



mineral resources

Department:
Mineral Resources
REPUBLIC OF SOUTH AFRICA

SCOPING REPORT

FOR LISTED ACTIVITIES ASSOCIATED WITH A MINING PERMIT.

Karusa North Borrow Pit

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).

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FILE REFERENCE NUMBER SAMRAD:	NC30/5/1/3/2/10503MP

13 November 2015
Report #: 2749a/MP/S/R1

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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Appendix 3: Socio-Economic (Notifications and responses to date)

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1 OBJECTIVE 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
- f) 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 of the EAP who prepared the report

Name of the Practitioner: Stephen van der Westhuizen and Jaques van der Vyver
Site Plan Consulting
Tel No: 021 854 4260; Fax No: 021 854 4321
E-mail address: steve@siteplan.co.za / Jaques@siteplan.co.za

2.2 The qualifications of the EAP

(With evidence attached as **Appendix 1**).

2.3 Summary of the EAP's past experience.

(EAP's curriculum vitae as **Appendix 2**)

3 Description of the property.

Farm Name:	Farm Rheebokke Fontein 209 Remainder
Application area (Ha)	4.945ha
Magisterial district:	Sutherland
Distance / direction from nearest town	Sutherland is located about 52km north of the application area
Surveyor General Code	C0720000000020900000

4 Locality map

(Show nearest town, scale not smaller than 1:250000 attached as **below**). (Also Refer Figure 2 Overleaf)

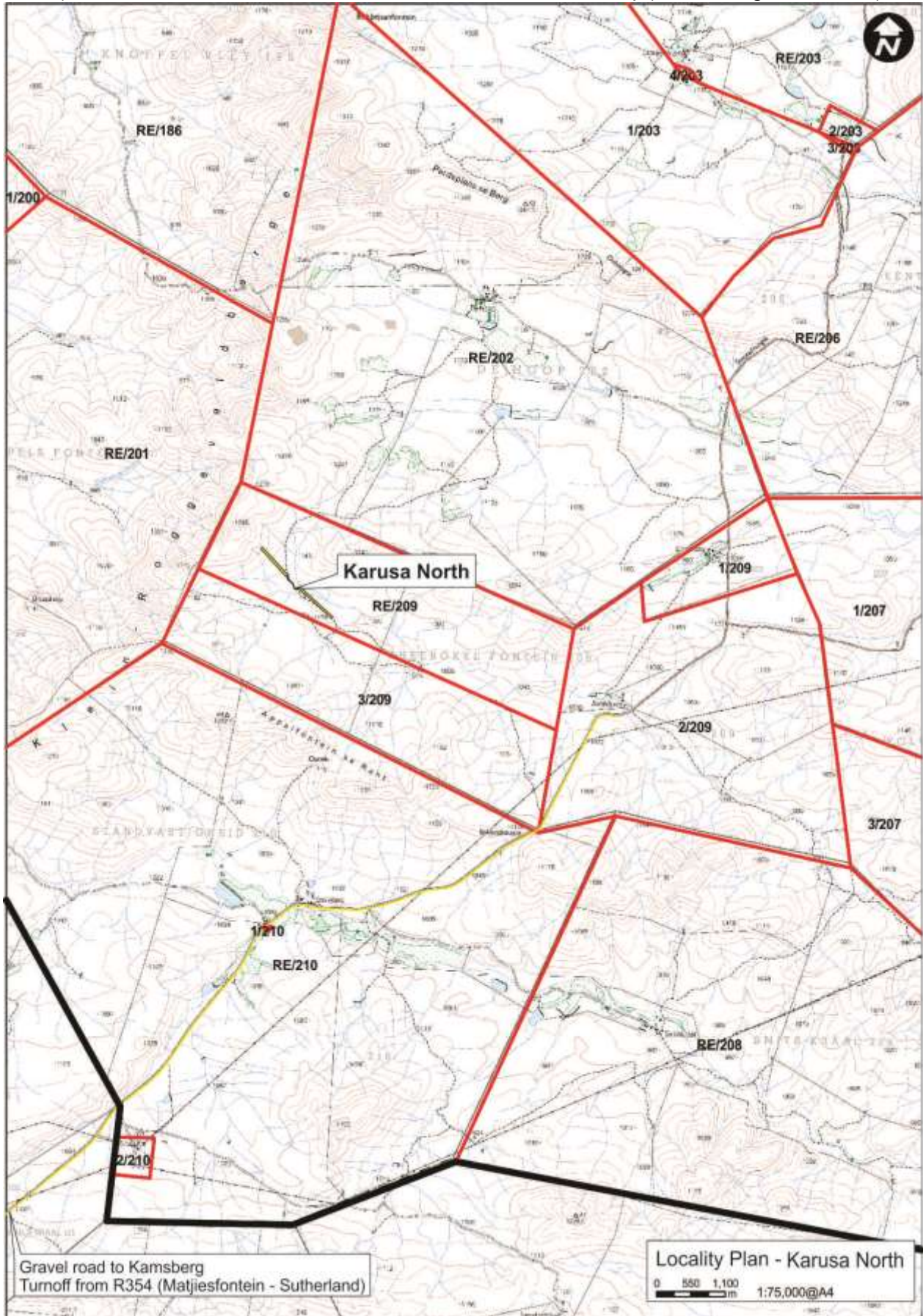


Figure 1: Locality Plan

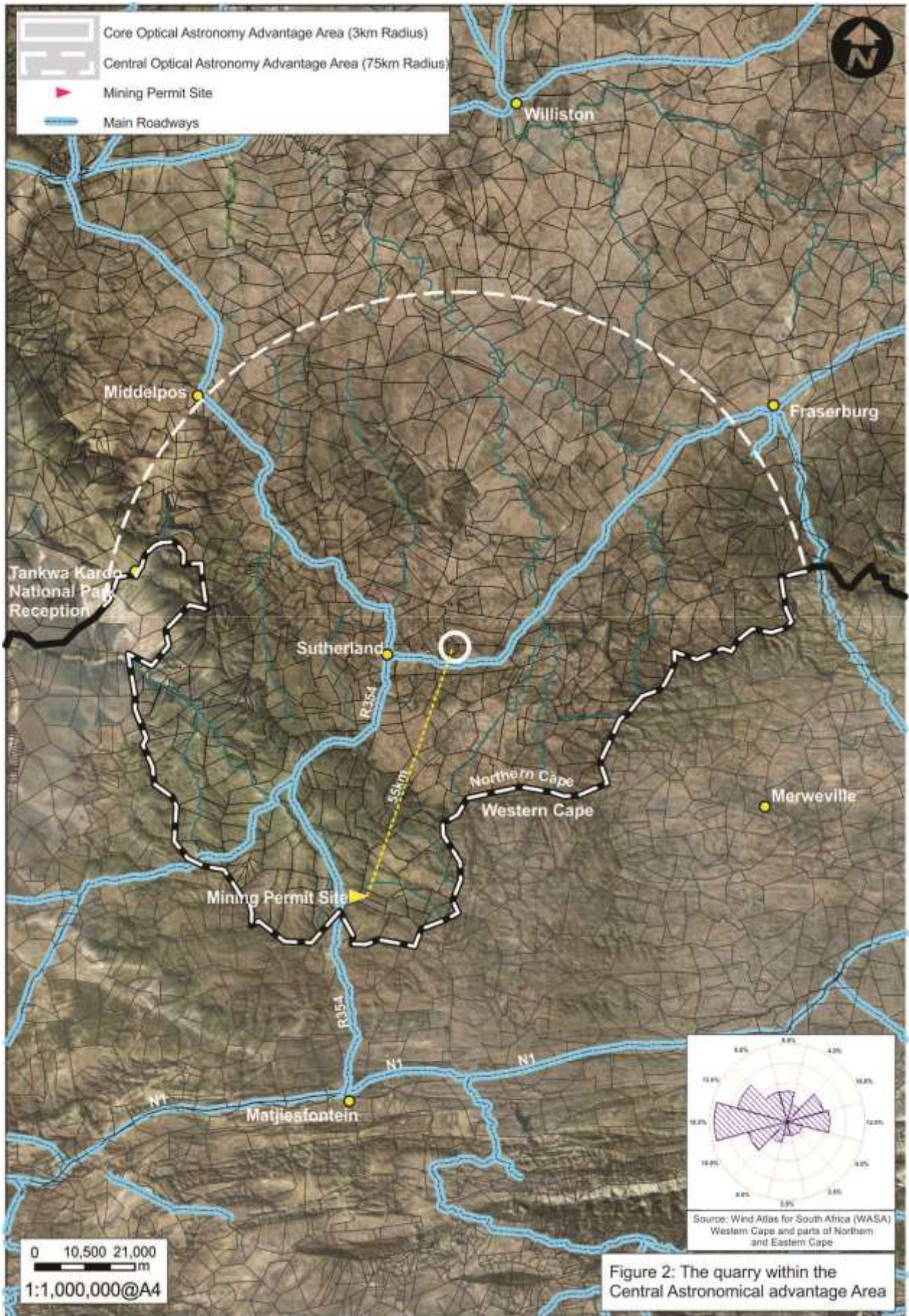


Figure 2: The site within the regional perspective of the Central Astronomy Advantage Area

5 Description of the scope of the proposed overall activity.

5.1 Background:

In order to provide suitable materials for the construction/maintenance of gravel access roads and turbine platforms to serve the wind energy projects currently underway south of Sutherland, Site Plan Consulting acting on behalf of Power Construction have identified this site as one of 3 soft(weathered) rock Borrow pits for utilisation.

Given the extent of the project, the volume and range of materials required, three such soft rock permit sites will require full utilisation, together with a fourth “hard rock” quarry which is to provide aggregate and crushed sand for concrete production.

Power Construction has appointed Site Plan Consulting CC to conduct the Applications on their behalf, which has entailed the lodging of this Application with the Department Mineral Resources (DMR) Northern Cape (which has been completed) and now further entails the Scoping Phase of the assessment, involving identification and notification of Interested and Affected Parties (I&APs) in a public participation process, and which will, later in the process, involve the Environmental Impact Assessment (EIA/EIR), identification of attenuation measures to limit impacts, and prescribing the environmental management in an Environmental Management Programme (EMPr).

Regional Geology

As per attached Figure 3 overleaf: Regional Geology Karusa, (extract from Geological Survey sheet 3220 Sutherland; enlarged 1:250 000 to 1:50 000) the quarry is to be developed in a 10-20m wide vertical Karoo dolerite dyke, which dolerite is intruded into the Beaufort Mudstone country rock and outcrops across the properties in a southeast – northwest direction.

Detailed geology

As per photo hereafter the strike surface of the dolerite dyke shows no fresh rock outcrop but presents as decomposed “sugar dolerite” with small core-stones at or near the surface, and often below the 150mm to 200mm soil horizon.

Based on road cutting excavations through the dyke on the R354 tar road, the dolerite shows “sugar dolerite” weathering to grey granular decomposed dolerite to a depth of generally 2,5m but up to 4m at which stage larger core-stones and local fresh dolerite are encountered and are likely to require drilling and blasting for crushing as such deeper fresh rock’s materials characteristics will improve the decomposed material grade on blending.

The dolerite will provide excellent quality materials for construction of the wind turbine platforms and all access roads of the 3 scheduled wind farms in the area.



Photo 1: Dolerite dyke running NW west of main Windmill on Karusa North with red-sprayed bushes delineating edge of dyke.

Photo 2: Small, round dolerite core-stones occur in soil indicating weathered dolerite substrate.



Figure 3: Regional Geology

5.2 The Mine Planning and considerations

Site Informants

All aspects of the site planning and location are wholly informed by the regional geology of the area.

The Beaufort mudstones and interbedded sandstones forming the country rock are largely unsuited to use for gravel road construction (inadequate lifespan of the road surface under heavy trafficking without constant maintenance), and largely do not meet the high specifications required for the materials which are to serve given the heavy loads which will be using the constructed roadways. While certain deposits of fractured sandstone gravels may be of some suitability, they would still require blending with the sought dolerite to fully suit the project requirements, and these sandstones are of negligible depth and localized extent on hill slopes, meaning that large areas would be required to fully meet the material volume requirements, causing unnecessary and widespread denuding of land which can be avoided by maximizing the use of the dolerite dykes sought under mining permit.

The following figure 4 overleaf sets out the envisioned operation for this Draft Scoping Report with any revisions to be included in the final scoping report:

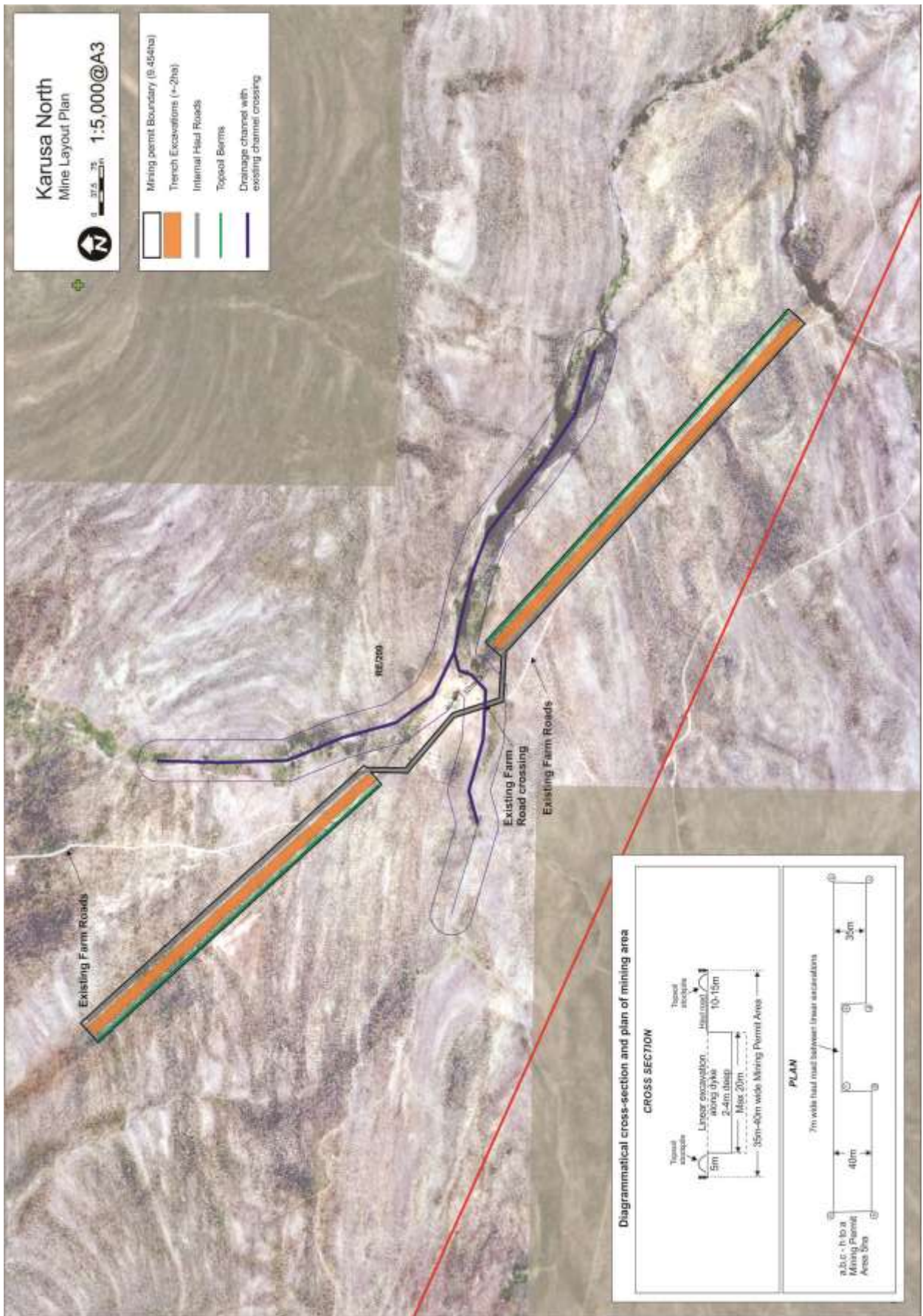


Figure 4: Proposed Site (mine) layout plan

Reserves

a. Resource

As in Figure 3; Regional Geology, the dolerite dyke strikes for some 3km across the farm while extending further both north-west and south-east of the property with a total resource in excess of 1 million m³.

b. Reserve

The reserve identified for mining of the upper 2,5m decomposed dolerite and the lower further 1,5m depth of semi-decomposed or fresh dolerite (to average 3m deep) yields the reserves as set out in the Table below.

- Topsoil will be dozed to excavation-parallel berms for re-use in rehabilitation.
- No material is classified as overburden as any highly weathered clayey material will be used to blend with the grey dolerite to improve its binding characteristics on the roads and turbine platforms.

