollution of water by preventing spills and dispose of wastes properly.

- **CONSERVATION OF VEGETATION**

  Plants, grasses and trees are very important to our existence on the earth. They provide food, fuel, shelter, raw materials and they clean the air. Indigenous plants are especially important for traditional medicine as well as the whole ecology of life. Human activities are destroying the natural forests of the earth. The natural forests are the “lungs” of the planet and unfortunately they are being cleared faster than they can be regenerated.

  - EIA’s are to be done before virgin bush can be cleared;
  - Vegetation cover reduces water and topsoil loss from the ground, do not clear vegetation unnecessarily;
  - Indigenous trees provide shade, attract wild birds;
  - Do not chop down indigenous trees without good reason;
  - Implement a tree planting programme;
  - Remove alien invasive trees in your area such as Prosopis, Syringa and Pepper trees, cactus plants.

- **WASTE MANAGEMENT**

  - Employees must be instructed on how to determine the difference between hazardous waste and general waste;
  - They must know how to separate hazardous and general waste and where to dispose of these wastes in the correct manner;
  - Examples of hazardous waste which must be recycled or sent to Waste Tech for disposal:
    - Oil, diesel, batteries, acids, paint, thinners, electronic waste
    - Pesticides, jik, Handy Andy;

- Old oil, old oil filters, old paint is hazardous and must not be disposed of to a general land fill. Oilkol of the Rose Foundation will collect old oil;
- Mercury in fluorescent light bulbs is hazardous, fluorescent lights must be handled with great care so as not to break the glass and release the mercury vapour into the air which you breathe.

- Examples of general wastes which can go to the municipal landfill:
  - Wood, paper, plastic, glass, old PPE.
- Recycle, Reuse, Reduce, and Recover where ever possible.

- **CONCLUSION**

The management of the Retrenchees will utilize the Environmental Awareness Plan to assure that all employees and contractors are aware of the environment and know how to manage it correctly.

(2) Manner in which risks will be dealt with in order to avoid pollution or the degradation of the environment.

Air quality:

To control the incidence of unacceptable levels of dust pollution on site via dust dispersion control.

Surface water:

Mitigation measures (or safety precautions) that are taken in order to eliminate any risk the project area could have on the natural, cultural and social environment of the concerned area and that must be implemented during the different phases i.e. construction, operational and post closure to minimize the impacts are as follows:

- Only environmental friendly materials must be used during the construction phase to minimize pollution of surface water runoff and/or underground water resources.
- Pipe leakages should be minimized.
- Proper clean and dirty water separation techniques must be used to ensure uncontaminated water returning to the environment.
- Non mining waste i.e. grease, lubricants, paints, flammable liquids, garbage, historical machinery and other combustible materials generated during activities should be placed and stored in a controlled manner in a proper designed area.
- The topography of rehabilitation disturbed areas must be rehabilitated in such a manner that the rehabilitated area blends in naturally with the surrounding natural area. This will reduce soil erosion and improve natural re-vegetation.

Ground water:

Groundwater Management Plan

The mine must develop a monitoring response protocol. This protocol will describe procedures in the event that groundwater monitoring information indicates that action is required.

Natural flora:

Loss of and disturbance to indigenous vegetation

- Minimise the footprint of transformation.
- Encourage proper rehabilitation of mined areas.
- Encourage the growth of natural plant species.
- Ensure measures for the adherence to the speed limit.

Loss of flora with conservation concern

- Footprint areas of the mining activities must be scanned for Red Listed and protected plant species prior to mining.
- It is recommended that these plants are identified and marked prior to mining.
- These plants should, where possible, be incorporated into the design layout and left in situ.
- However, if threatened of destruction by mining, these plants should be removed (with the relevant permits from DAFF and DENC) and relocated if possible.
- All those working on site must be educated about the conservation importance of the fauna and flora occurring on site.

Proliferation of alien vegetation

- Minimise the footprint of transformation.
- Encourage proper rehabilitation of mined areas.
- Encourage the growth of natural plant species.
- Mechanical methods (hand-pulling) of control to be implemented extensively.
- Annual follow-up operations to be implemented.

Encouragement of bush encroachment

- Minimise the footprint of transformation.
- Encourage proper rehabilitation of mined areas.
- Encourage the growth of a diverse selection of natural plant species.
- Mechanical methods (hand-pulling) of control to be implemented selectively.

- Annual follow-up monitoring to be implemented.

Fauna:

Loss, damage and fragmentation of natural habitats

- 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). No construction personnel or vehicles may leave the demarcated area except those authorised to do so.

