mineral resources
Department:
Mineral Resources
REPUBLIC OF SOUTH AFRICA

DRAFT SCOPING REPORT

FOR LISTED ACTIVITIES ASSOCIATED WITH MINING RIGHT (Section 102 Application).

SWARTBERG MINE

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

NAME OF APPLICANT:	**Kamgab Minerale (Pty) Ltd**
TEL NO:	**027 761 8766 / 082 8060860**
FAX NO:	**027 213 1175**
POSTAL ADDRESS:	**PO Box 243 Vredendal 8800**
PHYSICAL ADDRESS:	**Vioolsdrift Commonage, N7, North of Steinkopf**
FILE REFERENCE NUMBER SAMRAD:	**NC30/5/1/2/3/2/1(552)MR**

May 2021
Report #: 2063/EMP/DS

IMPORTANT NOTICE

In terms of the Mineral and Petroleum Resources Development Act (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 (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 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 furthermore 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.

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List of Abbreviations:

AEL	Atmospheric Emissions Licence
AELA	Atmospheric Emissions Licencing Authority
BSP	Biodiversity Spatial Plan
CBA	Critical Biodiversity Area
DMR	Department of Mineral Resources

DMRE	Department Mineral Resources and Energy
EAP	Environmental Assessment Practitioner
EMP	Environmental Management Programme
GIS	Geographic Information System
I&AP	Interested and Affected Party
MWP	Mining Work Programme
NEMBA	National Environmental Management: Biodiversity Act
NFEPA	National Freshwater Ecosystem Priority Areas
ngl	natural ground level
NID	Notification of Intent to Develop
NBKB	Ngwao-Boswa ya Kapa Bokone (Northern Cape Provincial Heritage Authority)
POD	Public Open Day
SAHRA	South African Heritage Authority
SDF	Spatial Development Framework
SLP	Social and Labour Plan
SPC	Spatial Planning Category

1 OBJECTIVES OF THE SCOPING PROCESS

The objective of the scoping process is to, through a consultative process—

a) identify the relevant policies and legislation relevant to the activity;

b) motivate 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 and confirm the preferred activity and technology alternative through an impact and risk assessment and ranking process;

d) identify and confirm the preferred site, through a detailed site selection process, which includes an impact and risk assessment process inclusive of cumulative impacts and a ranking process of all the identified alternatives focusing on the geographical, physical, biological, social, economic, and cultural aspects of the environment;

e) identify the key issues to be addressed in the assessment phase;

f) agree on the level of assessment to be undertaken, including the methodology to be applied, the expertise required as well as the extent of further consultation to be undertaken to determine the impacts and risks the activity will impose on the preferred site through the life of the activity, including the nature, significance, consequence, extent, duration and probability of the impacts to inform the location of the development footprint within the preferred site; and

g) Identify suitable measures to avoid, manage, or mitigate identified impacts and to determine the extent of the residual risks that need to be managed and monitored.

2 Contact Person and correspondence address

2.1 Details and qualifications of the EAP who prepared the report

Refer Appendix 1 for copy of CV and relevant experience.

EAP:	**Site Plan Consulting**		
Contact Person:	**Craig Donald**		
Registration:	**EAPASA (2020-2124)**		
Company:	**Site Plan Consulting**		
Physical address:	**Shop 5, Goede Hoop Shopping Centre, Broadway Blvd, Strand**		
Postal address:	**PO Box 28, Strand**		
Postal Code:	**7139**	Cell	**084 511 1520**
Telephone:	**021 854 4260**	Fax	**021 854 4321**
E-mail:	**craig@siteplan.co.za**		

3 Description of the property

Farm Names:	**Lot 226 (Vioolsdrift Settlement)**
Application area (Ha)	**401.7ha**
Magisterial district:	**Namaqualand**
Distance and direction from nearest town:	**The site is located approximately 47km N of Steinkopf along the N7 and 20km S of Vioolsdrif.**

21 digit Surveyor General Code for each farm portion:	**C0530013. Note that this portion of land is not a registered farm in the SG database. It is denoted as an "*Allotment Township*"**
Locality map	**Attach a locality map at a scale not smaller than 1:250000 and attach as Appendix 2.**
Description of the overall activity.	(Indicate Mining Right, Mining Permit, Prospecting right, Bulk Sampling, Production Right, Exploration Right, Reconnaisance permit, Technical co-operation permit, Additional listed activity) **Amendment of existing but obsolete EMP in respect of Mining Right.**

4 Locality plan

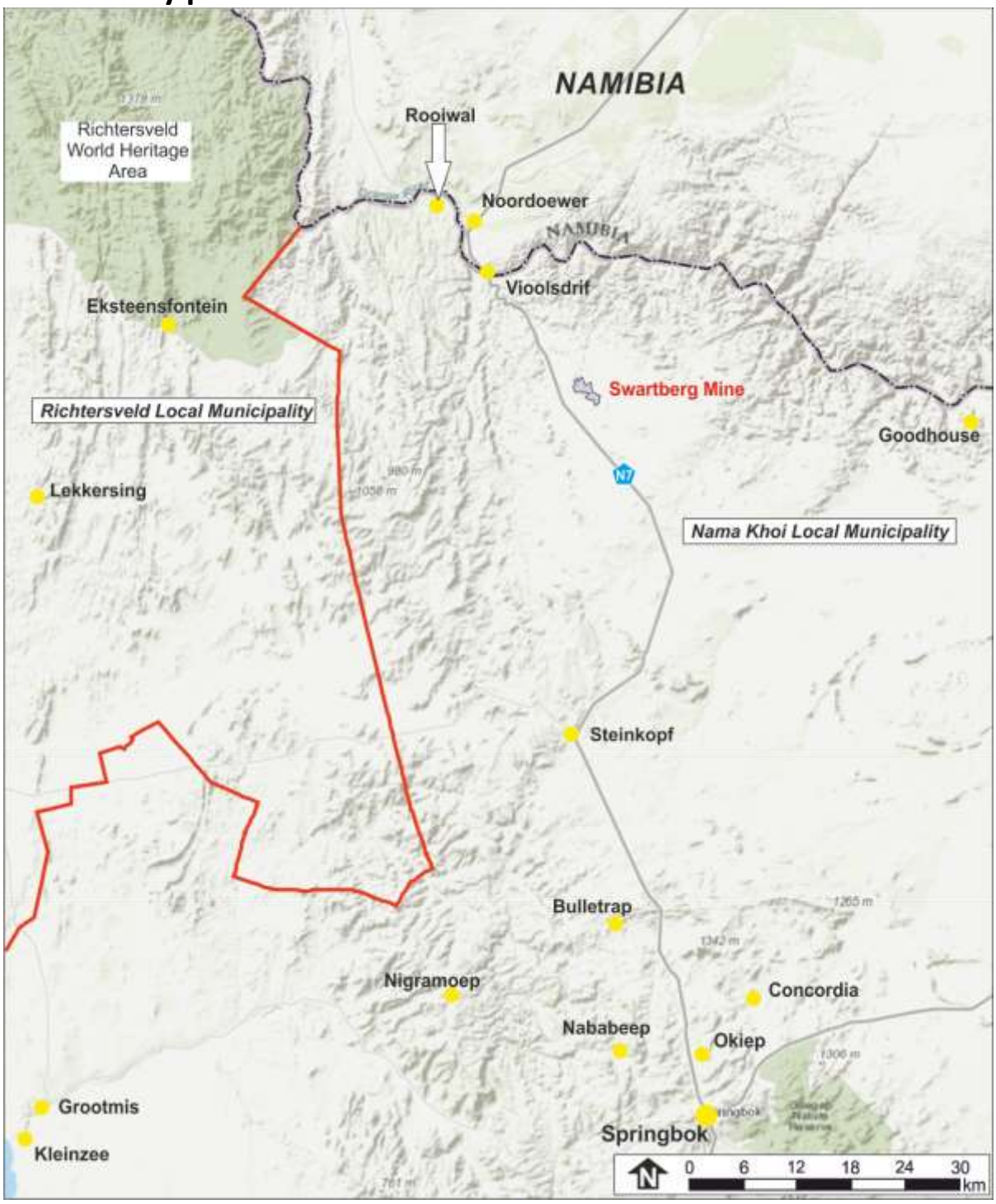
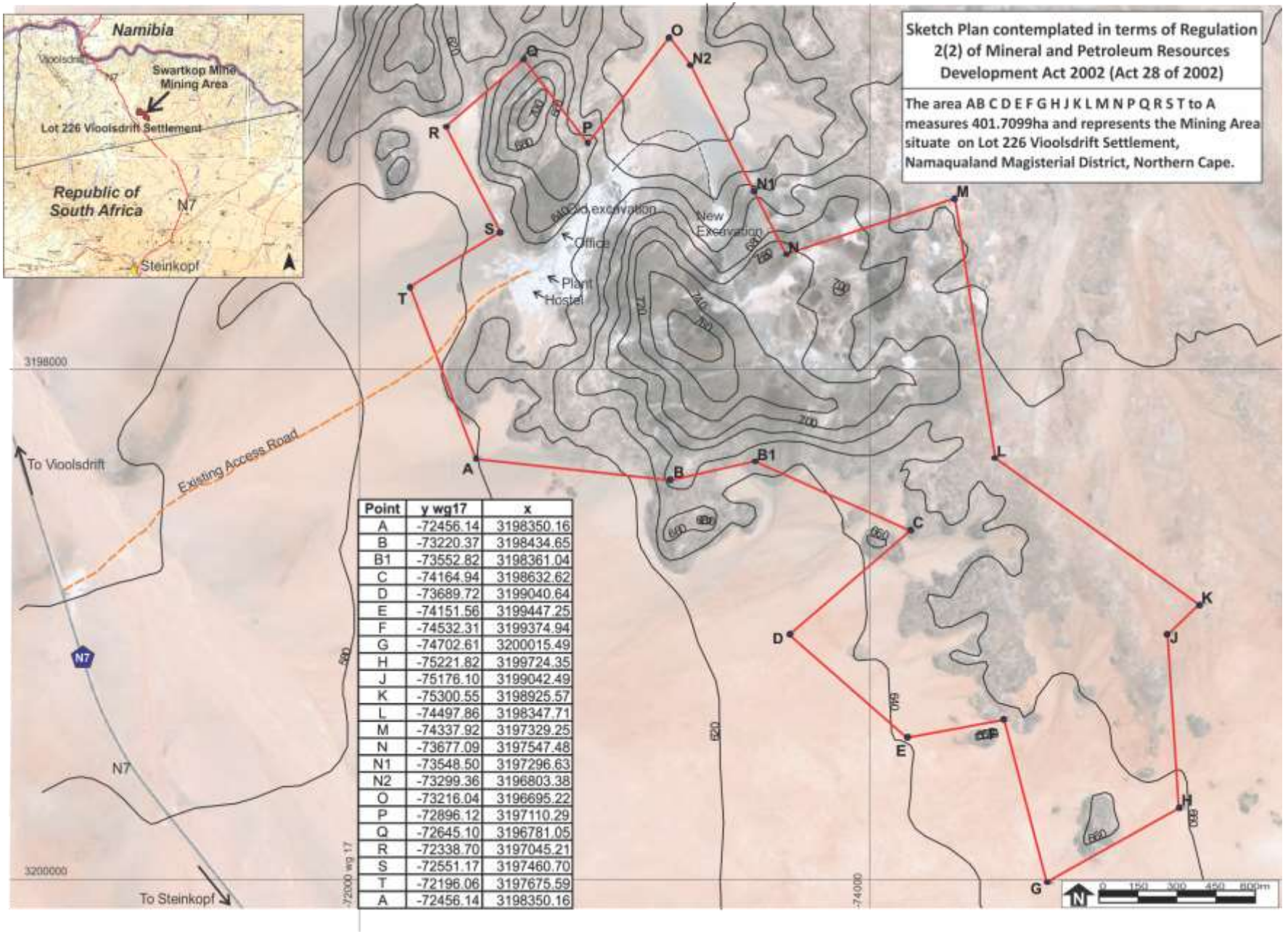


Figure 1: Locality Plan



Point	y wg17	x
A	-72456.14	3198350.16
B	-73220.37	3198434.65
B1	-73552.82	3198361.04
C	-74164.94	3198632.62
D	-73689.72	3199040.64
E	-74151.56	3199447.25
F	-74532.31	3199374.94
G	-74702.61	3200015.49
H	-75221.82	3199724.35
J	-75176.10	3199042.49
K	-75300.55	3198925.57
L	-74497.86	3198347.71
M	-74337.92	3197329.25
N	-73677.09	3197547.48
N1	-73548.50	3197296.63
N2	-73299.36	3196803.38
O	-73216.04	3196695.22
P	-72896.12	3197110.29
Q	-72645.10	3196781.05
R	-72338.70	3197045.21
S	-72551.17	3197460.70
T	-72196.06	3197675.59
A	-72456.14	3198350.16

Figure 2: Regulation 2 (2) Sketch Plan

5 Description of the scope of the proposed overall activity.

5.1 Amendments necessitating this MPRDA Section 102 Application

This project is already underway and the application relates to the amendment / updating of the EMP. The following are the main component areas at the mine described in more detail below:

1) The logistical facility area which includes office, workshop, water purification, wash bay, salvage yard, diesel tank and weighbridge facility.
2) Main plant and plant residue site. Processing plant not in use at present.
3) Main excavation currently being backfilled
4) Kloof Section excavation and overburden dump.
5) Hostel and manager's accommodation.

The only legal vehicle to bring about an amendment / update if the EMP is through Section 102 application (in terms of MPRDA). Such application requires an updated EA.

5.2 Project Description

The total project consists of the following components. Photos are all contained at the end of this chapter:

5.2.1 Mining

Mining is conducted as a surface mine hard rock drill and blast operation. Drilling is undertaken by a team using pneumatic hand held drills. The shot rock is collected from the floor by means of front-end loader and taken to the sorting platform for sorting of waste material.

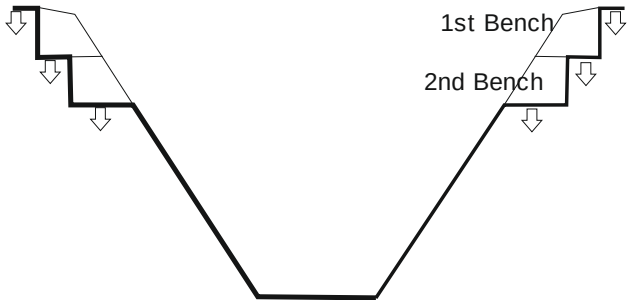
Note that mining of the Main Section excavation has ceased and that mining at present only takes place in the more recently established Kloof Section. The proposal is to backfill the main (old) excavation with all waste rock material and to explore new sections within the 401.7ha mining right area

The following factors have a direct impact on the formulation of the mine plan as contained further below:

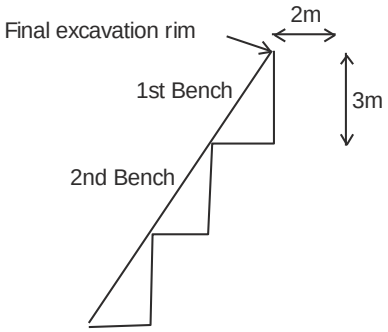
- The existing excavation configuration at Kloof Section. High faces, narrow adit and narrow floor have necessitated that the excavation be made wider so as to facilitate the benching of the sides of the excavation to obtain a more stable excavation. The existing narrow excavation is a result of the mining of only the feldspar and no advance into the surrounding amphibolite koppies to widen the excavation. Note that the amphibolite is an unsaleable product.
- Geological constraints (i.e. potential slip failures on the shear plane etc) also require that use of smaller face heights be initiated in order to retain advancing face stability.
- None of the facilities are visible from the N7 given the low ridge between these and the N7.
- The undercutting of the high northern face of the Main Section excavation has to-date been somewhat rectified by the backfilling of that portion of the

excavation. Such backfilling will continue to take place using all new waste rock and waste rock generated through the processing of the waste rock dump.

Initial perimeter bench establishment to be conducted as follows:



Final face on bench configuration is as follows:



Mine Layout Plan and Phasing

Mining in the main section has been completed and the proposed 30 year mine plan for the Kloof Section is as shown in figure 4 to consist of 3 phases as follows:

Phase 1:

- Advance current faces to the north and south with no westward advance beyond shear.
- Widen the adit from the current 3m wide adit to the dimensions as shown in figure 4. This process has been initiated as seen in photo 3.
- Lower the floor by a further 5m

Phase 2:

- Continue advance of the North and South faces
- In addition, initiate the westward advance of the western face
- Lower floor by another 15m to be 20m below present level

Phase 3:

Phase 3 can only be fully finalized after exploration of the areas surrounding Kloof section has been completed, but assumes:

- Continued advance of faces (mostly to the west)
- Lower floor to 40m below current levels

Suggested exploration to prove reserves in the Kloof Section

Given the good vertical and horizontal profile we have in the northern and southern faces of the Adit and mine bowl with general uniformity of good pegmatite and Feldspar recoverability in the floor, the most feasible way of establishing extent and recoverability at acceptable costs is a combination of percussion drilling and trial pitting whereby:

The trial pitting programme is to be conducted as follows;

- On a 10x15m grid with scheduling starting adjacent to the Adit and moving in gridlines both to the north and to the south
- Each hole to be blasted to a minimum 1m deep to expose fresh pegmatite in outcrop areas and to a maximum 2m deep in areas where the mica-lath cap is encountered (to prove the nature of the cap which is a good indicator of well differentiated pegmatite below it) or alternatively to deepen the pit to attempt to penetrate such cap and prove the Feldspar quality.
- No trial pitting is advocated in the black rock outcrop areas unless there are definite indications that pegmatite underlies the surface outcrop at depth of less than 1,5m.

A percussion drilling programme using a crawler rig with at least five 3,3m long rods is to be employed as follows to establish the extent of the pegmatite body relative to the dark country rock:

- Drill 5 percussion holes in the floor of the bowl and 2 holes in the Adit to a depth of 18m (to establish/prove the vertical lens shape pegmatite body configuration).
- Drill 4 percussion holes to 18m depth each along the Google photograph northern contact line between pegmatite and dark country rock (to establish such contact) or the presence of an extension of the currently exposed dolerite dyke.
- Drill 4 percussion holes to 18m depth each along the south-eastern contact line between pegmatite and dark country rock

5.2.2 Mine and Plant residue

Overburden from the Kloof Section will be dumped as a continued extension to the current dump east of the Kloof Section adit. Current overburden dump at the Kloof Section measures 1.58ha to a depth in the order of 3m.

The required future Kloof Section overburden dump extent is based on an estimate of the waste rock generated through mining. Table in Para 5.2.4 shows the calculation used in achieving the expected waste rock volume requiring spoiling as follows:

Phase	Waste Rock (tight m^3)	Waste Rock (Bulked m^3) 1.2x
Phase 1	16 953	20 343
Phase 2	101 790	122 148
Phase 3	146 215	175 458
Total	**264 958m^3**	**317 950m^3**

If 7m mine residue disposal dump depth is assumed then the remaining 317 950m³ waste will require 4.5ha waste surface area. So, increasing height of current dump by 4m over area of approximately 1.2ha means that an additional 3.8ha virgin area will be required for spoiling.

Feldspar ore from Kloof Section will be transported to the sorting section on the backfill platform of the Main Section excavation. All waste material from this sorting operation is pushed over the leading edge of the backfill to extend the backfill operation.

The operation at present has not advanced mining in the Kloof Section for some time as the holders have concentrated their efforts on the reprocessing of the previously dumped plant residue. Figure 3 shows the location of the previous plant residue material which is being reprocessed. All of that waste material generated by the reprocessing is used to backfill the main excavation.

Because of safety concerns, the backfilling along the south has been prevented from extending beyond its current limit (to avoid possible high wall collapse). The current limit is demarcated by a berm of the backfill surface – see photo 13.

5.2.3 Processing Plant

There are remnants of the previous processing plant on site – refer photo 6. The plant has not been used for some time and is unlikely to be utilised in the future. However, provision is made in this update of the EMP to re-establish the processing plant should it be required. The plant will be re-established on its current footprint if contemplated.

Processing plant would consist of single stage crusher, to a screen and winnowing plant, to a conveyor leading material to sorting tables for hand sorting.

5.2.4 Reserves & Lifespan

The following table shows the expected reserves and lifespan in the remainder of the Kloof Section excavation:

Lifespan is based on sales of 15 000tons per annum.

Phase	Pegmatite (m³)	% Feldspar	Waste Rock (tight)	Bank Feldspar (m³)	Feldspar (tons)	Lifespan
Phase 1	29 742	43%	16 953	12 789	33 251	2.2
Phase 2	169 650	40%	101 790	67 860	176 436	11.5
Phase 3	243 692	40%	146 215	97 477	253 440	16.5
Total	**443 084**		**264 958**	**178 126**	**463 127**	**30. 2**

5.2.5 Water Use

No water is used in the process. Water is only used for workshop and for domestic and sanitary use. Water is brought in by tanker from Vioolsdrift and filtered through a 2 stage water purification plant on site – refer photo 9. Water volumes used are absolutely minimal at about 5m³/day.

5.2.6 Logistical Facilities

The following logistical facilities are located on site (Refer Figure 3)

- The site is fully supplied with electricity from the national grid. All necessary electrical infrastructure is on site.
- Office, stores, ablutions and Workshop (Refer Photo 7)
- Fuel storage in suitably bunded fuel tank (Refer Photo 14)
- Weighbridge and dispatch facility (Refer Photo 8)
- Salvage Yard (Photo 1)
- Hostel facility (Refer Photo 11)
- Managers residence (Photo 10)

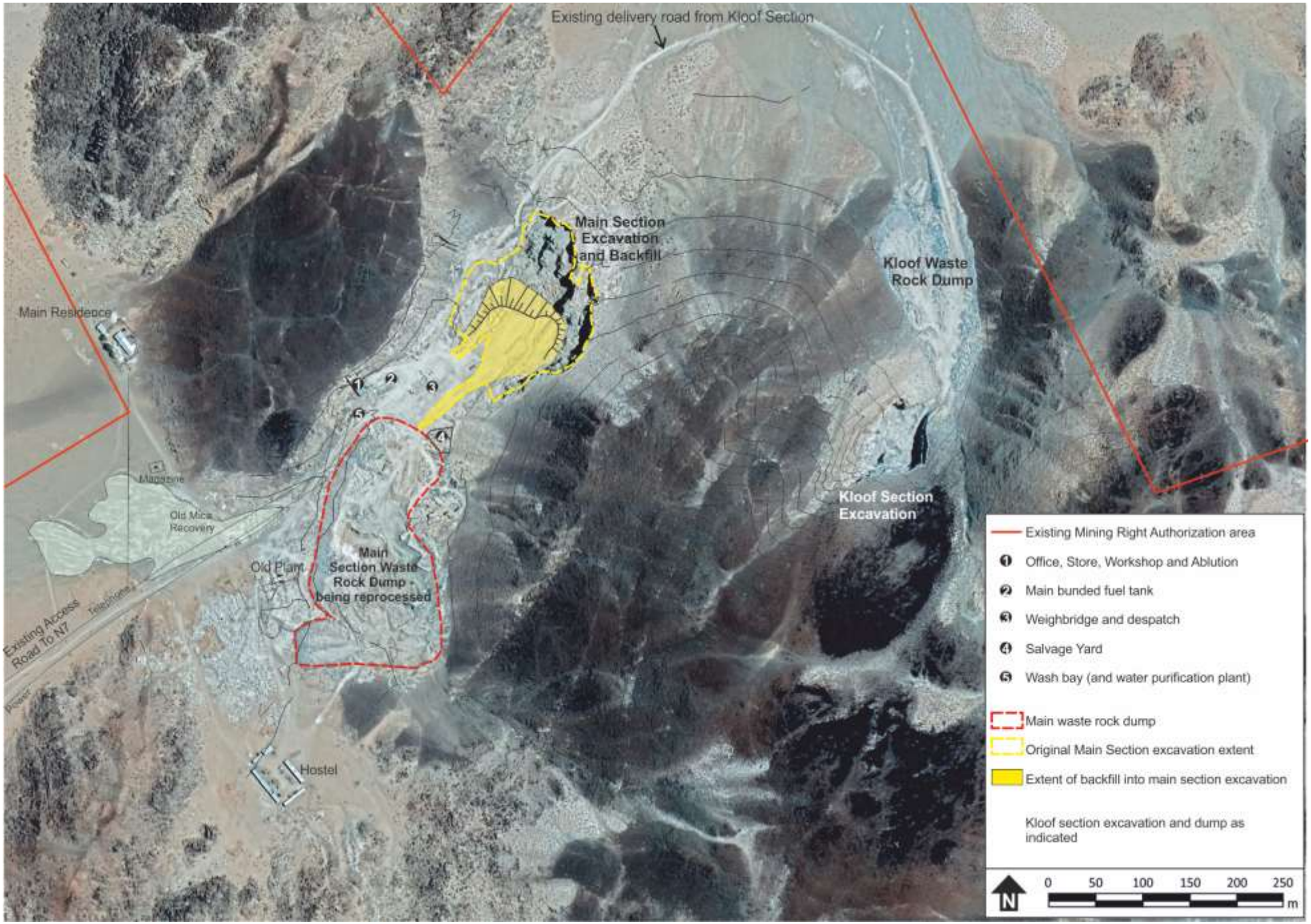


Figure 3: Existing Overall Site Layout Plan

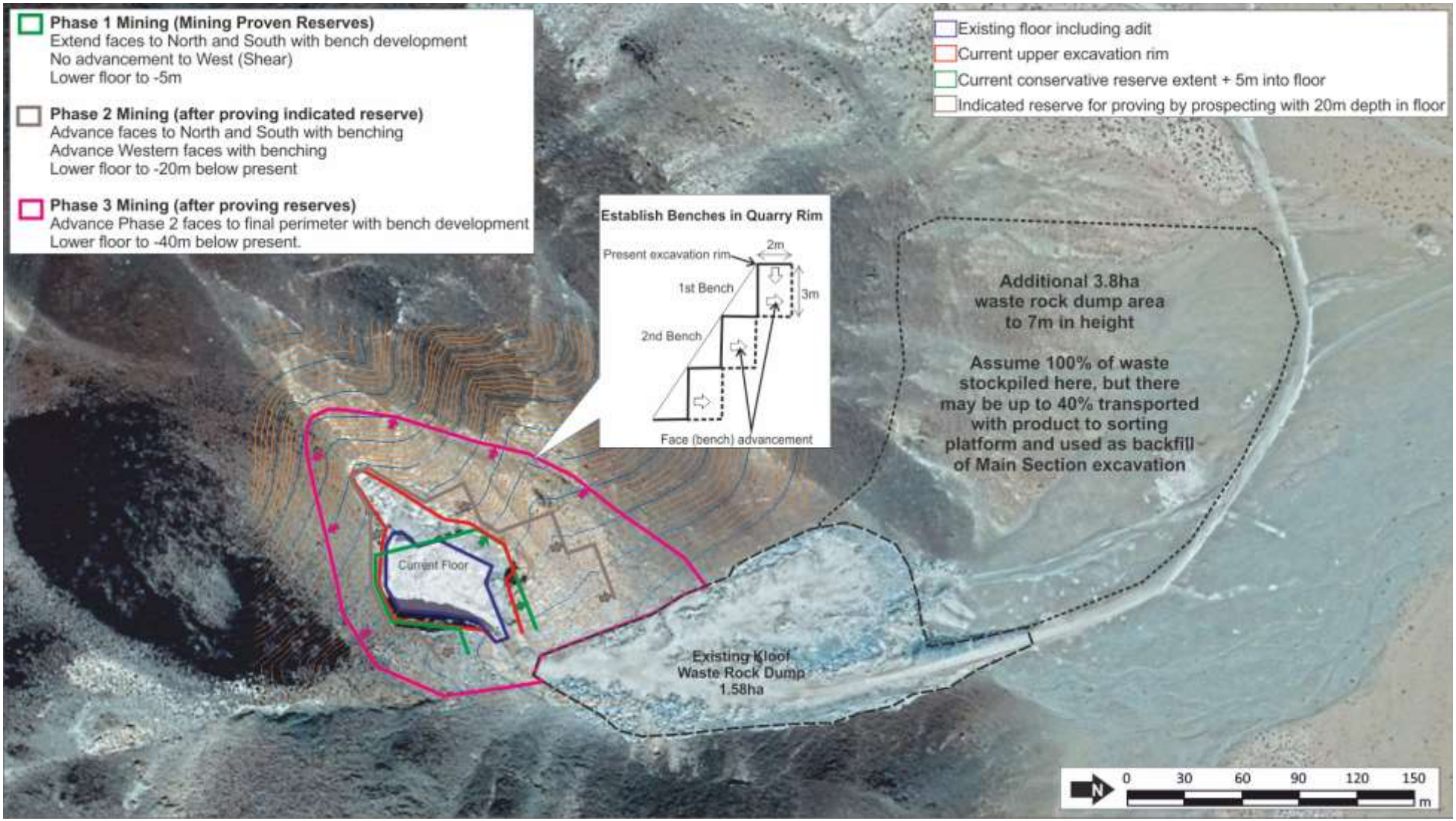


Figure 4: Kloof Section (Provisional Mine Plan subject to further exploration)

Photo 1: General view of the main excavation and logistical facility looking north, with the hostel in the west and the main excavation in the east.