The table hereafter reflects the reserves per product type to be produced:

Reserves of the Karusa North Quarry

Excavation Area	12890m ²
Assumed depth	3m
Volume	38670m ³

5.3 Mining Method and Processing

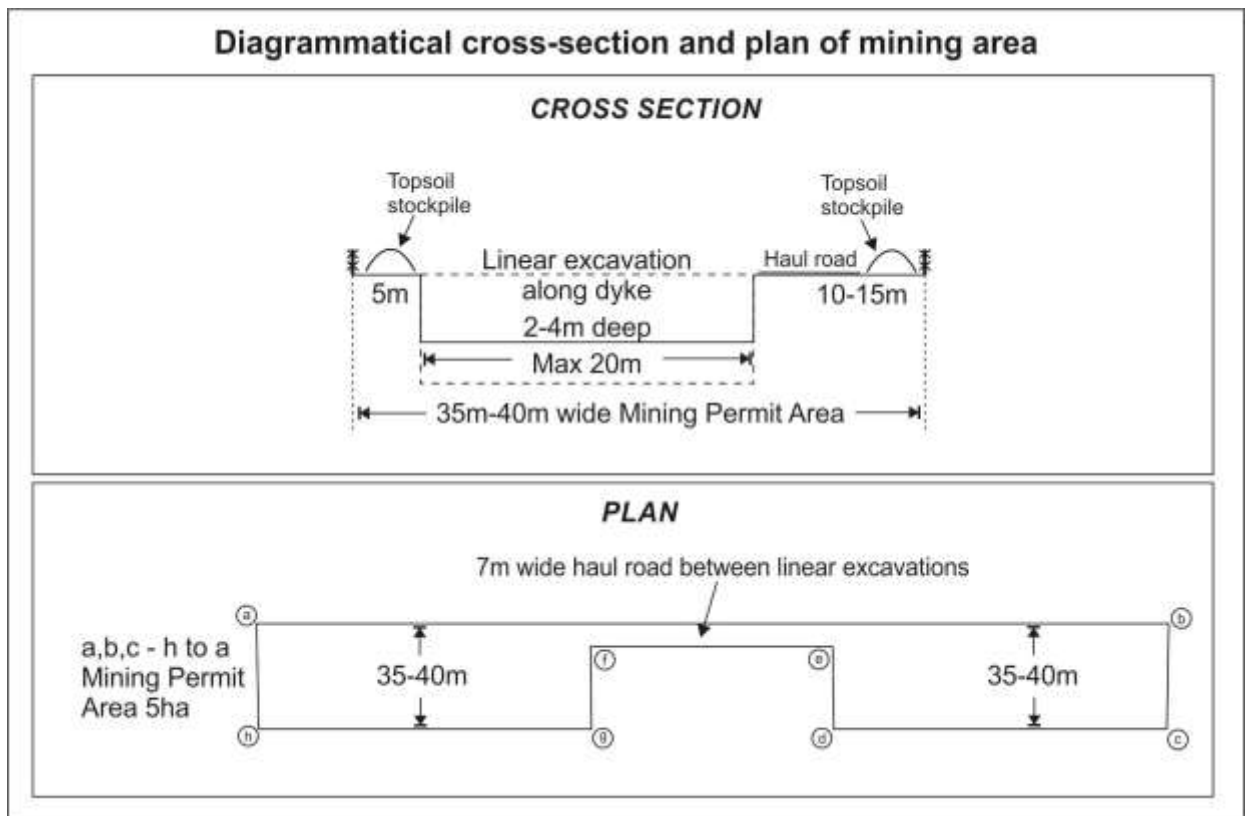
As has been previously mined on other farms, where the dyke served as road borrow pits and is clearly visible as an un-rehabilitated excavation, the proposed excavations will be linear trenches to the 10-15m width of the dyke, running for some 1550m. Within the dyke, the excavation will consist of the following actions: (Refer diagram overleaf)

- Topsoil/upper gravel removal of 200mm by dozer or excavator to trench-parallel topsoil berms.
- Excavator digging of the upper 2,5-4.0m depth of sugar dolerite, with:
 - direct loading into dump trucks for hauling to the respective use areas. Or
 - loading into the hopper of a mobile tracked crushing and screening plant, which will be located on the trench floor, and follow the hard excavation it advances along the trench floor.

Alternatively, the excavated rock may be loaded into dump trucks for hauling to a central crushing and screening plant located to serve to the construction sites and concrete batch plant.

- Additionally, where shallow hard un-weathered dolerite occurs this may be drilled and blasted prior to loading into dump trucks or mobile crusher hopper.

The operational methodology is illustrated by the following cross-section and plan.



In order to achieve the required volume, the linear excavation will extend along a total of 1550m of the dyke crossing the property. In order to achieve a single 5ha Mining Permit area, the mine blocks of 35-40m wide chosen in the best weathered areas of the dyke are to be linked by 7m wide haul road reserves to a total of less than 5ha.

Mining is to be conducted as a standard open cast operation as follows:

1 PRE ESTABLISHMENT

- 1.1. Application for a Mining Permit
- 1.2. Clearly demarcate use areas, permit boundary, delivery road and fence site
- 1.3. Demarcate No-Go Environmentally sensitive areas for strict avoidance

2 ESTABLISHMENT PHASE

- 2.1. Conduct Environmental Induction training to staff
- 2.2. Place chemical toilets for staff and establish containerized office/stores on site
- 2.3. Remove topsoil from demarcated areas to topsoil berms for later re-use.
- 2.4. Grass seed/shade net cover topsoil berms
- 2.5. Upgrade access road to Mining Permit area
- 2.6. Establish perimeter stormwater/ silt catchment channels
- 2.7. Conduct establishment phase monitoring.

3 OPERATIONAL PHASE

- 3.1. Advance excavation by Front-end loader or excavator, directly into dispatch vehicles or to Mobile crusher
- 3.2. Drilling of hard (fresh) rock where encountered
- 3.3. Blasting of hard (fresh) rock where encountered
- 3.4. Excavator loading of shot rock directly into despatch vehicles or to mobile crusher
- 3.5. Tracked mobile crusher crushing and screening, with the mobile crusher proceeding on tracks
- 3.6. Excavator loading crushed material to either delivery trucks or dump trucks to stockpile
- 3.7. Dispatch loading of delivery vehicles.
- 3.8. Shaping of excavation and the remainder of the mining permit area
- 3.9. Continuous ad hoc eradication of alien vegetation
- 3.10. Refuelling and hydrocarbon management.
- 3.11. Maintenance of stormwater control
- 3.12. Conduct operational phase maintenance and monitoring.

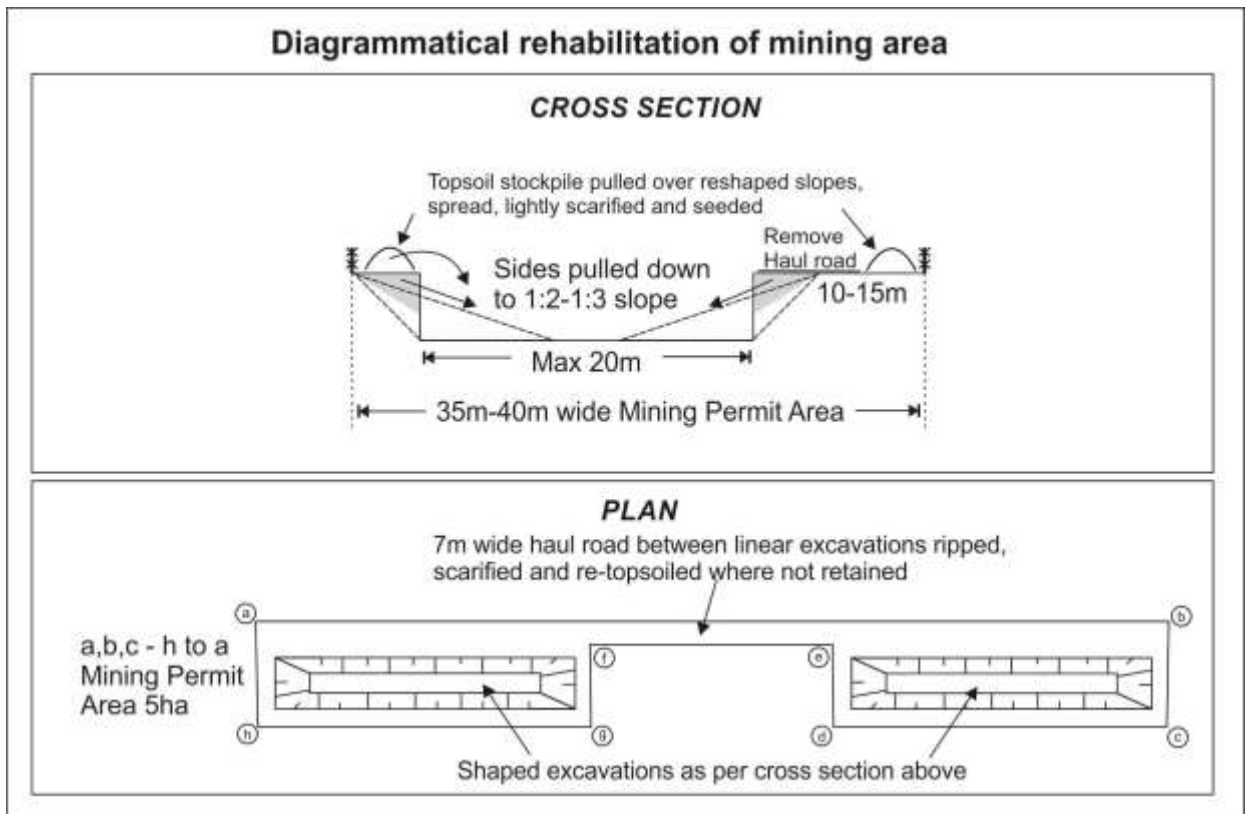
4 DECOMMISSIONING PHASE

- 4.1. Finalize shaping of remaining pit floor and sloping of final pit edges (including instatement of internal drainage)
- 4.2. Remove all structures (stores/office container, Chemical toilet lastly.)

- 4.3. Rip/scarify hardened/compacted surfaces.
- 4.4. Spread topsoil from berms over designated areas and lightly scarify
- 4.5. Finalize Revegetation by means of seeding. Seeding /Revegetation must take place in accordance with landowner specification/ requirements.

5 AFTERCARE PERIOD

- 5.1. Remove alien vegetation (except pasture species), if present
- 5.2. Monitor revegetation success, with follow-up seeding if required
- 5.3. Conduct final performance assessment
- 5.4. Lodge closure Application
- 5.5. DMR Grant Closure Application



6 Listed and specified activities

Provide a plan drawn to a scale acceptable to the competent authority but not less than 1:10 000 that shows the location, and area (hectares) of all the aforesaid main and listed activities, and infrastructure to be placed on site and attach as **Appendix 4**.

Refer also Figure 4.

NAME OF ACTIVITY		Aerial extent of Activity (Ha or m ²)	LISTED ACTIVITY (Mark with an X where applicable or affected)	APPLICABLE LISTING NOTICE (GNR 983, GNR 984 or GNR 985)	WASTE MANAGEMENT AUTHORISATION (Indicate whether an authorisation is required in terms of the Waste Management Act). (Mark with an X)
<u>1</u>	<u>PRE ESTABLISHMENT</u>	<u>Aerial Extent</u>	<u>Listed Activity</u>	<u>Applicable Listing Notice</u>	<u>Waste Authorization</u>
1.1.	Application for a Mining Permit	4.945ha Mining area	X	GNR983: Activity # 21	
1.2.	Clearly demarcate use areas, permit boundary, delivery road and fence site	Within the 4.945ha Mining			

1.3.	Demarcate No-Go Environmentally sensitive areas for strict avoidance	Within the 4.945ha Mining Area			
<u>2</u>	<u>ESTABLISHMENT PHASE</u>	<u>Aerial Extent</u>	<u>Listed Activity</u>	<u>Applicable Listing Notice</u>	<u>Waste Authorization</u>
2.1.	Conduct Environmental Induction training to staff	Within the 4.945ha Mining Area			
2.2.	Place chemical toilets for staff and establish containerized office/stores on site	Within the 4.945ha Mining Area			
2.3.	Remove topsoil from demarcated areas to topsoil berms for later re-use.	Within the 4.945ha Mining Area	X	GNR 985: Activity # 12 (NOTE: GNR 983. Activity # 27 does not apply)	
2.4.	Grass seed/shade net cover topsoil berms	Within the 4.945ha Mining Area			
2.5.	Upgrade access road to Mining Permit area	Within the 4.945ha Mining Area			
2.6.	Establish perimeter stormwater/ silt catchment channels	Within the 4.945ha Mining Area			
2.7.	Conduct establishment phase monitoring.	Within the 4.945ha Mining Area			
<u>3</u>	<u>OPERATIONAL PHASE</u>	<u>Aerial Extent</u>	<u>Listed Activity</u>	<u>Applicable Listing Notice</u>	<u>Waste Authorization</u>
3.1.	Advance excavation by Front-end loader or excavator, directly into dispatch vehicles or to Mobile crusher	Within the 4.945ha Mining Area			
3.2.	Drilling of hard (fresh) rock where encountered	Within the 4.945ha Mining Area			
3.3.	Blasting of hard (fresh) rock where encountered	Within the 4.945ha Mining Area			
3.4.	Excavator loading of shot rock directly into despatch vehicles or to mobile crusher	Within the 4.945ha Mining Area			
3.5.	Tracked mobile crusher crushing and screening, with the mobile crusher proceeding on tracks	Within the 4.945ha Mining Area	X	GNR 984: Activity #21	
3.6.	Excavator loading crushed material to either delivery trucks	Within the 4.945ha			

	or dump trucks to stockpile	Mining Area			
3.7	Dispatch loading of delivery vehicles.	Within the 4.945ha Mining Area			
3.8	Shaping of excavation and the remainder of the mining permit area	Within the 4.945ha Mining Area			
3.9	Continuous ad hoc eradication of alien vegetation	Within the 4.945ha Mining Area			
3.10	Refuelling and hydrocarbon management.	Within the 4.945ha Mining Area			
3.11	Maintenance of stormwater control	Within the 4.945ha Mining Area			
3.12	Conduct operational phase maintenance and monitoring.	Within the 4.945ha Mining Area			
4	<u>DECOMMISSIONING PHASE</u>	<u>Aerial Extent</u>	<u>Listed Activity</u>	<u>Applicable Listing Notice</u>	<u>Waste Authorization</u>
4.1.	Finalize shaping of remaining pit floor and sloping of final pit edges (including instatement of internal drainage)	Within the 4.945ha Mining Area			
4.2.	Remove all structures (stores/office container, Chemical toilet lastly.)	Within the 4.945ha Mining Area			
4.3.	Rip/scarify hardened/compacted surfaces.	Within the 4.945ha Mining Area			
4.4.	Spread topsoil from berms over designated areas and lightly scarify	Within the 4.945ha Mining Area			
4.5.	Finalize Revegetation by means of seeding. Seeding /Revegetation must take place in accordance with landowner specification/ requirements.	Within the 4.945ha Mining Area			
5	<u>AFTERCARE PERIOD</u>	<u>Aerial Extent</u>	<u>Listed Activity</u>	<u>Applicable Listing Notice</u>	<u>Waste Authorization</u>
5.1.	Remove alien vegetation (except pasture species), if present	Within the 4.945ha Mining Area			
5.2.	Monitor revegetation success, with follow-up seeding if required	Within the 4.945ha			

		Mining Area			
5.3.	Conduct final performance assessment				
5.4.	Lodge closure Application		X	GNR983: Activity # 22. Only applicable at time of closure	
5.5.	DMR Grant Closure Application				

GNR 983 #28 is Not Applicable at all to this application. Mining is contained in its own definition within the NEMA and is not included under: "Residential, mixed, retail, commercial, industrial or institutional developments. (We do note however that under the Land Use categorisation under the Municipal Planning by-law, mining is contained under Industrial 2 Classification). In terms of the NEMA GNR983 #21 serves to contemplate Mining as a developmental activity, and is included as an applicable listed activity

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	REFERENCE WHERE APPLIED	HOW DOES THIS DEVELOPMENT COMPLY WITH AND RESPOND TO THE POLICY AND LEGISLATIVE CONTEXT
(A description of the policy and legislative context within which the development is proposed including an identification of all legislation, policies, plans, guidelines, spatial tools, municipal development planning frameworks and instruments that are applicable to this activity and are	(i.e. Where in this document has it been explained how the development complies with and responds to the legislation and policy context)	(E.g. In terms of the National Water Act:- Water Use License has/has not been applied for).
National Environmental Management Act	Entire document including public participation	Environmental Authorization from DMR as competent authority
Mineral and Petroleum Resources Development Act	Template for Scoping Report	DMR application and process
Namakwa District Map of Critical Biodiversity Areas	Need and Desirability (Para 9)	End Use informant
EIA Guideline and Information Document Series' "Guideline on Need and Desirability	Need and Desirability (Para 9)	Guideline for information utilized in this document
EIA Guideline 5 Assessing alternatives and impacts	Cumulative Impact Assessment (Para 9.2.1)	Guideline for information utilized in this document
NEMWA	Not applicable	No application for Waste Licence
Mining and Biodiversity Guideline: Mainstreaming biodiversity into the mining sector. Department of Environmental Affairs, Department of Mineral Resources, Chamber of Mines, South African Mining and Biodiversity Forum, And South African National Biodiversity Institute. 2013.	Need and Desirability (Para 9)	Tool to facilitate the sustainable development of South Africa's mineral resources in a way that enables regulators, industry and practitioners to minimise the impact of mining on the country's biodiversity And ecosystem services.
Astronomy Geographic Advantage Act (Act 21 of 2007)	Para 14.1.9: Dust	The development requires agreement by the Management Authority, following tabling of an assessment of risk and attenuation measures. The Authority is the Astronomy Management Authority (AMA) and additionally discussion with the Head: Small Telescopes Operations

Revised Draft IDP of the Karoo Hoogland Municipality 2015-2016.	Part 6.6.10	A full Application for Land Use Authorisation will be further conducted prior to commencement of activities.
-----------------------------------------------------------------	-------------	--------------------------------------------------------------------------------------------------------------

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).