Disturbance, displacement and killing of fauna

- 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 extent of the proposed mine should be demarcated on site layout plans, and no construction personnel or vehicles may leave the demarcated area except those authorised to do so. Those areas surrounding the mine site that are not part of the demarcated development area should be considered as a no go zone for employees, machinery or even visitors.
- The 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.

Broad-scale ecological processes

- Minimise the footprint of transformation.
- Encourage proper rehabilitation of mined areas.

- Encourage the growth of natural plant species.
- 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).

Noise and vibration:

- To control the incidence of unacceptable noise and vibration levels on site.
- There will be a shift in the immediate noise levels of the proposed activities on a temporary basis during the construction phase and a permanent basis during the operational phase and the communities will have to be briefed and informed of this during the public participation process. Regular feed-back to the community during the operational phase of the project of the baseline noise and ground vibration monitoring must take place. A system whereby complaints are recorded and investigated must be made available.

Visual (Aesthetics):

- 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 WRD, 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.
  - Ensure that the design fits into the surrounding environment and it is aesthetically pleasing;
  - 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;
- Mitigation of lighting impacts includes the pro-active design, planning and specification lighting for the development. The correct specification and placement of lighting and light fixtures for the proposed development will go far to contain rather than spread the light. Additional measures include the following:
  - Limiting mounting heights of lighting fixtures by specifying foot-lights or bollard level lights;
  - Making use of minimum lumen or wattage in fixtures;
  - Making use of down-lighters, or shielded fixtures; and
  - Making use of energy efficient lighting or other types of low impact lighting.
  - Secondary impacts anticipated as a result of the proposed development (i.e. visual character, sense of place and tourism potential) are not possible to mitigate.

Soils:

Topography, soil erosion and associated degradation of ecosystems

- Backfill all excavations continuously.
- Employ effective rehabilitation strategies to restore surface topography of excavations and plant site.
- Stabilise the mine residue deposits.
  - All temporary infrastructures should be demolished during closure.

Soil erosion

- At no point may plant cover be removed within the no-development zones.
- All attempts must be made to avoid exposure of dispersive soils.
- Re-establishment of plant cover on disturbed areas must take place as soon as possible, once activities in the area have ceased.

- Ground exposure should be minimised in terms of the surface area and duration, wherever possible.
- The mining operation must co-ordinate different activities in order to optimise the utilisation of the reclaimed dumps and thereby prevent repeated and unnecessary dumping.
- The soil that is stripped during construction should be stock-piled in layers and protected by berms to prevent erosion.
- All stockpiles must be kept as small as possible, with gentle slopes (18 degrees) in order to avoid excessive erosional induced losses.
- Stockpiled soil material are to be stored and bermed on the higher lying areas of the footprint area and not in any storm water run-off channels or any other areas where it is likely to cause erosion, or where water would naturally accumulate.
- Stockpiles susceptible to wind erosion are to be covered during windy periods.
- Audits must be carried out at regular intervals to identify areas where erosion is occurring.
- Appropriate remedial action, including the rehabilitation of the eroded areas, must occur.
- Rehabilitation of the erosion channels and gullies.
- The mining operation should avoid land with steep slopes.
- Dust suppression must take place.
- 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.

Loss of soil fertility

- 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 in order to ensure that the quality of the topsoil is not impaired.
- Topsoil stockpiles must be kept separate from sub-soils.
- The topsoil should be replaced as soon as possible on to the backfilled areas, thereby allowing for the re-growth of the seed bank contained within the topsoil.

Soil pollution

- 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 becontained in a bund wall.
  Vehicles and machinery should be regularly serviced and maintained.
- At no point may plant cover be removed within the no-development zones.
- All attempts must be made to avoid exposure of dispersive soils.
- Re-establishment of plant cover on disturbed areas must take place as soon as possible, once activities in the area have ceased.
- Ground exposure should be minimised in terms of the surface area and duration, wherever possible.
- The soil that is stockpiled during construction should be stock-piled in layers and protected by berms to prevent erosion.
- All stockpiles must be kept as small as possible, with gentle slopes (18 degrees) in order to avoid excessive erosional induced losses.
- Stockpiled soil material are to be stored and bermed on the higher lying areas of the footprint area and not in any storm water run-off channels or any other areas where it is likely to cause erosion, or where water would naturally accumulate.
- Stockpiles susceptible to wind erosion are to be covered during windy periods.
- Audits must be carried out at regular intervals to identify areas where erosion is occurring.
- Appropriate remedial action, including the rehabilitation of the eroded areas, must occur.
- Rehabilitation of the erosion channels and gullies.
- The mining operation should avoid land with steep slopes.
- Dust suppression must take place.
- 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.
- 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 in order to ensure that the quality of the topsoil is not impaired.
- Topsoil stockpiles must be kept separate from sub-soils.
- The topsoil should be replaced as soon as possible on to the backfilled areas, thereby allowing for the re-growth of the seed bank contained within the topsoil.
- 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.
  - *To prevent soil pollution;*
  - *To limit soil compaction;*
  - *To curb soil erosion; and*
  - *To reinstate a growth medium able to sustain plant life.*

Land capability:

- To minimise the reduction of land capability.