Photo 2: Looking west from the top of the Main Section excavation at the backfill which has taken place to date.

Photo 3: General overview of the Kloof Section from the north showing the recent bench development (orange area) and just off picture right is the main overburden dump seen in Photo 5.

Photo 4 : Looking NE from the slope above the hostel, showing the main plant residue dump being hollowed out from the inside for re-processing and backfilling of the main section excavation.

Photo 5: Looking north from the adit of the Kloof Section excavation at the main section access road and the existing waste dump.


Photo 6: Remnants of the old Processing Plant with the plant residue dump in the background being reprocessed from the east.

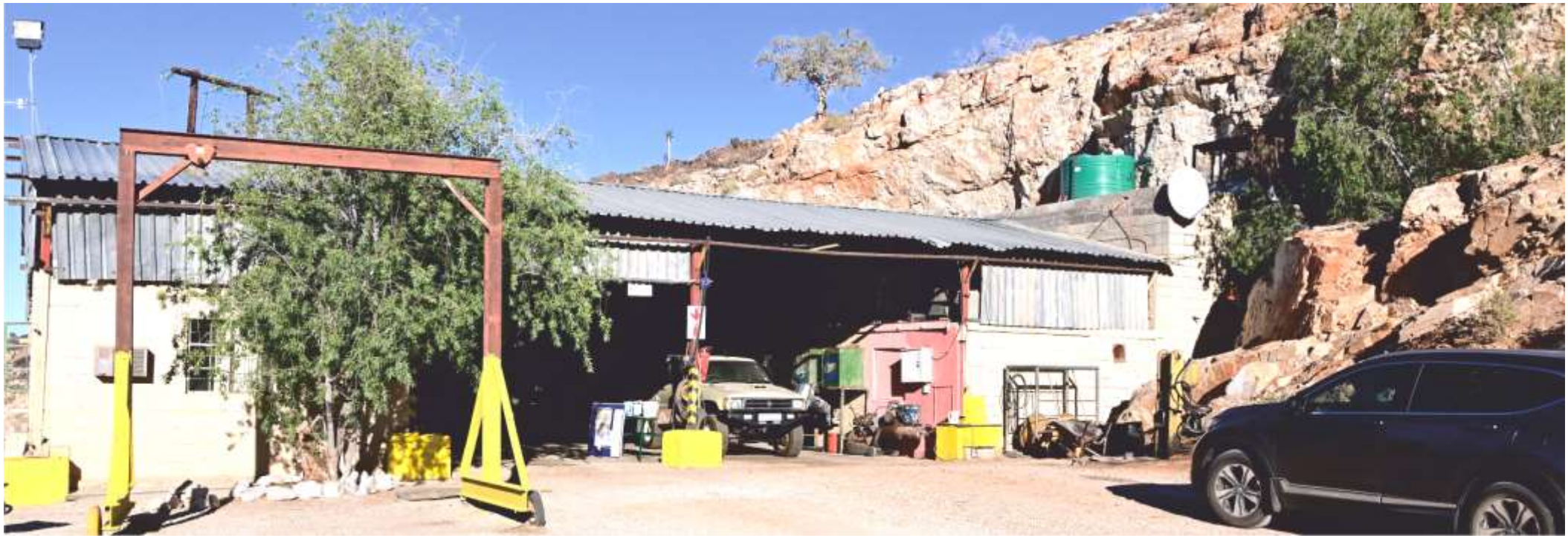


Photo 7: Office, Stores, Workshop and ablution facility

Photo 8: Weighbridge and dispatch facility

Photo 9: Small water purification plant

Photo 10: The manager's residence near the entrance to the activity areas

Photo 11: The Hostel complex

Photo 12: Magazine

Photo 13: The sorting operation on the backfill platform. Note the safety berm before the face in the south (on the backfill platform).

Photo 14: The bunded fuel tank. The bund was a bricked structure, but has recently been plastered at the DMRE's instruction

Photo 15: Drip trays in position. Needs more attention given the oil stains still on surface

Photo 16: Wash bay facility with a very basic oil trap. Oil trap must be upgraded and covered despite very low rainfall

Photo 17: Neat / upgraded designated parking areas for seldom used machinery

Photo 18: Recently fenced salvage yard. Note the large tank is currently used for used oil storage. This needs a bund, or can be replaced by the 1000l tanks (but must still be supplied with a bund).

Photo 19: Recent management interventions have been initiated to improve general site condition with good demarcation of activity areas.

Photo 20: Status of access road. It is imperative that no access to adjacent veld be allowed or that the road not be allowed to widen from its current footprint.

6 Listed and specified activities

NAME OF ACTIVITY	Aerial extent of Activity (Ha or m^2)	LISTED ACTIVITY (Mark with X)	LISTING NOTICE *(GNR 983, GNR 984 or GNR 985), as amended 2017*	WASTE MANAGEMENT AUTHORISATION (Mark with X)
Mining Right.	401.7ha	X	GNR984: Activity # 17	
1. "ESTABLISHMENT" ACTIVITIES:				
1.1. Provide concrete apron at bunded fuel tank with oil trap	±20m²			
1.2. Upgrade oil trap at Wash Bay	3 stage trap			
1.3. Provide concrete apron and oil trap at Workshop	±50m²			
1.4. Formalise used oil storage and construct bund for used oil container				
1.5. Re-establish processing plant if considered (on existing footprint)	1.2ha	X	GNR984: Activity # 17	
1.6. Provide chemical toilets at Kloof Section when operational	2 toilets			
1.7. Total disturbance area of current and proposed disturbances (including road and tracks) is very close to 20ha. Cautionary approach assumes greater than 20ha disturbance and the appropriate listed activity is thus applied for.	>20ha	X	GNR 984: Activity 15	
2. OPERATIONAL PHASE ACTIVITIES				
A. Main Section and Logistical Facilities				
2.1. Continue reprocessing of existing waste rock dump. No further extension of main pit will occur.	3.1ha	X[1]	GNR984: Activity # 17	
2.2. Hauling material from waste rock dump to surface of backfill				
2.3. Continue backfill main section waste rock into main pit (and later with any waste material resultant from material transported from the Kloof Section and sorted on the backfill platform)				Backfill does not constitute waste disposal, so no waste licence required
2.4. Use of processing plant (if contemplated (unlikely)): Crushing and screening	1.2ha	X	GNR984: Activity # 17	
2.5. Loading and delivery of saleable product Includes use of delivery route to N7	2.3km >4m	X	GNR985: Activity # 4	
2.6. Use of workshop				
2.7. Use of bunded fuel tank	<80m³			
2.8. Use of Wash Bay				
2.9. Water is sourced from Orange River, trucked in and passed through purification plant				

[1] Reprocessing takes place by hand sorting only (but still included to ensure compliance with NEMA listing)

NAME OF ACTIVITY	Aerial extent of Activity (Ha or m^2)	LISTED ACTIVITY (Mark with X)	LISTING NOTICE *(GNR 983, GNR 984 or GNR 985), as amended 2017*	WASTE MANAGEMENT AUTHORISATION (Mark with X)
2.10. Domestic / General waste into main section pit to be covered by backfill. Floor area of remaining backfill measures only 159m².	Max 200m² and less than 25 000tons	X (NEMWA)	Category A: Activity 10[2]	X
2.11. Hazardous waste transported off site for handling at licenced facility				
B. Kloof Section				
2.12. Advance of excavation through drilling and blasting (No topsoil available)	Estimated 3.2ha remaining of 3.7ha total	X	GNR984: Activity # 17 GNR 985: Activity # 12	
2.13. Loading of shot rock and waste rock				
2.14. Hauling of shot rock and waste rock. Road already in place. Use of road.	Assume wider than 4m. 850m	X	GNR985: Activity 4	
2.15. Topsoil removal ahead of waste rock dump advance –	Estimated additional 3.8ha for total of 5.3ha	X	GNR985: Activity 12 GNR 985: Activity # 14 /23	
2.16. Waste rock dump development	Up to 5.3ha to 7m deep maximum[3]	X	GNR983: Activity 19 GNR983: Activity # 48[4]	X
3. DECOMMISSIONING PHASE ACTIVITIES		**X**	**GNR 983: Activity # 22**	
3.1. Finalise shaping of all remnant dumps and level all ad hoc dumps				
3.2. Cover waste rock dump in Kloof section with removed sand cover				
3.3. Demolish all unrequired structures				
3.4. Remove all protruding foundations and footings				
3.5. Remove all pipelines and cables				
3.6. Remove diesel tank & decontaminate				
3.7. Remove weighbridge concrete structures				
3.8. Rip / scarify all hardened areas				
3.9. Retain access roads for future use				
4. AFTERCARE PERIOD				
4.1. Remove alien vegetation, if present				
4.2. Conduct final performance assessment				
4.3. Lodge closure Application				
4.4. DMR Grant Closure Application				

[2] Using DEA toolkit (http://iwmp.environment.gov.za/guideline/2/2-2-3), assume 270.1kg/person/year (Middle income) x 20 people on the mine = 5 402kg per annum x 30 years = 162 060kg or 162tons (far below the 25 000ton limit).

[3] This calculation of area assumes worst case scenario for dumping where 100% of waste material from the Kloof Section is dumped here. In reality, a significant percentage of the waste will be transported with the product to the sorting platform and used as backfill in the Main Section excavation.

[4] Development/ extension of infrastructure (assuming the waste rock dump is classified as infrastructure) within 32m of water course.

Listed Activities Identified in Table above:

Listed Activity	Listed activity description	Comment
GNR 983: Activity # 19	The infilling or depositing of any material of more than 10 m^3 into, or the dredging, excavation, removal or moving of soil, sand, shells, shell grit, pebbles or rock of more than 10m^3 from a watercourse.	Note that Activity 19 is excluded if part of a mining permit application but not specifically excluded as part of Mining Right application, so it is retained here.
GNR 983: Activity # 22	The decommissioning of any activity requiring – (i) a closure certificate in terms of section 43 of the MPRDA); or (ii) a prospecting right, mining right, mining permit, production right or exploration right, where the throughput of the activity has reduced by 90% or more over a period of 5 years excluding where the competent authority has in writing agreed that such reduction in throughput does not constitute closure;	
GNR 983: Activity # 48	The expansion of— …. (i) Infrastructure or structures where the physical footprint is expanded by 100m^2 or more; or …. where such expansion [or expansion and related operation] occurs— (a) within a watercourse; or… (c) if no development setback exists, within 32m of a watercourse, measured from the edge of a watercourse;	
GNR 984: Activity # 15	The clearance of an area of 20 hectares or more of indigenous vegetation….	Total disturbance area of current and proposed disturbances (including road and tracks) is very close to 20ha. Cautionary approach assumes greater than 20ha disturbance and the appropriate listed activity is thus applied for
GNR 984: Activity # 17	Any activity including the operation of that activity which requires a mining right as contemplated in section 22 of the MPRDA), including— (a) associated infrastructure, structures and earthworks, directly related to the extraction of a mineral resource [,] ; or (b) the primary processing of a mineral resource including winning, extraction, classifying, concentrating, crushing, screening or washing;	
GNR 985: Activity # 4	The development of a road wider than 4m with a reserve less than 13.5m: ii) Outside Urban Area: … ee) Critical biodiversity areas as identified in systematic biodiversity plans adopted by the competent authority or in bioregional plans.	
GNR 985: Activity # 12	The clearance of an area of 300m^2 or more of indigenous vegetation: ii) Within critical biodiversity areas identified in bioregional plans	
GNR 985: Activity # 14	The development of—… ii) Infrastructure or structures with a physical footprint of 10m^2 or more;… (a) within a watercourse; or… (c) if no development setback exists, within 32m of a watercourse, measured from the edge of a watercourse;	
GNR 985: Activity # 23	The expansion of—… ii) Infrastructure or structures with a physical footprint of 10m^2 or more;… (a) within a watercourse; or… (c) if no development setback exists, within 32m of a watercourse, measured from the edge of a watercourse;	

7 Description of the activities to be undertaken

(Describe Methodology or technology to be employed, and for a linear activity, a description of the route of the activity)

Refer Para 5 and 6 above.

8 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)	REFERENCE WHERE APPLIED (i.e. Where in this document has it been explained how the development complies with and responds to the legislation and policy context)	HOW DOES THIS DEVELOPMENT COMPLY WITH AND RESPOND TO THE POLICY AND LEGISLATIVE CONTEXT
National Environmental Management Act	Entire document including public participation	Environmental Authorization from DMR as competent authority
NEMA Regulations	Application	Governs listed activities and content of reports
Mineral and Petroleum Resources Development Act	Template for documentation	DMR application and process
Namakwa Bioregional Plan	Vegetation / Biodiversity	Specialist study may be required
SKEP	Vegetation / Biodiversity	Specialist study may be required
Mapping of NC CBA's	Vegetation / Biodiversity	Specialist study may be required
Municipality's SDF and IDP	Need and Desirability (Para 9.1)	End Use informant.
National Water Act	Water related elements	Water Use Licence application if required
National Heritage Resources Act	Para 23.1.2	Document consulted with SANBI and NBKB.
EIA Guideline and Information Document Series' "Guideline on Need and Desirability	Need and Desirability (Para 9.1)	Guideline for information utilized in this document
EIA Guideline 5 Assessing alternatives and impacts	Cumulative Impact Assessment (Para 9.2)	Guideline for information utilized in this document
NEMWA	Application has been made with this EA Application	Disposal mine residues. Methodology and Environmental Controls
Hazardous Substances Act, 1973 (Act 15 of 1973)	Hazardous Materials Handling in upcoming EMP	The measures proposed must take the Act into account.
Noise and dust regulations and recommendations	Noise and dust reduction measures	The mitigation measures proposed take the requirements into account.
NEM: AQA	Air Emissions Licence not required	NA.
Land Use Planning Act, 2014 (Act No. 13 of 2014)	Not applicable until after EA has been (if) granted.	A land use application may be required
National Dust Control Regulations (Government Notice No. R. 827 of 1/11/2013)	Dust control	Dust control measures to be implemented and monitoring required
List of waste management activities promulgated in GN No. 921 of 29 November 2013 (as amended);	Waste Management	Application for waste licence required

APPLICABLE LEGISLATION AND GUIDELINES USED TO COMPILE THE REPORT (A description of the policy and legislative context within which the development is proposed)	REFERENCE WHERE APPLIED (i.e. Where in this document has it been explained how the development complies with and responds to the legislation and policy context)	HOW DOES THIS DEVELOPMENT COMPLY WITH AND RESPOND TO THE POLICY AND LEGISLATIVE CONTEXT
National Waste Information Regulations promulgated in GN No. R. 625 of 13 August 2012	Waste Management	Waste handling protocol to be described in EMP
Waste Classification and Management Regulations promulgated in GN No. R. 634 of 23 August 2013	Waste Management	Waste handling protocol to be described in EMP
National Norms and Standards for the Storage of Waste promulgated in GN No. 926 of 29 November 2013	Waste Management	Waste handling protocol to be described in EMP
Regulations Regarding the Planning and Management of Residue Stockpiles and Residue Deposits From a Prospecting, Mining, Exploration or Production Operation. Govt Notice R632 2015	Mine residue handling	Mine residue handling to be finalised in EMP
Regulation 16(1)(b)(v) of the EIA Regulations, 2014 (as amended)	Requires that application for EA must be go together with web based Screening Tool	Screening tool lodged under separate cover

9 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).

9.1 Need and desirability analysis

The 2017 EIA Guideline and Information Document Series' "Guideline on Need and Desirability" has been used to consider this aspect.

Important: The need and desirability should not **only** focus on the actual production phase of this site's lifespan but also concentrate on the long term / permanent post project land use proposal. As background to the following paragraphs, the **proposed eventual land use for the site is still subject to public input, but is anticipated to be rehabilitated as far as is possible to match surrounding wilderness area.**

Need refers to timing of a project whilst desirability refers to the placing of the activity. In this case, there can hardly be any argument against the need and desirability of the project which reprocesses existing unrehabilitated dumps and in the process provides an opportunity to rehabilitate portions of the significantly disturbed site. The project also creates significant number of jobs for up to 30 years.

The first port of call in considering need and desirability is a determination of how the proposed project fits in with the Municipal Integrated Development Plan (IDP), and the Spatial Development Framework (SDF). The SDF classifies the site in the 2014 SDF document is "Extensive Agricultural Area" – Refer Figure 8 below.

The SDF contains a number of Spatial Objectives. Where applicable / relevant to this operation and process, these are quoted below:

"SPATIAL OBJECTIVE 1: To improve connectivity and linkages to the region as a whole and to specific areas of economic importance, in order to promote accessibility to opportunities and services".

"*SPATIAL OBJECTIVE 3: To develop sustainable and diverse local economies by the utilisation of opportunities in the different spatial categories*". Under this Spatial Objective there is specific mention of mining as quoted hereunder:
"MINING

- *There is a concentration of minerals around the Springbok area, as well as in a broad band along the south of the Orange River. Although many of these sources have been depleted, there are still plenty occurrences that can be exploited and this should be considered for small scale mining.*
- *The Industrial mining corridor as indicated in the PSDF must be investigated for opportunities and exploited where possible.*
- *To solve the disputes and issues related to mining rights and to investigate the possibility for local communities to gain access and limited mining rights in areas to be identified for this".*

"SPATIAL OBJECTIVE 4: To protect the pristine and unique natural environment with its four distinct bio-geographical regions by means of effective management and managed use".

- *To protect the natural spaces affected by the Terrestrial and Aquatic Critical Biodiversity areas against development and overgrazing, due to its vital role in maintaining biodiversity.*
- *To support the Critical Biodiversity Corridor Linkages towards the surrounding municipalities.*
- *To rehabilitate all mining areas and damaged areas in the region and to remove and terminate unwanted activities and undesirable structures in and around protected areas.*

The conclusion that can be drawn from the information obtained from the SDF is that development is to be encouraged **provided** that it is conducted in an environmentally responsible manner which does not generate significant negative impact on especially the tourism industry and Critical Biodiversity Areas (especially corridors). Figure 5 overleaf shows the Mining Right area located in area classified in the SDF as Critical Biodiversity area, but the existing mine and proposed future development does not result in any detrimental impact to any corridor or biodiversity linkage.

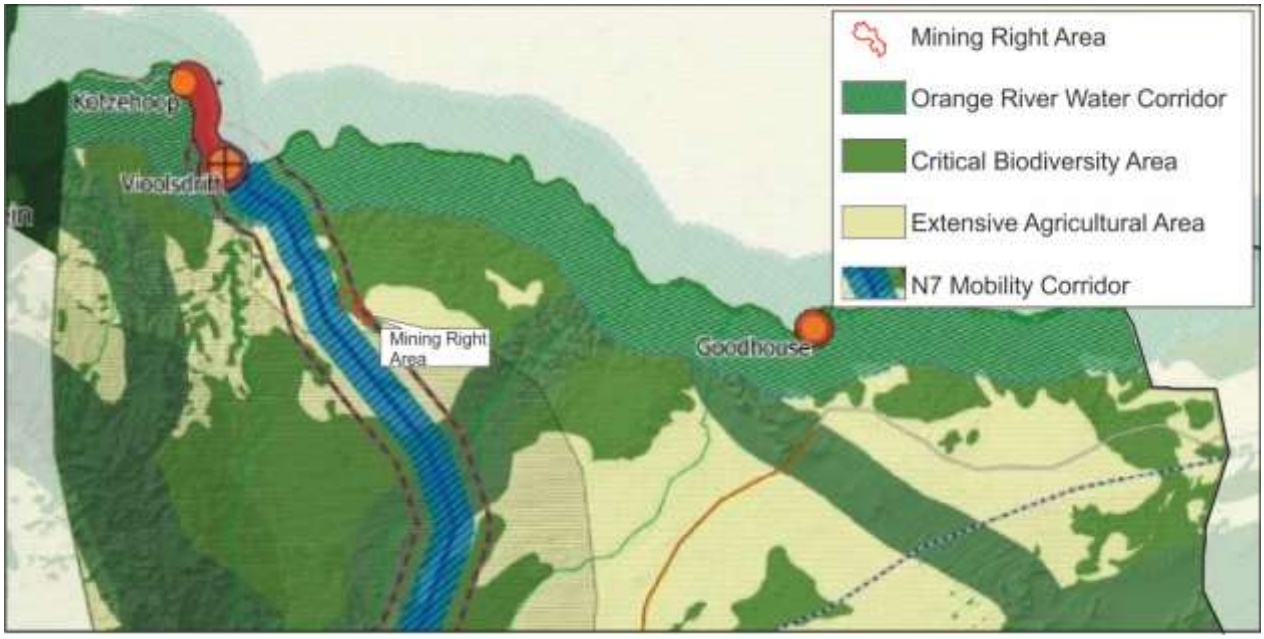


Figure 5: Excerpt from May 2014 SDF

The following tables are from the published 2017 Guideline on Need and Desirability:

9.1.1 Securing ecological sustainable development and use of natural resources

Securing ecological sustainable development and use of natural resources

1.	**How will this development (and its separate elements/aspects) impact on the ecological integrity of the area?**	
1.1.	How were the following ecological integrity considerations taken into account:	
1.1.1.	Threatened Ecosystems	The only future additional disturbance will be realized through the extension of the Kloof Section excavation and waste rock dump. The excavation will extend from current 0.7ha to measure maximum 3.7ha whilst the 1.5ha waste rock dump will be expanded by 3.8ha to measure 5.3ha (for total additional disturbance area of 6.8ha): . 1) Figure 11 shows the Critical Biodiversity Area (CBA) mapping for the area. It shows that the disturbance areas have been acknowledged as such in the CBA mapping and that the vegetation which is remaining falls into CBA 2. The closest Protected Area is more than 10km distant (being the Richtersveld National Park). 2) Mucina and Rutherford classifies the veld type as Eastern Gariep Rocky Desert which is not classified as Critically Endangered, Endangered nor Vulnerable in terms of the NEM:BA listed Ecosystems (GNR 32689). 3) The site is located just outside of the Greater Richtersveld Geographic Priority area of SKEP (Succulent Karoo Ecosystem Project)
1.1.2.	Sensitive, vulnerable, highly dynamic or stressed ecosystems, such as coastal shores, estuaries, wetlands, and similar systems require specific attention in management and planning procedures, especially where they are subject to significant human resource usage and development pressure	
1.1.3.	Critical Biodiversity Areas ("CBAs") and Ecological Support Areas ("ESAs"),	
1.1.4.	Conservation targets.	The vegetation type (Eastern Gariep Rocky Desert) is **not** classified as Critically Endangered, Endangered or Vulnerable in terms of NEM: BA. Mucina and Rutherford (2006) record that the Eastern Gariep Rocky Desert is *Least Threatened* in terms of its conservation status, despite the fact that none is formally conserved against a target of 34%. It is probable that the vegetation in the rocky slopes around the excavation form the vegetation of the Eastern Gariep Rocky Desert whilst the vegetation on the plains and hill wash where the Kloof Section overburden dump is proposed is located on the Eastern Gariep Plains Desert. Also not classified as Critically Endangered, Endangered or Vulnerable in terms of NEM: BA and despite a target of 34% conservation, none is conserved in formal protected areas.
1.1.5.	Ecological drivers of the ecosystem.	The site is located in an arid landscape with low rainfall in the order of 40mm. Summers are hot with average temperatures reaching over 30°C. Mucina and Rutherford state: "*Heavy grazing and arid climate combined with the ease of accessibility to stock meant that pastoral activities in the past have significantly altered the structure and composition of the vegetation in this unit*". Prosopis infestation is a problem in around springs or aquifers.
1.1.6.	Environmental Management Framework	No EMF could be sourced from the Nama Khoi Municipality