The EIA Guideline and Information Document Series' "Guideline on Need and Desirability" dated August 2010 has been used to consider this aspect.

Important: The actual mining takes place in the short term and as a result the need and desirability **should not only** focus on the actual mining phase of this site's lifespan but also concentrate on the long term / permanent post mining land use proposal.

The guideline referred to above provides a list of 15 questions which are aimed at addressing the issue of need and desirability. The questions have been copied below with the consideration of each question as it relates to this application immediately following each question.

Need refers to timing of a project whilst desirability is defined to consider the placing of the activity. 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).

9.1 Need ('timing'):

Question 1: *Is the land use (associated with the activity being applied for) considered within the timeframe intended by the existing approved Spatial Development Framework (SDF) agreed to by the relevant environmental authority? (I.e. is the proposed development in line with the projects and programmes identified as priorities within the credible IDP).*

9.1.1 Conservation status of the site

Refer the following figures 5 and 6:

The site of the proposed mine does not fall within any CBA. It is however largely in a natural state and as such a botanical assessment has been identified to be conducted by specialist botanist.

We do note that large areas of similar habitat predominate in the region, and given the short term lifespan of the mining, together with rehabilitation, the site will be returned to largely similar habitat, however altered geologically and topographically.

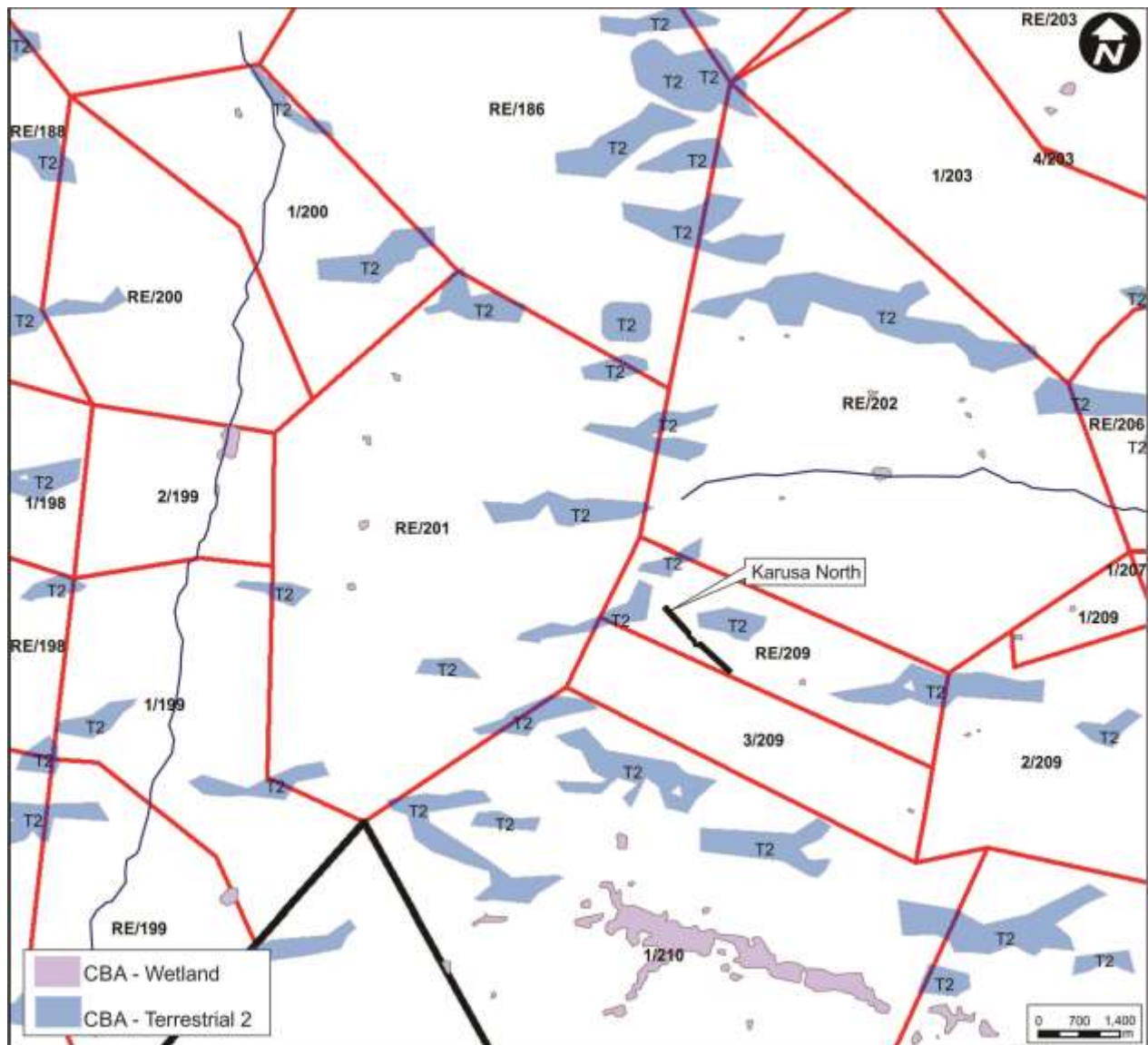


Figure 5: CBA Classification of the site, as per Namakwa District Municipal

We do further note the following classification as taken from the Mining Biodiversity guideline documentation as prepared by all state departments (Developed by the Departments of Environmental Affairs and Mineral Resources; with inputs from :Department of Environmental Affairs, Department of Mineral Resources, Chamber of Mines South African, Mining and Biodiversity Forum, South African National Biodiversity Institute, Grasslands Programme - with funding from the United Nations Development, Programme Global Environment Facility, WWF South Africa, Endangered Wildlife Trust, Centre for Sustainability in Mining and Industry, CapeNature, Mpumalanga Parks and Tourism Agency, De Beers, AngloGold Ashanti, Anglo American, Richards Bay Minerals, Centre for Environmental Rights, Centre for Applied Legal Studies, deVilliers Brownlie Associates, Department of Water Affairs, Live4Design, National Union of Mineworkers, Solidarity, UASA.

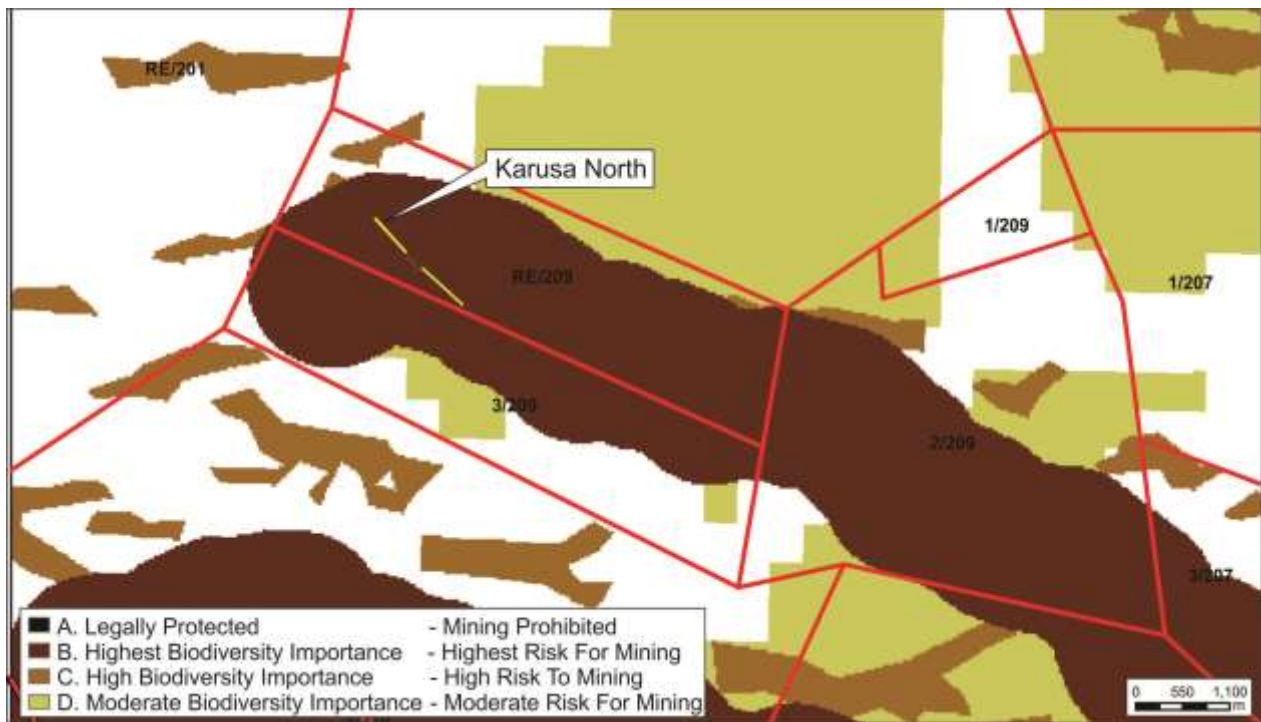


Figure 6: Mining and Biodiversity Guideline

<p>B. Highest Biodiversity Importance – Highest risk for mining</p>	<ul style="list-style-type: none"> • Critically endangered and endangered ecosystems • Critical Biodiversity Areas (or equivalent areas) from provincial spatial biodiversity plans • River and wetland Freshwater Ecosystem Priority Areas (FEPAs) and a 1km buffer around these FEPAs • Ramsar Sites 	<p>Highest risk for mining</p>	<p>Environmental screening, environmental impact assessment (EIA) and their associated Specialist studies should focus on confirming the presence and significance of these biodiversity features, and to provide site-specific basis on which to apply the mitigation hierarchy to inform regulatory decision-making for mining, water use licences, and Environmental authorisations. If they are confirmed, the likelihood of a fatal flaw for new mining projects is very high because of the significance of the biodiversity features in these areas and the associated ecosystem services. These areas are viewed as necessary to ensure protection of biodiversity, environmental sustainability, and human well-being.</p> <p>An EIA should include the strategic assessment of optimum, sustainable land use for a particular area and will determine the significance of the impact on biodiversity.</p> <p>This assessment should fully take into account the environmental sensitivity of the area, the overall environmental and socio-economic costs and benefits of mining, as well as the potential strategic importance of the minerals to the country. Authorisations may well not be granted. If granted, the authorisation may set limits on allowed activities and impacts, and may specify biodiversity offsets that would be written into licence agreements and/or authorisations.</p>
<p>C. High biodiversity importance</p>	<ul style="list-style-type: none"> • Protected area buffers (including buffers around National Parks, World Heritage Sites* and Nature Reserves) • Transfrontier Conservation Areas (remaining areas outside of formally 	<p>High risk to mining</p>	<p>These areas are important for conserving biodiversity, for supporting or buffering other biodiversity priority areas, for maintaining important ecosystem services for particular communities or the country as a whole. An environmental impact assessment should include an assessment of optimum, sustainable land use for a particular area and will determine the significance of the impact on biodiversity.</p>

	proclaimed protected areas) <ul style="list-style-type: none"> • Other identified priorities from provincial spatial biodiversity plans • High water yield areas • Coastal Protection Zone • Estuarine functional zone 	Mining options may be limited in these areas, and red flags for mining projects are possible. Authorisations may set limits and specify biodiversity offsets that would be written into licence agreements and/or authorisations. Note that the status of buffer areas of WHS is subject to a current intra-governmental process. If this recognises buffers areas as having the same status as the core areas in terms of mining, then the guidelines will need to be revised. The implications for existing mines would need to be clarified.
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Of specific note is the following:

“An EIA should include the strategic assessment of optimum, sustainable land use for a particular area and will determine the significance of the impact on biodiversity.

This assessment should fully take into account the environmental sensitivity of the area, the overall environmental and socio-economic costs and benefits of mining, as well as the potential strategic importance of the minerals to the country.”

While we note this high importance placed on the biodiversity of the site, we do however still believe that it is acceptable to proceed with the Mining envisioned given:

- The benefit gained from provision of construction materials sourced on-site which allows large economic gains in terms of cost-savings
- The large scale of similar vegetation (which will be confirmed by specialist botanist)
- That a full search and rescue of vegetation will be conducted in liaison with botanist
- The site will provide topsoil to be used during rehabilitation
- That the very minimal width of the envisioned excavations allows for a large perimeter which will be in contact with recolonization sources for both vegetation and animal life, and within which context we expect very rapid recovery of the area

9.1.2 Site within the context of the Sutherland Central Astronomy Advantage Area (SCAA)

As shown in Figure 2, the site is located within the SCAA, proclaimed in terms of the Astronomy Geographic Advantage Area Act (21 of 2007) and managed by the Astronomy Management Authority, all of which has the objective of, in this case, protecting the Southern African Large Telescope (SALT) from interference by atmospheric dust. Accordingly the Act, together with the revised Draft IDP 2015-2016 for Karoo Hoogland Municipality, seeks to limit dust generation in the area of jurisdiction as shown in Figure 2.

In essence, all dust generation activities are discouraged from establishing within the proclaimed area and while the Draft Regulations in terms of the Act have not yet been published, the Draft IDP lists 9 control mechanisms of which the following extract is being considered in this application:

“1. All developments including industrial, domestic, sporting, cultural and tourism shall be subject to standards determined by the management authority to assess potential impact on the observing conditions at the core site.

7. *Open cast mining is prohibited*

8. *Other mining and constructing activities shall be agreed to with the management authority after the receipt of assessment”;*

As point of departure in respect of dust, we note the following:

- (i) The operation will not represent traditional long term mining per se, but be a very short term contract mining operations to serve short term wind energy facility construction projects.
- (ii) Only limited ad hoc blasting and crushing is considered within the mining operational requirements, and as such any dust generation will be of localised extent, with minimal atmospheric dust generation.
- (iii) Given the following, there is expected to be no impact on the SALT from this site:
 - The site lies 55km south of the SALT
 - The prevailing wind conditions are to the East and West, with only a 3% occurrence of southerly winds
 - The Mining Permit Areas are below the escarpment on which the SALT is located (with a height difference of +-600m, acting to reduce any potential dust impacts.

Full consultation with the AMA and South African Astronomical Observatory will be undertaken, but given the locality of the mining, and the above considerations as listed, the risk is extremely low that Impact on the SALT will occur.

Question 2: *Should development concerned in terms of this land use (associated with the activity being applied for) occur here at this point in time?*

Yes. The primary driving force behind the Application for this Mining permit is the absence of available commercial construction material in the area, and the distribution of suitable rock for construction aggregate sources in proximate locations to wind farm projects in this region. We must again emphasise the costs incurred with long distance hauling of materials from further afield, together with the associated damage to the transport infrastructure and road safety risk escalation posed by such long distance transport will be weighed up against the negative elements of establishing a temporary borrow pit in the region. The transport cost, road damage, and road safety risk impacts are ultimately borne by the community of this region. Materials sources for construction are a fundamental requirement for maintenance and upgrade projects, and given the huge investment in this region currently for the Construction of the various Wind Energy Facilities and the economic benefit brought about by such, the Development of a proximate source of high quality aggregate for the projects is of fundamental importance.

Question 3: *Does the community/area need the activity and the associated land use concerned (is it a societal priority)? This refers to the strategic as well as local level (e.g. development is a national priority, but within a specific local context it could be inappropriate)*

This questions deals with “justifiable economic development” and it should lead to the conclusion of whether the project serves the community in the broader sense. There are 2 points to consider in this respect:

1. From a financial point of view: The mining of this site will lead to much cheaper construction materials to projects occurring within the region.
2. The site is far-removed from any community as to render the impact from mining (i.e. biophysical) on a community negligible in all respects. There will be no impacts on surrounding land users.

Question 4: *Are the necessary services with adequate capacity currently available (at the time of application), or must additional capacity be created to cater for the development?*

All necessary services will be provided by the Wind Farm Construction project infrastructure and services, should they be required in addition to the temporary requirements included in the Mining Planning outlined herein.

Question 5: *Is this development provided for in the infrastructure planning of the municipality, and if not what will the implication be on the infrastructure planning of the municipality (priority and placement of services and opportunity costs)?*

There is no need for placement of services or infrastructure by the municipality in terms of this application or post mining proposals.

Question 6: *Is this project part of a national programme to address an issue of national concern or importance?*

No. (But indirectly it forms part of the Renewable Energy Generation programme at National Level)

9.2 Desirability ('placing'):

Question 7: *Is the development the best practicable environmental option for this land/site?*

According to NEMA the "best practicable environmental option" means the option that provides the most benefit and causes the least damage to the environment *as a whole*, at a cost acceptable to society, in the long term as well as in the short term. In determining the best practicable environmental option, adequate consideration must also be given to opportunity costs.