Sensitive landscapes:

- To protect sensitive landscapes (natural drainage channels) from potential negative impacts.
- Maintain buffer areas.

Surface environment - waste management:

- To ensure that the discarding of any waste material produced as a result of the proposed mining operation, including rubble, litter, garbage, rubbish or discards of any description, whether solid of liquid, takes place only at a site or sites demarcated for such purposes.
- To prevent waste material from being dumped within the borders or the vicinity of the mining area.

Emergency Response Plan

Defining an Environmental Emergency Response Plan

An effective, comprehensive, well-considered and tested environmental emergency preparedness and response plan has the potential to save lives, prevent unnecessary damage to the company and other property and to manage environmental risk in the event of a large chemical spill, oil spill, fuel spill, explosives spill or sewerage spill. Environmental emergencies occur over the short term and require an immediate response. A mine, as part of its management tools, should have an Environmental Emergency Response Plan. If one does not exist then one should be compiled and disseminated to all employees and contractors and in the event of an emergency, the emergency response plan should be consulted. This plan should be placed around the mine where it can be viewed easily. The plan should contain a list of procedures, evacuation routes and a list of emergency contact numbers. It is advisable that the mine tests the emergency response plan in order to identify any areas for improvement. If the emergency has the potential to affect surrounding communities, they

should be alerted via alarm signals or contacted in person. The surrounding community must be informed, on a continuous basis, of the potential dangers and emergencies that exist, and the actions to be taken in such emergencies. Communication is vital in an emergency and thus communication devices, such as mobile phones, two-way radios, pagers or telephones, must be placed around the mine. A checklist of emergency response units must be consulted and the relevant units notified. The checklist includes:

- Fire department;
- Police;
- Emergency health services such as ambulances, paramedic teams, poisons centres;
- Hospitals, both local and further afield, for specialist care;
- Public health authorities;
- Environmental agencies, especially those responsible for air, water and waste issues;
- Other industrial facilities in the vicinity with emergency response facilities;
- Public works and highways departments, port and airport authorities; and
- Public information authorities and media organisations.

Emergency Procedures

Below are the possible environmental related emergencies, procedures and responses to be followed and incorporated into the Emergency Preparedness and Response Plan.

POSSIBLE ENVIRONMENTAL RELATED EMERGENCY	ACTION PLANS/REMEDIATION	TIME/PERIOD	RESPONSIBLE PERSON/PARTY
Spillage of oil, diesel by vehicles, tankers, storage tanks etc.	The spillage should be contained (bund earth walls) by all means. Depending on the amount of spillage it could be remediated in situ or in the case of large amount of spillage that is contained, could be removed, etc. • Leakage from the vehicle, tanker etc, that caused the emergency, should be stopped and the vehicle removed to the workshop area for repairs. • In all cases of spillage, irrespective of the chemical, remove or extinguish any fire (naked flame) to within at least 10 metres from the spill. • Cover the spills with absorbent	Immediately	The Retrenchees

	material. The person who reported the spill must fill out an incident report, if applicable and forward it to the Department of Environmental Affairs and/or Department of Water and Sanitation after a thorough investigation.		
Sewerage Spills	The spillage should be contained (bund earth walls) by all means. Depending on the amount of spillage it could be remediated in situ or in the case of large amount of spillage that is contained, could be removed, etc. • The leakage must be stopped and reason for spill must be rectified. • The person who reported the spill must fill out an incident report and forward it to the Environmental Department and/or Department of Water and Sanitation after a thorough investigation.	Immediately	The Retrenchees
Fires	All fires in the veld, buildings, diesel tanks, chemical fires, etc. should be extinguish and prevented to spread to any other piece of land, building, etc. The necessary equipment should be in place and ready to be used if an accidental fire is started. • There shall be an emergency preparedness plan in place in order to fight accidental fires and veld fires, should they occur. The adjacent land owners/users/managers should also be informed and/or involved. Immediately Environmental manager, Safety officer, Local Fire Brigade. • The use of branches of trees and shrubs for fire making purposes must be strictly prohibited. • No fires may be lit except at places approved by the ESM (private residences will be able have lit fires but not for the purpose of waste disposal). • All businesses shall ensure that	Immediately	The Retrenchees