1.1.7.	Spatial Development Framework, and	The SDF shows the site to be located in "CBA" (Refer Figure 5). Whilst the SDF certainly drives the notion that tourism is critical to the Nama Khoi Municipality and that such tourism is ensured through maximization of conservation of natural vegetation, landscapes and views, the SDF also acknowledges the role of mining in the area.
1.1.8.	Global and international responsibilities relating to the environment (e.g. RAMSAR sites, Climate Change, etc.).	None relevant
1.2.	How will this development disturb or enhance ecosystems and/or result in the loss or protection of biological diversity? What measures were explored to firstly avoid these negative impacts, and where these negative impacts could not be avoided altogether, what measures were explored to minimise and remedy (including offsetting) the impacts? What measures were explored to enhance positive impacts	This is an operational mine and the bulk of disturbances have already occurred however the following have a bearing: 1) The only extension of activities takes place at the Kloof Section where MAXIMUM 6ha of disturbance will take place through excavation and waste rock dump extension 2) The existing Plant residue dump at the Main Section is currently being reprocessed and used to backfill the existing Main Section pit. 3) Wherever possible, all waste material will be used to backfill the pit. Full mitigation and monitoring efforts aimed at minimising or preventing any negative impacts will be detailed in the upcoming EIA/EMP.
1.3.	How will this development pollute and/or degrade the biophysical environment? What measures were explored to firstly avoid these impacts, and where impacts could not be avoided altogether, what measures were explored to minimise and remedy (including offsetting) the impacts? What measures were explored to enhance positive impacts?	As stated above, the extension of the Kloof Section excavation and waste rock dump will disturb a maximum of 6 ha above and beyond the current disturbance which has taken place. The only other real risk of pollution to the site and surrounds is through hydrocarbon pollution. All mitigation and monitoring efforts aimed at minimising or preventing any negative impacts will be addressed in the upcoming EIA/EMP which will contain full Hydrocarbon policy. The aim of the rehabilitation programme will be to maximise the wilderness land capability of the site once mining has been completed.
1.4.	What waste will be generated by this development? What measures were explored to firstly avoid waste, and where waste could not be avoided altogether, what measures were explored to minimise, reuse and/or recycle the waste? What measures have been explored to safely treat and/or dispose of unavoidable waste?	The continued mining at Kloof Section will generate overburden which will require spoiling on site. The aim is to maximise backfilling at the Main Section excavation, but there will eb material which cannot be backfilled. That material which cannot be backfilled will generate a Mine Residue dump as a n extension to the existing Kloof Section dump (additional 3.8ha max). Minimal domestic waste is generated at this site. The waste which is generated will either be disposed of in the main Section excavation under the backfill or be transported directly to the closest Municipal landfill site.
1.5.	How will this development disturb or enhance landscapes and/or sites that constitute the nation's cultural heritage? What measures were explored to firstly avoid these impacts, and where impacts could not be avoided altogether, what measures were explored to minimise and remedy (including offsetting) the impacts? What measures were explored to enhance positive impacts?	Not applicable at this disturbed site.

1.6.	How will this development use and/or impact on non-renewable natural resources? What measures were explored to ensure responsible and equitable use of the resources? How have the consequences of the depletion of the non-renewable natural resources been considered? What measures were explored to firstly avoid these impacts, and where impacts could not be avoided altogether, what measures were explored to minimise and remedy (including offsetting) the impacts? What measures were explored to enhance positive impacts?	Mining generally depletes non-renewable resources. In terms of equitable use of the resource, the applicant has met all the legal requirements of the mining charter, the application is subject to all Mineral (MPRDA) and Environmental (NEMA) legislation and the public participation associated therewith. The application will also be subject to input from several commenting authorities.
1.7.	How will this development use and/or impact on renewable natural resources and the ecosystem of which they are part? Will the use of the resources and/or impact on the ecosystem jeopardize the integrity of the resource and/or system taking into account carrying capacity restrictions, limits of acceptable change, and thresholds? What measures were explored to firstly avoid the use of resources, or if avoidance is not possible, to minimise the use of resources? What measures were taken to ensure responsible and equitable use of the resources? What measures were explored to enhance positive impacts?	None. Given the mining and disturbance which has taken place here already and the absolutely low carrying capacity of the veld and the small scale of the additional development, there will be no jeopardy in respect of carrying capacity, limits of acceptable changes and thresholds. NA, mining does represent the use / exploitation of a resource. The operation uses absolutely minimal water and fuel. The applicant has / will continue to meet all the requirements of the MPRDA and Mining Charter.
1.7.1.	Does the proposed development exacerbate the increased dependency on increased use of resources to maintain economic growth or does it reduce resource dependency (i.e. de-materialized growth)? (note: sustainability requires that settlements reduce their ecological footprint by using less material and energy demands and reduce the amount of waste they generate, without compromising their quest to improve their quality of life)	This mining operation does not lower the dependency on use of resources to maintain economic growth. The resources it does use are diesel, water and labour. Waste generation is limited.

1.7.2.	Does the proposed use of natural resources constitute the best use thereof? Is the use justifiable when considering intra- and intergenerational equity, and are there more important priorities for which the resources should be used (i.e. what are the opportunity costs of using these resources against a proposed development alternative?)	The natural resources used (apart from the Feldspar target mineral) are absolutely minimal. In terms of the use of the Feldspar, there can be no other use for this natural resource apart from leaving it in the ground. The Feldspar is an important constituent in the glass making. It is highly unlikely that the use of this resource will impact on any future generation's equity. The only alternative to this use is wilderness/ grazing. The impact of this small mine in the larger Vioolsdrift / Steinkopf commonages is insignificant, and after successful rehabilitation the site could still function as grazing and / or wilderness area (albeit with modified topography).
1.7.3.	Do the proposed location, type and scale of development promote a reduced dependency on resources	No.
1.8.	How were a risk-averse and cautious approach applied in terms of ecological impacts	Specialist study/ies will be tasked to address ecological concern identified by the EAP and through public participation.
1.8.1.	What are the limits of current knowledge (note: the gaps, uncertainties and assumptions must be clearly stated)?	The Scoping report will be lodged with the Heritage Authorities to determine whether any Heritage Studies are required.
1.8.2.	What is the level of risk associated with the limits of current knowledge?	Given the current focus on reprocessing and very slow rate of excavation advance (of the future Kloof Section Excavation and Dump), the risk is assessed as very low
1.8.3.	Based on the limits of knowledge and the level of risk, how and to what extent was a risk-averse and cautious approach applied to the development?	Given the limits of knowledge in respect Heritage, it is required that the authorities be consulted.
1.9.	How will the ecological impacts resulting from this development impact on people's environmental right in terms following:	
1.9.1.	Negative impacts: e.g. access to resources, opportunity costs, loss of amenity (e.g. open space), air and water quality impacts, nuisance (noise, odour, etc.), health impacts, visual impacts, etc. What measures were taken to firstly avoid negative impacts, but if avoidance is not possible, to minimise, manage and remedy negative impacts?	The negative impacts have been identified in this document. Measures taken to avoid, minimise, manage and remedy negative impacts as well as monitoring will be contained in the upcoming EIA/EMP.
1.9.2.	Positive impacts: e.g. improved access to resources, improved amenity, improved air or water quality, etc. What measures were taken to enhance positive impacts?	Proposed measures taken to enhance positive impacts will be contained in the upcoming EIA/EMP.

1.10.	Describe the linkages and dependencies between human wellbeing, livelihoods and ecosystem services applicable to the area in question and how the development's ecological impacts will result in socioeconomic impacts (e.g. on livelihoods, loss of heritage site, opportunity costs, etc.)?	The economic base in this area was copper mining to the south and farming along the range River to the North. The commonage area is utilised for grazing . Copper mining has now ceased and unemployment is high with an associated increase in social issues affecting the towns to the south. The proposed continuation of the operation cannot result in any negative socio economic impact. The ecological impact will not diminish any other persons or group of persons' potential livelihood.
1.11.	Based on all of the above, how will this development positively or negatively impact on ecological integrity objectives/ targets/ considerations of the area?	At this stage of the process, it is clear that if the site is properly managed during its operational phase and decommissioning rehabilitation is conducted to a high level, then the residual impact will be insignificant and the site could still function to its pre-mining capability.
1.12.	Considering the need to secure ecological integrity and a healthy biophysical environment, describe how the alternatives identified (in terms of all the different elements of the development and all the different impacts being proposed), resulted in the selection of the "best practicable environmental option" in terms of ecological considerations?	Not applicable to this operational project.
1.13.	Describe the positive and negative cumulative ecological/biophysical impacts bearing in mind the size, scale, scope and nature of the project in relation to its location and existing and other planned developments in the area?	Provisional cumulative impact has been described as insignificant on all aspects of the ecology (as described in para 9.2)

9.1.2 Promoting justifiable economic and social development

2.	**Promoting justifiable economic and social development**	
2.1.	What is the socio-economic context of the area, based on, amongst other considerations, the following considerations?:	

2.1.1.	The IDP (and its sector plans' vision, objectives, strategies, indicators and targets) and any other strategic plans, frameworks of policies applicable to the area,	The IDP targets economic growth and makes continual reference to the impact of mining having left the area. So, although mining is prized for its ability to create jobs, the value of the tourism industry has not been discounted and appears to be a focus for the area. This project does not negatively impact on tourism as it takes place in a previously disturbed area and is all but invisible from all tourist routes. The proposed development meets targets of the IDP in that it does facilitate development as well as creating jobs (up to 30) for the life of the project.
2.1.2.	Spatial priorities and desired spatial patterns (e.g. need for integrated of segregated communities, need to upgrade informal settlements, need for densification, etc.),	Not applicable
2.1.3.	Spatial characteristics (e.g. existing land uses, planned land uses, cultural landscapes, etc.), and	The EMP will contain full description of the proposed rehabilitation of the site so that it can best integrate into the surrounding wilderness / grazing land.
2.1.4.	Municipal Economic Development Strategy ("LED Strategy").	The Municipality, along with many others, suffers from low employment rates and virtually any economic development has the potential for large multiplier effects.
2.2.	Considering the socio-economic context, what will the socio-economic impacts be of the development (and its separate elements/aspects), and specifically also on the socio-economic objectives of the area?	
2.2.1.	Will the development complement the local socio-economic initiatives (such as local economic development (LED) initiatives), or skills development programs?	Although the full operation is small scale and temporary in nature (i.e. up to 30 years), the proposed development does lend itself to economic development and skills development in that time. Mining Right requires the compilation of a Social and Labour Plan which incorporates Local Economic Development.
2.3.	How will this development address the specific physical, psychological, developmental, cultural and social needs and interests of the relevant communities	
2.4.	Will the development result in equitable (intra- and inter-generational) impact distribution, in the short- and long-term? Will the impact be socially and economically sustainable in the short- and long-term?	It is highly unlikely that the use of this resource will impact on any future generation's environment to any significant degree. The only alternative to this use is wilderness/ grazing. The impact of this small mine in the larger Vioolsdrift / Steinkopf commonages is insignificant, and after successful rehabilitation the site could still function as grazing and / or wilderness area (albeit with modified topography).
2.5.	In terms of location, describe how the placement of the proposed development will:	
2.5.1.	result in the creation of residential and employment opportunities in close proximity to or integrated with each other	NA
2.5.2.	reduce the need for transport of people and goods	NA
2.5.3.	result in access to public transport or enable non-motorised and pedestrian transport (e.g. will the development result in densification and the achievement of thresholds in terms public transport),	NA
2.5.4.	compliment other uses in the area,	Provided rehabilitation occurs as per the future EMP, then the impact will most likely be insignificant.

2.5.5.	be in line with the planning for the area,	Provided rehabilitation occurs as per the future EMP, then the impact will most likely be insignificant.
2.5.6.	for urban related development, make use of underutilised land available with the urban edge,	Not applicable
2.5.7.	optimise the use of existing resources and infrastructure	Not applicable.
2.5.8.	opportunity costs in terms of bulk infrastructure expansions in non-priority areas (e.g. not aligned with the bulk infrastructure planning for the settlement that reflects the spatial reconstruction priorities of the settlement),	Not applicable.
2.5.9.	discourage "urban sprawl" and contribute to compaction/densification,	Not applicable.
2.5.10.	contribute to the correction of the historically distorted spatial patterns of settlements and to the optimum use of existing infrastructure in excess of current needs,	Not applicable.
2.5.11.	encourage environmentally sustainable land development practices and processes	Provided rehabilitation occurs as per the future EMP, then the impact will most likely be insignificant.
2.5.12.	take into account special locational factors that might favour the specific location (e.g. the location of a strategic mineral resource, access to the port, access to rail, etc.),	The location has been chosen because of its availability of Feldspar.
2.5.13.	the investment in the settlement or area in question will generate the highest socio-economic returns (i.e. an area with high economic potential),	Not applicable.
2.5.14.	impact on the sense of history, sense of place and heritage of the area and the socio-cultural and cultural-historic characteristics and sensitivities of the area, and	This document will be lodged to Heritage authorities to test their response in this regard.
2.5.15.	in terms of the nature, scale and location of the development promote or act as a catalyst to create a more integrated settlement?	Not applicable.
2.6.	How were a risk-averse and cautious approach applied in terms of socio-economic impacts?	
2.6.1.	What are the limits of current knowledge (note: the gaps, uncertainties and assumptions must be clearly stated)?	None known in respect of Socio economic factors, although the site will most likely be subject to Heritage Impact Assessment as required by Heritage authorities. If such request is received from the Heritage authority then such studies will be undertaken.
2.6.2.	What is the level of risk (note: related to inequality, social fabric, livelihoods, vulnerable communities, critical resources, economic vulnerability and sustainability) associated with the limits of current knowledge?	There is no risk to these socio-economic aspects through the continued operation at this site.
2.6.3.	Based on the limits of knowledge and the level of risk, how and to what extent was a risk-averse and cautious approach applied to the development?	Not applicable.

2.7.	How will the socio-economic impacts resulting from this development impact on people's environmental right in terms following	
2.7.1.	Negative impacts: e.g. health (e.g. HIV-Aids), safety, social ills, etc. What measures were taken to firstly avoid negative impacts, but if avoidance is not possible, to minimise, manage and remedy negative impacts	The negative impacts have been identified in part 15 of this document. Measures taken to avoid, minimise, manage and remedy negative impacts will be detailed in future EIA/EMP section, but are provisionally summarised in part 23.
2.7.2.	Positive impacts. What measures were taken to enhance positive impacts?	See line item 2.7.1 above
2.8.	Considering the linkages and dependencies between human wellbeing, livelihoods and ecosystem services, describe the linkages and dependencies applicable to the area in question and how the development's socio-economic impacts will result in ecological impacts (e.g. over utilisation of natural resources, etc.)?	The impact on natural resources is very low in the long term (provided all future mitigation and rehabilitation measures are implemented).
2.9.	What measures were taken to pursue the selection of the "best practicable environmental option" in terms of socio-economic considerations	The following aspects contribute / will contribute to the best practical environmental option: 1) Proposed operational rehabilitation 2) Decommissioning rehabilitation 3) Backfill of Main Section excavation 4) Removal of Main Section waste rock dump through reprocessing 5) Minimal disturbance footprint
2.10.	What measures were taken to pursue environmental justice so that adverse environmental impacts shall not be distributed in such a manner as to unfairly discriminate against any person, particularly vulnerable and disadvantaged persons (who are the beneficiaries and is the development located appropriately)? Considering the need for social equity and justice, do the alternatives identified, allow the "best practicable environmental option" to be selected, or is there a need for other alternatives to be considered?	There is no unfair discrimination against any person as a result of the proposed mining. The company meets all its mining charter requirements.
2.11.	What measures were taken to pursue equitable access to environmental resources, benefits and services to meet basic human needs and ensure human wellbeing, and what special measures were taken to ensure access thereto by categories of persons disadvantaged by unfair discrimination?	All legislation has been adhered to.
2.12.	What measures were taken to ensure that the responsibility for the environmental health and safety consequences of the development has been addressed throughout the development's life cycle?	All mines are subject to Health and Safety legislation (Mine Health and Safety Act 29 of 1996). Such prescriptions are not within the ambit of this document but are strictly monitored by DMR.
2.13.	What measures were taken to:	
2.13.1.	Ensure the participation of all interested and affected parties.	Refer Part 13 for description of future Public Participation

2.13.2.	Provide all people with an opportunity to develop the understanding, skills and capacity necessary for achieving equitable and effective participation.	Refer Part 13 for description of proposed Public Participation
2.13.3.	Ensure participation by vulnerable and disadvantaged persons.	The application will be advertised in local newspapers and advertised on poster at the site entrance. In addition, the applicable ward councilor/s will be notified.
2.13.4.	Promote community wellbeing and empowerment through environmental education, the raising of environmental awareness, the sharing of knowledge and experience and other appropriate means.	None.
2.13.5.	Ensure openness and transparency, and access to information in terms of the process.	Refer Part 13 for description of proposed Public Participation
2.13.6.	Ensure that the interests, needs and values of all interested and affected parties were taken into account, and that adequate recognition were given to all forms of knowledge, including traditional and ordinary knowledge, and,	Refer Part 13 for description of proposed Public Participation
2.13.7.	ensure that the vital role of women and youth in environmental management and development were recognised and their full participation therein were be promoted.	Refer Part 13 for description of proposed Public Participation
2.14.	Considering the interests, needs and values of all the interested and affected parties, describe how the development will allow for opportunities for all the segments of the community (e.g.. a mixture of low-, middle-, and high-income housing opportunities) that is consistent with the priority needs of the local area (or that is proportional to the needs of an area)?	All Mining Rights are accompanied by a Social and Labour Plan. Such SLP contains opportunities for educational development of community members as well as a compulsory LED project implementation for the betterment of the community.
2.15.	What measures have been taken to ensure that current and/or future workers will be informed of work that potentially might be harmful to human health or the environment or of dangers associated with the work, and what measures have been taken to ensure that the right of workers to refuse such work will be respected and protected?	All mines are subject to Health and Safety legislation (Mine Health and Safety Act 29 of 1996). Such prescriptions are not within the ambit of this document but are strictly monitored by DMR.
2.16.	Describe how the development will impact on job creation in terms of, amongst other aspects:	
2.16.1.	the number of temporary versus permanent jobs that will be created,	The project will continue to provide employment for up to 30 people.
2.16.2.	whether the labour in the area will be able to take up the job opportunities (i.e. do the required skills match the skills available in the area),	Yes
2.16.3.	the distance from where labourers will have to travel,	Staff are housed on site
2.16.4.	the location of jobs opportunities versus the location of impacts (i.e. equitable distribution of costs and benefits), and	Staff are employed locally, but distance are too large to allow for daily transport in and out of the site.

2.16.5.	the opportunity costs in terms of job creation (e.g. a mine might create 100 jobs, but impact on 1000 agricultural jobs, etc.).	The proposed mining operation will not take any jobs away in any other sector (eg tourism).
2.17.	What measures were taken to ensure:	
2.17.1.	that there were intergovernmental coordination and harmonisation of policies, legislation and actions relating to the environment, and	Refer Part 13 for future description of Public Participation which includes all relevant State Departments at all levels of governance
2.17.2.	that actual or potential conflicts of interest between organs of state were resolved through conflict resolution procedures	Not applicable
2.18.	What measures were taken to ensure that the environment will be held in public trust for the people, that the beneficial use of environmental resources will serve the public interest, and that the environment will be protected as the people's common heritage?	Environmental impact has been assessed to be insignificant in all aspects of the environment provided rehabilitation takes place as per the EIA/EMP. The proposed project will be subject to extensive public participation to ensure all public are aware of and have input into the planning and approval process.
2.19.	Are the mitigation measures proposed realistic and what long-term environmental legacy and managed burden will be left?	The management of impact is the responsibility of the applicant with monitoring and auditing largely by independent parties. The Mineral legislation requires that Closure be granted before the applicant can relinquish responsibility for the site. Such closure process is arduous and requires enforced participation by and satisfaction of relevant State Departments and applies to all disturbances whether generated by the incumbent or not.
2.20.	What measures were taken to ensure that the costs of remedying pollution, environmental degradation and consequent adverse health effects and of preventing, controlling or minimising further pollution, environmental damage or adverse health effects will be paid for by those responsible for harming the environment?	In terms of operational control of environmental impact and pollution, the EMP must prescribe measures to be put in place to monitor and then mitigate / manage or avoid any known or unexpected impact. In addition, all holders are responsible to annually update a calculation to determine the costs of Immediate Closure of the site. Such calculation is based on DMR Guideline and the value of the fund must be provided to the DMR either in form of cash or by bank Guarantee. Should the holder "disappear", then the fund is used by the State to rehabilitate the site.
2.21.	Considering the need to secure ecological integrity and a healthy bio-physical environment, describe how the alternatives identified (in terms of all the different elements of the development and all the different impacts being proposed), resulted in the selection of the best practicable environmental option in terms of socio-economic considerations?	The only feasible alternative applicable to this application is the no go option.
2.22.	Describe the positive and negative cumulative socio-economic impacts bearing in mind the size, scale, scope and nature of the project in relation to its location and other planned developments in the area?	Refer Para 9.2

9.2 Cumulative Impact Assessment

The assessment of cumulative impacts on a site specific basis is often a complex operation. The aim of this impact analysis is ultimately to determine at which point the combined impacts from several operations (similar or dissimilar) in the area will affect the environment or part thereof to such a negative degree that the project should not be allowed to proceed.

Always remember that mining is a place-bound operation (as opposed to say housing or shopping development which is less dependent on geology or other factors).

No cumulative impact assessment is conducted for this site given the small scale of activities and lack of surrounding land uses.

10 Period for which the environmental authorisation is required

The Environmental Authorisation is sought for 30 years to coincide with the maximum permissible period for a Mining Right.

11 Description of the process followed to reach the proposed preferred site.

NB!! – This section is not about the impact assessment itself; It is about the determination of the specific site layout having taken into consideration the comparison of the originally proposed site plan, the comparison of that plan with the plan of environmental features and current land uses, the issues raised by interested and affected parties, and the consideration of alternatives to the initially proposed site layout as a result.

This is an operational site and much of the site layout is a *fait accompli*. Be that as it may, the site layout was informed by:

Geology- Location of Feldspar:

The site was chosen because of its proximity to the slag dumps generated by the old refinery at Nababeep.

Existing on site Land uses / Land Form:

This has been an operational site for several decades and has in that time achieved a site layout based on geological and logistical constraints and opportunities. Comparison of the site today with a decade ago shows a significant improvement in site layout, particularly in respect of the backfilling which has taken place into the Main Section excavation using previously processed material (plant waste).

The location of the flat land north of the Kloof Section lends itself perfectly to the development of the waste rock dump from the adit of that excavation.

12 Details of all alternatives considered.

12.1 Property on which or location where it is proposed to undertake the activity

The option of an alternative site has not been investigated.

12.2 Type of activity to be undertaken

Mining will continue to be undertaken at this site.

12.3 Design or layout of the activity

The site layout is largely based on pre-existing site layout. The current site layout is probably the most logical and pragmatic alternative given the confines of topography and geology.

12.4 Technology to be used in the activity

In the past the material was sent through a crusher and screening plant to a hand sorting conveyor. This option was problematic in that the material to be sorted was small and hand sorting took a long time and missed significant amounts of Feldspar (hence the reprocessing of the plant residue dumps).

At the moment, the blasted material is hand sorted and no plant is in place. It is unlikely that a processing plant will be re-established on site but the option is retained in this EMP and EA.

12.5 Operational aspects of the activity

Any alternative operational aspect will be considered and implemented if it represents a more suitable alternative.

12.6 Option of not implementing the activity

Provided operational and decommissioning rehabilitation takes place a high level of compliance with the provisions of any EMP prescriptions, then there is no reason why the activity should not go ahead.

13 Details of the Public Participation Process Followed

THIS DOCUMENT IS THE DRAFT SCOPING REPORT AND WILL SERVE AS THE BASIS DOCUMENT FOR PUBLIC INPUT. As a result, the description which follows is the proposed public participation methodology.

Note that the public participation process is to be conducted simultaneously for the Waste Licence, using this draft Scoping Report as information document. It is required that the advert be placed in 2 local newspapers to meet the regulations in respect of Public Participation for the abovementioned processes.

Public participation will take place in the following manner:

1) The **landowner** is the State and the land is managed by Nama Khoi Municipality.
2) **Surrounding landowners**: Given the absolute isolation of the site no surrounding landowners will be consulted.
3) **Residents of Steinkopf and Vioolsdrift / Rooiwal**: will be alerted to the application and existence of draft Scoping Report (and draft Social and Labour Plan) through posters at the site entrance, well visited locations and newspaper adverts.