While we note this high importance placed on both biodiversity of the site as well as importance of grazing land, we do however still believe that it is acceptable to proceed with the Mining envisioned given:

- a. The benefit gained from provision of construction materials sourced on-site which allows large economic gains in terms of cost-savings
- b. The large scale of similar vegetation (which will be confirmed by specialist botanist)
- c. That a full search and rescue of vegetation will be conducted in liaison with botanist

- d. That full rehabilitation of the area will be conducted.
- e. That the very minimal width of the envisioned excavations allows for a large perimeter which will be in contact with recolonization sources for both vegetation and animal life, and within which context we expect very rapid recovery of the area

Question 8: *Would the approval of this application compromise the integrity of the existing approved and credible municipal IDP and SDF as agreed to by the relevant authorities.*

No. Mining (temporary contract quarrying) under this Mining Permit would only allow 2 to maximum 5 years of activity, and while altering the environment of the site, does not exclude future reintegration into wilderness, grazing or even conservation use.

Question 9: *Would the approval of this application compromise the integrity of the existing environmental management priorities for the area (e.g. as defined in EMFs), and if so, can it be justified in terms of sustainability considerations?*

No. Mining under this Mining Permit would only allow 2-5 years of activity, and while altering the environment of the site, does not exclude future reintegration into wilderness, grazing or conservation use.

Question 10: *Do location factors favour this land use (associated with the activity applied for) at this place? (This relates to the contextualisation of the proposed land use on this site within its broader context).*

Yes. The site is place bound but fortunately central to the construction projects which it will serve and is additionally informed primarily by the geological structure to be mined, dolerite, being by far the most suitable material for the roadway construction it will serve.

Question 11: *How will the activities or the land use associated with the activities applied for, impact on sensitive natural and cultural areas (built and rural/natural environment)?*

In terms of Heritage, the site will be subject to an assessment by Specialists and such assessment will inform and be included in all future documentation

In terms of the natural environment, a specialist botanist will be tasked with assessment of the site, and will be tasked with providing full inputs to this Scoping report and all further documentation.

Question 12: *How will the development impact on people's health and wellbeing (e.g. in terms of noise, odours, visual character and sense of place, etc.)?*

It is of importance to note that the site operations will be conducted strictly in accordance with the Mine Health and Safety Act (Act 29 of 1996)

This site is remote, and located so distant from any residence or community as to render any impact in terms of health and well-being absolutely insignificant.

The nearest residence (that of the land owner) is some 5.5km from the site, which puts it far outside of the danger radius of blast vibration and fly rock.

In terms of sense of place, the post mining excavation will not be visible from any public property or adjacent property.

Question 13: *Will the proposed activity or the land use associated with the activity applied for, result in unacceptable opportunity costs?*

No. This issue is dealt with in question 3 above.

Question 14: *Will the proposed land use result in unacceptable cumulative impacts?*

No. Refer para 9.2.1 below.

9.2.1 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 place-bound factors).

The following is an amended procedure sourced from http://www.eiatoolkit.ewt.org.za/documents/DEAT/guidelines/AT_EIA_Guideline5_Assessing_alternatives_and_impacts.doc

Types of cumulative impacts

Additive impact: Impacts of the same nature from different operations (e.g. excessive groundwater abstraction from several operations in the same area result in a severe drawdown effect)

Interactive impact: where a cumulative impact is the result of a combination of different impacts to cause a new kind of impact. This kind of impact can be:

- Countervailing – the net adverse effect is less than the sum of the individual impacts (e.g. pumping clear water into a polluted water resource).
- Synergistic – when the impacts work together to develop a sum of different impacts results in an impact which is greater than the individual impacts.

Methodology used in assessing cumulative impact/s

Determine extent of cumulative impacts:

- Identify potentially significant cumulative impacts associated with the proposed activity
- Establish the geographic scope of the assessment

- Establish the timeframe of the analysis
- Identify other activities affecting the environmental resources of the area

Describe the affected environment:

- Characterise the resources identified above in terms of their response to change and ability to withstand stress
- Define a baseline condition that provides a measuring point for the environmental resources that will be acted upon

Assess the cumulative impacts:

- Determine the magnitude or significance of cumulative impacts

Recommend mitigation measures.

So, using the aforementioned procedure as headings, herewith an assessment of the cumulative impacts arising from this operation:

At this stage of pre-Scoping we present the following perspectives on these matters.

Determining the extent of the cumulative impacts:

Identification of potentially significant impacts:

Proposed operations of this type could conceivably result in the following cumulative impacts:

Vegetation: Based on our assessment to date of the published literature, it is expected that the Specialist botanical assessment will find that impact on vegetation will be high, but Low with mitigation. This will be additive to the impact of the Wind Farm construction which this mining will serve, but we note that such wind farm construction will be operation fully within the guidelines set by its Environmental Authorisation

Noise: This will be additive to the impact of the Wind Farm construction which this mining will serve, but we note that such wind farm construction will be operation fully within the guidelines set by its Environmental Authorisation.

While blast noise will be widespread, it will be subject of mitigation measures as later described, and is of very limited duration and will occur only very sporadically (maximum of once per month during operational activity).

Dust:

i) General: Dust is unlikely to present any impact on any farmstead or immediately surrounding land use given the distances involved. This will be additive to the impact of the Wind Farm construction which this mining will serve, but we note that such wind farm construction will be operation fully within the guidelines set by its Environmental Authorisation

ii) Impact on the R354 Road: Dust generation by the quarry will be limited to not have any significant impact on road users and there are no other surrounding dust generators to raise the cumulative impact.

iii) **Impact on the SALT:** The quarry will raise the cumulative dust impact of the Region on the SALT and hence dust attenuation commitments will be maximised to minimise such cumulative impact, which is the aim of the Act. The on-site operational considerations are currently being adapted in this regard and will be submitted to the astronomy management authorities as a specific report on dust assessment and attenuation.

Socio-economic impacts: This will accrue a cumulative benefit, in terms of cost savings involved with the construction of the Wind Farm Projects, and allowance for employment on site of a larger staff complement by the contractor(Applicant hereto).

Agriculture: This will be additive to the impact of the Wind Farm construction which this mining will serve, but we note that such wind farm construction will be operation fully within the guidelines set by its Environmental Authorisation.

Geographic Scope of assessment:

Impact aspect	Geographic scope
Vegetation	NA
Dust	Local area – no impact on any community
Noise	Local area - no impact on any community
Socio-economic	Minor benefit to employment pool
Agriculture	Minor loss of agricultural grazing land

Timeframe of analysis

The proposed project will take place over a period of approximately 2 years (extendable to a maximum of 5 years). The timeframe of the analysis would typically depend on the nature of the impact being assessed:

- 1) Life-of-mine impacts to be assessed are noise, dust and socio-economic impact.
- 2) In respect of surface mining there is always a residual permanent impact in the form of alteration in topography. In this case, the footprint area of the excavations can be suitably rehabilitated to allow return to grazing use.

Other activities impacting on environmental resources in the area

All aspects will be additive to the impact of the Wind Farm construction which this mining will serve, but we note that such wind farm construction will be operating fully within the guidelines set by its Environmental Authorisation.

Magnitude and significance of cumulative impacts

Vegetation: Very Low

Noise: Very Low.

Air Quality: Very Low

Socio-economic: No significant impact (minor benefit)

10 Period for which the environmental authorisation is required

A mining Permit is sought to allow for mining for a period of 2 years, with the MPRDA allowing for three consecutive annual renewal periods if required. As such, Environmental Authorization is sought for 5 years, to allow for potential lengthened lifespan or delayed onset of activities.

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 (1) 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.

All aspects of the site planning and location are wholly informed by the regional geology of the area.

The Beaufort mudstones and interbedded sandstones are largely unsuited to use for gravel road construction (inadequate lifespan of the road surface under heavy trafficking without constant maintenance), and largely do not meet the high specifications required for the materials which are to serve given the heavy loads which will be using the constructed roadways. While certain deposits of fractured sandstone gravels may be of some suitability, they would still require blending with the sought dolerite to fully suit the project requirements, and these sandstones are of negligible depth and localized extent on hill slopes, meaning that large areas would be required to fully meet the material volume requirements, causing unnecessary and widespread denuding of land which can be avoided by maximizing the use of the dolerite dykes sought under mining permit.

12 Details of all alternatives considered.

With reference to the site plan provided as Appendix 4 and the location of the individual activities on site, provide details of the alternatives considered with respect to the following. Remember that the public participation process may reveal additional alternatives:

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

Site Plan Consulting undertook an investigation into potential materials sources in the area, with primary focus being appropriate sources for supplying materials to the various wind farm projects undergo between Matjiesfontein and Sutherland, specifically in relation to materials suitable for gravel roadway construction and maintenance.

The Beaufort mudstones and interbedded sandstones are largely unsuited to use for gravel road construction (inadequate lifespan of the road surface under heavy trafficking without constant maintenance), and largely do not meet the high specifications required for the materials which are to serve given the heavy loads which will be using the constructed roadways. While certain deposits of fractured sandstone gravels may be of some suitability, they would still require blending with the sought dolerite to fully suit the project requirements, and these sandstones are of negligible depth and localized extent on hill slopes, meaning that large areas would be required to fully meet the material

volume requirements, causing unnecessary and widespread denuding of land which can be avoided by maximizing the use of the dolerite dykes sought under mining permit.

Given the scarcity of materials three sites were identified as viable alternatives, of which all three are under application given the large quantities of materials which are required.

12.2 Type of activity to be undertaken;

Construction aggregate mining is the activity to be undertaken. In this regard there are no alternative considerations in respect to such operating procedures.

12.3 Design or layout of the activity;

The layout of the excavation was based on a full geological assessment of the area and on-site assessment of:

- Current condition of the site,
- Ecological status and sensitivity of the site
- Surface geological analysis of the site
- Visual considerations of the site in relation to the wider region

12.4 Technology to be used in the activity;

Standard mining practice of such small scale mining operations as established in the industry is followed, with the use of the following machinery:

- Recover and loading of softer weathered rock with **excavator**
- **Potential for a Tracked Mobile Crusher on site**, for conducting of primary processing by means of screening and crushing to required materials specifications.
- **Percussion drill-rig** use in drilling of blast holes in fresh hard rock when encountered
- **Best available blast design** will be applied at the site to minimize fly rock and dust generation by blasting.
- **Excavator** loading of blasted rock
- Delivery by means of **Trucks** to construction sites

12.5 Operational aspects of the activity;

Refer Figure 3 and Paragraphs 5.2 and 6.

12.6 Option of not implementing the activity.

Primarily, the aspect of no-go project goes against the principle of optimization of resource as espoused in the MPRDA, and in this case the negative impact considerations do not justify a no-go project option.

Additionally, in terms of materials requirements to serve the wind energy facility construction projects, no available commercial aggregate sources in the vicinity lead to

exorbitant costs due to importation of materials from other sources (Oudtshoorn, Robertson, Worcester), as well as increased traffic of the already dangerous N1 national route by heavy duty trucks, and additional wear on transport infrastructure.

13 Details of the Public Participation Process Followed

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

Refer Figure 7 Overleaf to be read with Table 13 thereafter.

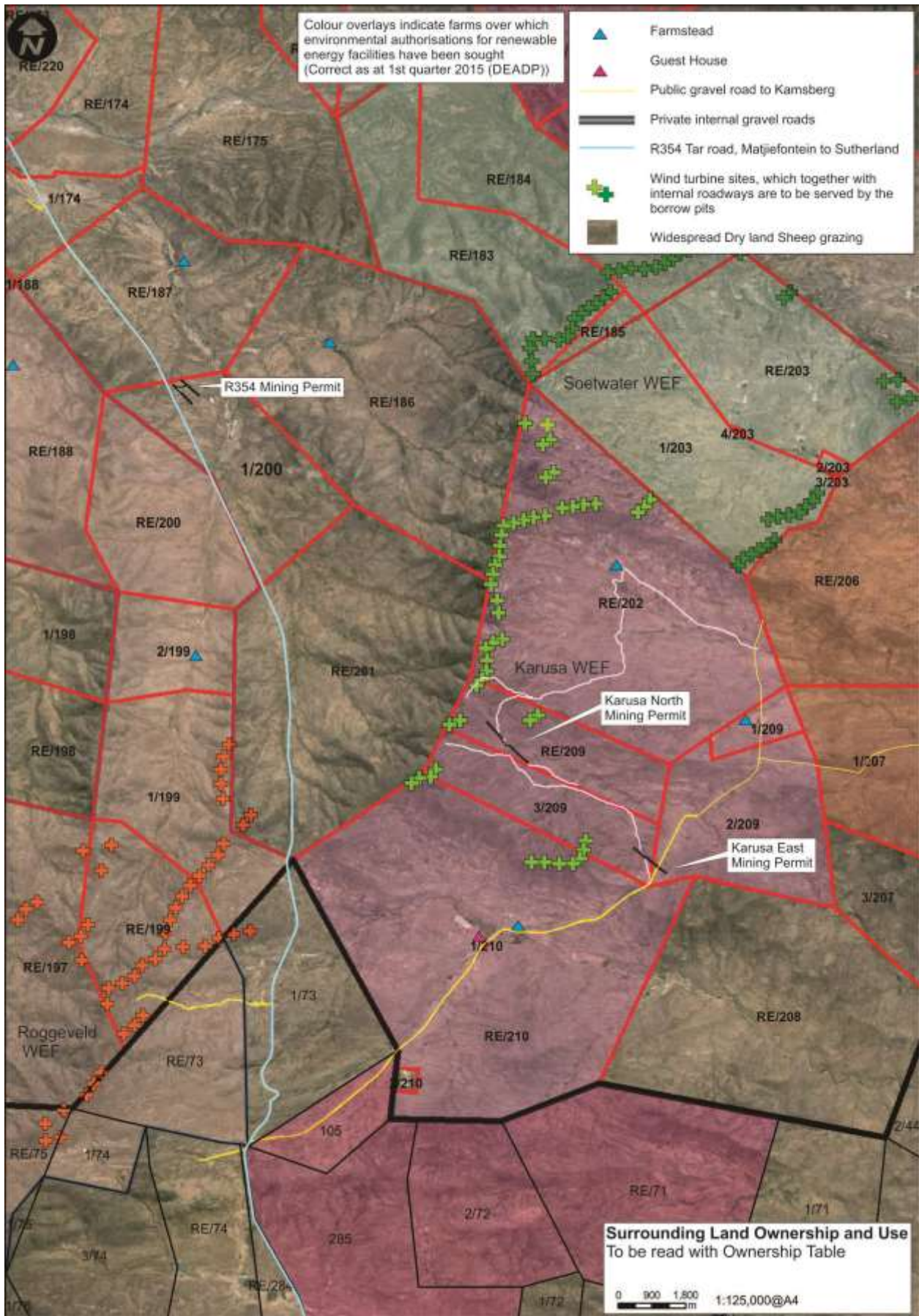


Figure 7: Surrounding Land Use. To be read with Table 13

The Public Participation Process includes the following:

- On site consultation with the land owner, and Notification of immediately adjacent land owners (refer figure 7 Surrounding land use for Farm localities) by means of drop-off of notification letters and copies of Draft Scoping Reports, as well as telephonic follow up.
- Erection of A2-size posters along the Application property boundary, abutting public thoroughfares
- Posting of bilingual (English/Afrikaans) newspaper advertisements in the “Noordwester” Local newspaper.
- Placing of Response forms and copies of the Draft Scoping Report at the Sutherland Public Library (referred to in the newspaper advertisements)
- Posting by Registered mail of Notification letters and copies of the Draft Scoping Report to Commenting Authorities/Departments.

Refer Table 13 overleaf; list of correspondents and issues raised (to be completed during Scoping Phase).