	the basic fire-fighting equipment is to the satisfaction of the Local Emergency Services. • All businesses must take precautions when working with welding or grinding equipment near potential sources of combustion. Such precautions include having a suitable, tested and approved fire extinguisher immediately at hand and the use of welding curtains. • The Atmospheric Pollution Prevention Act (No. 45 of 1965) states that burning is not permitted as a means of disposal.		

n) Specific information required by the Competent Authority

(Among others, confirm that the financial provision will be reviewed annually)

The following applies to the submission of information:

All procedures (emergency, environmental awareness, rehabilitation strategies, etc.) must be included into the mine's Environmental Management System (EMS). The mine's EMS will monitor and assess the performance of the EMP on an ongoing basis. Formal audits of the performance assessment of the EMP will take place every year as stipulated by law, or at any other period if required by government;

All information as required by the various government departments should be captured and be readily available for submission when required;

A bi-annual Performance Assessment Report (PAR) will be submitted to the DMR;

Surface water monitoring will be undertaken monthly and annually reports will be submitted to the DWA;

The financial provision for closure (quantum and method) will be updated annually as part of the Environmental Programme Performance Assessment; and

The closure plan must be reviewed every five (5) years, and must always keep pace with the current best practices.

2) UNDERTAKING

The EAP herewith confirms

a) the correctness of the information provided in the reports;

b) the inclusion of comments and inputs from stakeholders and I&APs;

c) the inclusion of inputs and recommendations from the specialist reports where relevant; and

d) the acceptability of the project in relation to the finding of the assessment and level of mitigation proposed.

_____

Signature of the Environmental Assessment Practitioner:

Wadala Mining and Consulting Pty Ltd

_____

Name of Company:

Date: 22 March 2017

- END –

APPENDIX 1

CURRICULUM VITAE – RH OOSTHUIZEN

PERSONAL DETAILS

FULL NAMES AND SURNAME	:	**Roelina Henriëtte** Oosthuizen
DATE OF BIRTH	:	18 April 1970
I.D. NO	:	700418 0037 08 2
MARITAL STATUS	:	Married
CITIZENSHIP	:	**Republic of** South Africa
RESIDENTIAL ADDRESS	:	Farm Oberon Kimberley
POSTAL ADDRESS	:	P.O. Box 110823 Hadisonpark Kimberley 8306
E-MAIL ADDRESS	:	**r**oosthuizen950@gmail .com
CEL NO	:	084 208 9088
DRIVER'S LICENCE	:	EB
LANGUAGES	:	Afrikaans (home language) English

QUALIFICATIONS

2000	**UNIVERSITY OF THE ORANGE FREE STATE**
	Qualification: Master in Environmental Management.
1991	**NORTH WEST UNIVERSITY**
	Qualification: B – Comm: Industrial psychology.
1988	**BRITSHIGH SCHOOL (BRITS)** **Qualification: Matric**

COURSES and Conferences ATTENDED

I have attended various mining and environmental conferences and seminars to stay abreast with the latest changes in legislation, legal compliance and policy positions in the sector.

August 1994	Junior Managers (Public Service Training Institute)
November 1994	Mineral Laws Administration (Public Service Training Institute)
October 1997	Mineral Laws Administration & Environmental Management (University of Pretoria)
July 2002	Project Management for Environmental Systems (University of the Orange Free State)
August 2004	Environmental and Sustainability in Mining Minerals and Energy Education and Training Institute (MEETI)
September 2005	Converting Old Order Rights to New Order Rights in Mining (International Quality & Productivity Centre Johannesburg)
November 2006	Mine waste disposal and Achievement of Mine Closure
February 2007	Introduction to ArcGis 1
April 2010	Mining Law Update Conference (IIR BV South Africa)
November 2010	Social Labour Plans for Mining Workshop (Melrose Training)
August 2011	Mineral Resources Compliance and Reporting (ITC)
May 2012	Enviro Mining Conference 2012 (Sustainability and Rehabilitation) (Spectacular Training Conferences)
August 2012	Mineral Resources Compliance and Reporting 4th Annual (ITC)
March 2013	1st Enviro Mining-Ensuring Environmental Compliance and reporting
March 2014	4th Annual Enviro Mining Conference
March 2015	5th Annual Enviro Mining Conference