4) **State Departments**: Registered mail will be sent or hand delivered to the following State departments and NGOs:
    a. Department of Environment & Nature Conservation
    b. Department of Water and Sanitation
    c. Dept. of Agriculture Forestry and Fisheries
    d. Municipality – Manager's Office and Environmental Section
    e. SAHRA
    f. Land Claims Commissioner.

5) **Broader public** will be notified in 3 ways:
    a. By way of newspaper advert in 2 local newspapers (Plattelander and Namakwalander)
    b. By way of posters placed at project entrance. Posters will measure 62 x 40cm as per NEMA regulations.
    c. Though notification of the local councilor.

Please note that each of these notifications will contain details as to:

- How to contact the EAP
- How to get to see a copy of the draft Scoping report with notice that 2 copies of the draft Scoping Report (and draft SLP) will be available at Public Libraries / Municipal offices or available per email or hard copy by post
- If there is sufficient interest then a public open day will be arranged.

Future public participation will then consist of the following:

1) Receipt of all comments in respect of the draft Scoping Report.
2) Compilation of final Scoping report with copies of all received comments.
3) Lodging to DMR
4) Late comments will be entertained and submitted to the DMR
5) Finalization of a draft EMP including:
    a. Specialist studies if required.
    b. Comments in respect of the draft scoping report
6) Distribution of draft EIA-EMP to registered I&AP's as well as all State Departments and NGOs listed above for 30 day commenting period
7) If comments received on draft EIA/EMP make material change to EMP, then redistribution of 2nd draft version of the EIA-EMP will take place
8) Lodging of Final EMP to DMR with all comments and changes made as required.

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	Para in this report where the issues / responses were incorporated.
Landowner					
Managed by Nama Khoi Municipality Jacques Cloete Jacques.cloete4@gmail.com PO Box 17, Springbok, 8240 4 Namakwa Street, Springbok Tel 027 718 8100					
Surrounding Landowners					
NONE					
Municipal Representatives					
Nama Khoi Municipality: Municipal Manager: Samantha Titus 4 Namakwa St Springbok 8240 (027) 718 8100 info@namakhoi.gov.za Samantha.titus@namakhoi.gov.za					
Nama Khoi Municipality: Environmental Section: Technical Department Jacques Cloete Jacques.cloete@namakhoi.gov.za					
Ward Councillor – Ward 2 Susan Cloete susanjanecloete@gmail.com 063 693 4692					
Organs of state and NGO's (Responsible for infrastructure that may be affected Roads, Eskom, Telkom, DWS etc.)					
Department of Environment and Nature Conservation : Northern Cape Head of Department Kimberlite Building, 162 George St, West End Kimberley, 8301 Tel 053 807 7300					

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	Para in this report where the issues / responses were incorporated.
Department of Environment and Nature Conservation : Northern Cape Private Bag X16 Springbok 8240 Tel: 027 718 8800 (053 807 7300) Peter Cloete Email: peter.denc87@gmail.com					
Department of Water and Sanitation: Mr Abe Abrahams: Chief Director: Northern Cape Private Bag X6101 Kimberley 8300 Tel: (053) 830 8800 Cell: 082 883 6741 AbrahamsA@dws.gov.za					
DWS Northern Cape Region 28 Beaconsfield Road Kimberley 8301 Ms V Ramugondo ramugondov@dws.gov.za					
Dept. of Agriculture Forestry and Fisheries(Springbok): 2 Hospital Street, Springbok, 8240 PO Box 18 Springbok, 8240 District Manager Mr Darren Engelbrecht E: darrenlengelbrecht@gmail.com Tel: 027 712 1315					
Department of Public Works Ruwayda Baulackay Private Bag X5002, Kimberley, 8300 Tel: 053 838 5202 Cell: 083 459 7602 Email: ruwayda.baulackay@dpw.gov.za					
Communities					
Community of Vioolsdrift (Newspaper adverts in 2 local newspapers) as well as posters. Copies of Scoping report left at local libraries					

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	Para in this report where the issues / responses were incorporated.
Commission On Restitution Of Land Rights: Regional Land Claims Commission: Northern Cape. Tel: (053) 807 5700 Ryan.oliver@drdlr.gov.za					
Traditional Leaders					
Other Competent Authorities					
SAHRA/HNC Lodgement on Heritage electronic lodging system: SAHRIS					
DMR:NC Regional Manager					
OTHER AFFECTED PARTIES					
INTERESTED PARTIES					

Note that final comments must be in within 30 days and will be forwarded to the DMR as soon as possible after that.

14 Environmental attributes of the site - The Baseline Environment

14.1 Type of environment affected by the proposed activity.

14.1.1 Geology

General

The Swartberg pegmatite swarm occurs inter-intruded with what appears as shown in Figure 7 to be a concentrated swarm of dykes and sills of dark mineral rocks (diorites and amphibolites).

Typical of pegmatite swarms, the white pegmatite outcrops are seen in Figure 6 as occurring randomly within the hill and showing common control over neither their occurrence or size nor any relationship with the dark mineral rocks or the exposed grey gneiss country rock around the hill. The GoogleEarth® imagery shows the Kloof pegmatite as being one of the larger pegmatites in the swarm and the recent mining thereof has indicated a suitable feldspar texture (crystal intergrowth with quartz and micas) which permits economical recovery thereof.

Within any pegmatite body the complexity and the unpredictability of the mineral occurrence, the crystal size and the intergrowth pattern is unfortunately as unpredictable as the extent of the pegmatite body itself, other than in particularly well-zoned pegmatites which are in the minority.

Background to the Main excavation's geology

The Main Excavation is located in a large pegmatite body which strikes NE/SW for 500m. The pegmatite occurs in a terrain generally consisting of grey gneissic granite (host rock) and is somewhat complicated by the presence of two amphibolite bodies adjacent to the pegmatite. The total pegmatite occurrence appears to strike parallel to two large quartz-diorite dykes further west and the pegmatite itself consists of 2 sub-intrusions. The main pegmatite consists either of two pegmatites or of a single pegmatite sheared along a shear plane striking SW/NE.

The detail geology shows the pegmatite / amphibolite contact as well as differentiation in especially the SE wall zone of the pegmatite where it ranges in crystalline texture between the following:

- Coarse intergrown feldspar and quartz (target material for mining) with recoverable feldspar >100mm
- Granitic textured zones varying from normal granitic texture to graphic texture.

In addition, the amphibolite/gneiss country rock shows variation between the following rock types:

- Amphibolite proper
- Grey gneiss
- Biotite / amphibolite schist
- Diorite (Dolerite)

The main zoned feldspar body in the central pegmatite consists of almost entirely pure Feldspar with only sub-ordinate large quartz masses and mica replacement bodies

(restricted to the upper horizon). In addition, a concentration of quartz veins and micas is associated with the main shear zone in the mine.

On the north-western contact with the adjacent amphibolite, there is a narrow 1 - 2m contact zone in the pegmatite showing the following as revealed by an overburden removal blast:

- elongated micas
- veins of tantalite.
- some copper oxide stains with showings of beryl.

The pegmatite body is interpreted as being well zoned in the upper (NW) hanging wall with the following generalized characteristics:

Weathering Features

Red iron oxide discolouration in the main west face is a weathering feature and not a zonal pegmatite feature. Consequently it is interpreted in this study as having a maximal depth approximately parallel to the original land surface i.e.: dipping north-westward at ±15° (this interpretation should however be confirmed by core drilling of vertical holes to the west of the main face). Material in this weathered zone should be stockpiled separately as overburden and as iron stained feldspar for possible later sale as low grade material.

Structural Geology

The pegmatite is characterised by the following structural elements

- A shear zone striking 040 – 055° and dipping 39 – 50°N with associated quartz veins with extensive mica developments as seen in Photo 6. This shear zone poses a major threat to face stability of the south-east faces of the mining excavation as well as to haul road stability. Recent mining has however largely removed this earlier unstable situation and future mining must be conducted so as to avoid re-developing.
- Vertical joints on 040° which can lead to failure of projecting (overhanging) rock bodies.
- Closely spaced horizontal and vertical joints on 000, 018 and 315° which allow for good blast fragmentation.

In addition, a concentration of quartz veins and micas is associated with the main shear zone in the mine. On the north-western contact with the adjacent amphibolite, there is a narrow 1 - 2m contact zone in the pegmatite showing the following as revealed by an overburden removal blast:

- elongated micas
- veins of tantalite.
- some copper oxide stains with showings of beryl.

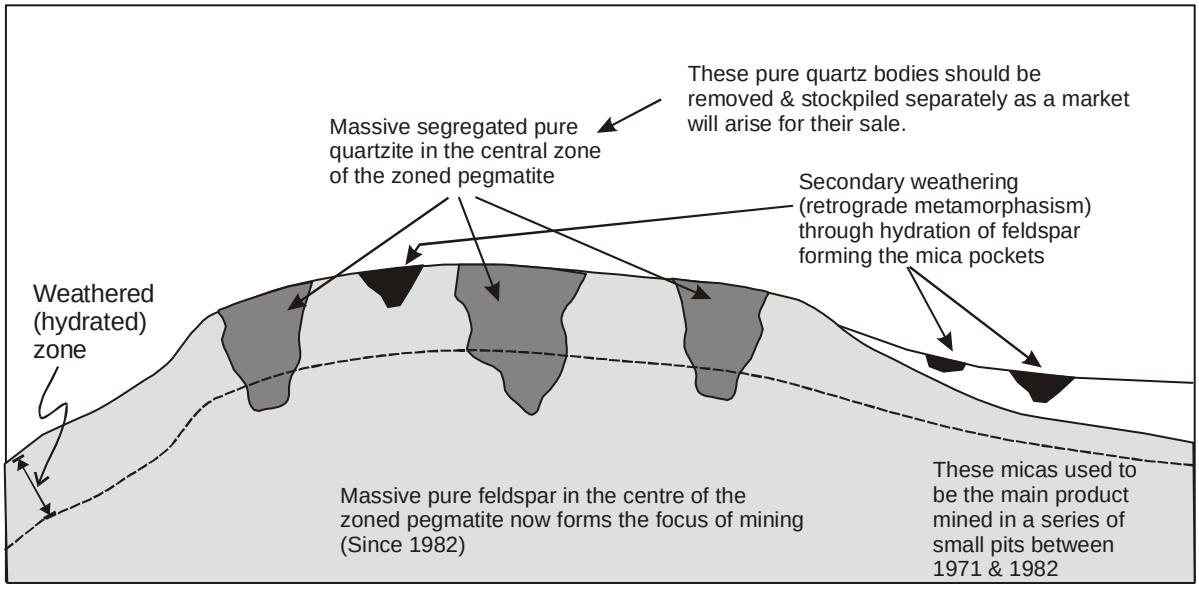


Figure 6: Quartz and mica structures in relation to the zoned pegmatite body

The pegmatite body is interpreted as being slightly zonal with the following generalized characteristics:

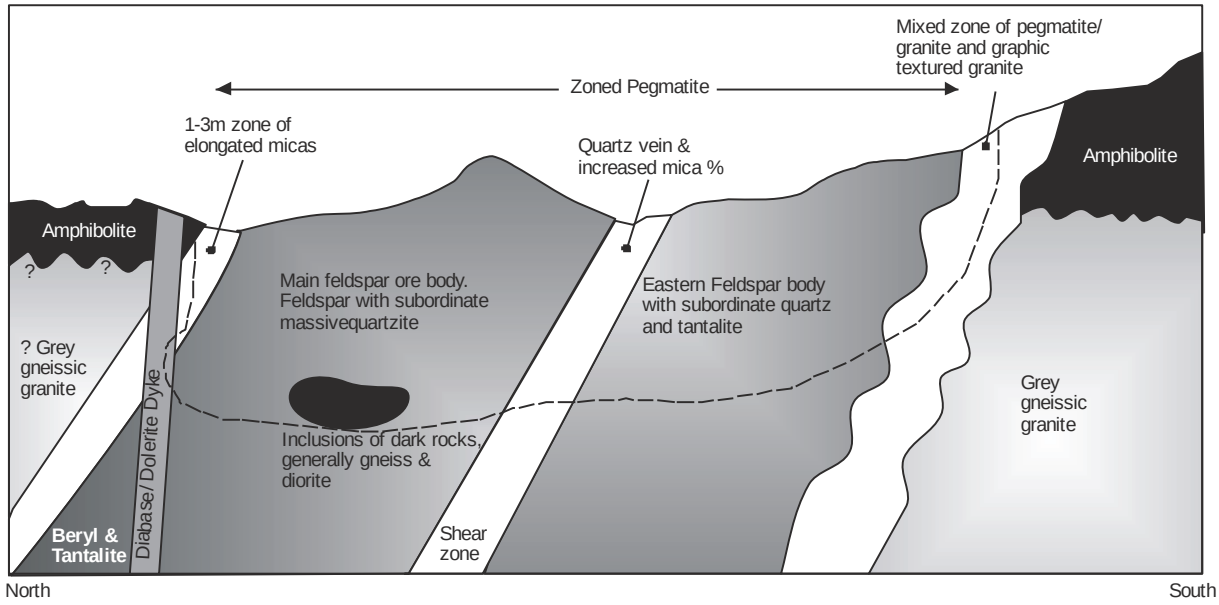


Figure 7: Geological cross section across the main excavation pegmatite

Kloof Ore Body – Geological Observations

Cross-sections below and Figure 4 relate the observations made in the mine which underlie the current interpretation of the rock body and its potential extent which also forms the basis of the recommended exploration to confirm these indications and reinforce resource/reserve estimates.

i) As the Kloof pegmatite body outcrops in the bottom and both sides of a north-easterly trending kloof with an increasing elevation of its lateral contacts (north-westerly and south-easterly contacts) with the dark rocks, the body is interpreted as having a south-west, north-east longitudinal form and in light of its termination to the north-east at low level and to the south-west at high level,

possessing a lens-shaped form (as opposed to a north-easterly dipping sill-shape body) which sill shape is intimated by thin pegmatitic sill intrusions in the country rock to its north-east and north but with no evidence of the thick body's continuity.

ii) In the north-west foot-wall the side of a steeply inclined dark mineral dyke? (mass of country rock) is exposed with no indication as yet whether it is intrusive into the pegmatite or the pegmatite intrusive into the dark rock. The strike of the "dyke" is south-west, north-east with a south-easterly dip ±70º i.e. sub-parallel to the numerous "diabase" dykes of the area and parallel to that left of the Swartberg Main Adit, that being a dolerite dyke.

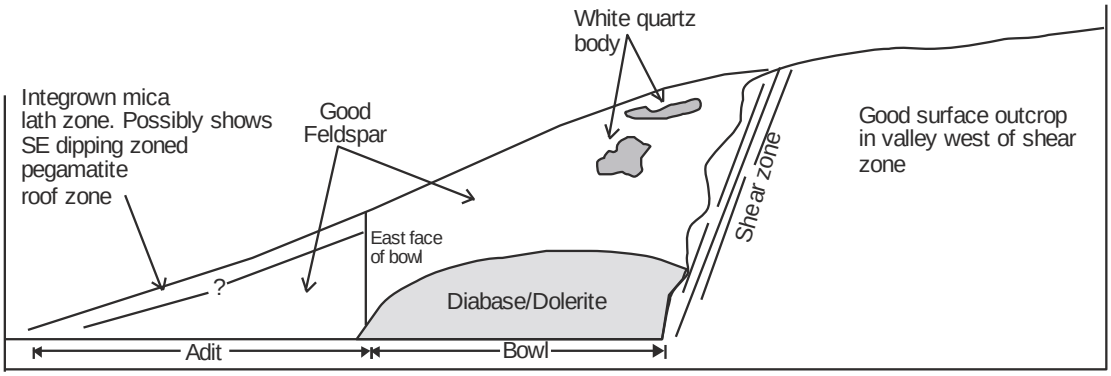
iii) A further contact (exposure) of country rock occured in the south-west corner of the excavation at floor level with this contact being east-west, and above which pegmatite occurs in the 20m face. Such contact now mined away. Within that south face, very good coarse Feldspar occurred/s with a high level of differentiation, with pure quartz forming a large mass of 2.5m diameter in the face.

iv) Near the top of the south face an elongated xenolith of grey gneiss measuring ±6m long x 1m high occurs (typical of the xenoliths which occurred in Swartberg Main).

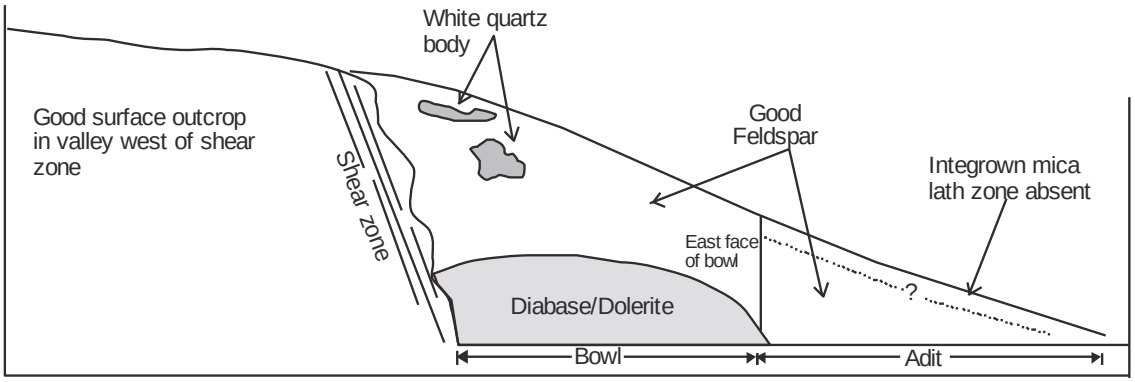
v) In the west face the pegmatite is continuous but structurally deformed by a vertical shear-zone with a north-north-east strike (sub-parallel to the major shear which occurs parallel to the south-east face in Swartberg Main).

vi) Within the upper 2m below natural ground level where the adit broadens into the Kloof Mine Section, there is a ± 1m thick zone of mica-lath inter-growth with granular textured Feldspar. This zone appears to be dipping south-east semi-parallel to the slope of the hill and has the same petrological composition and structure as the 3m thick zone which defines the north-west extent of the Swartberg Main pegmatite and given its gradation into the central body of the Main pegmatite presented the Swartberg Main pegmatite as a distinctly "zoned pegmatite". Strict extrapolation of this phenomenon would present the Kloof pegmatite as a south-eastward dipping body and will also explain the "sill" outcrop trace-line which delineates the Kloof body and appears to extend into the hill in the north-east. Within such model the pegmatite body has the potential to extend to the south below the dark mineral capping (unless the current footwall exposure of country rock is the indication of contact only metres beyond the south-face). Such interpretation would concur with a normal vertical contact lens-shaped pegmatite body which shows no lateral zoning in its contact with the country rock. In respect of the possible implications of the mica-lath roof zone for extension of the pegmatite to the north of the Adit, both this roof zone model and the outcrop trace of light coloured rock in the GoogleEarth imagery indicate a favourable extension of the pegmatite in the middle and lower slope of the hill towards the north.

vii) Good recoverable Feldspar occurs in the south wall of the Adit and east wall of the Kloof excavation bowl as well as in the north wall of the Adit and extending further north in the north-east corner of the bowl. Such good Feldspar extends in the north face of the bowl from floor level upwards in the north-east and north face of the bowl and above the dolerite dyke in the north-western corner of the bowl.



Cross Section Looking South West



Cross Section Looking North

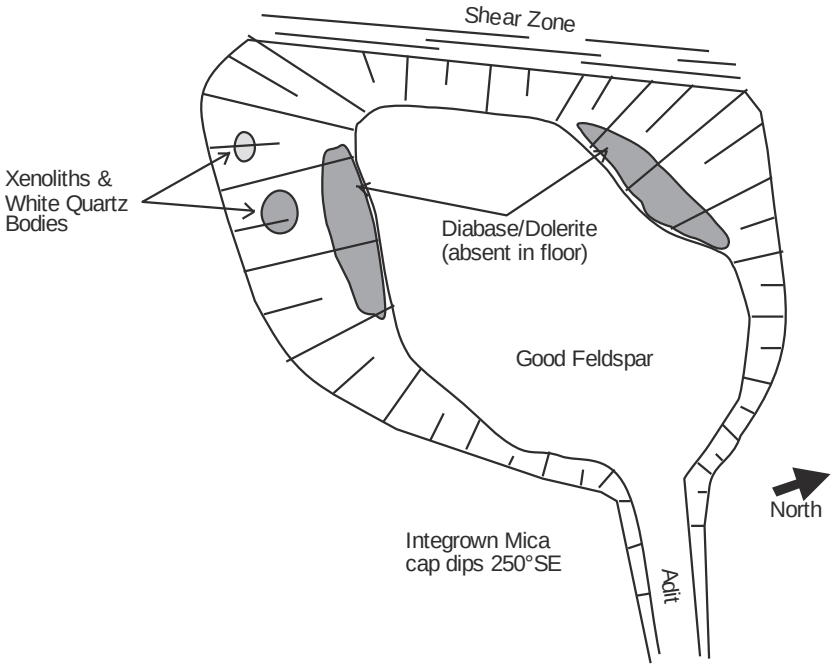


Figure 8: Cross sections and plans showing geological understanding of Kloof Section

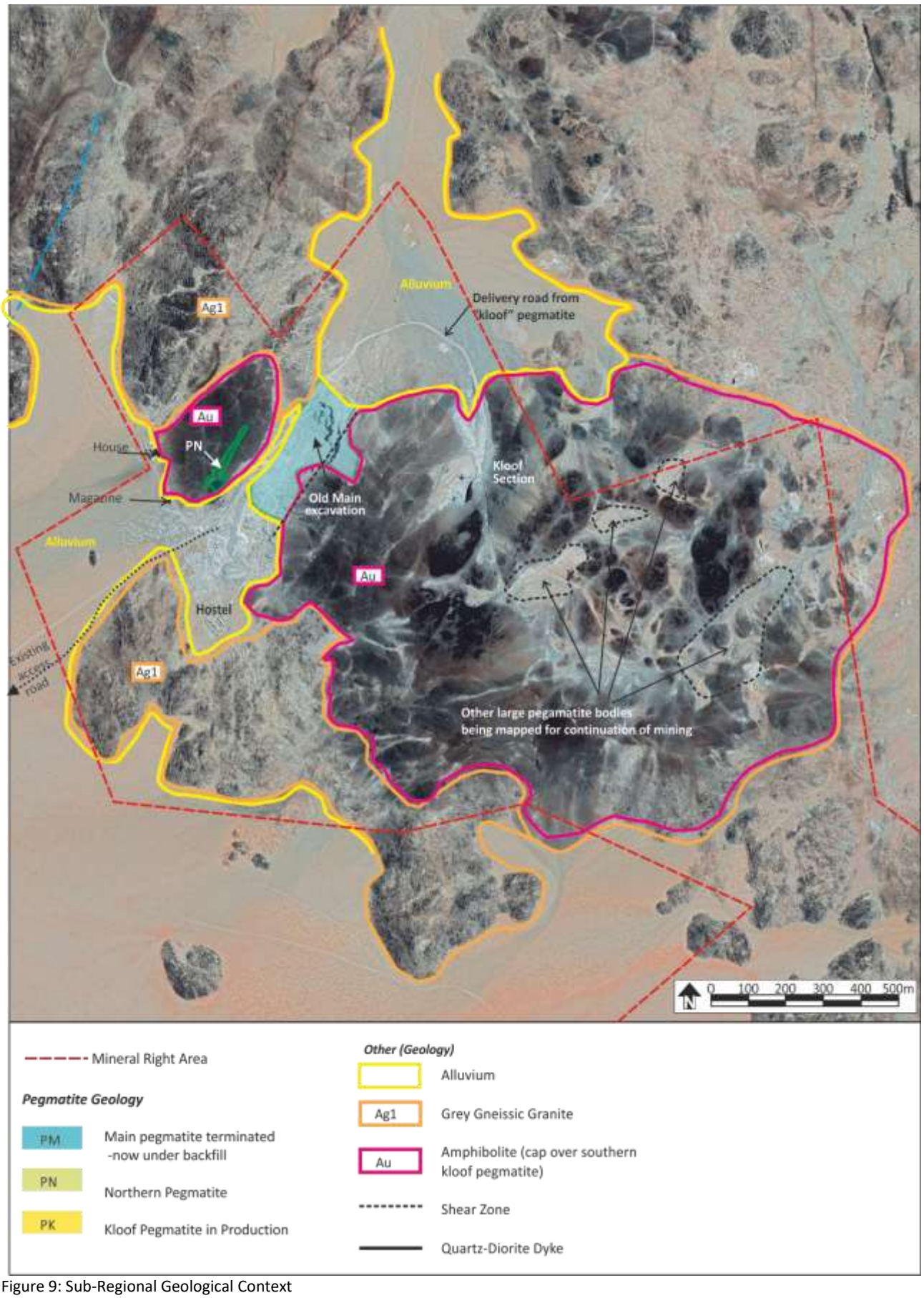


Figure 9: Sub-Regional Geological Context

14.1.2 Topography

The hills of the Swartberg rise out of the fluvial plains which surround the site. The N7 is located approximately 2.5km west of the quarry across the fluvial plain. The view of the excavation is largely eliminated by a low ridge to the SW of the excavation.

The main excavation and all logistical facilities are located on a raised saddle between the two (amphibolite) hills to the north and south of the main excavation pegmatite body.

The Kloof Section is located on a north facing slope in a shallow valley, about one third of the way to the top of the koppie to the east of the main excavation.