Table 13: Preliminarily Identified Interested and Affected Parties – Sutherland Quarry Mining Permit

Land owner of applicant farm			Surrounding adjacent land owners		
Permit	Farm	Owner	Adjacent Farm	Adjacent Owner	Contact
Karusa North	Farm 209-rem	Dirk van Zyl Trust	201-rem	Standvastigheid Familie Trust	Francois Conradie
			209-3	Wolvekop Trust	Francois Conradie
			209-2	Ockert Conradie	Ockert Conradie
			202-rem	Dirk van Zyl Trust	Erasmus van Zyl
			209-1	Ockert Conradie	Ockert Conradie

Other I&APs

Department	Designation	Representative
Department Environment and Nature Conservation	EIA Administration	EIA Administration
Karoo Hoogland Municipality	Municipal manager	Gustav von Mollendorf
Karoo Hoogland Municipality	Ward Councillor Ward 4	Jeremiah Davids
Karoo Hoogland Municipality	Deputy Director; Infrastructure	Frannie Lotter
Department Water Affairs	Chief Director: Northern Cape	Mr A Abrahams
Agriculture, land reform and rural development (NC)	Head of Department	Mr. Viljoen Mothibi Secretary C Fortune
Regional land claims commission: Free State and Northern Cape	Land Restitution Support (Northern Cape Province)	Ryan Oliver
Department Transport, Roads and Public Works (NC)	Head of Department	Mr K Nogwili Secretary Ms N Corns
National Department Science and Technology	Director: Astronomy Management Authority(AMA) Department of Science and Technology	Mere Kgampe deputy director: Ms Nametshego Gumbi
South African Astronomical Observatory	Head: Small Telescope Operations	Dr Ramatholo Sefako
ESKOM	Land and Rights; Land Development and Environment	Shaun Swanepoel

14 The Environmental attributes associated with the sites: Baseline Environment

14.1 Type of environment affected by the proposed activity.

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

The following notes the existing environment together with potential impacts where highly relevant

14.1.1 Topography (Refer Figure 8: Regional Topography and Figure 3 for site contours)

The south-eastern half of the mining permit lies on generally level ground within a localised valley, with the north-western half rising some 40m over a 750m length

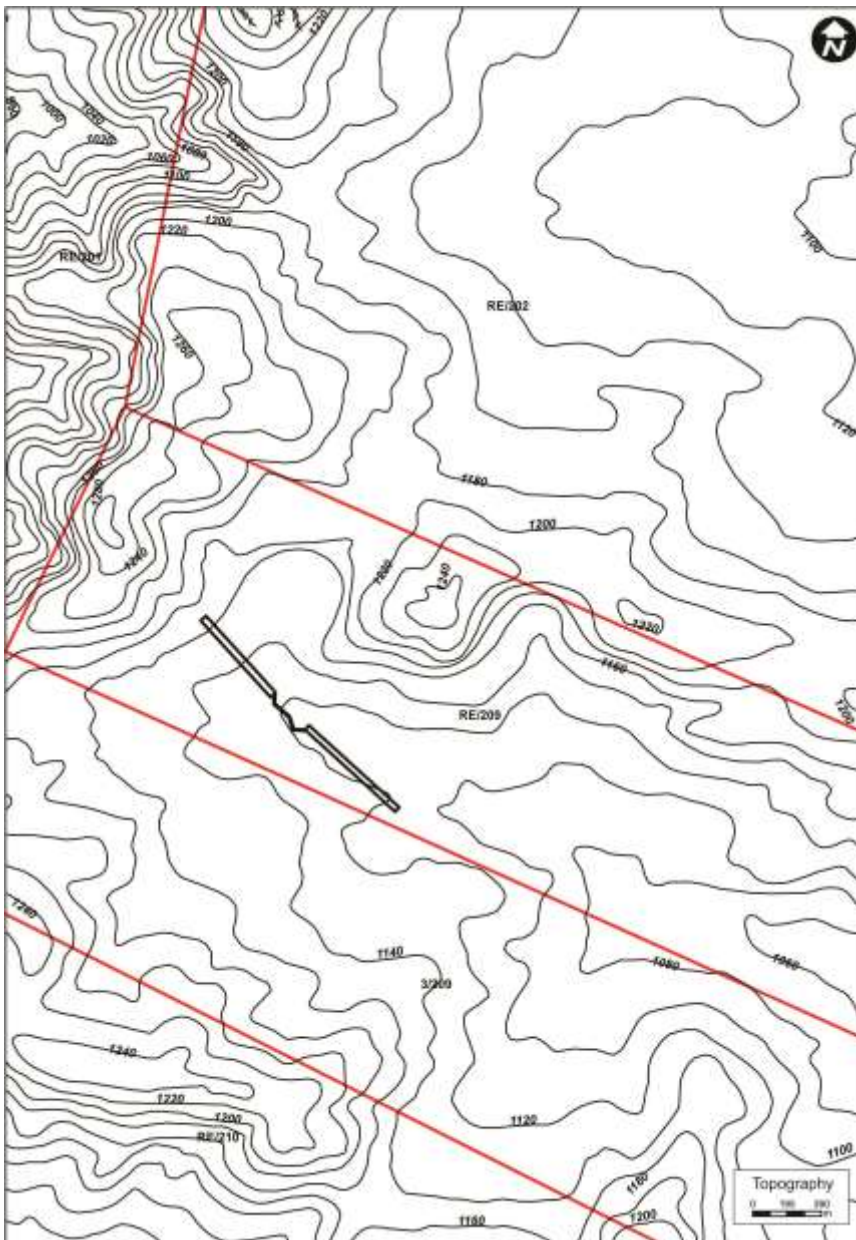


Figure 8: Regional Topography

14.1.2 Visual Impact

The site is remote and completely isolated. There is no visibility from any public viewpoint or farmstead.

14.1.3 Soil

The site is characterised by thin layer of upper weathered soils and upper gravels, underlain by primarily the weathered dolerite sought as construction material. Adjacent to the dolerite dyke such topsoil is underlain or interrupted by surface outcropping of harder fractured sandstones and baked mudstones.

14.1.4 Land Capability

As taken from Cape farm Mapper (Gis.elsenberg.com/apps/cfm) the following describes the land capability of the site: Non-Arable; Low potential grazing land. Dryland grazing is practiced over the site and following rehabilitation the site will be returned to such use.

14.1.5 Natural Vegetation

While a specialist botanist is to be appointed, we note the following vegetation classification of the site, based on Mucina and Rutherford, 2012:

FRs 5 Central Mountain Shale Renosterveld

Name of vegetation type	Central Mountain Shale Renosterveld
Code as used in the Book - contains space	FRs5
Conservation Target (percent of area) from NSBA	27%
Protected (percent of area) from NSBA	
Remaining (percent of area) from NSBA	99%
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	1236.51
Name of the Biome	Fynbos Biome
Name of Group (only differs from Bioregion in Fynbos)	Shale Renosterveld
Name of Bioregion (only differs from Group in Fynbos)	Karoo Renosterveld Bioregion

Distribution

Northern and Western Cape Provinces: Southern and south-eastern slopes of the Klein Roggeveldberge and Komsberg below the Roggeveld section of the Great Escarpment (facing the Moordenaars Karoo) as well as farther east below Besemgoedberg and Suurkop west of Merweville and in the west in the Karookop area between Losper se Berg and high points around Thyshoogte. Altitude 1 050–1 500 m.

Conservation

Least threatened. Target 27%. None conserved in statutory or private conservation areas. Only about 1% transformed. Erosion moderate.



Figure 9: Original vegetation classification of the site, As per Mucina and Rutherford, 2012

14.1.6 Animal Life

Vast expanses of the same habitat 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 proposed activities negates any significance of any impact in this regard.

Experience at many mining operations in which Site Plan Consulting have been involved over the past 30 years reveals the following in respect of **impact** on mobile wildlife:

- Initial activity and blasting in the short term scares away mammal and bird life but these soon return despite daily crusher and other activity noise or even subsequent periodic blasting. (This comment is informed by the fact that a very successful bird park with bird hides visited by members of the Port Elizabeth ornithological clubs reports a broad diversity of species in the rehabilitated valley adjacent to the continued plant and excavation operation at Moregrove Quarry, Eastern Cape.
- Small buck footprints were found daily in the silt deposits in the proximity of the plant of the Outeniqua Quarry in George

- Leopard being sighted within the mining area during the active crushing plant construction period of Palmiet Quarry in the Western Cape, notable for being situated within the Kogelberg Biosphere Reserve
- Fish eagles nest and breed successfully every year in the same Bluegum tree immediately adjacent to the face-advance of Peak Quarry in Eerste River, despite immediately adjacent blasting and the direct line of sight, crusher noise and hauling activities
- Blue crane pairs observed nesting in the post-rehabilitation monitoring the first year following closure of a large “soft rock” calcrete borrow pit near Still Bay.
- Egyptian Geese which live year-round in the old Glencairn Quarry at Fish Hoek, western Cape, and which can be seen remaining unperturbed during and despite the use of the old quarry now being as a Firing Range for the False Bay Sports Shooting Club.
- Visits to temporarily abandoned quarries and old quarries with hard rock faces at numerous sites reveal almost immediate re-use of such sites by dassies and nesting birds (notably raptors, including owls).

14.1.7 Surface Water

As indicated on the Mine Plan (Figure 4 and Appendix 4), a perennial stream operates to the north adjacent to the mining permit area, and in addition dissects the Mining permit area in the central roadway. While the Permit area has included the roadway for practical purposes we note that the crossing of such stream is an existing and demonstrable use and will remain unchanged. No mining will be conducted within 32m of the water course and the water course will not be impacted upon in any way.

The excavations following mining will remain shaped to be internally draining, and will not cause any siltation of the stream channel.

14.1.8 Ground Water

Given the minimal depth of mining the groundwater regime will not be impacted upon in any way.

14.1.9 Air Quality (Dust)

As the consideration of dust within the SALT context is being dealt with as a separate Specialised report, this paragraph deals with dust under normal environmental considerations.

At present, the existing ambient dust levels are attributed to the following:

- Occasional vehicles on unsurfaced roads in the area
- Minimal agricultural activities surrounding the site (primarily livestock movement)
- Additionally, at the time of commencement of the mining activities additional dust generation will be underway from the construction of the wind energy facility over the farms.

The consideration of dust in this application relates to two distinct aspects of dust impact, namely that on coarse fallout dust and fine airborne (suspended) dust.

- a. **Fallout dust:** ie the coarser, heavier fraction of dust generally associated with dust impact of quarry activities on surrounding users, which dust levels are well recorded in the industry by downwind settling of dust in wet-receiving containers, and measured monthly to be expressed in mg/m²/day.

Given the number of monitoring station results of pre-attenuation and post-attenuation monitoring at various quarries the reduced levels of fallout dust over distance and the efficiency of attenuation measures in achieving fallout dust reduction are well known to the consulting team and will be considered in the context of the site during the Scoping exercise and the results of this assessment expressed in the Environmental Impact Report (EIR) and circulated to relevant I&APs to whom this information will be important.

- b. **Airborne/suspended dust:** ie the very fine fraction, which as opposed to fallout dust, remains suspended in the air for lengthy periods and distances downwind. As this dust fraction is the mining industry's concern regarding lung diseases, its levels of occurrence in the working areas are monitored quantitatively and can serve as the basis for considering the airborne dust emission from the site in respect of the SALT consideration.

It is noted that dust impact is a well-known element which the quarry industry faces and accordingly the industry has developed numerous attenuation measures which it applies under appropriate circumstances to minimise dust impact either in respect of fallout dust or airborne/suspended dust, and in many cases both.

As further background in approaching the matter of dust impact on the SALT, the reader is referred to Figure 2 which shows the proposed permit site some 55km south of the SALT site.

As per the wind rose as inset on figure 2 and shown overleaf in detail in extract from the Wind Atlas for South Africa (WASA) , wind in the direction of the SALT only occurs at a percentage of 3% of the annual wind regime.

Regarding fallout dust: While normal quarry dust is considered within the SANS 1929:2004 Dust Fall Standards and even to the 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", given the dust sensitivity of the site the dust fallout standards hereafter will not be relied upon and the long term target set for the industry of 300mg/m²/day is set as the target for this site which in experience of the consulting team will require the dedicated attention to and application of all available attenuation measures available.

"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 m² 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/m²/day¹ 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/ m² /day¹ 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 dust fall rates which fall within Band 4 (ALERT Band) as specified in Table 9.

4.8.5 Exceptions

Dust falls 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 dust fall 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"

The following wind rose reflects the prevailing wind regime for the area:

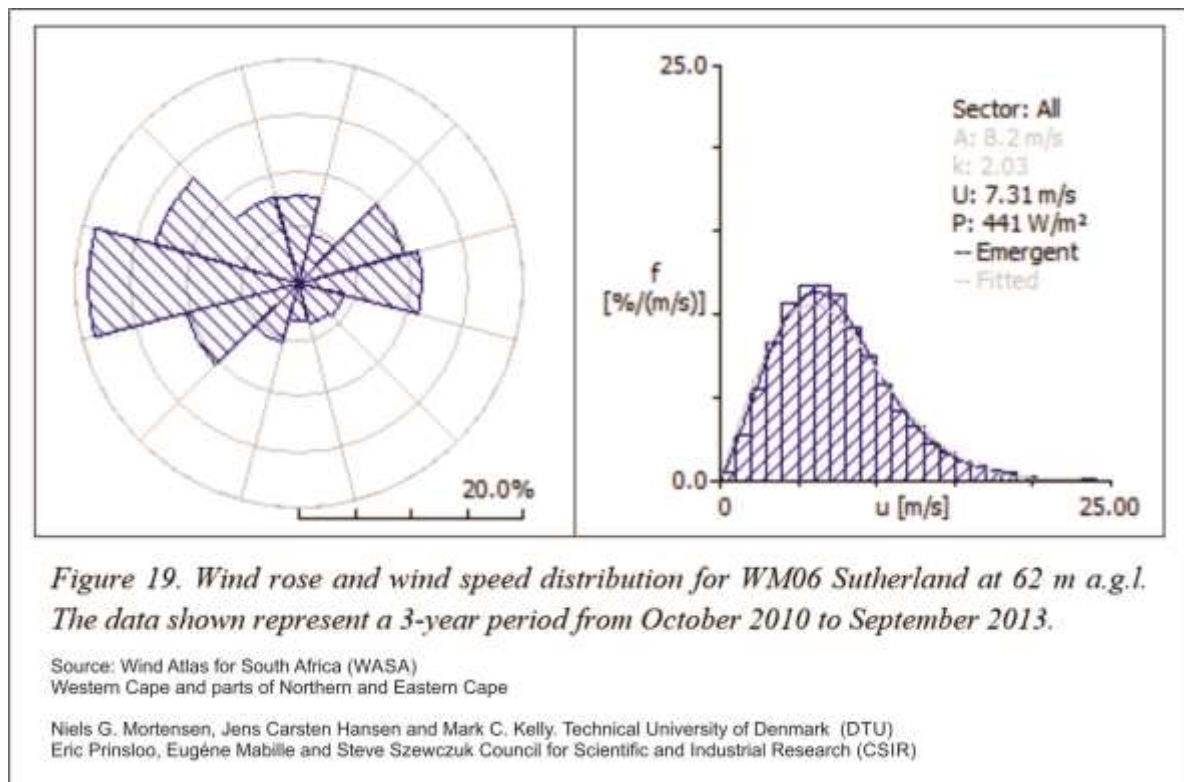


Figure: Wind rose: Sutherland

As background for the reader, the following table outlines where hard rock quarrying dust is generated and what related attenuation measures are applied to such generation activities:

Dust generation activities/areas/points	Related attenuation measures when necessary
Site preparation, including dozing of topsoil to berms, delivery road construction, digging of stormwater channels, and construction of the primary ramp.	Pre-wetting of areas prior to earthmoving
Drilling. (Not generally but on an ad hoc basis)	All rigs equipped with dust extraction equipment
Blasting (we note that as opposed to sedimentary rocks, dolerite is generally a low dust generator). (Not generally but on an ad hoc basis)	Blast design shall be designed to optimize rock fracturing with minimal air blast. Furthermore, blasting can be scheduled for suitable day or time of day when wind favours dispersion of dust away from the SALT.
Loading and hauling of shot rock to crusher. (Not generally but on an ad hoc basis)	The blast pile can be wet by fire hose spraying from water cart prior to loading
Crushing and screening. (Not generally but on an ad hoc basis) (If in the interest of reduced dust emission quarry production is directed only at concrete aggregate sizes production and not road base course, water application will not clog screens and can therefore be liberally used on concrete stone production).	Water sprays and mist sprays on all tipping and conveyer belt transfer points, screens and conveyer discharges to surge pile and stockpiles.
Stockpiling (As above, liberal application of water by sprinklers can be applied to concrete aggregate stockpiles without affecting material quality).	Agricultural-type water sprinklers on stockpiles and removal of non-concrete aggregate production material from site to reduce on-site stockpiles of dust generating materials.
On site maneuvering and dispatch trucking	Combination of water cart wetting of all maneuvering and roadways and sprinkler installations along gravel delivery route and past the weigh bridge.

14.1.10 Noise

Current noise generating activities in the area are related to:

- Minimal agricultural activities

Additionally, at the time of commencement of the mining activities additional noise generation will be underway from the construction of the wind energy facility over the farm and adjacent farms.

14.1.11 Archaeology/Heritage

In terms of Heritage, the site will be subject to a heritage assessment, in terms of the National Heritage Act.

14.1.12 Traffic (Refer Figure 5)

Private farm roads will be utilised.

While blasting and fly rock is not a current land use, it is listed here given the potential significance of its impacts on immediately surrounding land which are at present not subject to any such risk.

14.1.13 Blast Vibration and fly rock

As blast design is infinitely variable, and the prescriptions for blast impact consideration in mining require such impact to be based on risk, the impact of blast vibration is a factor of both method of blasting (blast design) and distance to affected infrastructure or persons.

The following infrastructure and surrounding uses of land have been identified as being subject to blast vibration and fly rock:

- Farm windmill and watering hole adjacent to the central Mining Permit roadway.

At Draft Scoping Level the following can be said:

- Through appropriate blast design **blast vibration can be managed to pose no threat**, based on numerous blast vibration records of other quarries.
- Fly rock** is legally acknowledged as being a potential impact within a radius of up to 500m. As such this operation will not impact on any surrounding farmsteads or other activity centres, but would impact on farm personnel and livestock who may be in close proximity to the quarry at the time of blasting (**which persons will be alerted well in advance of such blast, and the blaster shall ensure that all personnel and livestock are evacuated from the danger zone prior to blasting**).

Given the proximity of the windmill, the Applicant will ensure remediation of any damage which may occur to such water point installation during the operation of mining.

The quarry manager will notify adjacent landowners/managers of the intended date and time of the blasting in order that:

- The residents and personnel outside the danger area can expect the blast, and in so doing the startling effect of the blast by the air blast vibration can be reduced.
- All farm personnel will avoid entering the danger radius during the period of the blast.