CAREER HISTORY

Wadala Mining and Consulting (Pty) Ltd:

ADDRESS : **Farm Oberon**
Kimberley
8301

PERIOD OF EMPLOYMENT : 01 August 2013 - Part time

POSITION HELD **Mineral Law Administration and Environmental Manager**

Diacor Closed Corporation:

ADDRESS : **6 Mullin Street**
Hadisonpark
Kimberley
8306

PERIOD OF EMPLOYMENT : 01 October 2013 – Present and part time
consultancy work

POSITION HELD **Mineral Law Administration and Environmental Manager**

Mentor Trading and Investments 52 (Pty) Ltd:

ADDRESS : 2 Kekewich Drive
Monridge Office Park no 6
Monument Heights
Kimberley
8301

PERIOD OF EMPLOYMENT : 01 October 2012 – 01 October 2013

POSITION HELD **Mineral Law Administration and Environmental Manager**

Rockwell Diamonds Inc:

ADDRESS : PO Box 251
BARKLY-WES
8375

PERIOD OF EMPLOYMENT : 01 March 2005 – 30 September 2012

POSITION HELD **Mineral Law Administration and Environmental Manager**

MAIN JOB FUNCTIONS

- Collect analyse and interpret information regarding the measurement of impacts of mining operations on the environment, the rehabilitation of land surfaces.
- The prevention, control and combating of pollution.
- Co-ordinate, investigate, audit and resolve environmental problems in conjunction with the Department of Water and Sanitation, Department of Agriculture and the provincial Department of Tourism, Environment and Conservation.
- Address complaints and inquiries received from the public and mining industry.
- Consult with relevant authorities and interested and affected people regarding the approval of Environmental Management Programmes.
- Ensuring that rehabilitation standards are applied.
- Ensuring that the requirements stated in Environmental Management Programme Reports are adhered to.
- Evaluate Mining Rights and Prospecting Right applications and recommend site-specific conditions according to legislative requirements.
- Constant liaison with the public, the mining industry and other government authorities on Environmental matters, legislation and agreements.
- Calculate and verify financial provision for outstanding rehabilitation.

DEPT OF MINERALS & ENERGY:

ADDRESS : 43 Chapel Street
Standard Bank Building
KIMBERLEY

PERIOD OF EMPLOYMENT : 01 April 1997 to 01 March 2005

POSITION HELD **Senior Environmentalist - Assistant Director Environment**

MAIN JOB FUNCTIONS :

- Collect analyse and interpret information regarding the measurement of impacts of mining operations on the environment, the rehabilitation of land surfaces.
- The prevention, control and combating of pollution.
- Co-ordinate and prioritise the rehabilitation of derelict and ownerless mines.
- Co-ordinate, investigate, audit and resolve environmental problems in conjunction with the Department of Water Affairs and Forestry, Department of Agriculture and the provincial Department of Tourism, Environment and Conservation.
- Address complaints and inquiries received from the public and mining industry.
- Consult with relevant authorities and interested and affected people regarding the approval of Environmental Management Programmes.
- Ensuring that rehabilitation standards are applied.
- Ensuring that the requirements stated in Environmental Management Programme Reports are adhered to.
- Conduct inspections and recommendations on mines that apply for closure.
- Evaluate mining licences and prospecting applications and recommend site-specific conditions according to legislative requirements.
- Constant liaison with the public, the mining industry and other government authorities on environmental matters, legislation and agreements.
- Influence new development processes through participation in the EMPR and EIA processes and give guidance through education and awareness programmes.
- Calculate and verify financial provision for outstanding rehabilitation.

DEPT. OF MINERALS AND ENERGY:

POSITION HELD : Assistant Mineral Laws Officer – Senior Mineral Laws Officer

PERIOD OF EMPLOYMENT : 01 November 1993 – March 1997

ADVISORY COMMISSION ON LAND ALLOCATION

POSITION HELD : Assistant Administrative Officer

PERIOD OF EMPLOYMENT : 10 February 1992 – October 1993

Experience Projects Completed

I am a dedicated professional Mineral Law Administration and Environmental Manager with 23 years extensive experience in the managing and mitigating of specifically mining related impacts. I started my career in 1993 in the Department of Minerals and Energy where I have done Environmental inspections with site visits on all mines in the Northern Cape. I have done Environmental Audits on operational and closed mining sites in collaboration with other Departments. I have also specifically looked at pollution control measures on mining sites and the effectiveness of these measures. I have evaluated submitted EIA /EMP documents and have worked closely with all other Departments and stakeholders to make sure that all environmental aspects have been dealt with adequately in submitted documents. I left the Department for the Private Sector in 2005. I have since worked for a Canadian Group of Companies in the Private Sector, started a consultancy where I provide various mining companies with professional advice and guidance on Mineral Law and Environmental Issues. I have also represented the South African Diamond Producers Organisation (SADPO) on the Environmental Policy Committee (EPC) at the Chamber of Mines between 2005 and 2011.