Impact of Existing operation

There are five main areas of existing impact with regard to topography:

- The main plant residue rock dump which is subject to further reprocessing. All waste material is utilised in the backfilling of the Main Section excavation. The positive impact of this initiative is enhanced by the fact that the high faces of the Main Section excavation were being undercut and were potentially unsafe.
- The Main Section excavation is unlikely to be completely backfilled to natural pre-mining contours, but the previous significant impact is reducing with backfilling. The impact is currently moderate.
- The existing development of the Kloof section excavation. The existing pit is a steep sided excavation over an area of about 0.6ha, resulting in moderate to significant impact on topography. It is imperative that benching be put in place to reduce the impact. The ±30 year excavation configuration is shown in Figure 4.
- Kloof Section Waste rock dump: The current waste rock dump measures 1.5ha to 3m in height. The impact is at present insignificant but will increase with advance.
- The existing smaller scattered waste stockpiles in the stockpile area are temporary and impact is seen as insignificant

Activity	***Spatial extent of impact***	***Duration***	***Probability***	***Impact rating***
Dump reprocessing	Current waste rock dumps over area of 3.1ha. Diminishing with reprocessing	Life of mine if all re-processed and backfilled, otherwise permanent	Probable	Moderate reducing
Main Section excavation	2.1ha	Permanent	Definite	Moderate, reducing
Kloof Excavation	Current 0.6-0.7ha	Permanent	Certain	Moderate / Significant
Kloof Waste Rock dump	Currently 1.5ha	Permanent	Certain	Insignificant, increasing
Ad hoc heaps and stockpiles	Ad hoc	Life of operation	Certain	Insignificant

14.1.3 Visual Impact

The main contributing factor to high visual impact associated with pegmatite mining is the difference in colour between the white minerals of pegmatites and in this case the contrasting black outcrops of the amphibolite hills surrounding the excavation.

The site is located at a distance of 2,5km from the N7 and the main excavation is distantly visible to the view from the N7. This impact is reduced by the presence of a low ridge to the west of the excavation (between the excavation and the N7). This low ridge also hides the plant and existing dump areas from view. Note that the activities at the kloof pegmatite are not visible from any public road or residence.

In light of visual impact on the wilderness landscape, all future logistical facilities must be restricted to the "enclosed" low lying sandy plain area (Figure 4).

14.1.4 Soil

The excavation and immediately surrounding area has been disturbed by mining activities and would generally only have had a very thin layer of growing medium made up mostly of quartz shards. On the original main excavation pegmatite outcrop (now largely mined) soils were either absent or of the Mispah form, on the valley floors and fluvial plains however the soils are deeper Clovelly form (Paleishewel Series) (up to 2-3m).

Topsoil is largely absent from the Kloof excavation expansion area and any recovery of topsoil is in any event very difficult in such rocky conditions (refer photo 3).

For the purposes of topsoil management, the upper 15cm will be classified as topsoil with its grass seed bank (wherever present).

There is no sub-soil on the pegmatite and amphibolite koppies. However on the plain, the subsoil is present to an undetermined depth. It is made up of the same material as the topsoil and very little if any differentiation between the top- and subsoil exists. This material has a high erosion potential if not sufficiently sloped given the lack of vegetation to bind the soil, but in light of the low rainfall, erosion is very slow.

Impact of Existing Mining

Impact on topsoil / subsoil has resulted from the:

- Development of the Main Section excavation over an area of 2.1ha
- Development of the Main Section Waste rock dump over an area of 3.1ha
- Development of previous plant and current logistical facilities and manoeuvring area over 3.1ha
- Develop of the Kloof Section excavation
- Development of Kloof section waste rock dump
- Development of Main access road and road between Main and Kloof Sections.

Note that there will be no further impact on soil emanating from the main excavation (given its cessation and use as backfill site) nor from the main section's waste rock dump, as this dump will not be extended any further (and will in fact reduce in size).

Existing impacts on soil are quantified as follows:

Activity	***Spatial extent***	***Duration***	***Probability***	***Impact Rating***
Main excavation development	2.1ha	Permanent	Definite	Moderate
Main Waste Rock Dump	3.1ha (Reducing)	Possibly temporary if all waste reprocessed	Possible, But impact has occurred	Moderate to insignificant

Activity	*Spatial extent*	*Duration*	*Probability*	*Impact Rating*
Plant and Logistical Facility area	3.1ha	Life of mine	definite	Moderate to insignificant
Kloof excavation	0.7ha	Permanent	Definite	Moderate
Kloof Waste rock dump	1.5ha	Permanent (not removed ahead of dumping)	Definite	Moderate to Insignificant
Access track and track between Main and Kloof Section	3-4m wide	Life of mine (and beyond)	Definite	Insignificant

14.1.5 Pre – Project Land Capability

The wilderness / grazing land capability has been completely disturbed by the work conducted during the establishment and operational phases of this operation.

The extent of existing / previous disturbances is as follows as shown in figure 3:

a) Main section excavation 1.2ha, currently undergoing backfill
b) Main Section waste rock dump – 3.1ha currently reducing due to reprocessing
c) Old plant area and current logistical facility area – 3.1ha
d) Current excavation and waste rock dump at Kloof Section.

The existing impact is insignificant and the site can return to its original land capability post mining (albeit with a modified topography).

14.1.6 Natural Vegetation

The main sources of information typically used at Scoping Stage are:

- Mucina and Rutherford mapping (2006): Vegetation of South Africa, Lesotho and Swaziland.
- CBA mapping from SANBI's CBA mapping (2017 Northern Cape).
- The classification of the vegetation types according to Critically Endangered, Endangered, Vulnerable or Least Threatened classification in terms of NEM: BA.

In addition, reference is made here to specialist study conducted in 2002.

The Mucina and Rutherford mapping (Refer Figure 10) shows the Mining Right area to be located within the Eastern Gariep Rocky Desert. According to National Environmental Management Biodiversity Act's schedule in respect of the National List of Ecosystems that are Threatened and in Need of Protect published in GN1002 (9/12/12), this vegetation type is classified as least threatened.

Eastern Gariep Rocky Desert Conservation Targets:

Conservation Target (percent of area) from NSBA	34%
Protected (percent of area) from NSBA	0%
Remaining (percent of area) from NSBA	99.7%
Description of conservation status from NSBA	Least threatened
Description of the Protection Status from NSBA	Not protected
Area (sqkm) of the full extent of the Vegetation Type	2568.2km²

Eastern Gariep Plains Desert Conservation Targets:

Conservation Target (percent of area) from NSBA	34%
Protected (percent of area) from NSBA	0%
Remaining (percent of area) from NSBA	99.7%
Description of conservation status from NSBA	Least threatened
Description of the Protection Status from NSBA	Not protected
Area (sqkm) of the full extent of the Vegetation Type	1578.0km²

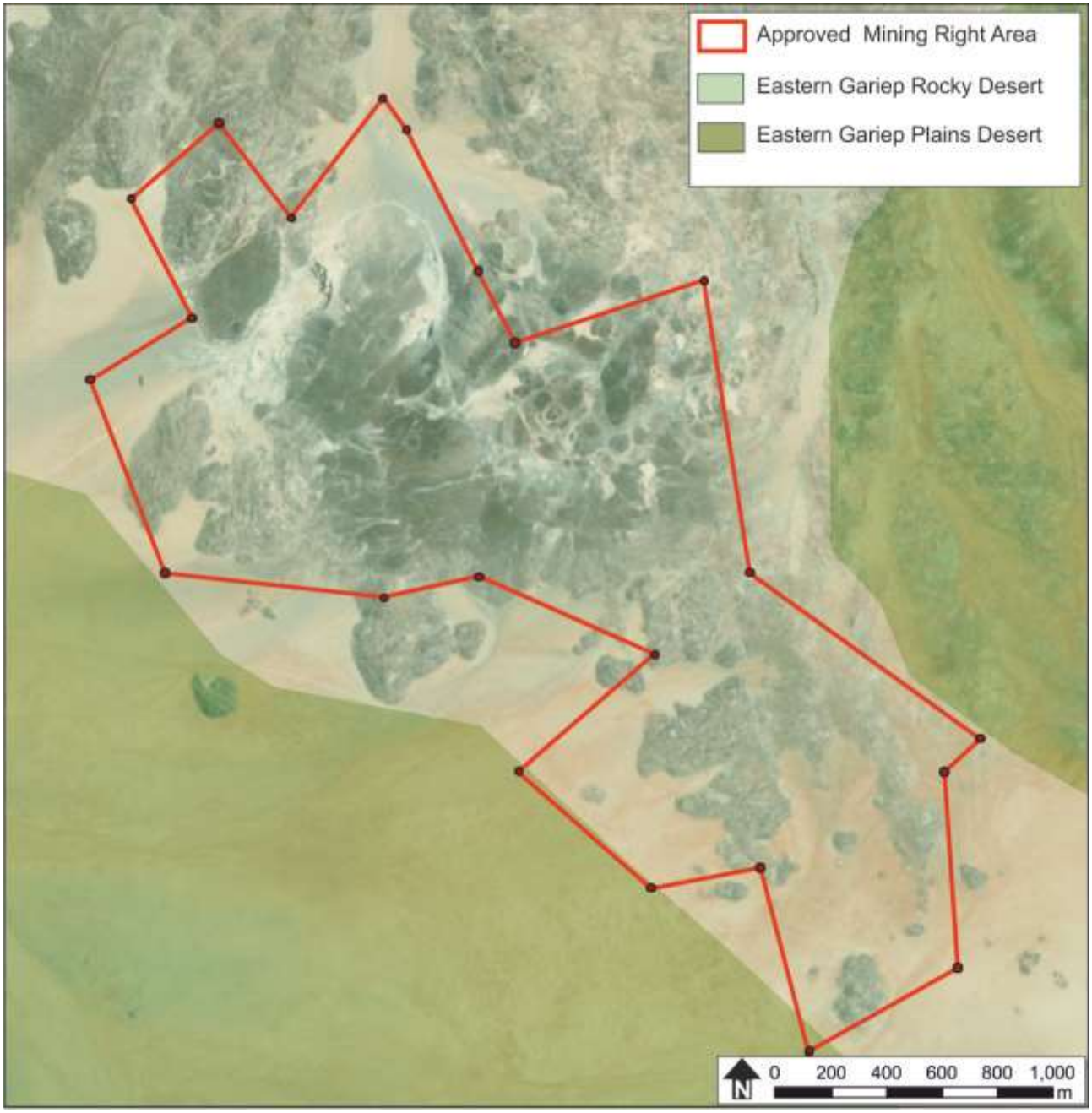


Figure 10: Vegetation Classification (Mucina and Rutherford)

Rocky Desert Distribution

All the rocky desert areas along the Orange River, including Groot Pellaberge, Dabenorisberge, Abbasasberge and many smaller mountains between Pella and Vioolsdrif. Also some mountains mapped further south well away from the Orange River such as the Haramoebberge and Witberg. Altitude about 250–1 205 m at the highest peak of the Groot Pella.

Rocky Desert Conservation

Target 34%. None conserved in South Africa in statutory conservation areas. This unit also occurs north of the Orange River in Namibia where it is potentially conserved through the ownership of the Farm Tsams by the Namibian Ministry of Environment and Tourism.

Plains Desert Distribution

Comprises the sheet wash plains east of the Richtersveld, which lead down to the Orange River at Henkries, Goodhouse, Kabis, Klein Pella/Kambreek and the vicinity of Onseepkans. Also mapped

on plains west of Pella to south of Vuurdoodberg Mountain (and Goodhouse) in the west, forming a broad east-west passage between the mountains to the north that fringe or are close to the Orange River and the more broken east-west line of hills and mountains to the south (for example Annakoppies, Grootberg, Witberg, Haramoebberge, Bantamberg and Amankop). Also found at lower reaches of the Kaboep River in the east. This unit also occurs north of the Orange River in Namibia. Altitude roughly 250–900 m.

Plains Desert Conservation
Target 34%. None conserved in statutory conservation areas. Few intact examples of this vegetation remain. Heavy grazing and arid climate combined with the ease of accessibility of the vegetation to stock mean that pastoral activities in the past have significantly altered the structure and composition of vegetation of this unit. In some areas *Prosopis* shows potential to become a serious problem, especially around natural springs or aquifers. Some very restricted areas are cultivated, mainly with date palms and grape vines.

Figure 12 shows the CBA mapping according to SANBI's 2016 Northern Cape mapping. It shows the current disturbance areas in the Mining Right area to be largely transformed (i.e. blank area) but with the undisturbed areas categorised as CBA 2.

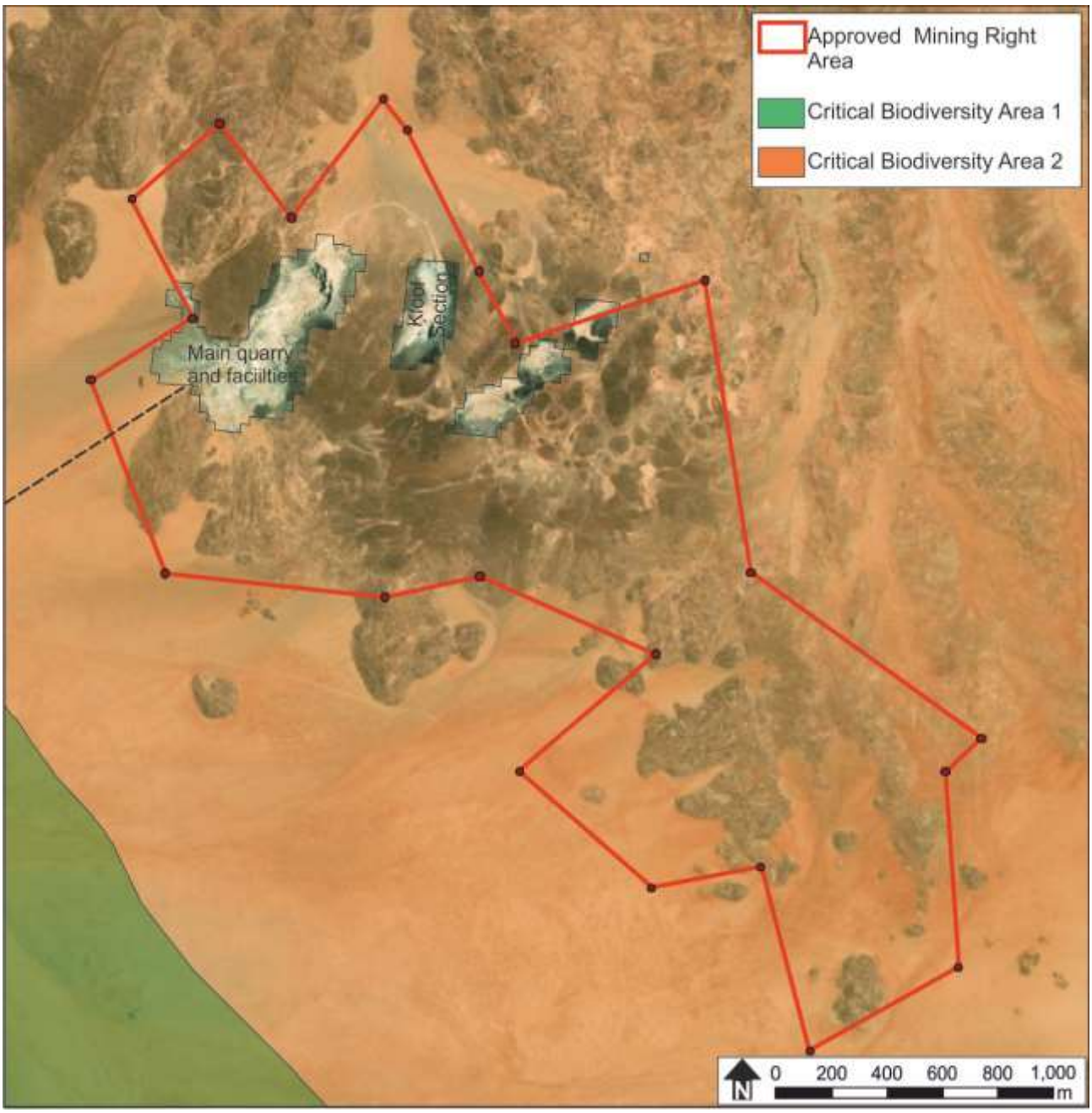


Figure 11: CBA Data – 2016 CBA Mapping for the Northern Cape

A botanical assessment of the site was conducted on 30 June 2002 and the findings were as follows (Full report contained in Appendix 2). Note that such study did not include the Kloof Section, but it can be reasonably extrapolated in this case:

<u>The western sandy plain (vlakte) *[and Sandy hill wash where Kloof Section dump extension is planned]*</u>
This area near the entrance to the site shows moderate to heavy disturbance with the remaining patches of natural vegetation heavily overgrazed. The local and regional conservation value is "low".

Species noted in this area are all well represented in the region and include:

- *Mesembryanthenum crytallinum* (ysplant)
- *Psilocaulon rapaceum* (asbos)

- *Brownanthus sp*
- *Codon royenii*
- *Tribulus terrestis*
- *Sisyndite spartea*
- *Zygophyllum leptpetalum*
- *Augea capensis*
- *Dyerophytum africanum*

Annuals

- *Heliophila sp*

Grasses (Very low grass cover (<1%))

- *Eanneapogon devauxii*
- *Stipagrostis obtusa* (small bushman grass)
- *Stipagrostis uniplumis* (silky bushman grass)

In the area closer to the N7 (200m from the mine entrance) the vegetation is less disturbed (but still over grazed) with succulents typical of undisturbed areas.

The local and regional vegetation conservation value in this area is given as "Moderate to High".

Species noted here:

- *Euphorbia friedrichae* (Red Data Book listed as "Indeterminate")
- *Sarocaulon flavescens* (boesmankers)
- *Ebracteola spinea* (regionally endemic vygie)
- *Ebracteola fulleri* (regionally endemic vygie)

The North-eastern overburden dump area

Dominant species here are shrubby succulents, which are generally widespread and include:

- *Ceraria namaquensis*
- *Ceraria fruticulosa*
- *Senecio cephalophorus*
- *Euphorbia decussata*
- *Aridaria noctiflora*
- *Hereroa hesperantha,*
- *Boscia foetida* (shepherd's tree)

No rare or localised species were found in this area

The local and regional conservation value of this area is given as Moderate.

Existing quarry perimeter (the pegmatite vein) *[Main Section Excavation and by extension probably similar at Kloof Section]*

The vegetation on the pegmatite vein on Swartberg has been largely destroyed by the quarrying operations, and it is likely that many species that were restricted to this habitat are, or are now very nearly, locally extinct.

Dwarf succulents. No bulbous species were noted, other than an unidentified species of *Tenicroa (with* a single, thin leaf; possibly a new species).

- *Anacampseros baeseckii*
- *Crassula garibina.*
- *Conophytum devium*
- *Conophytum longum*
- *Clydiae,*

Woody shrubs are very rare in the area and the only one noted was *Lycium oxycarpum.*

The dominant species are widespread leaf and stem succulents such as:

- *Senecio cephalophorus,*
- *Euphorbia decussata,*
- *Arenifera sp.,*
- *Ceraria fruticulosa,*
- *Ceraria narnaquensis,*
- *Crassula sericea,*
- *Crassula namaquensis,*
- *Zygophyllum leptopetalum,*
- *Phyllobolus sp*
- *Tylecodon ventricosus.*
- *Acanthopsis hofmannseggiana.*
- *Commiphora capensis*
- *Commiphora cervifolia*
- *Aloe dichotoma* (kokerboom)
- *Stapelia similisalso*
- *Sarcostemma viminale*
- *Ceraria fruticulosa,*
- *Euphorbia gariepina,*
- *Arenifera* sp
- *Hoodia gordonii* (ghaap)
- *Tylecodon hallii*

No *Pachypodium namaquanum* (halfmens) could be seen, and it is assumed that these have been removed, as they (one small plant ±150mm tall) have been reported from the site.

In addition to the findings of the botanical survey it must be added that many mature very beautiful halfmens specimens are located between 1 and 1,5km SE of the mine in the east slopes of the Swartberg.

The local and regional conservation value of the vegetation within 40m of the existing excavation edge is generally Moderate.

Endangered or rare species

No *Pachypodium namaquanum* (halfmens) could be seen, and it is assumed that these have been removed, as they (one small plant ±150mm tall) have been reported from the site.

Invader or exotic species

Nicotiana glauca is noted to have seeded along the access road and must be uprooted and burned as it is noticed.

14.1.7 Animal Life

Vast expanses of the same vegetation surrounding the site provide a habitat suitable for species typical of the area. These include rodents (rats, mice, shrews etc.), reptiles (snakes) birds and insects. The large scale of the habitat type when compared to the extent of the existing activities negates any significance of any impact in this regard.

14.1.8 Surface Water

None within 500m of the main excavation but a small episodic stream is located immediately below the kloof excavation site. The existing Kloof section waste rock dump has been developed on top of a small stream. The catchment above that dump is very small (in the order of 22ha). According to mine personnel, when the rare rainfall episodes do occur, then the water flows below the dump and disappears into the permeable sands of the fluvial plain (which is what normally happens anyway).

As the streams are highly episodic, sampling is not possible within the compilation period of this report. As no chemical processing of the products is undertaken, no pollution of water can occur and assessment of surface water clearly will be of little value as there are no users of any surface water in any event.

14.1.9 Ground Water

No groundwater has been encountered at this operation. As groundwater quality and yield in this entire area is very poor there are no users of any groundwater and as the mine does not chemically process any minerals, no pollution of groundwater is expected.

14.1.10 Air Quality

National Standards and Legislative context

(a) Dust standard applied.

NEM:AQA

The stipulations in the National Environmental Management: Air Quality Act, 2004 (Act No. 39 of 2004) with revisions in Government Notice R.827, published in Government Gazette No. 36974 of 1 November 2013 must be considered in any future dust monitoring and reporting. A Standard for the acceptance dust fall rate is set out in Table 1 for residential and non-residential areas.

Restriction Area	Dust fall rate (D) : mg.m-2.day-1 , 30-day average)	Permitted frequency of exceeding dust fall rate
Residential	D < 600	Two within a year, no sequential months
Non- Residential	600 < D < 1 200	Two within a year, no sequential months

SANS1929:2004

Attention is drawn to paragraph 4.8.4 of the extract from SANS regarding recognition that certain enterprises need to operate within "band 3" by virtue of "the practical operation of the enterprise..." provided that the best available control technology is applied for the duration".

"DUST FALL STANDARDS SANS 1929:2004

4.8 Dust Deposition

4.8.1 General

The four-band scale to be used in the evaluation of dust deposition is given in 4.8.2 and target, alert and action levels indicated in 4.8.3. Permissible margins of tolerance are outlines in 4.8.4 and exceptions noted in 4.8.5

4.8.2 Evaluation Criteria for Dust Deposition

Dust deposition rates shall be expressed in units of mg m^2 day-1 over a 30-day averaging period. Dust deposition shall be evaluated against a four-band scale as presented in Table 9.

Table 9 – Four-band scale evaluation criteria for dust deposition

Band number	Band description label	DUSTFALL RATE (D) (*mg* /m^2 /day [1] 30-day average)	Comment
1	Residential	D < 600	Permissible for residential and light commercial.
2	Industrial	600< D < 1 200	Permissible for heavy commercial and industrial.
3	Action	1 200 < D < 2 400	Requires investigation and remediation if two sequential months lie in this band, or more than three occur in a year.
4	Alert	2 400 < D	Immediate action and remediation required following the first exceedance. Incident report to be submitted to relevant authority.

4.8.3 Target, Action and Alert Thresholds are given in Table 10

Table 10 – Target, action and alert thresholds for dust deposition

Level	DUSTFALL RATE (D) (mg/ m^2 /day [1] 30-day average)	Averaging period	Permitted frequency of exceedances
Target	300	Annual	
Action residential	500	30 days	Three within any year, no two sequential months
Action industrial	1 200	30 days	Three within any year, no two sequential months.
Alert threshold	2 400	30 days	None. First exceedance requires remediation and compulsory report to authorities.

4.8.4 Margin of Tolerance

An enterprise may submit a request to the authorities to operate within Band 3 (ACTION Band), as specified in Table 9, for a limited period, providing that this is essential in terms of the practical operation of the enterprise (for example the final removal of a tailings deposit) and provided that the best available control technology is applied for the duration.

No margin of tolerance will be granted for operations that result in dustfall rates which fall within Band 4 (ALERT Band) as specified in Table 9.

4.8.5 Exceptions

Dustfalls that exceed the specified rates but that can be shown to be the result of some extreme weather or geological event shall be discounted for the purpose of enforcement and control. Such event might typically result in excessive dustfall rates across an entire metropolitan region, and not be localised to a particular operation. Natural seasonal variations, such as dry windy period during the Highveld spring will not be considered extreme events for this definition"

In respect of dust, the ambient dust levels are low and any existing dust impact is the result of:

- Existing mining on the site. No processing occurs, however dust generation from unsurfaced roadways and stockpiles can be reasonably high in this arid area.
- Occasional vehicles on unsurfaced roads in the area.
- Wind generated dust on a regional level (especially during dry times)

14.1.11 Noise

(a) Standards to be applied

National standards / recommendations:

SANS 0103 titled "The Measurement and Rating of Environmental Noise with regard to Land Use, Health, Annoyance and Speech……" and its recommended levels shall apply.

Recommended limits: Assuming working hours of between 06h00 and 19h00 which classifies as daytime, a recommended maximum noise level of **45dBA** is set in terms of the table below, row a.

Type of district	Equivalent Continuous Rating Level for Noise ($L_{AEQ,T}$) - (dBA)					
	Outdoors			Indoors		
	Day-night ($L_{R,dn}$)	Daytime ($L_{Req,d}$)	Night-time ($L_{Req,N}$)	Day-night ($L_{R,dn}$)	Daytime ($L_{Req,d}$)	Night-time ($L_{Req,N}$)
RESIDENTIAL DISTRICTS						
Rural districts	**45**	**45**	**35**	**35**	**35**	**25**
Suburban districts (little road traffic)	**50**	**50**	**40**	**40**	**40**	**30**
Urban districts	55	55	45	45	45	35
NON-RESIDENTIAL DISTRICTS						
Urban districts (some workshops, business premises, main roads)	60	60	50	50	50	40
Central business districts	65	65	55	55	55	45
Industrial districts	70	70	60	60	60	50

Expected community response

In terms of community response to noise, SANS recommendations are to be used as follows:

Excess dB above ambient	Estimated Community / Group Response	
	Category	Description
0	None	No observed reaction
5	Little	Sporadic complaints
10	Medium	Wide spread complaints
15	Strong	Threats of community / group action
20	Very Strong	Vigorous community / group action

In addition, the general noise industry rule of "ambient +7 dB" shall serve as a good indicator above which levels are generally "not acceptable".