In accordance with the blasting code:

- The blaster shall drive along the perimeter fences to inspect the adjacent lands to ensure that there are no persons or livestock within the blast radius
- a hooter/siren will alert all persons in proximity of the pending blast

14.2 Description of the current land uses

The farm is currently utilised for limited dryland livestock grazing and wilderness use.

The following land uses surround the proposed site (Refer Figure 7).

- Widespread wilderness use and grazing of livestock
- Limited distant intensive agriculture as evidenced by the Aerial Imagery in Figure 7
- The closest community is that of Sutherland some 50km to the north,
- The Closest farmstead is of the adjacent farm 5.5km to the north.
- OF SPECIAL CONSIDERATION: The South African Large Telescope (SALT) is situated 55km to the north of the site as per Figure 2.

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

Refer Figure 1, Para 14.1 and 14.2 as well as para 5.

14.4 Environmental and current land use map.

(Show all environmental and current land use features)

<u>Figure 1: Locality Plan</u>	7
<u>Figure 2: The site within the regional perspective of the Central Astronomy Advantage Area</u>	8
<u>Figure 3: Regional Geology</u>	10
<u>Figure 4: Proposed Site (mine) layout plan</u>	12
<u>Figure 5: CBA Classification of the site, as per Namakwa District Municipal</u>	20
<u>Figure 6: Mining and Biodiversity Guideline</u>	21
<u>Figure 7: Surrounding Land Use. To be read with Table 13</u>	32
<u>Figure 8: Regional Topography</u>	35
<u>Figure 9: Original vegetation classification of the site, As per Mucina and Rutherford</u> , 37	

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).

Step one is to identify applicable impacts, as per table below. Second step is to ascribe significance and details as per table thereafter.

Activity. This table identifies potential impacts but does not differentiate between negative or beneficial impacts.		Geology	Topography	Soil/ Topsoil	Visual	Land Capability	Vegetation	Surface Water	Ground Water	Animal Life	Noise	Air Quality (Dust)	Social/ Economic	Archaeology/ Cultural	Hydrocarbon Impact	Traffic /Access	Blast vibration and fly rock
1.1.	Application for a Mining Permit																
1.2.	Clearly demarcate use areas, permit																

	boundary, delivery road and fence site																		
1.3.	Demarcate No-Go Environmentally sensitive areas for strict avoidance																		
2.1.	Conduct Environmental Induction training to staff																		
2.2.	Place chemical toilets for staff and establish containerized office/stores on site																		
2.3.	Remove topsoil from demarcated areas to topsoil berms for later re-use.																		
2.4.	Grass seed/shade net cover topsoil berms																		
2.5.	Upgrade access road to Mining Permit area																		
2.6.	Establish perimeter stormwater/ silt catchment channels																		
2.7.	Conduct establishment phase monitoring.																		
3.1.	Advance excavation by Front-end loader or excavator, directly into dispatch vehicles or to Mobile crusher																		
3.2.	Drilling of hard (fresh) rock where encountered																		
3.3.	Blasting of hard (fresh) rock where encountered																		
3.4.	Excavator loading of shot rock directly into despatch vehicles or to mobile crusher																		
3.5.	Tracked mobile crusher crushing and screening, with the mobile crusher proceeding on tracks																		
3.6.	Excavator loading crushed material to either delivery trucks or dump trucks to stockpile																		
3.7.	Dispatch loading of delivery vehicles.																		
3.8.	Shaping of excavation and the remainder of the mining permit area																		
3.9.	Continuous ad hoc eradication of alien vegetation																		
3.1.	Refuelling and hydrocarbon management.																		
3.11.	Maintenance of stormwater control																		
3.12.	Conduct operational phase maintenance and monitoring.																		
4.1.	Finalize shaping of remaining pit floor and sloping of final pit edges (including instatement of internal drainage)																		
4.2.	Remove all structures (stores/office container, Chemical toilet lastly.)																		
4.3.	Rip/scarify hardened/compacted surfaces.																		
4.4.	Spread topsoil from berms over designated areas and lightly scarify																		
4.5.	Finalize Revegetation by means of seeding. Seeding /Revegetation must take place in accordance with landowner specification/ requirements.																		
5.1.	Remove alien vegetation (except pasture species), if present																		
5.2.	Monitor revegetation success, with follow-up seeding if required																		
5.3.	Conduct final performance assessment																		
5.4.	Lodge closure Application																		
5.5.	DMR Grant Closure Application																		

Note the table below contains only the potential negative impacts identified in the above. It does not (and is not meant to) show beneficial impacts which arise out of operational or decommissioning rehabilitation activities or monitoring. This has been done in order to reduce the length of this report.

So, for example, the positive impact on soil, vegetation and land capability which arises out of topsoil replacement is not shown in the tables which follow.

In these tables the responses on dust generation and impact levels are extraneous to the consideration of dust impact on the SALT, which matter will be dealt with as a specific item in the EIA

Extent to which impact can cause or be:

Activity.	Impact	Nature of Impact	Extent	Duration	Probability	Significance	Reversed	irreplaceable loss of resource	avoided managed or mitigated	
1	PRE ESTABLISHMENT	Impact	Nature of Impact	Extent	Duration	Probability	Significance	Reversed	irreplaceable loss of resource	avoided managed or mitigated
1.1.	Application for a Mining Permit									
1.2.	Clearly demarcate use areas, permit boundary, delivery road and fence site									
1.3.	Demarcate No-Go Environmentally sensitive areas for strict avoidance									
2	ESTABLISHMENT PHASE	Impact	Nature of Impact	Extent	Duration	Probability	Significance	Reversed	irreplaceable loss of resource	avoided managed or mitigated
2.1.	Conduct Environmental Induction training to staff									
2.2.	Place chemical toilets for staff and establish containerized office/stores on site									
2.3.	Remove topsoil from demarcated areas to topsoil berms for later re-use.	Noise	Noise generated by earthmoving equipment and haul trucks	Mining area and surrounds	Life of Mine	Definite	Insignificant given remoteness of the site	Fully reversible	No	Refer Para 22.9
		Air quality (dust)	Dust generated by earthmoving equipment and haul trucks	Localised	Life of Mine	Definite	Insignificant given remoteness of the site	Fully reversible	No	Refer Para 22.9
		Hydrocarbon Impact	Potential Hydrocarbon leaks	Localised	Life of Mine	Possible	Insignificant if remediated	Fully reversible	No	Refer Para 22.9
2.4.	Grass seed/shade net cover topsoil berms	Air quality (dust)	Dust generated by earthmoving equipment and haul trucks	Localised	Life of Mine	Definite	Insignificant given remoteness of the site	Fully reversible	No	Refer Para 22.9
2.5.	Upgrade access road to Mining Permit area	Air quality (dust)	Dust generated by earthmoving equipment and haul trucks	Localised	Life of Mine	Definite	Insignificant given remoteness of the site	Fully reversible	No	Refer Para 22.9
		Hydrocarbon Impact	Potential Hydrocarbon leaks	Localised	Life of Mine	Possible	Insignificant if remediated	Fully reversible	No	Refer Para 22.9
2.6.	Establish perimeter stormwater/ silt catchment channels									
2.7.	Conduct establishment phase monitoring.									
3	OPERATIONAL PHASE	Impact	Nature of Impact	Extent	Duration	Probability	Significance	Reversed	irreplaceable loss of	avoided managed or

									resource	mitigated
3.1.	Advance excavation by Front-end loader or excavator, directly into dispatch vehicles or to Mobile crusher	Geology	Change in geological feature of the land	Mining Area	Permanent	Definite	Insignificant	No	Yes	Refer Para 22.9
		Topography	Change in geological feature of the land	Mining Area	Permanent	Definite	Insignificant	No	Yes	Refer Para 22.9
		Land capability	Loss of original land capability until rehabilitation	Mining Area	Until successfully rehabilitated	Definite	Insignificant	Yes	No	Refer Para 22.9
		Noise	Noise generated by earthmoving equipment and haul trucks	Mining area and surrounds	Life of Mine	Definite	Insignificant given remoteness of the site	Fully reversible	No	Refer Para 22.9
		Air quality (dust)	Dust generated by earthmoving equipment and haul trucks	Localised	Life of Mine	Definite	Insignificant given remoteness of the site	Fully reversible	No	Refer Para 22.9
		Hydrocarbon Impact	Potential Hydrocarbon leaks	Localised	Life of Mine	Possible	Insignificant if remediated	Fully reversible	No	Refer Para 22.9
3.2	Drilling of hard (fresh) rock where encountered	Noise	Noise generated by drilling equipment	Localised	Ad hoc during life of mine	Possible should blasting be required	Insignificant (None on surrounding land users)	No	No	Refer Para 22.9
		Air quality (dust)	Dust generated by earthmoving equipment and haul trucks	Local and potentially on SALT at 50+km North	Ad hoc during life of mine	Possible should blasting be required	Insignificant to Low given distances and prevailing winds	No	No	Refer Para 22.9
		Hydrocarbon Impact	Potential Hydrocarbon leaks	Localised	Until remediation	Possible should blasting be required	Insignificant if remediated	Fully reversible	No	Refer Para 22.9
3.3	Blasting of hard (fresh) rock where encountered	Geology	Change in geological feature of the land	Mining Area	Permanent	Possible should blasting be required	Insignificant	No	Yes	Refer Para 22.9
		Topography	Change in geological feature of the land	Mining Area	Permanent	Possible should blasting be required	Insignificant	No	Yes	Refer Para 22.9
		Noise	Widespread startling effect of blast on surrounding land users	Widespread Surrounds	Ad hoc during life of mine	Possible should blasting be required	Low to Moderate given low density of settlements in the area	No	No	Refer Para 22.9
		Air quality (dust)	Dust generated by blasting	Local and potentially on SALT at 50+km North	Ad hoc during life of mine	Possible should blasting be required	Insignificant to Low given distances and prevailing winds	No	No	Refer Para 22.9
		Blast vibration	Structural damage to infrastructure	Radius of +-500m from blast	Ad hoc during life of mine	Possible should blasting be required	Insignificant given Locality of Mining Area	No	No	Refer Para 22.9
		Fly rock	Damage to infrastructure,	Radius of within	Ad hoc during	Possible	Insignificant given	No	No	Refer Para

			danger to persons, livestock	max 500m from blast	life of mine	should blasting be required	Locality of Mining Area			22.9
3.4	Excavator loading of shot rock directly into despatch vehicles or to mobile crusher	Geology	Change in geological feature of the land	Mining Area	Permanent	Possible should blasting be required	Insignificant	No	Yes	Refer Para 22.9
		Topography	Change in geological feature of the land	Mining Area	Permanent	Possible should blasting be required	Insignificant	No	Yes	Refer Para 22.9
		Land capability	Loss of original land capability until rehabilitation	Mining Area	Until successfully rehabilitated	Possible should blasting be required	Insignificant	Yes	No	Refer Para 22.9
		Noise	Noise generated by earthmoving equipment and haul trucks	Mining area and surrounds	Life of Mine	Possible should blasting be required	Insignificant given remoteness of the site	Fully reversible	No	Refer Para 22.9
		Air quality (dust)	Dust generated by earthmoving equipment and haul trucks	Localised	Life of Mine	Possible should blasting be required	Insignificant given remoteness of the site	Fully reversible	No	Refer Para 22.9
		Hydrocarbon Impact	Potential Hydrocarbon leaks	Localised	Life of Mine	Possible should blasting be required	Insignificant if remediated	Fully reversible	No	Refer Para 22.9
3.5	Tracked mobile crusher crushing and screening, with the mobile crusher proceeding on tracks	Noise	Noise generated by earthmoving equipment and haul trucks	Mining area and surrounds	Life of Mine	Definite	Insignificant given remoteness of the site	Fully reversible	No	Refer Para 22.9
		Air quality (dust)	Dust generated by earthmoving equipment and haul trucks	Localised	Life of Mine	Definite	Insignificant given remoteness of the site	Fully reversible	No	Refer Para 22.9
		Hydrocarbon Impact	Potential Hydrocarbon leaks	Localised	Life of Mine	Possible	Insignificant if remediated	Fully reversible	No	Refer Para 22.9
3.6	Excavator loading crushed material to either delivery trucks or dump trucks to stockpile	Noise	Noise generated by earthmoving equipment and haul trucks	Mining area and surrounds	Life of Mine	Definite	Insignificant given remoteness of the site	Fully reversible	No	Refer Para 22.9
		Air quality (dust)	Dust generated by earthmoving equipment and haul trucks	Localised	Life of Mine	Definite	Insignificant given remoteness of the site	Fully reversible	No	Refer Para 22.9
		Hydrocarbon Impact	Potential Hydrocarbon leaks	Localised	Life of Mine	Possible	Insignificant if remediated	Fully reversible	No	Refer Para 22.9
3.7	Dispatch loading of delivery vehicles.	Noise	Noise generated by earthmoving equipment and haul trucks	Mining area and surrounds	Life of Mine	Definite	Insignificant given remoteness of the site	Fully reversible	No	Refer Para 22.9
		Air quality (dust)	Dust generated by earthmoving equipment and haul trucks	Localised	Life of Mine	Definite	Insignificant given remoteness of the site	Fully reversible	No	Refer Para 22.9

		Hydrocarbon Impact	Potential Hydrocarbon leaks	Localised	Life of Mine	Possible	Insignificant if remediated	Fully reversible	No	Refer Para 22.9
3.8	Shaping of excavation and the remainder of the mining permit area	Noise	Noise generated by earthmoving equipment and haul trucks	Mining area and surrounds	Life of Mine	Definite	Insignificant given remoteness of the site	Fully reversible	No	Refer Para 22.9
		Air quality (dust)	Dust generated by earthmoving equipment and haul trucks	Localised	Life of Mine	Definite	Insignificant given remoteness of the site	Fully reversible	No	Refer Para 22.9
		Hydrocarbon Impact	Potential Hydrocarbon leaks	Localised	Life of Mine	Possible	Insignificant if remediated	Fully reversible	No	Refer Para 22.9
3.9	Continuous ad hoc eradication of alien vegetation									
3.1	Refuelling and hydrocarbon management.									
3.11	Maintenance of stormwater control									
3.12	Conduct operational phase maintenance and monitoring.									
4	DECOMMISSIONING PHASE	Impact	Nature of Impact	Extent	Duration	Probability	Significance	Reversed	irreplaceable loss of resource	avoided managed or mitigated
4.1.	Finalize shaping of remaining pit floor and sloping of final pit edges (including instatement of internal drainage)	Noise	Noise generated by earthmoving equipment and haul trucks	Mining area and surrounds	Life of Mine	Definite	Insignificant given remoteness of the site	Fully reversible	No	Refer Para 22.9
		Air quality (dust)	Dust generated by earthmoving equipment and haul trucks	Localised	Life of Mine	Definite	Insignificant given remoteness of the site	Fully reversible	No	Refer Para 22.9
		Hydrocarbon Impact	Potential Hydrocarbon leaks	Localised	Life of Mine	Possible	Insignificant if remediated	Fully reversible	No	Refer Para 22.9
4.2.	Remove all structures (stores/office container, Chemical toilet lastly.)									
4.3.	Rip/scarify hardened/compacted surfaces.	Noise	Noise generated by earthmoving equipment and haul trucks	Mining area and surrounds	Life of Mine	Definite	Insignificant given remoteness of the site	Fully reversible	No	Refer Para 22.9
		Air quality (dust)	Dust generated by earthmoving equipment and haul trucks	Localised	Life of Mine	Definite	Insignificant given remoteness of the site	Fully reversible	No	Refer Para 22.9
		Hydrocarbon Impact	Potential Hydrocarbon leaks	Localised	Life of Mine	Possible	Insignificant if remediated	Fully reversible	No	Refer Para 22.9
4.4.	Spread topsoil from berms over designated areas and lightly scarify	Noise	Noise generated by earthmoving equipment and haul trucks	Mining area and surrounds	Life of Mine	Definite	Insignificant given remoteness of the site	Fully reversible	No	Refer Para 22.9
		Air quality (dust)	Dust generated by earthmoving equipment and haul trucks	Localised	Life of Mine	Definite	Insignificant given remoteness of the site	Fully reversible	No	Refer Para 22.9
		Hydrocarbon	Potential Hydrocarbon leaks	Localised	Life of Mine	Possible	Insignificant if	Fully	No	Refer Para

		Impact						remediated	reversible		22.9
4.5.	Finalize Revegetation by means of seeding. Seeding /Revegetation must take place in accordance with landowner specification/ requirements.										
5	AFTERCARE PERIOD	Impact	Nature of Impact	Extent	Duration	Probability	Significance	Reversed	irreplaceable loss of resource	avoided managed or mitigated	
5.1.	Remove alien vegetation (except pasture species), if present										
5.2.	Monitor revegetation success, with follow-up seeding if required										
5.3.	Conduct final performance assessment										
5.4.	Lodge closure Application										
5.5.	DMR Grant Closure Application										

16 Methodology used in determining the significance of environmental impacts

(Describe how the significance, probability, and duration of the aforesaid identified impacts that were identified through the consultation process were determined in order to decide the extent to which the initial site layout needs revision).