2005

Environmental Management Plan with an application for a Prospecting Right for diamonds on Portion 9 and 14 of the farm Lanyon Vale 376, Hay in terms of Section 16(4) and Regulation 52 of the Minerals and Petroleum Resources Development Act, 2002 (Act 28 of 2002)
EMPlan was approved in August 2007 with the Prospecting Right
Client: HC van Wyk Diamonds Ltd

Environmental Management Plan with an application for a Prospecting Right for diamonds on Remainder of Portion 18 (a portion of Portion 10) of the farm Lanyon Vale 376, Hay in terms of Section 16(4) and Regulation 52 of the Minerals and Petroleum Resources Development Act, 2002 (Act 28 of 2002)
EMPlan was approved in August 2007 with the Prospecting Right
Client: HC van Wyk Diamonds Ltd

Environmental Management Plan with an application for a Prospecting Right for diamonds on Remainder of Portion 1, Portion 2 (a Portion of Portion 1), Portion 3 and Portion 5 of the farm Zweet Fontein nr 76 and Remainder of Portion 1 and portion 3 of the farm Blaaubosch Drift nr 78, Herbert in terms of Section 16(4) and Regulation 52 of the Minerals and Petroleum Resources Development Act, 2002 (Act 28 of 2002)
EMPlan was approved in August 2007 with the Prospecting Right
Client: HC van Wyk Diamonds Ltd

2006

Environmental Management Plan with an application for a Prospecting Right for Tin in Kakamas South Settlement, Kakamas in terms of Section 16(4) and Regulation 52 of the Minerals and Petroleum Resources Development Act, 2002 (Act 28 of 2002)

EMPlan was approved in June 2011 with the Prospecting Right
Client: Douglas Mining and Exploration (Pty) Ltd

2007

Environmental Management Plan with an application for a Prospecting Right for diamonds on the Remaining Extent, Portion 1 and Portion 2 of Diamond Valley 29, Hopetown in terms of Section 16(4) and Regulation 52 of the Minerals and Petroleum Resources Development Act, 2002 (Act 28 of 2002)
EMPlan was approved in April 2008 with the Prospecting Right
Client: HC van Wyk Diamonds Ltd

2008

Environmental Management Plan with an application for a Prospecting Right for diamonds on Portion 12, 13, 16, 24 & 25 Saxendrift 20 in terms of Section 16(4) and Regulation 52 of the Minerals and Petroleum Resources Development Act, 2002 (Act 28 of 2002)
EMPlan was approved in June 2008 with the Prospecting Right
Client : HC van Wyk Diamonds Ltd

Environmental Management Plan with an application for a Prospecting Right for diamonds on Erf 1 Windsorton, Barkly-Wes in terms of Section 16(4) and Regulation 52 of the Minerals and Petroleum Resources Development Act, 2002 (Act 28 of 2002)
EMPlan was approved in February 2009 with the Prospecting Right
Client: HC van Wyk Diamonds Ltd

2009

ENVIRONMENTAL IMPACT ASSESSMENT & ENVIRONMENTAL MANAGEMENT PROGRAMME SUBMITTED FOR AN APPLICATION FOR A MINING RIGHT CONVERSION IN TERMS OF SECTION 39 & OF REGULATION 50 & 51 OF THE MPRDA, 2002 (ACT NO. 28 OF 2002) for Wouterspan Mine (The Farm Lanyon Vale 376, Hay)
EIA/EMP approved on 25/01/2010
Client: HC van Wyk Diamonds Ltd

ENVIRONMENTAL IMPACT ASSESSMENT & ENVIRONMENTAL MANAGEMENT PROGRAMME SUBMITTED FOR AN APPLICATION FOR A MINING RIGHT CONVERSION IN TERMS OF SECTION 39 & OF REGULATION 50 & 51 OF THE MPRDA, 2002 (ACT NO. 28 OF 2002) for GW Ziegler on Remainder, Remainder of portion 1 (Amantia) and portion 2 (a portion of portion 1) of the farm Rietputs no. 15 and portion 1 (Spenceskop) of the farm Waterval no.14 in the district of Kimberley
EIA/EMP approved with conversion of the Mining Right
Client: GW Ziegler
2010