(b) Ambient Noise sources on site

The following equipment/activities currently generate noise in the area.

i) The most significant noise source (but still minor) is the mine generated noise
ii) Noise from the traffic on the N7.

14.1.12 Traffic

At present the site is only accessed by employees and delivery traffic. The traffic generation is in the order of 2-4 trucks per working day (i.e. absolutely insignificant traffic generation).

14.1.13 Surrounding land use

Surrounding land use is of importance in that it determines / defines the users/ uses that may be impacted by the mine. Surrounding land uses often inform the mine plan / method and in this case consists of the following:

- The site is located on the Vioolsdrift South Commonage and the main land use is the occasional goat grazing (normally further south)
- The N7 between Steinkopf and Vioolsdrift is located ±2km east of the quarry
- At the turnoff to the mine, a small farmstall type development use to be in place. It is now abandoned and is not part of the mine and does not fall within the mining right area.
- The official 4x4 trial from the N7 to Henkries Mond runs east-west ±4km south of the mine.
- Other surrounding mines in the pegmatites include the distantly located Groenhoekies and Blesberg Mines

It is clear that this mine is extremely isolated (in spite of its proximity to the N7) and there is no risk of any impact on any surrounding land user or land use.

14.2 Description of specific environmental features and infrastructure on the site.

Refer Figures 1-11, Paragraph 14.1 1 to 14.1.12.

14.3 Environmental and current land use map.

Refer figures as follows:

- Figure 1: Locality Plan
- Figure 2: Regulation 2 (2) Sketch Plan
- Figure 3: Existing Overall Site Layout Plan
- Figure 4: Kloof Section (Provisional Mine Plan subject to further exploration)
- Figure 5: Excerpt from May 2014 SDF
- Figure 6: Quartz and mica structures in relation to the zoned pegmatite body
- Figure 7: Geological cross section across the main excavation pegmatite
- Figure 8: Cross sections and plans showing geological understanding of Kloof Section
- Figure 9: Sub-Regional Geological Context
- Figure 10: Vegetation Classification (Mucina and Rutherford)
- Figure 11: CBA Data – 2016 CBA Mapping for the Northern Cape

15 Impacts identified

(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).

Note that in this Draft Scoping Report, the potential impacts identified:

1) Are potentially typical for such activities as identified through experience of the EAP in planning and monitoring of similar activities. Wherever impacts cannot be known because of lack of information, such potential impact has been included, to be assessed by specialist study.
2) Are in respect of proposed and ongoing activities. Impacts which occurred during establishment or development of the site have already been assessed in part 14 under the relevant environmental aspect heading.

This will be subject to further public participation to identify additional / different impacts.

Step one is to identify applicable impacts, as per table below. Second step is to ascribe significance and details as per table thereafter. Note that in the table below the following applies:

Negative impact which may or may not take place
Beneficial impact (will not be assessed further in order to reduce length of report)

Activity	Topography	Soil/ Topsoil	Visual	Land Capability	Vegetation	Surface Water & Erosion	Ground Water	Animal Life	Noise	Air Quality	Social/ Economic	Archaeology/ Cultural	Hydrocarbon	Traffic /Access
1. "ESTABLISHMENT" ACTIVITIES:														
1.1. Provide concrete apron at bunded fuel tank with oil trap														
1.2. Upgrade oil trap at Wash Bay														
1.3. Provide concrete apron and oil trap at Workshop														
1.4. Formalise used oil storage and construct bund for used oil container														
1.5. Re-establish processing plant if considered (on existing footprint)														
1.6. Provide chemical toilets at Kloof Section when operational														
2. OPERATIONAL PHASE ACTIVITIES														
A. Main Section and Logistical Facilities														
2.1. Continue reprocessing of existing waste rock dump. No further extension of main pit will occur.														
2.2. Hauling material from waste rock dump to surface of backfill														
2.3. Continue backfill main section waste rock into main pit (and later with any waste material resultant from material transported from the Kloof Section and sorted on the backfill platform)														
2.4. Use of processing plant (if contemplated (unlikely)): Crushing and screening														

Activity	Topography	Soil/ Topsoil	Visual	Land Capability	Vegetation	Surface Water & Erosion	Ground Water	Animal Life	Noise	Air Quality	Social/ Economic	Archaeology/ Cultural	Hydrocarbon	Traffic /Access
2.5. Loading and delivery of saleable product Includes use of delivery route to N7														
2.6. Use of workshop														
2.7. Use of bunded fuel tank														
2.8. Use of Wash Bay														
2.9. Water is sourced from Orange River, trucked in and passed through purification plant														
2.10. Domestic / General waste into main section pit to be covered by backfill. Floor area of remaining backfill measures only 159m².														
2.11. Hazardous waste transported off site for handling at licenced facility														
B. Kloof Section														
2.12. Advance of excavation through drilling and blasting (No topsoil available)														
2.13. Loading of shot rock and waste rock														
2.14. Hauling of shot rock and waste rock. Road already in place. Use of road.														
2.15. Topsoil removal ahead of waste rock dump advance –														
2.16. Waste rock dump development														
3. DECOMMISSIONING PHASE ACTIVITIES														
3.1. Finalise shaping of all remnant dumps and level all ad hoc dumps.														
3.2. Cover waste rock dump in Kloof section with removed sand cover														
3.3. Demolish all unrequired structures														
3.4. Remove all protruding foundations and footings														
3.5. Remove all pipelines and cables														
3.6. Remove diesel tank & decontaminate														
3.7. Remove weighbridge concrete structures														
3.8. Rip / scarify all hardened areas														
3.9. Retain access roads for future use														
4. AFTERCARE PERIOD														
4.1. Remove alien vegetation, if present														
4.2. Conduct final performance assessment														
4.3. Lodge closure Application														
4.4. DMR Grant Closure Application														

Note that the following table will only contain negative impacts (those highlighted in Red).

Activity	Nature of impact	Extent	Duration	Probability	Significance	Extent to which impact can cause or be:		
						reversed	irreplaceable loss	avoid, manage/ mitigate
1. "ESTABLISHMENT" ACTIVITIES:								
1.1. Provide concrete apron at bunded fuel tank with oil trap								
1.2. Upgrade oil trap at Wash Bay								
1.3. Provide concrete apron and oil trap at Workshop								
1.4. Formalise used oil storage and construct bund for used oil container								
1.5. Re-establish processing plant if considered (on existing footprint)								
1.5.1. Noise	Noise generated by earthmoving equipment	Local	Duration of activity	Definite	Insignificant	No	No	Avoided through ensuring silencers are operational
1.5.2. Air Quality	Dust generated by earthmoving equipment	Local	Duration of activity	Definite	Insignificant	No	No	Dust could be allayed by wetting, but unlikely to be required given isolation of site.
1.5.3. Hydrocarbon	Potential Hydrocarbon leaks	Local	Until clean-up	Possible	Insignificant (if cleared)	Yes	No	Can be avoided
1.6. Provide chemical toilets at Kloof Section when operational								
2. OPERATIONAL PHASE ACTIVITIES								
A. Main Section and Logistical Facilities								

Activity	Nature of impact	Extent	Duration	Probability	Significance	Extent to which impact can cause or be:		
						reversed	irreplaceable loss	avoid, manage/ mitigate
2.1. Continue reprocessing of existing waste rock dump. No further extension of main pit will occur.								
2.1.1. Noise	Noise generated by earthmoving equipment	Local	Duration of activity	Definite	Insignificant	No	No	Avoided through ensuring silencers are operational
2.1.2. Air Quality	Dust generated by earthmoving equipment	Local	Duration of activity	Definite	Insignificant	No	No	Dust could be allayed by wetting, but unlikely to be required given isolation of site.
2.1.3. Hydrocarbon	Potential Hydrocarbon leaks	Local	Until clean-up	Possible	Insignificant (if cleared)	Yes	No	Can be avoided
2.2. Hauling material from waste rock dump to surface of backfill								
2.2.1. Noise	Noise generated by earthmoving equipment	Local	Duration of activity	Definite	Insignificant	No	No	Avoided through ensuring silencers are operational
2.2.2. Air Quality	Dust generated by earthmoving equipment	Local	Duration of activity	Definite	Insignificant	No	No	Dust could be allayed by wetting, but unlikely to be required given isolation of site.
2.2.3. Hydrocarbon	Potential Hydrocarbon leaks	Local	Until clean-up	Possible	Insignificant (if cleared)	Yes	No	Can be avoided
2.3. Continue backfill main section waste rock into main pit (and later with any waste material resultant from material transported from the Kloof Section and sorted on the backfill platform)								

Activity	Nature of impact	Extent	Duration	Probability	Significance	Extent to which impact can cause or be:		
						reversed	irreplaceable loss	avoid, manage/ mitigate
2.3.1. Noise	Noise generated by earthmoving equipment	Local	Duration of activity	Definite	Insignificant	No	No	Avoided through ensuring silencers are operational
2.3.2. Air Quality	Dust generated by earthmoving equipment	Local	Duration of activity	Definite	Insignificant	No	No	Dust could be allayed by wetting, but unlikely to be required given isolation of site.
2.3.3. Hydrocarbon	Potential Hydrocarbon leaks	Local	Until clean-up	Possible	Insignificant (if cleared)	Yes	No	Can be avoided
2.4. Use of processing plant (if contemplated (unlikely)): Crushing and screening								
2.4.1. Noise	Noise generated by earthmoving equipment	Local	Duration of activity	Definite	Insignificant	No	No	Avoided through ensuring silencers are operational
2.4.2. Air Quality	Dust generated by earthmoving equipment	Local	Duration of activity	Definite	Insignificant	No	No	Dust could be allayed by wetting, but unlikely to be required given isolation of site.
2.4.3. Hydrocarbon	Potential Hydrocarbon leaks	Local	Until clean-up	Possible	Insignificant (if cleared)	Yes	No	Can be avoided
2.5. Loading and delivery of saleable product Includes use of delivery route to N7								
2.5.1. Noise	Noise generated by earthmoving equipment	Local	Duration of activity	Definite	Insignificant	No	No	Avoided through ensuring silencers are operational
2.5.2. Air Quality	Dust generated by earthmoving equipment	Local	Duration of activity	Definite	Insignificant	No	No	Dust could be allayed by wetting, but unlikely to be required given isolation of site.
2.5.3. Hydrocarbon	Potential Hydrocarbon leaks	Local	Until clean-up	Possible	Insignificant (if cleared)	Yes	No	Can be avoided

Activity	Nature of impact	Extent	Duration	Probability	Significance	Extent to which impact can cause or be:		
						reversed	irreplaceable loss	avoid, manage/ mitigate
2.5.4. Traffic	Traffic entering and existing site onto N7. Limited traffic generated from site- 2 trucks per day, staff live on site, visitors seldom enter site	Local / Intersection	Life of mine	Definite	Insignificant	No	No	Can be managed (if required).
2.6. Use of workshop								
2.6.1. Hydrocarbon	Potential Hydrocarbon leaks	Local	Until clean-up	Possible	Insignificant (if cleared)	Yes	No	Can be avoided
2.7. Use of bunded fuel tank								
2.7.1. Hydrocarbon	Potential Hydrocarbon leaks	Local	Until clean-up	Possible	Insignificant (if cleared)	Yes	No	Can be avoided
2.8. Use of Wash Bay								
2.8.1. Hydrocarbon	Potential Hydrocarbon leaks	Local	Until clean-up	Possible	Insignificant (if cleared)	Yes	No	Can be avoided
2.9. Water is sourced from Orange River, trucked in and passed through purification plant								
2.9.1. Surface Water (Use)	Abstraction of ±5m³ / day water from Orange River near Rooiwal	Local	Life of mine	Definite	Insignificant	No	No	Must be managed
2.10. Domestic / General waste into main section pit to be covered by backfill. Floor area of remaining backfill measures only 159m².								
2.10.1. Hydrocarbon / Leachate	Potential generation of hazardous leachate or hydrocarbon pollution from tainted domestic / general waste inadvertently being disposed of in pit	Local (If any)	Permanent	Unlikely	Insignificant to moderate	Cannot be reversed	No	Must be avoided

Activity	Nature of impact	Extent	Duration	Probability	Significance	Extent to which impact can cause or be:		
						reversed	irreplaceable loss	avoid, manage/ mitigate
2.11. Hazardous waste transported off site for handling at licenced facility								
2.11.1. Noise	Noise generated by earthmoving equipment	Local	Duration of activity	Definite	Insignificant	No	No	Avoided through ensuring silencers are operational
2.11.2. Air Quality	Dust generated by earthmoving equipment	Local	Duration of activity	Definite	Insignificant	No	No	Dust could be allayed by wetting, but unlikely to be required given isolation of site.
2.11.3. Hydrocarbon	Potential Hydrocarbon leaks	Local	Until clean-up	Possible	Insignificant (if cleared)	Yes	No	Can be avoided
B. Kloof Section								
2.12. Advance of excavation through drilling and blasting (No topsoil available)								
2.12.1. Topography	Development of excavation with faces and benches	Maximum surface area in order of 3.7ha	Permanent	Probable (extent may be less)	Moderate to Significant	Could be backfilled but unlikely	No	Must be mitigated (shaped)
2.12.2. Soil	Disturbance of soil profile during exaction development	Maximum surface area in order of 3.7ha (less existing 0.7ha pit)	Permanent (no topsoil removal takes place)	Definite with pit advance	Insignificant in respect of soil	No	Yes	It is impossible to remove topsoil from this rocky environment
2.12.3. Land Capability	Loss of grazing / wilderness are on excavation footprint	Maximum surface area in order of 3.7ha	Permanent[5]	Definite	Insignificant	Partial	Yes	Can be mitigated through shaping of pit to allow eventual revegetation on benches and floor

[5] The *Wilderness* land capability can be considered to be returned after mining has been completed, but it will be an altered habitat type. Grazing cannot be contemplated here after mining, nor is it currently occurring in these hills.

Activity	Nature of impact	Extent	Duration	Probability	Significance	Extent to which impact can cause or be:		
						reversed	irreplaceable loss	avoid, manage/ mitigate
2.12.4. Vegetation	Loss of vegetation on excavation footprint	Maximum surface area in order of 3.7ha (less existing 0.7ha pit)	Permanent	Definite	Insignificant	No	Yes	Can be mitigated through transplant programme
2.12.5. Animal Life	Loss of habitat with excavation advance	Maximum surface area in order of 3.7ha (less existing 0.7ha pit)	Permanent	Definite	Insignificant	No	Yes	Mitigation required (catch and release or chasing)
2.12.6. Noise	Noise generated by earthmoving equipment	Local	Duration of activity	Definite	Insignificant	No	No	Avoided through ensuring silencers are operational
2.12.7. Air Quality	Dust generated by earthmoving equipment	Local	Duration of activity	Definite	Insignificant	No	No	Dust could be allayed by wetting, but unlikely to be required given isolation of site.
2.12.8. Hydrocarbon	Potential Hydrocarbon leaks	Local	Until clean-up	Possible	Insignificant (if cleared)	Yes	No	Can be avoided
2.13. Loading of shot rock and waste rock								
2.13.1. Noise	Noise generated by earthmoving equipment	Local	Duration of activity	Definite	Insignificant	No	No	Avoided through ensuring silencers are operational
2.13.2. Air Quality	Dust generated by earthmoving equipment	Local	Duration of activity	Definite	Insignificant	No	No	Dust could be allayed by wetting, but unlikely to be required given isolation of site.
2.13.3. Hydrocarbon	Potential Hydrocarbon leaks	Local	Until clean-up	Possible	Insignificant (if cleared)	Yes	No	Can be avoided
2.14. Hauling of shot rock and waste rock. Road already in place. Use of road.								
2.14.1. Noise	Noise generated by earthmoving equipment	Local	Duration of activity	Definite	Insignificant	No	No	Avoided through ensuring silencers are operational

Activity	Nature of impact	Extent	Duration	Probability	Significance	Extent to which impact can cause or be:		
						reversed	irreplaceable loss	avoid, manage/ mitigate
2.14.2. Air Quality	Dust generated by earthmoving equipment	Local	Duration of activity	Definite	Insignificant	No	No	Dust could be allayed by wetting, but unlikely to be required given isolation of site.
2.14.3. Hydrocarbon	Potential Hydrocarbon leaks	Local	Until clean-up	Possible	Insignificant (if cleared)	Yes	No	Can be avoided
2.15. Topsoil removal ahead of waste rock dump advance.	Note that no topsoil has been removed ahead of existing dump development							
2.15.1. Soil	Removal of soil ahead of dump development	Up to 3.8ha to a depth of at least 350mm	Life of mine, to be used in rehabilitation	Must occur	Moderate	Yes	No	This is a management measure to allow for rehabilitation of future dump.
2.15.2. Land Capability	Loss of grazing / wilderness are on dump footprint	Maximum additional surface area in order of 3.8ha to yield total dump area of 5.3ha.	Incremental increase with expansion of dump	Definite	Insignificant	Yes	No	Can be returned with return of soil as cover of waste rock dump
2.15.3. Vegetation	Disturbance of vegetation on dump footprint	Maximum additional surface area in order of 3.8ha to yield total dump area of 5.3ha.	Incremental increase with expansion of dump	Definite	Insignificant	Yes	No	Can be returned with return of soil as cover of waste rock dump
2.15.4. Animal Life	Loss of habitat with dump soil removal advance	Maximum additional surface area in order of 3.8ha to yield total dump area of 5.3ha.	Temporary	Definite	Insignificant	No	Yes	Mitigation required (catch and release or chasing)
2.15.5. Noise	Noise generated by earthmoving equipment	Local	Duration of activity	Definite	Insignificant	No	No	Avoided through ensuring silencers are operational

Activity	Nature of impact	Extent	Duration	Probability	Significance	Extent to which impact can cause or be:		
						reversed	irreplaceable loss	avoid, manage/ mitigate
2.15.6. Air Quality	Dust generated by earthmoving equipment	Local	Duration of activity	Definite	Insignificant	No	No	Dust could be allayed by wetting, but unlikely to be required given isolation of site.
2.15.7. Hydrocarbon	Potential Hydrocarbon leaks	Local	Until clean-up	Possible	Insignificant (if cleared)	Yes	No	Can be avoided
2.16. Waste rock dump development								
2.16.1. Topography	Development of dump to 7m in height over additional area of 3.8ha	Total eventual area = 5.3ha	Permanent	Definitely will be a dump but may be smaller[6]	Insignificant to moderate	Conceivably (but unlikely)	No	Must be mitigated through shaping
2.16.2. Land Capability	Addressed in line item 2.15.2 above							
2.16.3. Surface Water	The proposed dump extension is located on a wide dendritic hill wash feature. There is no defined stream channel west of the access road but water flows from the higher lying rocky area over these permeable soils.	Total eventual area of dump = 5.3ha (from current extent of 1.5ha)	Permanent	No dumping east of access road to eliminate impact on possible stream channel	None if dump retained west of access road	Conceivably (but unlikely)	No	Avoided
2.16.4. Noise	Noise generated by earthmoving equipment	Local	Duration of activity	Definite	Insignificant	No	No	Avoided through ensuring silencers are operational
2.16.5. Air Quality	Dust generated by earthmoving equipment	Local	Duration of activity	Definite	Insignificant	No	No	Dust could be allayed by wetting, but unlikely to be required given isolation of site.

[6] The calculated waste rock volume assumes that all waste will be disposed of on this dump, however it is possible that up to 40% of the waste material will be transported with feldspar to the sorting area on the backfill platform. Once the Feldspar has been removed, then that waste material will be used in the backfill of the Main Section excavation.

Activity	Nature of impact	Extent	Duration	Probability	Significance	Extent to which impact can cause or be:		
						reversed	irreplaceable loss	avoid, manage/ mitigate
2.16.6. Hydrocarbon	Potential Hydrocarbon leaks	Local	Until clean-up	Possible	Insignificant (if cleared)	Yes	No	Can be avoided
3. DECOMMISSIONING PHASE ACTIVITIES								
3.1. Finalise shaping of all remnant dumps and level all ad hoc dumps.								
3.1.1. Noise	Noise generated by earthmoving equipment	Local	Duration of activity	Definite	Insignificant	No	No	Avoided through ensuring silencers are operational
3.1.2. Air Quality	Dust generated by earthmoving equipment	Local	Duration of activity	Definite	Insignificant	No	No	Dust could be allayed by wetting, but unlikely to be required given isolation of site.
3.1.3. Hydrocarbon	Potential Hydrocarbon leaks	Local	Until clean-up	Possible	Insignificant (if cleared)	Yes	No	Can be avoided
3.2. Cover waste rock dump in Kloof section with removed sand cover								
3.2.1. Noise	Noise generated by earthmoving equipment	Local	Duration of activity	Definite	Insignificant	No	No	Avoided through ensuring silencers are operational
3.2.2. Air Quality	Dust generated by earthmoving equipment	Local	Duration of activity	Definite	Insignificant	No	No	Dust could be allayed by wetting, but unlikely to be required given isolation of site.
3.2.3. Hydrocarbon	Potential Hydrocarbon leaks	Local	Until clean-up	Possible	Insignificant (if cleared)	Yes	No	Can be avoided
3.3. Demolish all unrequired structures								
3.4. Remove all protruding foundations and footings								
3.5. Remove all pipelines and cables								

Activity	Nature of impact	Extent	Duration	Probability	Significance	Extent to which impact can cause or be:		
						reversed	irreplaceable loss	avoid, manage/ mitigate
3.6. Remove diesel tank & decontaminate								
3.7. Remove weighbridge concrete structures								
3.8. Rip / scarify all hardened areas								
3.8.1. Noise	Noise generated by earthmoving equipment	Local	Duration of activity	Definite	Insignificant	No	No	Avoided through ensuring silencers are operational
3.8.2. Air Quality	Dust generated by earthmoving equipment	Local	Duration of activity	Definite	Insignificant	No	No	Dust could be allayed by wetting, but unlikely to be required given isolation of site.
3.8.3. Hydrocarbon	Potential Hydrocarbon leaks	Local	Until clean-up	Possible	Insignificant (if cleared)	Yes	No	Can be avoided
3.9. Retain access roads for future use								
4. AFTERCARE PERIOD								
4.1. Remove alien vegetation, if present								
4.2. Conduct final performance assessment								
4.3. Lodge closure Application								
4.4. DMR Grant Closure Application								

16 Methodology used in determining the significance of environmental impacts

An initial table was compiled which described each activity (whether listed or not in terms of NEMA), potential impact, significance and duration. Such table is included in the draft Scoping report which is being made available to all identified Interested and Affected Parties. Any relevant responses received will then inform a revision of the site layout plan.

The impacts are rated according to nature, extent, duration, probability of occurring and significance.

a) The significance level is based on the following criteria:

Significance		***Criteria***
Negative	Significant (S)	• Recommended level always exceeded with associated widespread community action • Disturbance to areas that are pristine, have conservation value, are important resource to humans and will be lost forever • Complete loss of land capability • Destruction of rare or endangered specimens • May affect the viability of the project
	Moderate (M)	• Moderate measurable deterioration and discomfort • Recommended level occasionally violated – still widespread complaints • Partial loss of land capability • Complete change in species variety or prevalence • May be managed • Is insignificant if managed according to EMP provisions
	Minor/ (I) Insignificant	• Minor deterioration. Change not measurable • Recommended level will rarely if ever be violated • Sporadic community complaints • Minor deterioration in land capability • Minor changes in species variety or prevalence
	Negligible	• An impact will occur but it is barely discernible and not worthy of further investigation
Positive	Minor	• Improvements in local socio-economics
	Significant	• Major improvements in local socio-economics with some regional benefits

b) The **duration** is classified as:
- Permanent (post-closure)
- Life of Mine (LOM)
- Temporary

c) The **probability** is ranked as:
- Definite/Certain
- Possible
- Unlikely

17 The positive and negative impacts that the proposed activity and alternatives will have on the environment and the community that may be affected.

Impacts on the environment are restricted in type given the previous use and disturbance that has already taken place. The following paragraphs describe the negative and positive impacts of the operation from this point forward (including those operational impacts which are on-going such as noise, dust, visual impact):

The operation has the following **negative impacts** (in no particular order) on the environment and community:

Topography:
There will be permanent impact on topography through the following activities:

1) The further extension of the Kloof Section excavation. Kloof Section excavation covers a surface area of 0.6ha. It is proposed to extend this to a maximum area of 3.7ha dependent on actual Feldspar presence which will be determined by drilling programme ahead of advance. It is critical that faces and benches be developed to limit impact on topography.
2) The extension of the waste rock dump at the Kloof Section. The existing dump measures 1.5ha and it is proposed to extend this to a maximum total of 5.3ha to 7m in height. It is most likely that the extent of this dump will be less than calculated because:
    a. There may be less Feldspar reserve proved by drilling than expected in this documentation. There will not be more. The attached mine plan shows the absolute maximum extent of the Feldspar lens.
    b. It has been estimated by the mine manager that up to 40% of the waste rock will be transported to the sorting platform on the backfill of the main section excavation. Once sorted, the waste material will be used to continue the backfill of the Main Section pit.
3) Positive impact on topography will occur through:
    a. Removal of the Main Section plant residue material to reprocessing. At present the Holders are hollowing out the dump from closest to the Main Section excavation and the perimeter slopes are still in place. But the proposal is to continue reprocessing that material until the entire dump is removed.
    b. The waste material resultant from the reprocessed plant residue material is used to backfill the Main Section excavation.