As an Application for the authorization of Mining activities, the first and foremost consideration is that of mining being a **place-bound activity**, reliant fully on the local geology and suitability of the site for mineral beneficiation.

The locality of the Site must thus be considered within this consideration together with the Mining Legislation which requires that an area is demarcated for Application prior to provision of any documentation, which area is then fixed and which does not offer option for revision once the Application process has commenced.

Given the above, a full assessment of the site prior to application is of utmost importance, and, full aspects of the site were assessed to guide the Site locality prior to Application, inclusive of geology, Social, and environmental considerations, and acting as an assessment of constraints, opportunities and feasibility of the envisioned development.

As the Mineral Legislation does not favour advertising of the project for public input prior to the Application, the pre-Application assessment will be herewith strengthened with further inputs from Interested and Affected Parties, but was based on specialist inputs from commencement.

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

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

All potential impacts of the operation have been addressed to date in paragraphs 14 and 15.

All comment regarding revision of the originally indicated Site (Mine) Layout will be included in final and pending documentation.

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).

Refer Paragraph 22.9.

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)

Refer para 11 and 12, and geology Para 5.1.

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)

Refer Paragraph 11 and 12.

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 sole alternative to the sought mining operation would be that of not proceeding with the operation. The considerations in respect of this option are discussed in paragraphs 9-12.

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

(The EAP must undertake to assess the aspects affected by each individual mining activity whether listed or not, including activities such as blasting, Loading, hauling and transport, and mining activities such as Excavations, stockpiles, discard dumps or dams, water supply dams and boreholes, accommodation, offices, ablution, stores, workshops, processing plant, storm water control, berms, roads, pipelines, power lines, conveyors, etc...etc...etc.)

As noted before, given that the potential dust impact on the SALT is a unique consideration out of the normal content of dust evaluation, the dust impact on the salt will be dealt with in a dedicated section of the EIA and will be workshopped fully with the relevant astronomy management authorities already preliminarily engaged in the process.

The following activities and environmental aspects thereof will continue to be assessed during the EIA process:

Activity. This table identifies potential impacts but does not differentiate between negative or beneficial impacts.		Impact	Provisionally assessed in the Draft Scoping Report	Status in Final Scoping Report
1	PRE ESTABLISHMENT	Impact		
1.1.	Application for a Mining Permit			
1.2.	Clearly demarcate use areas, permit boundary, delivery road and fence site			
1.3.	Demarcate No-Go Environmentally sensitive areas for strict avoidance			
2	ESTABLISHMENT PHASE	Impact		
2.1.	Conduct Environmental Induction training to staff			
2.2.	Place chemical toilets for staff and establish containerized office/stores on site			
2.3	Remove topsoil from demarcated areas to topsoil berms for later re-use.	Noise	Yes, Refer Part 15	No changes as yet
		Air quality (dust)	Yes, Refer Part 15	No changes as yet
		Hydrocarbon Impact	Yes, Refer Part 15	No changes as yet
2.4.	Grass seed/shade net cover topsoil berms	Air quality (dust)	Yes, Refer Part 15	No changes as yet
2.5.	Upgrade access road to Mining Permit area	Air quality (dust)	Yes, Refer Part 15	No changes as

				yet
		Hydrocarbon Impact	Yes, Refer Part 15	No changes as yet
2.6.	Establish perimeter stormwater/ silt catchment channels			
2.7.	Conduct establishment phase monitoring.			
3	OPERATIONAL PHASE	Impact		
3.1.	Advance excavation by Front-end loader or excavator, directly into dispatch vehicles or to Mobile crusher	Geology	Yes, Refer Part 15	No changes as yet
		Topography	Yes, Refer Part 15	No changes as yet
		Land capability	Yes, Refer Part 15	No changes as yet
		Noise	Yes, Refer Part 15	No changes as yet
		Air quality (dust)	Yes, Refer Part 15	No changes as yet
		Hydrocarbon Impact	Yes, Refer Part 15	No changes as yet
3.2	Drilling of hard (fresh) rock where encountered	Noise	Yes, Refer Part 15	No changes as yet
		Air quality (dust)	Yes, Refer Part 15	No changes as yet
		Hydrocarbon Impact	Yes, Refer Part 15	No changes as yet
3.3	Blasting of hard (fresh) rock where encountered	Geology	Yes, Refer Part 15	No changes as yet
		Topography	Yes, Refer Part 15	No changes as yet
		Noise	Yes, Refer Part 15	No changes as yet
		Air quality (dust)	Yes, Refer Part 15	No changes as yet
		Blast vibration	Yes, Refer Part 15	No changes as yet
		Fly rock	Yes, Refer Part 15	No changes as yet
3.4	Excavator loading of shot rock directly into despatch vehicles or to mobile crusher	Geology	Yes, Refer Part 15	No changes as yet
		Topography	Yes, Refer Part 15	No changes as yet
		Land capability	Yes, Refer Part 15	No changes as yet
		Noise	Yes, Refer Part 15	No changes as yet
		Air quality (dust)	Yes, Refer Part 15	No changes as yet
		Hydrocarbon Impact	Yes, Refer Part 15	No changes as yet
3.5	Tracked mobile crusher crushing and screening, with the mobile crusher proceeding on tracks	Noise	Yes, Refer Part 15	No changes as yet
		Air quality (dust)	Yes, Refer Part 15	No changes as yet
		Hydrocarbon Impact	Yes, Refer Part 15	No changes as yet
3.6	Excavator loading crushed material to either delivery trucks or dump trucks to stockpile	Noise	Yes, Refer Part 15	No changes as yet
		Air quality (dust)	Yes, Refer Part 15	No changes as yet
		Hydrocarbon Impact	Yes, Refer Part 15	No changes as yet
3.7	Dispatch loading of delivery vehicles.	Noise	Yes, Refer Part 15	No changes as yet
		Air quality (dust)	Yes, Refer Part 15	No changes as yet
		Hydrocarbon Impact	Yes, Refer Part 15	No changes as yet
3.8	Shaping of excavation and the remainder of the mining permit area	Noise	Yes, Refer Part 15	No changes as yet
		Air quality (dust)	Yes, Refer Part 15	No changes as yet
		Hydrocarbon Impact	Yes, Refer Part 15	No changes as yet

				yet
3.9	Continuous ad hoc eradication of alien vegetation			
3.1	Refuelling and hydrocarbon management.			
3.11	Maintenance of stormwater control			
3.12	Conduct operational phase maintenance and monitoring.			
4	DECOMMISSIONING PHASE	Impact		
4.1.	Finalize shaping of remaining pit floor and sloping of final pit edges (including instatement of internal drainage)	Noise	Yes, Refer Part 15	No changes as yet
		Air quality (dust)	Yes, Refer Part 15	No changes as yet
		Hydrocarbon Impact	Yes, Refer Part 15	No changes as yet
4.2.	Remove all structures (stores/office container, Chemical toilet lastly.)			
4.3.	Rip/scarify hardened/compacted surfaces.	Noise	Yes, Refer Part 15	No changes as yet
		Air quality (dust)	Yes, Refer Part 15	No changes as yet
		Hydrocarbon Impact	Yes, Refer Part 15	No changes as yet
4.4.	Spread topsoil from berms over designated areas and lightly scarify	Noise	Yes, Refer Part 15	No changes as yet
		Air quality (dust)	Yes, Refer Part 15	No changes as yet
		Hydrocarbon Impact	Yes, Refer Part 15	No changes as yet
4.5.	Finalize Revegetation by means of seeding. Seeding /Revegetation must take place in accordance with landowner specification/ requirements.			
5	AFTERCARE PERIOD	Impact		
5.1.	Remove alien vegetation (except pasture species), if present			
5.2.	Monitor revegetation success, with follow-up seeding if required			
5.3.	Conduct final performance assessment			
5.4.	Lodge closure Application			
5.5.	DMR Grant Closure Application			

22.3 Description of aspects to be assessed by specialists

The following specialists will be tasked with the studies to include the tabulated items (amongst others) in their brief:

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	Heritage practitioner has been tasked to prepare an assessment of the site	To be appended to documentation once received
Vegetation	Specialist Botanist has been tasked with a study to describe existing on site vegetation, to additionally assess the CBA mapping accuracy of the site, and then to provide inputs to rehabilitation / restoration methodology.	To be appended to documentation once received
Dust Impact on the SALT	A dust impact assessment and attenuation plan is being prepared for lodging and discussing with the astronomy management authorities	Will be appended to the final scoping report

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

In this draft scoping reporting the environmental aspects have been assessed based on the

experience of the report compilers through on site assessment and consideration in light of many years' experience (Refer CV in Appendix 1 & 2). These 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.

The results of such further assessments are to be included in the Final Scoping Report and will be included in the pending EIR/EMP.

22.5 The proposed method of assessing duration and significance

As per Para 22.4.

22.6 The stages at which the competent authority will be consulted

The draft Scoping report was submitted to relevant State Departments. The final Scoping report will be submitted to the competent authority (DMR) and such report will contain the full details and results of the initial public participation as at date of lodgement. (Late responses to the draft scoping report will be uploaded to SAMRAD as and when received).

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

(These steps must include the steps that will be taken to ensure consultation with the affected parties identified in (h) (ii) herein).

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

- 1) Landowner and adjacent surrounding land owners: Through personal or telephonic consultation, and provision of Draft Scoping Reports as background information.
- 2) General public: Through advertisement in local press, documentation prepared for perusal at the local public library (Sutherland), and Notice placed along the boundary of the Applicant property with adjacent public gravel road
- 3) In addition, the relevant Government Departments will be contacted by Registered Mail in respect of the proposed project.

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

22.7.2 Details of the engagement process to be followed.

(Describe the process to be undertaken to consult interested and affected parties including public meetings and one on one consultation. NB the affected parties must be specifically consulted regardless of whether or not they attended public meetings and records of such consultation will be required in the EIA at a later stage).

All parties (except landowner and State Departments) will have to register their interest in

the matter. This registration continues from now until finalisation of the EIR/EMP. (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 exceed 30 days as per the NEMA Regulations.

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

(Information to be provided must include the initial site plan and sufficient detail of the intended operation and the typical impacts of each activity, to enable them to assess what impact the activities will have on them or on the use of their land).

The information presented will depend on timing. Initially, this draft scoping report serves as the basis for comment, followed by the draft EIA/EMP which when compiled will form the basis of consultation.

As arranged with the astronomy authorities a draft report on dust attenuation measures and risk management will be tabled to them at end of scoping for discussion and for consideration.

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 transparently and all-inclusive as possible. If the interest is sufficient then a Public Open Day will be held and if not, then 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 with the following required at this stage (this list may be modified as a result of public participation):
 - Botanical assessment of the site
 - Archaeology / Heritage: Heritage Practitioner has been requested to submit a specialist assessment

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.

As noted before the attenuation of dust on the SALT is dealt with separately from this table

Activity.	Impact	Mitigation Type	Potential for residual risk
1 PRE ESTABLISHMENT	Impact	Mitigation Type	Potential for residual risk
1.1. Application for a Mining Permit			
1.2. Clearly demarcate use areas, permit boundary, delivery road and fence site		This is a mitigation measure	
1.3. Demarcate No-Go Environmentally sensitive areas for strict avoidance		This is a mitigation measure	
2 ESTABLISHMENT PHASE	Impact	Mitigation Type	Potential for residual risk
2.1. Conduct Environmental		NA	

	Induction training to staff			
2.2.	Place chemical toilets for staff and establish containerized office/stores on site	This is a mitigation measure		
2.3	Remove topsoil from demarcated areas to topsoil berms for later re-use.	Noise	Ensure vehicle silencers are in operation. Limit activities to daylight working hours	None
		Air quality (dust)	Wetting of unsurfaced areas by water cart spray when required (use of water for dust mitigation is to be kept to an absolute minimum.). Limiting of speeds on the affected roadways. Removed vegetation (saltbush rows) should be utilized as brush packing over denuded surfaces not under direct operational use	Potential if left denuded and unrehabilitated
		Hydrocarbon Impact	Control and remedy through Hydrocarbon management protocol.	Although unlikely, there is a minor residual risk if leak goes unnoticed or is not remedied.
2.4.	Grass seed/shade net cover topsoil berms	Air quality (dust)	Wetting of unsurfaced areas by water cart spray when required (use of water for dust mitigation is to be kept to an absolute minimum.). Limiting of speeds on the affected roadways. Removed vegetation (saltbush rows) should be utilized as brush packing over denuded surfaces not under direct operational use	Potential if left denuded and unrehabilitated
2.5.	Upgrade access road to Mining Permit area	Air quality (dust)	Wetting of unsurfaced areas by water cart spray when required (use of water for dust mitigation is to be kept to an absolute minimum.). Limiting of speeds on the affected roadways. Removed vegetation (saltbush rows) should be utilized as brush packing over denuded surfaces not under direct operational use	Potential if left denuded and unrehabilitated
		Hydrocarbon Impact	Control and remedy through Hydrocarbon management protocol.	Although unlikely, there is a minor residual risk if leak goes unnoticed or is not remedied.
2.6.	Establish perimeter stormwater/ silt catchment channels	This is a mitigation measure		
2.7.	Conduct establishment phase monitoring.	This is a mitigation measure		
3	OPERATIONAL PHASE	Impact	Mitigation Type	Potential for residual risk
3.1.	Advance excavation by Front-end loader or excavator, directly into dispatch vehicles or to Mobile crusher	Geology	Excavation according to approved Mine Plan and further Rehabilitation shaping	Potential if left denuded and unrehabilitated
		Topography	Excavation according to approved Mine Plan and further Rehabilitation shaping	Potential if left denuded and unrehabilitated
		Land capability	Rehabilitation (Shaping, topsoiling, reseeding)	Potential if left denuded and unrehabilitated
		Noise	Ensure vehicle silencers are in operation. Limit activities to daylight working hours	None
		Air quality (dust)	Wetting of unsurfaced areas by water cart spray when required (use of water for dust mitigation is to be kept to an absolute minimum.). Limiting of speeds on the affected roadways. Removed vegetation (saltbush rows) should be utilized as brush packing over denuded surfaces not under direct operational use	Potential if left denuded and unrehabilitated
		Hydrocarbon Impact	Control and remedy through Hydrocarbon management protocol.	Although unlikely, there is a minor residual risk if leak goes unnoticed or is not remedied.
3.2	Drilling of hard (fresh) rock where encountered	Noise	Ensure vehicle silencers are in operation. Limit activities to daylight working hours	None
		Air quality (dust)	All rigs equipped with dust extraction equipment	None
		Hydrocarbon Impact	Control and remedy through Hydrocarbon management protocol. Although unlikely, there is a minor residual risk if leak goes unnoticed or is not remedied.	Although unlikely, there is a minor residual risk if leak goes unnoticed or is not remedied.
3.3	Blasting of hard (fresh) rock where encountered	Geology	Excavation according to approved Mine Plan	Potential if left denuded and unrehabilitated
		Topography	Excavation according to approved Mine Plan	Potential if left denuded and unrehabilitated
		Noise	The quarry manager will notify adjacent landowners /managers of the intended date and time of the next blast in order that the residents and personnel outside	None

			the danger area can expect the blast, and in so doing the startling effect of the blast by the air blast vibration can be reduced.	
		Air quality (dust)	Blast shall be designed to optimize rock fracturing with minimal air blast. Furthermore, blasting can be scheduled for suitable day or time of day when wind favours dispersion of dust away from the SALT	None
		Blast vibration	The quarry manager will notify adjacent landowners /managers of the intended date and time of the next blast in order that the residents and personnel outside the danger area can expect the blast, and in so doing the startling effect of the blast vibration can be reduced.	None
		Fly rock	In accordance with the blasting code the blaster shall drive along the perimeter fences to inspect the adjacent lands to ensure that there are no persons or livestock within the blast radius, and a hooter/siren will alert all persons in proximity of the pending blast	None
3.4	Excavator loading of shot rock directly into despatch vehicles or to mobile crusher	Geology	Rehabilitation shaping	Potential if left denuded and unrehabilitated
		Topography	Rehabilitation shaping	Potential if left denuded and unrehabilitated
		Land capability	Rehabilitation (Shaping, topsoiling, reseeding)	Potential if left denuded and unrehabilitated
		Noise	Ensure vehicle silencers are in operation. Limit activities to daylight working hours	None
		Air quality (dust)	Wetting of unsurfaced areas by water cart spray when required (use of water for dust mitigation is to be kept to an absolute minimum.). Limiting of speeds on the affected roadways. Removed vegetation (saltbush rows) should be utilized as brush packing over denuded surfaces not under direct operational use	Potential if left denuded and unrehabilitated
		Hydrocarbon Impact	Control and remedy through Hydrocarbon management protocol. Although unlikely, there is a minor residual risk if leak goes unnoticed or is not remedied.	Although unlikely, there is a minor residual risk if leak goes unnoticed or is not remedied.
3.5	Tracked mobile crusher crushing and screening, with the mobile crusher proceeding on tracks	Noise	Ensure vehicle silencers are in operation. Limit activities to daylight working hours	None
		Air quality (dust)	Wetting of unsurfaced areas by water cart spray when required (use of water for dust mitigation is to be kept to an absolute minimum.). Limiting of speeds on the affected roadways. Removed vegetation (saltbush rows) should be utilized as brush packing over denuded surfaces not under direct operational use	Potential if left denuded and unrehabilitated
		Hydrocarbon Impact	Control and remedy through Hydrocarbon management protocol.	Although unlikely, there is a minor residual risk if leak goes unnoticed or is not remedied.
3.6	Excavator loading crushed material to either delivery trucks or dump trucks to stockpile	Noise	Ensure vehicle silencers are in operation. Limit activities to daylight working hours	None
		Air quality (dust)	Wetting of unsurfaced areas by water cart spray when required (use of water for dust mitigation is to be kept to an absolute minimum.). Limiting of speeds on the affected roadways. Removed vegetation (saltbush rows) should be utilized as brush packing over denuded surfaces not under direct operational use	Potential if left denuded and unrehabilitated
		Hydrocarbon Impact	Control and remedy through Hydrocarbon management protocol.	Although unlikely, there is a minor residual risk if leak goes unnoticed or is not remedied.
3.7	Dispatch loading of delivery vehicles.	Noise	Ensure vehicle silencers are in operation. Limit activities to daylight working hours	None
		Air quality (dust)	Wetting of unsurfaced areas by water cart spray when required (use of water for dust mitigation is to be kept to an absolute minimum.). Limiting of speeds on the affected roadways. Removed vegetation (saltbush rows) should be utilized as brush packing over denuded surfaces not under direct operational use	Potential if left denuded and unrehabilitated
		Hydrocarbon Impact	Control and remedy through Hydrocarbon management protocol.	Although unlikely, there is a minor residual risk if leak goes unnoticed or is not remedied.