Basic Assessment Application

Application for authorisation in terms of the National Environmental Management Act, 1998 (Act No. 107 of 1998), as amended and the Environmental Impact Assessment Regulations, 2006
PROPOSED EXTENTION OF A ROOF OVER AN EXCISTING DECK WITH TWO WOOD PILLARS BY MEANS OF THE EXCAVATING OF 0.5m X 0.5m X 1m X 2 (½m²) OF SOIL WITHIN 100M OF THE HIGH WATER MARK OF THE SEA
Falls within general notes under activities that requires basic assessment
Positive Record of Decision (ROD) Granted.
Client: Dr. Petrus van der Walt Vermeulen

REVISION OF ENVIRONMENTAL IMPACT ASSESSMENT & ENVIRONMENTAL MANAGEMENT PROGRAMME SUBMITTED FOR AN APPLICATION FOR A MINING RIGHT CONVERSIONS IN TERMS OF SECTION 39 & OF REGULATION 50 & 51 OF THE MPRDA, 2002 (ACT NO. 28 OF 2002) for HC VAN WYK DIAMONDS LTD (204 MRC) ON REMAINING EXTENT OF HOLPAN 161, BARKLY-WES
AND KLIPDAM DIAMOND MINING CO (003MRC) ON REMAINING EXTENT OF KLIPDAM 157, BARKLY-WES
Client: HC van Wyk Diamonds Ltd and Klipdam Diamond Mining Company Ltd

2011

APPLICATION FOR A LICENCE REGARDING PROTECTED TREES [SECTION 15(1) OF THE NATIONAL FORESTS ACT, 1998, AS AMENDED] on PORTION 1 (PAARDE PAN) OF THE FARM ANNEX SAXES DRIFT 21, HOPETOWN, NORTHERN CAPE for 14 Shephards tree (Boscia albitunca)
Licence issued on 24 September 2011
Client : Saxendrift Mine Pty Ltd

ENVIRONMENTAL IMPACT ASSESSMENT & ENVIRONMENTAL MANAGEMENT PROGRAMME SUBMITTED FOR AN APPLICATION FOR A MINING RIGHT CONVERSION IN TERMS OF SECTION 39 & OF REGULATION 50 & 51 OF THE MPRDA, 2002 (ACT NO. 28 OF 2002) on Portion 2 of the farm Good Hope 286, Barkly-Wes
EIA/EMP approved February 2013 by the Regional Manager
Client: Diacor CC

APPLICATION FOR CLOSURE CERTIFICATE [in terms of sections 43(3) of the Minerals and Petroleum Resources Development Act, 2002 (Act No 28 of 2002)] AND A CLOSURE PLAN FOR MINING ACTIVITIES PERFORMED BY HC VAN WYK DIAMONDS LTD ON THE REMAINING EXTENT OF PORTION 1 (WILLOWBANK), PORTION 2 (A PORTION OF PORTION 1) (WILLOWBANK), PORTION 3 (A PORTION OF PORTION 1) (WILLOWBANK) OF KHOSOPSKRAAL 227 AND PORTION 5 (ROSCOMMON) AND PORTION 2 (BORDON) OF HARRISDALE 226 AND FARM 362, BARKLY-WES
CLOSURE WAS GRANTED IN JULY 2010
Client: HC VAN WYK DIAMONDS LTD

2012

APPLICATION FOR A LICENCE REGARDING PROTECTED TREES [SECTION 15(1) OF THE NATIONAL FORESTS ACT, 1998, AS AMENDED] on PORTION 1 OF THE FARM BRAKFONTEIN 276, HOPETOWN NORTHERN CAPE for 4Shephards tree (Boscia albitunca)
Licence NCU 2831112 issued in November 2012
Client: Jasper Mining Pty Ltd

2013

APPLICATION FOR A LICENCE REGARDING PROTECTED TREES [SECTION 15(1) OF THE NATIONAL FORESTS ACT, 1998, AS AMENDED] ON REMAINDER OF THE FARM NIEWEJAARSKRAAL NO 40, PRIESKA, NORTHERN CAPE. 30 SHEPPHARD'S TREES
Licence NCU 4290214 issued in February 2014
Client: Saxendrift Mine (Pty) Ltd (Niewejaarskraal Mine)

AMENDMENT OF ENVIRONMENTAL IMPACT ASSESSMENT & ENVIRONMENTAL MANAGEMENT PROGRAMME SUBMITTED FOR A SECTION 11 APPLICATION OF A MINING RIGHT CONVERSION IN TERMS OF SECTION 39 & OF REGULATION 50 & 51 OF THE MPRDA, 2002 (ACT NO. 28 OF 2002) on The Farm Riets Drift no. 18, district
Client: Bo-Karoo Diamond Mining (Pty) Ltd to be ceded to Bondeo 140 CC.