Vegetation:
The vegetation specialist in 2002 assessed the impact rating of vegetation disturbance as moderate to high depending on location. The Kloof Excavation extension could conceivably result in high impact whilst the dump development will result in moderate impact. These impacts can be ameliorated with a search and rescue programme ahead of disturbance. If considered this would have to be done using the services of specialist botanist.

Soil:
Soil removal can only occur in respect of the Kloof Section dump development. It is impossible to remove topsoil ahead of excavation development in the Kloof excavation area.

Noise and dust:
Limited impact and will not impact on any surrounding land use or user.

Hydrocarbon Impact
The potential exists for impact from Hydrocarbon pollution and measures must be put in place to avoid such impact as well as interventions required should such hydrocarbon leak ever take place.

The only **positive impacts** are the socio economic impact which accrues through employment opportunities (direct and indirect), income from sales as well income and demand for down the line suppliers and services.

18 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).

This table has been compiled in the pre-scoping phase before issues and concerns have been raised by affected parties (if any).

Impact	Possible Mitigation	Level of risk
Topography: Negative Impact on topography will arise through the development of Kloof section excavation and dump, whilst positive impact will occur through reprocessing of Main Section Plant residue and backfilling of Main Section excavation	Maximise backfilling. In case of excavation, ensure faces and benches of pit edges. In case of dumps, shape dump leading edges to mimic natural contours. Limit slopes to less than angle of repose to allow cover material to stabilize on the slope.	It is acknowledged that such impact will occur. The risk would be associated with indiscriminate dumping and excavation development outside of the plan, and chasing the “eye” of the reserve. This chasing of the eye has happened before at this site and must be guarded against by ensuring faces and benches in the excavation. As a result of past experience, risk is assessed as high in respect of the excavation.
Land Capability: Wilderness /grazing land lost to mining disturbances. Impact is ascribed an insignificant rating.	The Holder must adhere to the Mine Plan and not allow for indiscriminate disturbances (dumping or excavations) outside of approved areas	Risk is low provided all proposed mitigation measures are successfully implemented.

Impact	Possible Mitigation	Level of risk
Soil / Vegetation: As described in Part 17, the only soil and vegetation impact is assessed to occur when the excavation is extended in the Kloof Section and the Kloof Section dump is developed to the north.	Removed topsoil from the dump advance will be stockpiled for proposed use during rehabilitation of the dump. Topsoil must be replaced as soon as feasible if any dump section reaches its final configuration, but it is understood that soil may be stockpiled for an extended period. Other mitigation measures include: Don't allow unnecessary access into surrounding veld. No poaching or trapping of animals is permitted. Ensure staff report any snare or poaching noted. Alien / exotic plant management must take place	The risk that topsoil will not survive the lifespan of the operation is High. Topsoil loss will occur through wind and water erosion.
Dust impact from the operation	Can be controlled with use of water.	Minimal risk given isolation of site. Must be controlled in terms of employee health regulations
	Limit speed on internal roads as well as access roads to the site	
	If dust result in any complaints from surrounding parties (highly unlikely), then a dust monitoring programme must be established and best options installed to eliminate any future dust from that source.	
Noise	The impacts of noise must limited more because of employee health reasons than for any impact on surrounding land users or land use	Minimal risk given isolation of site. Must be controlled in terms of employee health regulations
	All vehicles must be equipped with working silencers	
Waste / Hydrocarbon impact	Hydrocarbon management policy must be developed	Risk is low given relatively small scale of the activities and proposed interventions.
	Any transfer of fuel must take place using suitable funnels and pumping equipment	
	Staff to be trained in respect of hydrocarbon pollution and contamination clearing methodologies to be employed	
	Any regular servicing of plant and equipment to take place at the workshop or at head office site	
	Separate waste streams and handle accordingly	

19 The outcome of the site selection Matrix. Final Site Layout Plan

(Provide a final site layout plan as informed by the process of consultation with interested and affected parties)

Existing Site Layout Plan is as contained in Figures 3 and 4. Still subject to public participation.

20 Motivation where no alternative sites were considered.

Not applicable.

21 Statement motivating the preferred site.

(Provide a statement motivation the final site layout that is proposed)

Motivation for the use of the site doesn't strictly apply in this case given that it's the use of an existing previously disturbed operational site and the proposed continuation results in minor additional disturbances. However the following does apply in respect of motivation for continued use of this site:

a) The overriding factor is the geology and the availability of material suitable for financially feasible operation in an area which is not sterilized by surrounding land uses.

b) The main client of this mine is Consol Glass who requires this high quality Feldspar in their manufacturing. Locating another site with such quality Feldspar is in itself an unlikely proposition but would in any event result in additional impacts from start-up.

c) Site Plan Consulting has been visiting this site for decades and this EAP has been encouraged by the general advance in environmental management (and safety) at this site. The major improvement has been the backfilling of the Main Section Pit, but there have been improvements in the general housekeeping at the site. Even though there are still improvements to be made in the environmental management it is clear that the trend is in a positive direction and that future mining and rehabilitation will be of higher level than in previous years.

d) The project results in direct income, employment in an area of high unemployment and income to down the line industries.

22 Plan of study for the Environmental Impact Assessment process

22.1 Description of alternatives to be considered including the option of not going ahead with the activity.

The following alternatives must be considered during the EIA process:

Alternatives in respect of:	Contained in draft Scoping report	Update in Final Scoping report
Property on which or location where it is proposed to undertake the activity	Yes. Refer Para 12.1	Not yet applicable
Type of activity to be undertaken	Yes. Refer Para 12.2	Not yet applicable
Design or layout of the activity	Yes. Refer Para 12.3	Not yet applicable
Technology to be used in the activity	Yes. Refer Para 12.4	Not yet applicable

Alternatives in respect of:	Contained in draft Scoping report	Update in Final Scoping report
Operational aspects of the activity	Yes. Refer Para 12.5	Not yet applicable
Option of not implementing the activity	Yes. Refer Para 12.6	Not yet applicable

22.2 Description of the aspects to be assessed as part of the environmental impact assessment process

All activities and environmental aspects are to be assessed:

Activity	Was it provisionally assessed in the Draft Scoping Report	Status in the Final Scoping report
1. "ESTABLISHMENT" ACTIVITIES:		
1.1. Provide concrete apron at bunded fuel tank with oil trap		
1.2. Upgrade oil trap at Wash Bay		
1.3. Provide concrete apron and oil trap at Workshop		
1.4. Formalise used oil storage and construct bund for used oil container		
1.5. Re-establish processing plant if considered (on existing footprint)		
1.5.1. Noise	Yes- refer Part 15.	Not applicable yet.
1.5.2. Air Quality	Yes- refer Part 15.	Not applicable yet.
1.5.3. Hydrocarbon	Yes- refer Part 15.	Not applicable yet.
1.6. Provide chemical toilets at Kloof Section when operational		
2. OPERATIONAL PHASE ACTIVITIES		
A. Main Section and Logistical Facilities		
2.1. Continue reprocessing of existing waste rock dump. No further extension of main pit will occur.		
2.1.1. Noise	Yes- refer Part 15.	Not applicable yet.
2.1.2. Air Quality	Yes- refer Part 15.	Not applicable yet.
2.1.3. Hydrocarbon	Yes- refer Part 15.	Not applicable yet.
2.2. Hauling material from waste rock dump to surface of backfill		
2.2.1. Noise	Yes- refer Part 15.	Not applicable yet.
2.2.2. Air Quality	Yes- refer Part 15.	Not applicable yet.
2.2.3. Hydrocarbon	Yes- refer Part 15	Not applicable yet.
2.3. Continue backfill main section waste rock into main pit (and later with any waste material resultant from material transported from the Kloof Section and sorted on the backfill platform)		
2.3.1. Noise	Yes- refer Part 15.	Not applicable yet.
2.3.2. Air Quality	Yes- refer Part 15.	Not applicable yet.
2.3.3. Hydrocarbon	Yes- refer Part 15.	Not applicable yet.
2.4. Use of processing plant (if contemplated (unlikely)): Crushing and screening		
2.4.1. Noise	Yes- refer Part 15.	Not applicable yet.
2.4.2. Air Quality	Yes- refer Part 15.	Not applicable yet.
2.4.3. Hydrocarbon	Yes- refer Part 15.	Not applicable yet.
2.5. Loading and delivery of saleable product Includes use of delivery route to N7		
2.5.1. Noise	Yes- refer Part 15.	Not applicable yet.
2.5.2. Air Quality	Yes- refer Part 15.	Not applicable yet.

Activity	Was it provisionally assessed in the Draft Scoping Report	Status in the Final Scoping report
2.5.3. Hydrocarbon	Yes- refer Part 15.	Not applicable yet.
2.5.4. Traffic	Yes- refer Part 15.	Not applicable yet.
2.6. Use of workshop		
2.6.1. Hydrocarbon	Yes- refer Part 15.	Not applicable yet.
2.7. Use of bunded fuel tank		
2.7.1. Hydrocarbon	Yes- refer Part 15.	Not applicable yet.
2.8. Use of Wash Bay		
2.8.1. Hydrocarbon	Yes- refer Part 15.	Not applicable yet.
2.9. Water is sourced from Orange River, trucked in and passed through purification plant	Yes- refer Part 15.	Not applicable yet.
2.9.1. Surface Water (Use)	Yes- refer Part 15.	Not applicable yet.
2.10. Domestic / General waste into main section pit to be covered by backfill. Floor area of remaining backfill measures only 159m².	Yes- refer Part 15.	Not applicable yet.
2.10.1. Hydrocarbon / Leachate	Yes- refer Part 15.	Not applicable yet.
2.11. Hazardous waste transported off site for handling at licenced facility		
2.11.1. Noise	Yes- refer Part 15	Not applicable yet.
2.11.2. Air Quality	Yes- refer Part 15	Not applicable yet.
2.11.3. Hydrocarbon	Yes- refer Part 15.	Not applicable yet.
B. Kloof Section		
2.12. Advance of excavation through drilling and blasting (No topsoil available)		
2.12.1. Topography	Yes- refer Part 15.	Not applicable yet.
2.12.2. Soil	Yes- refer Part 15.	Not applicable yet.
2.12.3. Land Capability	Yes- refer Part 15.	Not applicable yet.
2.12.4. Vegetation	Yes- refer Part 15.	Not applicable yet.
2.12.5. Animal Life	Yes- refer Part 15.	Not applicable yet.
2.12.6. Noise	Yes- refer Part 15.	Not applicable yet.
2.12.7. Air Quality	Yes- refer Part 15.	Not applicable yet.
2.12.8. Hydrocarbon	Yes- refer Part 15.	Not applicable yet.
2.13. Loading of shot rock and waste rock		
2.13.1. Noise	Yes- refer Part 15.	Not applicable yet.
2.13.2. Air Quality	Yes- refer Part 15.	Not applicable yet.
2.13.3. Hydrocarbon	Yes- refer Part 15.	Not applicable yet.
2.14. Hauling of shot rock and waste rock. Road already in place. Use of road.		
2.14.1. Noise	Yes- refer Part 15.	Not applicable yet.
2.14.2. Air Quality	Yes- refer Part 15.	Not applicable yet.
2.14.3. Hydrocarbon	Yes- refer Part 15.	Not applicable yet.
2.15. Topsoil removal ahead of waste rock dump advance.		
2.15.1. Soil	Yes- refer Part 15.	Not applicable yet.
2.15.2. Land Capability	Yes- refer Part 15.	Not applicable yet.
2.15.3. Vegetation	Yes- refer Part 15.	Not applicable yet.
2.15.4. Animal Life	Yes- refer Part 15.	Not applicable yet.
2.15.5. Noise	Yes- refer Part 15.	Not applicable yet.
2.15.6. Air Quality	Yes- refer Part 15.	Not applicable yet.
2.15.7. Hydrocarbon		
2.16. Waste rock dump development		
2.16.1. Topography	Yes- refer Part 15.	Not applicable yet.
2.16.2. Land Capability	Yes- refer Part 15.	Not applicable yet.
2.16.3. Surface Water	Yes- refer Part 15.	Not applicable yet.

Activity	Was it provisionally assessed in the Draft Scoping Report	Status in the Final Scoping report
2.16.4. Noise	Yes- refer Part 15.	Not applicable yet.
2.16.5. Air Quality	Yes- refer Part 15.	Not applicable yet.
2.16.6. Hydrocarbon	Yes- refer Part 15.	Not applicable yet.
3. DECOMMISSIONING PHASE ACTIVITIES		
3.1. Finalise shaping of all remnant dumps and level all ad hoc dumps.		
3.1.1. Noise	Yes- refer Part 15.	Not applicable yet.
3.1.2. Air Quality	Yes- refer Part 15.	Not applicable yet.
3.1.3. Hydrocarbon	Yes- refer Part 15.	Not applicable yet.
3.2. Cover waste rock dump in Kloof section with removed sand cover		
3.2.1. Noise	Yes- refer Part 15.	Not applicable yet.
3.2.2. Air Quality	Yes- refer Part 15.	Not applicable yet.
3.2.3. Hydrocarbon	Yes- refer Part 15.	Not applicable yet.
3.3. Demolish all unrequired structures		
3.4. Remove all protruding foundations and footings		
3.5. Remove all pipelines and cables		
3.6. Remove diesel tank & decontaminate		
3.7. Remove weighbridge concrete structures		
3.8. Rip / scarify all hardened areas		
3.8.1. Noise	Yes- refer Part 15.	Not applicable yet.
3.8.2. Air Quality	Yes- refer Part 15.	Not applicable yet.
3.8.3. Hydrocarbon	Yes- refer Part 15.	Not applicable yet.
3.9. Retain access roads for future use		
4. AFTERCARE PERIOD		
4.1. Remove alien vegetation, if present		
4.2. Conduct final performance assessment		
4.3. Lodge closure Application		
4.4. DMR Grant Closure Application		

22.3 Description of aspects to be assessed by specialists

The screening tool which accompanied the application is a Department of Environment Affairs online generated report based on the application area intersection with certain online GIS layers. That tool recommended that the following specialist studies be undertaken but does state that it is the EAPs responsibility to confirm the list and to motivate whether such specialist studies will be required. The table below indicates the specialist studies recommended and a reason/ motivation why such specialist's study is being considered or not as part of this Environmental Authorisation:

Ref	Study suggested	Comment
1	Agricultural Impact Assessment	The screening tool acknowledges the LOW agricultural sensitivity of the area, but still calls for specialist assessment. NO SPECIALIST ASSESSMENT will be conducted given the restriction of activities to largely the currently disturbed footprint of activities. The proposed extension of activities in the Kloof Section will have absolutely no impact on Agriculture (with the exception of the ±6.8ha grazing area that will be lost in an area with exceptionally low carrying capacity).
2	Landscape/Visual Impact Assessment	Given the previous disturbance of the site and the fact that no additional visual impact will result as a result of the proposed, NO SPECIALIST ASSESSMENT will be conducted.

Ref	Study suggested	Comment
3	Archaeological and Cultural Heritage Impact Assessment	The Screening Tool ascribes a LOW sensitivity in this regard. Application will be lodged on SAHRIS. The requirement for additional studies will be determined by competent authority and if required will be completed by applicant.
4	Palaeontology Impact Assessment	The Screening Tool ascribes a medium sensitivity in this regard. Application will be lodged on SAHRIS. The requirement for additional studies will be determined by competent authority and if required will be completed by applicant.
5	Terrestrial Biodiversity Impact Assessment	The Screening Tool ascribes a high sensitivity in this regard, however NO SPECIALIST ASSESSMENT is deemed applicable given the restriction of activities to the currently disturbed footprint of activities and the very small scale of proposed additional disturbances.
6	Aquatic Biodiversity Impact Assessment	The Screening Tool ascribes a high sensitivity in this regard for the entire Mining Right area. The additional extension to the Kloof Section excavation and Kloof Section waste rock dump will not result in any impact on aquatic Biodiversity and no specialist assessment is required.
7	Hydrology	The impact on hydrology that would have occurred as a result of this operation has already occurred. A specialist assessment would yield no benefit at this stage.
8	Noise Impact Assessment	Noise is monitored as part of the Mine Health and Safety. This operation has been in place for several years and there have been no complaints regarding environmental noise. The site is so isolated that no noise impact will occur. As a result no specialist assessment is required, however it will be prescribed in the EMP that: 1) Noise must still be controlled for health and safety reasons 2) Should noise ever result in complaints from the neighbours, that an Environmental Noise Survey will be required.
9	Radioactivity Impact Assessment	Not applicable here.
10	Traffic Impact Assessment	The traffic generation from this site stems from: 1) Employees and visitors accessing the site – Even this is very low given the provision of hostel accommodation on site 2) Delivery of Feldspar (in the order of 2 truck trips generated per day) Given this absolutely minimal traffic volume it is not required that traffic impact assessment be conducted.
11	Geotechnical Assessment	The earlier mining of this site at the Main Section excavation resulted in undercut faces of exceptional height. It is for this reason that geotechnical assistance was sough during the backfilling operation and it was required that backfilling not approach the southern face. A berm has been put in place on the backfill platform to prevent inadvertent access.
12	Climate Impact Assessment	The small scale of this operation precludes any requirement for specialist Climate Impact Assessment. The contribution to global warming from this site's use of fossil fuels is negligible and cannot be reduced. Care must be taken to ensure maximal use of these resources and preventing leaks and wastage.
13	Health Impact Assessment	Employee health is monitored through provisions of the Mine Health and Safety Act. Environmental / Neighbourhood health will be monitored as part of the AEL process that is required.
14	Socio-Economic Assessment	Not applicable to this existing operation on disturbed site.
15	Ambient Air Quality Impact Assessment	Not required given the very low levels of dust generated at this site and the small scale of activities tied with the absolute isolation of the site.
16	Seismicity Assessment	Not applicable.
17	Plant Species Assessment	NO further SPECIALIST ASSESSMENT will be conducted given the earlier study conducted in this regard. That study was aimed at identifying the species on site as well as the impact of future mining. That was conducted in 2002 and is included as Appendix 2.

Ref	Study suggested	Comment
18	Animal Species Assessment	NO SPECIALIST ASSESSMENT will be conducted given the very small scale of activities and very slow rate of advance of those activities at this site.

So, the following aspects will require specialist input:

Specialist field of study	Tasks to be undertaken/ Aspects covered in study	Has it been included in Final Scoping report / Status as at Final Scoping report
Heritage Impact Assessment	Application will be lodged on SAHRIS. The requirement for additional studies will be determined by competent authority and if required will be completed by applicant.	Not yet applicable

22.4 Proposed method of assessing the environmental aspects including the proposed method of assessing alternatives

In this draft Scoping report the environmental aspects have been assessed based on the experience of the report compiler (Refer CV in Appendix 1). This will be further assessed and refined in the following ways:

- Consultation with / Call for comments from all Interested and Affected Parties (I&AP's)
- Call for specialist studies to include assessment on specific environmental elements as described in part 22.3 or as identified during the Scoping process.

The results of such further assessments will be included in the future EIA/EMP.

22.5 The proposed method of assessing duration and significance

As for Para 22.4.

22.6 The stages at which the competent authority will be consulted

This draft Scoping report will be submitted to relevant State Departments. The final Scoping report will be submitted to the competent authority and such report will contain the details and results of the initial public participation. Consultation continues and all comments will be forwarded to the DMR and included in future EIA/EMP.

The competent authority will decide on the implementation of the Plan of Study. If the applicant is given the go ahead to continue, then the EIA and EMP will be subject to public participation and finally lodged to the competent authority.

22.7 Particulars of the public participation process with regard to the Impact Assessment process that will be conducted

22.7.1 Steps to be taken to notify interested and affected parties

Notification of I&AP's will take place in a system relative to their expected input as follows:

1) Landowner: Through personal consultation
2) General public and residents of the area: Through advert in local press and notice / poster placed at entrance of operation and at various public places throughout

Vioolsdrif and Rooiwal and possibly Steinkopf (Post Office, Municipality, Library).

3) In addition, the Local Authority and relevant Govt. Departments will be contacted by telephone and Email in respect of the proposed project. In the past SPC has used registered mail but that has proved unreliable and the use of courier delivery will now be utilised.

4) No public Open Day will take place

Note that all parties will have full access to the Scoping report and EIA/EMP (in final or draft form depending on timing of consultation).

22.7.2 Details of the engagement process to be followed.

All parties (except landowner and State Departments) will have to register their interest in the matter. Land owner and State Departments will be deemed to be registered I&AP's.

All registered I&AP's will be kept abreast of the application and will be supplied with all relevant documentation as well as consultations (one on one), if they so wish.

All commenting periods will be minimum 30 days as per NEMA regulations.

22.7.3 Description of the information to be provided to Interested and Affected Parties.

The information presented will depend on timing. Initially, this draft Scoping report will serve as the basis for comment. The next round of public participation will use the draft EIA/EMP as the information provided for further consultation.

22.8 Description of the tasks that will be undertaken during the environmental impact assessment process.

The following tasks will need to be undertaken during the EIA process:

- Public participation will proceed as a transparent as an all-inclusive as possible.
- All registered I&AP's will be kept informed and provided several opportunities to comment.
- Draft EIA / EMP will be compiled as basis for further consultation
- Specialist studies will be completed and I&AP's will have opportunity to comment on those studies (as part of the draft EIA/EMP)

22.9 Measures to avoid, reverse, mitigate, or manage identified impacts and to determine the extent of the residual risks that need to be managed and monitored.

Activity	**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 etc.).	Potential for Residual Risk
1. "ESTABLISHMENT" ACTIVITIES:		
1.1. Provide concrete apron at bunded fuel tank with oil trap		
1.2. Upgrade oil trap at Wash Bay		

Activity	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 etc.).	Potential for Residual Risk
1.3. Provide concrete apron and oil trap at Workshop		
1.4. Formalise used oil storage and construct bund for used oil container		
1.5. Re-establish processing plant if considered (on existing footprint)		
1.5.1. Noise	Control through noise control (if feasible)	None
1.5.2. Air Quality	Control through dust control if required	None
1.5.3. Hydrocarbon	Control and remedy through Hydrocarbon management protocol.	Although *unlikely*, there is a *minor residual risk* if leak is not remedied.
1.6. Provide chemical toilets at Kloof Section when operational		
2. OPERATIONAL PHASE ACTIVITIES		
A. Main Section and Logistical Facilities		
2.1. Continue reprocessing of existing waste rock dump. No further extension of main pit will occur.		
2.1.1. Noise	Control through noise control (if feasible)	None
2.1.2. Air Quality	Control through dust control if required	None
2.1.3. Hydrocarbon	Control and remedy through Hydrocarbon management protocol.	Although *unlikely*, there is a *minor residual risk* if leak is not remedied.
2.2. Hauling material from waste rock dump to surface of backfill		
2.2.1. Noise	Control through noise control (if feasible)	None
2.2.2. Air Quality	Control through dust control if required	None
2.2.3. Hydrocarbon	Control and remedy through Hydrocarbon management protocol.	Although *unlikely*, there is a *minor residual risk* if leak is not remedied.
2.3. Continue backfill main section waste rock into main pit (and later with any waste material resultant from material transported from the Kloof Section and sorted on the backfill platform)		
2.3.1. Noise	Control through noise control (if feasible)	None
2.3.2. Air Quality	Control through dust control if required	None
2.3.3. Hydrocarbon	Control and remedy through Hydrocarbon management protocol.	Although *unlikely*, there is a *minor residual risk* if leak is not remedied.
2.4. Use of processing plant (if contemplated (unlikely)): Crushing and screening		

Activity	**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 etc.).	**Potential for Residual Risk**
2.4.1. Noise	Control through noise control (if feasible)	None
2.4.2. Air Quality	Control through dust control if required	None
2.4.3. Hydrocarbon	Control and remedy through Hydrocarbon management protocol.	Although *unlikely*, there is a *minor residual risk* if leak is not remedied.
2.5. Loading and delivery of saleable product. Includes use of delivery route to N7		
2.5.1. Noise	Control through noise control (if feasible)	None
2.5.2. Air Quality	Control through dust control if required	None
2.5.3. Hydrocarbon	Control and remedy through Hydrocarbon management protocol.	Although *unlikely*, there is a *minor residual risk* if leak is not remedied.
2.5.4. Traffic	Avoid impact. Limit speeds. Adherence to traffic laws	None
2.6. Use of workshop		
2.6.1. Hydrocarbon	Control and remedy through Hydrocarbon management protocol.	Although *unlikely*, there is a *minor residual risk* if leak is not remedied.
2.7. Use of bunded fuel tank		
2.7.1. Hydrocarbon	Control and remedy through Hydrocarbon management protocol.	Although *unlikely*, there is a *minor residual risk* if leak is not remedied.
2.8. Use of Wash Bay		
2.8.1. Hydrocarbon	Control through noise control (if feasible)	None
2.9. Water is sourced from Orange River, trucked in and passed through purification plant		
2.9.1. Surface Water (Use)	Control and remedy through Hydrocarbon management protocol.	Although *unlikely*, there is a *minor residual risk* if leak is not remedied.
2.10. Domestic / General waste into main section pit to be covered by backfill. Floor area of remaining backfill measures only 159m².		
2.10.1. Hydrocarbon / Leachate	Control and remedy through Hydrocarbon management protocol. Control /Avoid through sorting of waste.	Although *unlikely*, there is a *minor residual risk* if hydrocarbon leak is not remedied. Possibility of leachate if "domestic" waste inadvertently disposed of in pit.
2.11. Hazardous waste transported off site for handling at licenced facility		
2.11.1. Noise	Control through noise control (if feasible)	None
2.11.2. Air Quality	Control through dust control if required	None