3.8	Shaping of excavation and the remainder of the mining permit area	Noise	Ensure vehicle silencers are in operation. Limit activities to daylight working hours	None
		Air quality (dust)	Wetting of unsurfaced areas by water cart spray when required (use of water for dust mitigation is to be kept to an absolute minimum.). Limiting of speeds on the affected roadways. Removed vegetation (saltbush rows) should be utilized as brush packing over denuded surfaces not under direct operational use	Potential if left denuded and unrehabilitated
		Hydrocarbon Impact	Control and remedy through Hydrocarbon management protocol.	Although unlikely, there is a minor residual risk if leak goes unnoticed or is not remedied.
3.9	Continuous ad hoc eradication of alien vegetation	This is a mitigation measure		
3.1	Refuelling and hydrocarbon management.	This is a mitigation measure		
3.11	Maintenance of stormwater control	This is a mitigation measure		
3.12	Conduct operational phase maintenance and monitoring.	This is a mitigation measure		
4	DECOMMISSIONING PHASE	Impact	Mitigation Type	Potential for residual risk
4.1.	Finalize shaping of remaining pit floor and sloping of final pit edges (including instatement of internal drainage)	Noise	Ensure vehicle silencers are in operation. Limit activities to daylight working hours	None
		Air quality (dust)	Wetting of unsurfaced areas by water cart spray when required (use of water for dust mitigation is to be kept to an absolute minimum.). Limiting of speeds on the affected roadways. Removed vegetation (saltbush rows) should be utilized as brush packing over denuded surfaces not under direct operational use	Potential if left denuded and unrehabilitated
		Hydrocarbon Impact	Control and remedy through Hydrocarbon management protocol.	Although unlikely, there is a minor residual risk if leak goes unnoticed or is not remedied.
4.2.	Remove all structures (stores/office container, Chemical toilet lastly.)	This is a mitigation measure		
4.3.	Rip/scarify hardened/compacted surfaces.	Noise	Ensure vehicle silencers are in operation. Limit activities to daylight working hours	None
		Air quality (dust)	Wetting of unsurfaced areas by water cart spray when required (use of water for dust mitigation is to be kept to an absolute minimum.). Limiting of speeds on the affected roadways. Removed vegetation (saltbush rows) should be utilized as brush packing over denuded surfaces not under direct operational use	Potential if left denuded and unrehabilitated
		Hydrocarbon Impact	Control and remedy through Hydrocarbon management protocol.	Although unlikely, there is a minor residual risk if leak goes unnoticed or is not remedied.
4.4.	Spread topsoil from berms over designated areas and lightly scarify	Noise	Ensure vehicle silencers are in operation. Limit activities to daylight working hours	None
		Air quality (dust)	Wetting of unsurfaced areas by water cart spray when required (use of water for dust mitigation is to be kept to an absolute minimum.). Limiting of speeds on the affected roadways. Removed vegetation (saltbush rows) should be utilized as brush packing over denuded surfaces not under direct operational use	Potential if left denuded and unrehabilitated
		Hydrocarbon Impact	Control and remedy through Hydrocarbon management protocol.	Although unlikely, there is a minor residual risk if leak goes unnoticed or is not remedied.
4.5.	Finalize Revegetation by means of seeding. Seeding /Revegetation must take place in accordance with landowner specification/ requirements.	This is a mitigation measure		
5	AFTERCARE PERIOD	Impact	Mitigation Type	Potential for residual risk
5.1.	Remove alien vegetation (except pasture species), if present	This is a mitigation measure		
5.2.	Monitor revegetation success, with follow-up seeding if required	This is a mitigation measure		

5.3.	Conduct final performance assessment	NA
5.4.	Lodge closure Application	NA
5.5.	DMR Grant Closure Application	NA

Additionally, the following applies over Life-of-Mine

Employee movement on site	<ul style="list-style-type: none"> • Strict control of employee movement on site, • Enforcement within the Conditions of Employment of staff, regarding potential fines or dismissal should staff not stay within the bounds of activity. • Environmental Induction training of the staff, inclusive of : <ul style="list-style-type: none"> ○ Importance of the environmental, ○ Caution against polluting activities (use of veld as toilet, hydrocarbon management, danger of veld fires)
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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.

(Provide the results of Investigation, assessment, and evaluation of the impact of the mining, bulk sampling or alluvial diamond prospecting on any directly affected person including the landowner, lawful occupier, or, where applicable, potential beneficiaries of any land restitution claim, attach the investigation report as **Appendix 3** and confirm that the applicable mitigation is reflected in 2.5.3; 2.11.6.and 2.12.herein).

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

- Mining Company and employees: controlled cost and limitation of excessive and unnecessary transport fees (importation of suitable materials).
- Consumer: Guaranteed supply of construction aggregate at pre-determined costs
- Land owner: Staff movement on property with associated potential for theft, damage to land, as well as Loss (however temporary) of grazing use of the land over which the mining will occur.

Land Claims Commission response has confirmed that there have been no claims lodged in respect of this property.

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, attach the investigation report as **Appendix 3** and confirm that the applicable mitigation is reflected in 2.5.3; 2.11.6.and 2.12.herein).

A specialist has been appointed to compile a specialist assessment. Such assessment and mitigation procedures will be incorporated into all further documentation.

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 4**).

Not Applicable.

25 UNDERTAKING REGARDING CORRECTNESS OF INFORMATION

I Stephen van der Westhuizen 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: 13/11//2015

26 UNDERTAKING REGARDING LEVEL OF AGREEMENT

I **Stephen van der Westhuizen** 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: 13/11/2015

**Appendix 1& 2:
Qualification and CV of EAP**

I, Stephen van der Westhuizen, 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 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

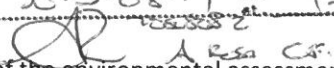
the proposed activity proceeding other than remuneration for work performed in terms of the Regulations;

- I have a vested interest in the proposed activity proceeding, such vested interest being:

Handtekening van die verklaarder en dat verklaarder erken dat hy/ sy verklaar dat die inhoud van hierdie verklaring en dit begryp. Hierdie verklaarder se handtekening/merk/dulmafdruk is in my teenwoordigheid daarop aangebring.

by me and that the deponent has acknowledged that he/she knows and understands the content of this statement. The deponent has sworn to/affirmed before me and deponent's signature/mark/thumbprint was placed thereon in my presence.

to STRAND op 2015-08-19 om 12:31
at

Signature of the environmental assessment practitioner: 

(HANDTEKENING) KOMMISSARIS VAN EDE
(SIGNATURE) COMMISSIONER OF OATHS
Name of company: Site Plan Consulting

VOORNAAM EN AFTREKNAAM IN DRIE LETTERS
FULL FIRST NAMES AND SURNAME IN BLOCK LETTERS
G. A. TER HAAR

BESIGHEIDSAADRES (STRAATADRES)
BUSINESS ADDRESS (STREET ADDRESS)
STRAND

RANG/RANK
CST

SA POLISIEDIENS
SA POLICE SERVICE



I, Jaques van der Vyver, 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

Signature of the environmental assessment practitioner

Signature of the environmental assessment practitioner

Signature of the environmental assessment practitioner

Signature of the environmental assessment practitioner

Signature of the environmental assessment practitioner

Signature of the environmental assessment practitioner

Signature of the environmental assessment practitioner

Signature of the environmental assessment practitioner

Signature of the environmental assessment practitioner

Signature of the environmental assessment practitioner



Signature of the environmental assessment practitioner

CV of EAP

STEPHEN VAN DER WESTHUIZEN

July 2015

Profession: Environmental Geologist

Date of Birth: 20 December 1955

Parent Firm: Site Plan Consulting CC (and previously jointly with Settlement Planning Services (Setplan))

Position in Firm: Member (previously Director of Setplan)

Years with the Firm: 32 years with Site Plan Consulting and Setplan

Nationality: RSA

Education:

Year	Qualification	Institution
1972	Senior Certificate Matriculation	Hottentots Holland High School, Somerset West, South Africa
1973 - 1976	Bachelor of Science (BSc) Geology	University of Stellenbosch
1977 - 1979	Master of Town and Regional Planning (cum laude)	University of Stellenbosch

Professional Qualifications:

Member of the Geological Society of South Africa.
Member of the South African Council for Planners (under the Planning Professions Act; 36 of 2002 (Registration number A/310/1985))

Languages and Degree of Proficiency:

English (fluent, read, write)
Afrikaans (fluent, read, write)

Countries of Work Experience:

South Africa, Lesotho, Namibia, Botswana, Angola

Scope of Training and Experience:

- ❑ Background training in the earth sciences and spatial planning, and 32 years of practical experience in these fields.
- ❑ Four year partnership with industrial engineers in project feasibility, design and construction supervision in parallel with Site Plan between 1983 and 1986.
- ❑ Specialist expertise in construction project impacts including having served as lead environmental planner in Setplan's award winning Lesotho Highlands Water Project team.
- ❑ Author of over 300 Environmental Management Programme Reports (EMPRs) for mines and quarries submitted to the Department of Minerals and Energy/Mineral Resources related to dam and road construction, commercial aggregate supplies and the mining of various minerals (salt, diamonds, rare earths, dimension stone granite and marble, kaolin, gypsum, copper, veldspar and pegmatite minerals).
- ❑ Feasibility studies/mining cost assessments and rehabilitation cost calculations.

In addition to geological, mine planning and mine rehabilitation investigations Stephen has been extensively involved in researching the feasibility of mining operations. Of specific reference is his experience in:

- Compilation of monthly and annual cash flow analyses for amongst others: Messrs. Titan Lime; Grabouw (Palmiet) Quarry (a large metropolitan quarry to serve Cape Town); Prieska Gypsum mines.
- Valuation of material reserves in State expropriation cases.
- Rehabilitation cost calculations for all mines for which EMPR's have been compiled (in excess of 300 to date). Such valuations include quantification of cost of removal of facilities and the site's rehabilitation as well as assessment of the value of such facilities which may be taken over by the land owner, which costs are either deducted from royalties payable or from responsibility for rehabilitation.
- Economic assessments of mineral deposits such as the Platinum/Chrome reserves west of the Pilanesberg as the basis for infrastructure investment by the Development Bank of Southern Africa.

His experience extends into feasibility studies and environmental considerations for non-mining infrastructure investment appraisals, conducted by Setplan for DBSA project appraisals (project values of up to R75 million).

Relevant Project Experience:

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

- Groen River Diamond prospecting
- Kuruman dolomitic aggregate
- Berg River Limestone
- Rare Earth Minerals, Namaqualand
- Three Rivers Prospecting – Breede River Valley

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

- Rare Earth Minerals, Steenkampskraal, Knersvlakte
- Palmiet Quarry (within Kogelberg Biosphere)
- Numerous quarries for Afrimat Limited (Stanford, Kliprug, Hartebeestfontein (Kusile power station))
- Kuipersbult (Medupi power station) ,
- Numerous Granite Dimension stone mines, including Naroehuis Granite Mine,
- La farge Group quarries (large commercial quarry sites in Cape Town, East London, Port Elizabeth, Saldanah and other)
- Borrow Pits to serve renewable energy projects in Tsitsikamma and Molteno
- Numerous salt and gypsum extraction mining operations
- ..over 300+ Mining Authorizations over the past 34 years

Environmental Performance Assessments (monitoring) of the following sites on one off or regular basis:

- Numerous Granite Dimension stone mines, including Naroehuis Granite Mine,
- Numerous SANRAL and provincial Road contract quarries and borrow pits, (Stilbaai, Graafwater, Hopetown-Strydenberg
- Hermanus River gravel mine
- Numerous Sand Mines, including Kersfontein sand mine, Doornfontein sand mine,
- Assessment of nation-wide mining operations of Afrimat Limited (35+ mining sites)

Closure Applications (for mining and prospecting operations):

- O'Okiep Copper Company
- Alexkor SOC – Compilation of Closure Plan

- SANRAL and provincial Road contract quarries and borrow pits, (Stilbaai, Graafwater, Hopetown-Strydenberg)

Other non-mining

- Lesotho Highlands – Katse Dam. Integration of Lesotho Highlands Phase 1b into the physical economic and environmental planning of north-west Lesotho.
- Numerous resort developments on the Eastern Cape coast.
- Strategic feasibility and initial planning of Madikwe Game Reserve.
- Richards Bay and beachfront development plant, including stabilization of Pelican Island.

Contact Number:

Should the reader require specific information on any aspect of the above, please contact Stephen van der Westhuizen at telephone number: (021) 8544260.

Profession: Ecologist

Date of Birth: 17 February 1983

Parent Firm: Site Plan Consulting

Position in Firm: Consultant/GIS operator

Years with the Firm: 6 years

Nationality: RSA

Education:

Year	Qualification	Institution
2001	Senior Certificate Matriculation	Hottentots Holland High School, Somerset West, South Africa
2009	Bachelor of Science (BSc) Biodiversity and Ecology	University of Stellenbosch

Languages and Degree of Proficiency:

English (fluent, read, write)
Afrikaans (fluent, read, write)

Countries of Work Experience:

South Africa

Scope of Training and Experience:

- Training in the environmental sciences, inclusive of geology, ecology, botany, microbiology, biochemistry and population dynamics.
- Fieldwork experience on ad hoc basis for Stellenbosch University: Department of Zoology
- 2-years ad hoc conducting of ECO tasks and environmental inputs to Site Plan Consulting projects
- 4-year full time employment by Site Plan Consulting, including
 - fulfilling of ECO Monitoring obligations on road contracts,
 - Environmental Performance Assessments and EIA/EMP compilation
 - GIS mapping and plan compilation
 - Compiling and Authorisation of mining applications and closures

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

- Three Rivers Prospecting – Breede River Valley

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

- Borrow Pits to serve renewable energy projects in Tsitsikamma and Molteno
- Private construction quarries serving roads contracts in Kuruman, Carnarvon, Gansbaai

- Oaklands Urban Development –Sand mining authorizations acquisition and mineral legislation consultation

Environmental Performance Assessments (monitoring) of the following sites on one off or regular basis:

- Numerous SANRAL and provincial Road contract quarries and borrow pits, (Stilbaai, Graafwater, Hopetown-Strydenberg)
- Hermanus River gravel mine
- Numerous Sand Mines, including Kersfontein sand mine, Doornfontein sand mine,
- Assessment of nation-wide mining operations of Afrimat Limited (35+ mining sites)

Closure Applications (for mining and prospecting operations):

- Alexkor SOC – Compilation of Closure Plan
- SANRAL and provincial Road contract quarries and borrow pits, (Stilbaai, Graafwater, Hopetown-Strydenberg)

Contact Number:

Should the reader require specific information on any aspect of the above, please contact Jaques van der Vyver at telephone number: (021) 8544260.

Appendix 3:
Socio-Economic (Notifications and responses to date)

TO BE COMPLETED FOLLOWING FIRST ROUND OF PUBLIC PARTICIPATION

**Appendix 4:
Site (Mine) Layout Plan**

Karusa North Mine Layout Plan



0 37.5 75 m 1:5,000@A3

- Mining permit Boundary (9.454ha)
- Trench Excavations (+-2ha)
- Internal Haul Roads
- Topsoil Berms
- Drainage channel with existing channel crossing

Existing Farm Roads

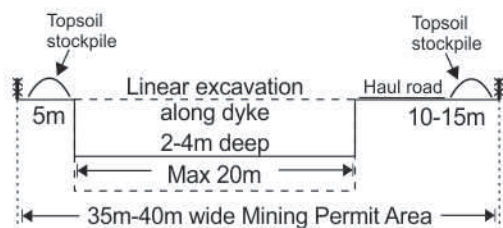
RE/209

Existing Farm Road crossing

Existing Farm Roads

Diagrammatical cross-section and plan of mining area

CROSS SECTION



PLAN