2014

Application for a Water Users Licence Application in terms of Section 27 of the National Water Act no 36 of 1998 on the Farm Engelde Wilgeboomfontein 22, Prieska
Application still under review
Client: Thunderflex 78 (Pty) Ltd

ENVIRONMENTAL IMPACT ASSESSMENT & ENVIRONMENTAL MANAGEMENT PROGRAMME SUBMITTED FOR AN APPLICATION FOR A MINING RIGHT CONVERSION IN TERMS OF SECTION 39 & OF REGULATION 50 & 51 OF THE MPRDA, 2002 (ACT NO. 28 OF 2002) on Portion 1 of the farm Brakfontein 276 district of Hopetown
EIA/EMP approved April 2015 by the Regional Manager
Client: Jasper Mining (Pty) Ltd

Environmental Management Plan with an application for a Prospecting Right for diamonds on REMAINING EXTENT OF THE FARM MARKSDRIFT 3, HOPETOWN in terms of Section 16(4) and Regulation 52 of the Minerals and Petroleum Resources Development Act, 2002 (Act 28 of 2002)
EMPlan was approved in April 2015 with the Prospecting Right
Client: BONDEO 140 CC

2015

ENVIRONMENTAL IMPACT ASSESSMENT & ENVIRONMENTAL MANAGEMENT PROGRAMME

SUBMITTED FOR AN APPLICATION FOR A PROSPECTING RIGHT IN TERMS OF SECTION 39 & OF REGULATION 50 & 51 OF THE MPRDA, 2002 (ACT NO. 28 OF 2002) on Portion 1 of the farm Speculatie 217 district of Boshof
EIA/EMP has been acceptedby the Regional Manager Free State Region
Client: Thaba Thafita Diamond Prospecting CC

ENVIRONMENTAL IMPACT ASSESSMENT & ENVIRONMENTAL MANAGEMENT PROGRAMME SUBMITTED FOR AN APPLICATION FOR A PROSPECTING RIGHT IN TERMS OF SECTION 39 & OF REGULATION 50 & 51 OF THE MPRDA, 2002 (ACT NO. 28 OF 2002) on a Portion of Erf 1318, Galeshewe , and a Portion of the Remainder Erf 5336, Kimberley
EIA/EMP still under review by the Regional Manager Northern Cape Region
Client: Mystic Pearl 157 (Pty) Ltd

2016

ANNUAL REHABILITATION PLAN for Associated Manganese Mines of South Africa Ltd
Glosam Prospecting Area
February 2016

REFERENCES

Dr Elizabeth (Betsie) Milne
Tel No.: 082 992 1261
Fax No.: N/A (No fax)
E-mail address: betsiemilne@gmail.com

Glenn Norton
Group Technical Manager: Rockwell Diamonds Inc.
Mobile : +27(0)836305357
Email : glenn@rockwelldiamonds.com

Hennie van Wyk
Member : Diacor CC
Mobile: +27(0)828201879
Email : hennie@goodhopereserve.co.za

DIE UNIVERSITEIT VAN DIE ORANJE-VRYSTAAT

THE UNIVERSITY OF THE ORANGE FREE STATE

HIERMEE WORD VERKLAAR DAT DIE GRAAD THIS IS TO CERTIFY THAT THE DEGREE

Magister in Omgewingsbestuur
Master in Environmental Management

TOEGEKEN IS AAN
HAS BEEN CONFERRED UPON

ROELINA HENRIËTTE OOSTHUIZEN

NADAT AAN DIE STATUTE EN REGULASIES VAN DIE UNIVERSITEIT VOLDOEN IS. AS BEWYS DAARVAN PLAAS ONS ONS ONDERSKEIE HANDTEKENINGE EN DIE SEël VAN DIE UNIVERSITEIT HIERONDER.

IN ACCORDANCE WITH THE STATUTES AND REGULATIONS OF THE UNIVERSITY. AS WITNESS OUR RESPECTIVE SIGNATURES AND THE SEAL OF THE UNIVERSITY BELOW.

VISEKANSELIER/VICE-CHANCELLOR

DEKAAN/DEAN

REGISTRATEUR/REGISTRAR

BLOEMFONTEIN
2000-09-16