Activity	**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 etc.).	**Potential for Residual Risk**
2.11.3. Hydrocarbon	Control and remedy through Hydrocarbon management protocol.	Although *unlikely*, there is a *minor residual risk* if leak is not remedied.
B. Kloof Section		
2.12. Advance of excavation through drilling and blasting (No topsoil available)		
2.12.1. Topography	Remedy through rehabilitation shaping	Moderate
2.12.2. Soil	None. Impossible to remove topsoil ahead of mining in this hill	Moderate
2.12.3. Land Capability	Remedy through rehabilitation shaping	Insignificant
2.12.4. Vegetation	Search and rescue - transplanting	Insignificant / Moderate
2.12.5. Animal Life	Search and rescue, chasing and moving	Insignificant
2.12.6. Noise	Control through noise control (if feasible)	None
2.12.7. Air Quality	Control through dust control if required	None
2.12.8. Hydrocarbon	Control and remedy through Hydrocarbon management protocol.	Although *unlikely*, there is a *minor residual risk* if leak is not remedied.
2.13. Loading of shot rock and waste rock		
2.13.1. Noise	Control through noise control (if feasible)	None
2.13.2. Air Quality	Control through dust control if required	None
2.13.3. Hydrocarbon	Control and remedy through Hydrocarbon management protocol.	Although *unlikely*, there is a *minor residual risk* if leak is not remedied.
2.14. Hauling of shot rock and waste rock. Road already in place. Use of road.		
2.14.1. Noise	Control through noise control (if feasible)	None
2.14.2. Air Quality	Control through dust control if required	None
2.14.3. Hydrocarbon	Control and remedy through Hydrocarbon management protocol.	Although *unlikely*, there is a *minor residual risk* if leak is not remedied.
2.15. Topsoil removal ahead of waste rock dump advance.		
2.15.1. Soil	Remedy through EMP prescription – remove and replace as cover	Insignificant
2.15.2. Land Capability	Remedy through rehabilitation shaping	Insignificant
2.15.3. Vegetation	Search and rescue - transplanting	Insignificant / Moderate
2.15.4. Animal Life	Search and rescue, chasing and moving	Insignificant
2.15.5. Noise	Control through noise control (if feasible)	None
2.15.6. Air Quality	Control through dust control if required	None

Activity	**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 etc.).	**Potential for Residual Risk**
2.15.7. Hydrocarbon	Control and remedy through Hydrocarbon management protocol.	Although *unlikely*, there is a *minor residual risk* if leak is not remedied.
2.16. Waste rock dump development		
2.16.1. Topography	Remedy through design measures and rehabilitation	Minor in terms of topography
2.16.2. Land Capability	Remedy through design measures and rehabilitation	Insignificant to none (especially if covered of topsoil)
2.16.3. Surface Water	Avoid east of road	Minor
2.16.4. Noise	Control through noise control (if feasible)	None
2.16.5. Air Quality	Control through dust control if required	None
2.16.6. Hydrocarbon	Control and remedy through Hydrocarbon management protocol.	Although *unlikely*, there is a *minor residual risk* if leak is not remedied.
3. DECOMMISSIONING PHASE ACTIVITIES		
3.1. Finalise shaping of all remnant dumps and level all ad hoc dumps.		
3.1.1. Noise	Control through noise control (if feasible)	None
3.1.2. Air Quality	Control through dust control if required	None
3.1.3. Hydrocarbon	Control and remedy through Hydrocarbon management protocol.	Although *unlikely*, there is a *minor residual risk* if leak is not remedied.
3.2. Cover waste rock dump in Kloof section with removed sand cover		
3.2.1. Noise	Control through noise control (if feasible)	None
3.2.2. Air Quality	Control through dust control if required	None
3.2.3. Hydrocarbon	Control and remedy through Hydrocarbon management protocol.	Although *unlikely*, there is a *minor residual risk* if leak is not remedied.
3.3. Demolish all unrequired structures		
3.4. Remove all protruding foundations and footings		
3.5. Remove all pipelines and cables		
3.6. Remove diesel tank & decontaminate		
3.7. Remove weighbridge concrete structures		
3.8. Rip / scarify all hardened areas		
3.8.1. Noise	Control through noise control (if feasible)	None
3.8.2. Air Quality	Control through dust control if required	None
3.8.3. Hydrocarbon	Control and remedy through Hydrocarbon management protocol.	Although *unlikely*, there is a *minor residual risk* if leak is not remedied.
3.9. Retain access roads for future use		
4. AFTERCARE PERIOD		

Activity	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 etc.).	Potential for Residual Risk
4.1. Remove alien vegetation, if present		
4.2. Conduct final performance assessment		
4.3. Lodge closure Application		
4.4. DMR Grant Closure Application		

23 Other Information required by the competent Authority

23.1 Compliance with the provisions of sections 24(4)(a) & (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:-

23.1.1 Impact on the socio-economic conditions of any directly affected person.

Socio-economic impact occurs as a result of the following parties' socio-economic status being altered:

- Landowner: Positive impact in respect of surface rental and / or other income as a result of the operation.
- Mining Company and employees: Income to holder and income to employees for duration of the project.
- Consumer: Supply of product
- Down the line and indirect suppliers: Income
- The applicant company is bound by prescriptions of the Social and Labour Plan to contribute to the community's skills development and must also implement a Local Economic Development project which meets the satisfaction of the DMR and local authority.
- The Social and Labour Plan also prescribes skills development for staff and community members.

23.1.2 Impact on any national estate referred to in section 3(2) of the National Heritage Resources Act.

(Provide the results of Investigation, assessment, and 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).

Application will be lodged on SAHRIS to SAHRA for their decision on additional studies that may be required, if any. Such studies will be compiled.

24 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).

Not applicable – refer Site Layout Plan as indicated in Figures 3 and 4.

25 UNDERTAKING REGARDING CORRECTNESS OF INFORMATION

I, **CRAIG DONALD** herewith undertake that the information provided in the foregoing report is correct, and that the comments and inputs from stakeholders and Interested and Affected parties has been correctly recorded in the report.

Signature of the EAP
DATE: 9 June 2021

26 UNDERTAKING REGARDING LEVEL OF AGREEMENT

I, **CRAIG DONALD** herewith undertake that the information provided in the foregoing report is correct, and that the level of agreement with interested and Affected Parties and stakeholders has been correctly recorded and reported herein.

Signature of the EAP
DATE: 9 June 2021

Appendix 1:

CV of EAP and Declaration

Name: **CRAIG DONALD**

Date of Birth: 26 February 1967

Parent Firm: Site Plan Consulting

Position in Firm: Member

Years with the Firm: Since 1989

Nationality: South African

Qualifications:

Year	Qualification	Institution
1984	Senior Certificate Matriculation	Plumstead High School
1992	National Higher Diploma: Town & Regional Planning (*cum Laude*)	Cape Technikon
1995	Minerals and Metals Extraction short course	Continuing Engineering Education, University of Witwatersrand
1997	National Diploma: Surface Mine Management	Technikon SA
1999	Principles for Environmental Management short course	Environmental Evaluation Unit of University of Cape Town
2003	Masters of Business Administration	University of Cape Town

Languages : English (first language)
Afrikaans (second language)

Key Qualifications:
I have many years practical experience in diverse spatial and mine planning projects after completing a National Higher Diploma in Town and Regional Planning.

After joining Setplan (in 1989), my main involvement was the preparation of environmental management programmes (mainly in surface mining related field) and geographic information systems. In order to obtain a deeper understanding of the relevant issues, I completed a

Surface Mine Management course as well as short courses such as the Environmental Evaluation course run by the EEU of UCT. I completed a part-time MBA at UCT in 2003 and became a member of Site Plan Consulting CC in 2006.

In that time I have developed experience in use of Word, Excel, CorelDraw and ArcView GIS and expanded my tasks as follows.

Main tasks:
The main focus of work experience has been in the licencing, physical and environmental planning, monitoring and closure of surface mining operations. The mines have varied in:

- Size from small sand mines to the largest aggregate or diamond producers,
- Products from clay to diamonds,
- Location from the Alexander Bay to East London/KZN coastal areas as well as inland in Free State and Limpopo
- Scale and type of environmental impact.

In respect of the licencing and physical planning of surface mines, the work entails *inter alia* the compilation of:

- Mining and Prospecting Work Programmes: a detailed mine / prospect plan and project description including cash flow forecast / budget to determine mine's economic viability and cost of prospecting
- Social and Labour Plan: Legislated document required to describe how the mine will maximise its socio-economic impact through enforced education, training and corporate social responsibility programmes for the staff and surrounding community.

In respect of the environmental planning, the work has entailed the compilation of Environmental Management Plans and Programmes in accordance with the requirements of the Mineral and Petroleum Resources Development Act with due regard for National Environmental Management Act (before the amalgamation of these 2 pieces of legislation in December 2014). Such EMP's have been conducted with full public participation and liaison with and full input form specialists as required. Such documents also required the calculation of the financial quantum required for closure / decommissioning activities. This quantum is recalculated on an annual basis once the project is operational.

In respect of monitoring the work involves conducting of environmental audits to measure the level of compliance of actual site conditions against the prescriptions of the EMP. The auditing task also served to highlight any shortcomings in the EMP.

Closure of surface mining operations has entailed the conducting of all public participation and the lodging of all documentation required.

In addition, the work also entails annual updates of Rehabilitation Quantum calculations for almost all of the approved Mining Rights in the list below. These calculations were conducted using both the Guideline of the DMR and as Itemised costs in certain relevant operations.

Relevant Project Experience:

Prospecting Rights (including public participation and compilation of EMPlans (inclusive of EIAs)):

- For Salt on Papendorp Pan as community initiative
- EMPs only for 7 Heavy Mineral Prospects of the West Coast
- Firlands (Gordons Bay) for aggregate
- Zoet and Zuur Diamond pipe (Boshof, Free State)
- Several Alluvial Diamond prospects on West Coast and inland West Coast (Western and Northern Cape)
- Phosphate prospect (Saldanha)
- Aggregate prospect near Oyster Bay in Eastern Cape
- Cobalt, Copper, Molybdenum, Nickel, Lead, Zinc, Silver, Gold & Platinum Group Minerals on 13 farms in the Kenhardt Magisterial District
- Nickel and related minerals on 8 farms near Kliprand
- Kaolin at Langklip (near Saldanha)
- Base minerals around Oena Mine in Northern Cape
- 6 sites for Uranium in the Karoo
- Nickel prospect at Oup near Pofadder
- Commissioners Pan Salt Prospect
- Gypsum prospects near Kimberley, Vanrhysdorp and in the Bushmanland
- Sand sources for Atlantis Foundries (Western Cape)

Mining Permits and Rights (including full Public Participation and compilation of EMPs inclusive of EIAs)

- Caledon Manganese Mining Permit
- Pentlands Granite Quarry Mining Right near Empangeni (KZN)
- Gamohaan Aggregate Quarry near Kuruman
- Cawood Salt Mine at Sout River mouth (Amendment of existing Right)
- Kuipersbult Aggregate Mining Right near Lephalale (Limpopo) as source for Medupi Power station construction
- Dikpens Gypsum Mine Extension (Bushmanland)
- Yserfontein Pan Gypsum mine - update of EMP
- Gypsum Mine for PPC near Vanrhynsdorp
- Transand Aggregate mine near Hartenbosch
- Aggregate and sand mine on municipal owned land in Gansbaai (Permit and Right)
- Sand mining permit near Salmonsdam Nature Reserve, Stanford
- Limestone Mining Right north of Klawer
- Sand Mining permits near Gouritz River / Vlees Bay
- Gecko Fert Phospate Mining Right near Langebaanweg
- Oyster Bay Mining Right application for Aggregate
- Moddergat Sand Mining Right (between Worcester and Villiersdorp)
- Mining Right for Manganese near Swellendam
- Involvement to a greater or lesser degree in at least 50 other Mining Permit and Mining Right applications
- EMP updates / amendments (some of which did not require public participation) for several operations (at least 20).

Environmental Performance /Audit Assessments (monitoring) of the following sites on one off or regular basis. First compiled in terms of MPRDA prescriptions and since December 2014 guided by NEMA requirements:

- Crammix Clay Mine (Brakenfel)
- Botriver Sand mine (Steyns)
- Cawood Salt Mine (Sout River)
- Swellendam Manganese Mine
- Buffelsbank Diamond Mine
- Gecko Fert Phosphate Prospects
- Cape Lime Limestone Mine near Vredendal
- Denron operations (Sand and Aggregate) Knysna / Plettenberg Bay area
- Dimension Stone Mines of Verde Bitterfontein (Namaqualand)
- Limestone quarries in Bredasdorp and Vredendal
- Cawood Salt Mine on West Coast
- 3 x Salt Mines north of Upington
- PPC Gypsum Mine near Vanrhynsdorp
- Lafarge Western Cape operations including Tygerberg, Dorstberg, Peak and Saldanha Quarries
- Various Afrimat aggregate operations throughout the country

Closure Applications (for mining and prospecting operations):

- Gecko Fert Phosphate Prospecting Rights and Mining Permit
- Knysna Whitebridge Quarry
- Denron Funda and Helderwater Quarry – Plettenberg Bay
- Crammix Clay Mine
- Vaale Valley Sand Mine (Mossel Bay)
- Various Dimension Stone bulk samples for Verde Bitterfontein (Namaqualand)
- Bergsig / Farm 292 Closure (Hartenbos)
- Klipfontein Sand Mine (Vlees Bay)
- Welbedagt Gravel Permit (Herbertsdale / Mossel Bay)

"One Environmental System" applications (Post 8 December 2014) all conducted in terms of NEMA process:

- Cape Lime Sand Mine (Schaap Kraal operation) – Afrimat
- Atlantis Foundries Sand Mine – ZLLD Sand Mining (Pty) Ltd
- De Hoek Sand Mining Right – Buy-Line Trading (Pty) Ltd
- Denver Quarry Section 102 (MPRDA)– Afrimat
- Desert Rose Dimension Stone Mine – Application only
- Naroogna Pan Salt Mine – United Salt (Pty) Ltd
- Stanford Quarry Extension – Afrimat
- Bester Calcrete Mining Permit – West Coast Calcrete
- Commissioner Pan Salt Mine – Dwaggas Salt Works (Pty) Ltd
- Lezmin Sand Mine (Gouritz Area) – Lezmin 2021 CC
- Yzerfontein Gypsum Mine (Section 102) – St Gobain Construction Materials (SA)
- Skietkuil Quarry Mining Permit – Skietkuil Quarries CC
- Honingklip Gravel Mining Permit – Western Cape Construction Materials (Pty) Ltd

- Johnsons Clay Brick (Section 102)
- Okiep Dumps Reprocessing Application – O'okiep Copper Company Ltd
- Karoo One / Bo Plaas Sand and Gravel Mining Permit
- Bosluispan Diamond Mine (Section 102 Application) – Kori Diamonds (Pty) Ltd
- Oena Diamond Mine (Section 102 Application) – African Star Minerals

Section 24G Applications:

- Makulu Quarry – Denron
- Swellendam Manganese Mine – Sikhova Environmentally Friendly Building Solutions
- Illegal Waste Disposal Site – Die Kop – Plettenberg Bay

DECLARATION OF THE EAP

I, CRAIG DONALD declare that —

General declaration:

- I act as the independent environmental practitioner in this application
- I will perform the work relating to the application in an objective manner, even if this results in views and findings that are not favourable to the applicant
- I declare that there are no circumstances that may compromise my objectivity in performing such work;
- I have expertise in conducting environmental impact assessments, including knowledge of the Act, Regulations and any guidelines that have relevance to the proposed activity;
- I will comply with the Act, Regulations and all other applicable legislation;
- I will take into account, to the extent possible, the matters listed in regulation 8 of the Regulations when preparing the application and any report relating to the application;
- I have no, and will not engage in, conflicting interests in the undertaking of the activity;
- I undertake to disclose to the applicant and the competent authority all material information in my possession that reasonably has or may have the potential of influencing - any decision to be taken with respect to the application by the competent authority; and - the objectivity of any report, plan or document to be prepared by myself for submission to the competent authority;
- I will ensure that information containing all relevant facts in respect of the application is distributed or made available to interested and affected parties and the public and that participation by interested and affected parties is facilitated in such a manner that all interested and affected parties will be provided with a reasonable opportunity to participate and to provide comments on documents that are produced to support the application;
- I will ensure that the comments of all interested and affected parties are considered and recorded in reports that are submitted to the competent authority in respect of the application, provided that comments that are made by interested and affected parties in respect of a final report that will be submitted to the competent authority may be attached to the report without further amendment to the report;
- I will keep a register of all interested and affected parties that participated in a public participation process; and
- I will provide the competent authority with access to all information at my disposal regarding the application, whether such information is favourable to the applicant or not
- all the particulars furnished by me in this form are true and correct;
- will perform all other obligations as expected from an environmental assessment practitioner in terms of the Regulations; and
- I realise that a false declaration is an offence in terms of regulation 71 of the Regulations and is punishable in terms of section 24F of the Act.

Disclosure of Vested Interest (delete whichever is not applicable)

- I do not have and will not have any vested interest (either business, financial, personal or other) in the proposed activity proceeding other than remuneration for work performed in terms of the Regulations;
- ~~I have a vested interest in the proposed activity proceeding, such vested interest being:~~

Signature of the environmental assessment practitioner:

Name of company: Site Plan Consulting

Date: 26 | 07 | 2015

SOUTH AFRICAN POLICE SERVICE
VISPOL HEAD
2015 -07- 25
SOMERSET WEST
AMAPOLISA OMZANTSHI AFRICA

SAPS MAIN ROAD SOMERSET WEST 0851801303

APPENDIX 2:

BOTANICAL ASSESSMENT
(Nick Helme)

NICK HELME BOTANICAL SURVEYS
PO Box 22652 Scarborough 7974
Ph/fax: (021) 780 1420 cell: 082 82 38 350 email: botanick@iafrica.com
Not registered for VAT.
Accounts payable to : N.A.Helme

BOTANICAL ASSESSMENT OF SWARTBERG MINE SOUTHEAST OF VIOOLSDRIF

NICK HELME

July 2002

1. INTRODUCTION AND STUDY AREA

This botanical assessment was commisioned by Setplan to help inform decisions regarding the ongoing environmental management of Swartberg Mine southeast of Vioolsdrif. The mine follows a northeast trending pegmatite vein from the western base of Swartberg, and the area is being actively mined, with the excavation currently about 50m deep and at least 100m wide. The existing heavily disturbed area already covers about 12ha. The vein is rich in feldspar, mica, and quartz. The surrounding rocks are dark red to black granites (?amphibolites) which get very hot in summer and the area around the vein is thus only sparsely vegetated. There are other small patches of pegmatite nearby, including a contiguous arm to the northwest which is being mined. There are also small outcrops of white quartz, notably just northeast of the main excavation.

The mine is located largely within the biogeographic region of Bushmanland, in an extremely arid area which forms part of the Gariep centre of plant endemism, which is the richest succulent plant region in the world (van Wyk and Smith 2001). The Gariep centre (basically the Orange River valley from Augrabies to the river mouth at Alexander Bay) has also been identified as one of the 25 key plant conservation areas in the world by Conservation International (2000), and plants restricted to this area are known as regional endemics for the purposes of this report. Local endemics are species restricted to the area bounded by Steinkopf, Vioolsdrif, and Goodhouse. The site was visited on 30 June 2002.

2. THE VEGETATION

The vegetation on the Swartberg is strikingly different from that on the Blesberg, with the latter having many Namaqualand elements not present on the former. The area is much more heavily grazed (by goats) than the Blesberg, and this may help account for the sparseness of the vegetation.

2.1 The western sandy vlakte

The gently sloping vlakte near the entrance have been heavily to moderately disturbed, but there are still some patches of natural vegetation. Soils tend to be deep sandy gravels derived from granites. Numerous alluvial elements are present in the flora, indicating that this area is something of a drainage zone. The area is heavily grazed, and there is little evident grass. All species noted here are common and widespread and include *Mesembryanthemum crytallinum* (ysplant), *Psilocaulon rapaceum* (asbos), *Brownanthus* sp., *Codon royenii*, *Sisyndite spartea*, *Zygophyllum leptopetalum*, *Augea capensis*, *Tribulus terrestris* (dubbeltjie), *Dyerophytum africanum*, various annuals such as *Heliophila* sp., and various grasses including *Enneapogon desvauxii*, *Stipagrostis uniplumis* (silky Bushman grass), and *Stipagrostis obtusa* (small Bushman grass). Grass cover is very low, less than 1%. This area will rehabilitate well if all dumped material is concentrated in an area closest to the excavation, and the sands lightly scarified perpendicular to the prevailing winds.

Further towards the N7, about 200m from the mine entrance, the vegetation becomes less disturbed, although still overgrazed, and here one finds some succulents more typical of undisturbed areas. Most striking is the odd *Euphorbia friedrichae* (Red Data Book listed as "Indeterminate"), plus *Sarcocaulon flavescens* (boesmankers), and the regionally endemic vygies *Ebracteola spinea* and *Ebracteola fulleri*.

The local and regional conservation value of the partly disturbed vlakte area within 200m of the mine entrance is Low, and the undisturbed area closer to the N7 is of Moderate – High local and regional importance.

2.2 The northeastern overburden dump area

The proposed expansion direction of the overburden dumps in the northeast will have a substantial negative impact on the shrubby succulent vegetation that is found on these rocky quartzite slopes. The area is dominated by relatively widespread shrubby succulents such as *Ceraria namaquensis, Ceraria fruticulosa, Senecio cephalophorus, Euphorbia decussata, Aridaria noctiflora*, and *Hereroa hesperantha*, plus the small tree *Boscia foetida* (sheperd's tree). No rare or localised species were found in this area, probably because it is a relatively recent habitat derived from the nearby quartz outcrop that has been largely removed by the excavation.

The local and regional conservation value of this area is Moderate.

2.3 Existing quarry perimeter

Due to the intense summer heat and aridity the majority of plants in the area are found in the coolest habitats, which tends to mean the pale coloured rocks that reflect some of the heat, such as quartz and feldspar/pegmatite. Relatively few plants can tolerate the extreme heat of the darker gneiss boulders that dominate the hills in the area. Many plants are wedged tightly into shaded crevices, often on south facing slopes, for extra protection from the heat and aridity. The vegetation of the pegmatite vein is therefore much richer than the surrounding granite areas, and the pegmatites support a number of species never found on pure granite/gneiss.

The vegetation on the pegmatite vein on Swartberg has been largely destroyed by the quarrying operations, and it is likely that many species that were restricted to this habitat are, or are now very nearly, locally extinct.

The most interesting plants on the pegmatite vein are the dwarf succulents. No bulbous species were noted, other than an unidentified species of *Tenicroa* (with

a single, thin leaf; possibly a new species). *Anacampseros baeseckii* is a common dwarf succulent throughout Bushmanland, as is *Crassula garibina*. Three small *Conophytum* species are locally restricted to the pegmatite and/or quartz outcrops, but none are common on this site. The locally endemic *Conophytum devium* is restricted to pegmatite (feldspar) areas, and has a small population about 50m northeast of the current northwestern excavation. It is likely that this species was very common on the pegmatite outcrop prior to quarrying, but is now rare on the site, being restricted to small pegmatite patches away from the main deposit. Slightly northeast of this species are two further local endemics, *Conophytum longum* and *C. lydiae*, but in very limited numbers (<15 of each species), growing in shallow gravel pans (with feldspar elements) between granite boulders. I suspect that these populations are outside the area to be excavated, judging by the map I was given.

Woody shrubs are very rare in the area, unlike on the nearby Blesberg, and the only one noted was *Lycium oxycarpum*. The dominant species are widespread leaf and stem succulents such as *Senecio cephalophorus, Euphorbia decussata, Arenifera* sp., *Ceraria fruticulosa, Ceraria namaquensis, Crassula sericea, Crassula namaquensis, Zygophyllum leptopetalum, Phyllobolus sp.*, and *Tylecodon ventricosus*. One of the most common species is a small non-succulent, very spiny perennial known as *Acanthopsis hofmannseggiana*. Also present on the quartz outcrop very close to the existing excavation are the regionally endemic succulent trees *Commiphora capensis* and *Commiphora cervifolia*. A number of excavated, dead specimens of these species were seen near the overburden dump. A few *Aloe dichotoma* (kokerboom) occur about 80m north of the vein, and 20m south of the main excavation is a young plant that has been knocked over, perhaps by blasting shrapnel. The small widespread succulent *Stapelia similis* also occurs north of the excavation. South of the excavation the common succulent *Sarcostemma viminale* forms dense patches on the quartz vein, in association with *Ceraria fruticulosa, Euphorbia gariepina,*

and *Arenifera* sp. The succulent *Hoodia gordonii* (ghaap) also occurs here, along with a few specimens of the regional endemic *Tylecodon hallii*. Most specimens of this latter species were found south of the southern escavation. No *Pachypodium namaquanum* (halfmens) could be seen, and it is assumed that these have been removed, as they have been reported form the site.

The species of conservation concern recorded in the areas immediately around the excavation (within 40m of the current edge) thus include the regionally endemic succulent trees *Commiphora capensis* and *C. cervifolia*, and the regionally endemic 0.4m succulent *Tylecodon hallii*. These species are not Red Data Book listed, and are fairly common in the region.

Some plants around the quarry edge have been damaged by rock shrapnel from the blasting.

The local and regional conservation value of the vegetation within 40m of the existing quarry edge is generally Moderate.

3. CONCLUSIONS AND RECOMMENDATIONS

- Three regionally endemic plant species occur within 40m of the existing quarry edge, which puts them at risk. The species are not Red Data Book listed, and are regionally quite common. The species are not capable of being transplanted due to their long root systems.
- Mitigation is recommended (in terms of the above) if quarrying is to continue, and I would recommend that quarrying be allowed to expand only on a limited basis in a southerly direction (the current direction), with no significant widening (by more than 20m) of the quarry to the north. Of particular concern in the north is the presence of the three locally endemic *Conophytum* species about 50m northeast of the current northwestern excavation. These species are not found immediately south of the quarry.

- If possible the white quartz outcrop south of the main excavation should be left intact as it supports a number of interesting species not found on the adjacent granites.
- The vlakte areas should rehabilitate quite well naturally, once the dumped material is removed, but it may help to scarify the area (perpendicular to the prevailing winds) to allow windblown seeds to accumulate in the small sandy hollows.